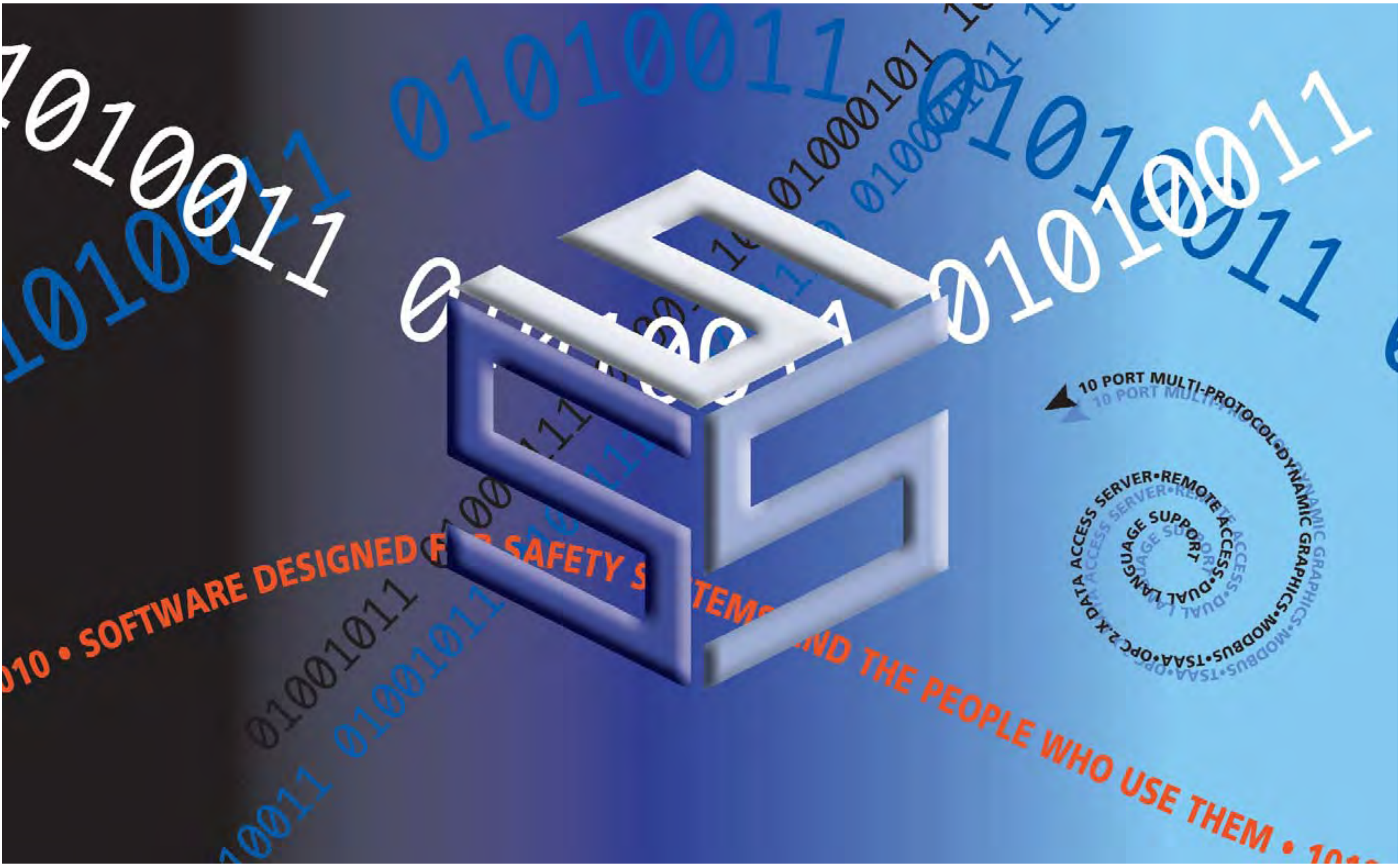

Safety System Software (S^3)

VERSION 3.1

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What is S^3?

Safety System Software (S^3) is a complete, high performance Human Machine Interface software package that is designed to work seamlessly with a variety of Safety Systems including all three generations of the Detector Electronics “Eagle ” addressable systems. It allows data to be acquired from these systems for event and alarm tracking, display on custom graphics, and to be shared with other systems.

When used as an Operator Interface Station (OIS) it also allows commands to be sent to attached systems to perform a variety of functions. S^3 also provides convenient and accurate device configuration, programming and diagnostic tools.

There are no cumbersome keyboard commands for the operator to learn. The entire interface is graphic in nature. Onscreen point and click icons allow convenient navigation through the application with easy access to the various features.

The S^3 database contains all of the information needed to allow for easy and accurate configuration. All pertinent information for the device being configured including user selectable options is displayed on an easy to understand “point configuration screen”. From this screen the configuration can be viewed and changes can be made as desired.

Pre-configured “Point Display Screens” present data for complex networked devices as well as conventional ones in a consolidated and easy to understand format. With Eagle Quantum Premier devices, each node on the network provides detailed status information, recent alarms and calibration records.

S^3 also provides password protection for up to 64 different user accounts to keep unauthorized personnel from modifying system configurations, and thousands of user levels for accessing command and control functions.

In short, S^3 collects, tracks, displays and distributes your safety system information while allowing intuitive operator input for command and control functions of these safety systems.

Features

- User friendly point and click navigation, with no special keyboard commands to learn.
- Menu driven configuration ensures easy installation or modification.
- Configuration additions or changes can be made at any time with minimal interruption to system operation.
- Alarm and calibration data available online.
- Automatic diagnostics ensures reliable system operation.
- Up to 10 simultaneous active communication ports.
- Automatic serial port configuration; baud rate, data bits, stop bits, parity.
- OPC 2.03 Data Access Server option to share data with outside systems.
- Complete logic programming and simulation environment.
- Comprehensive “event tracking” for up to 250,000 unique tags.
- Event logging to screen, disk, and printer.
- Single window view of data from a variety of sources.
- Up to 256 custom graphics with support for mid-level overviews and a custom full-system overview.
- Custom graphics can be created in a wide range of high resolution formats from XGA at the “low end” to HDTV at the high end.
- Support for true color graphics with import capability.
- “Z-Axis” linking and navigation capability in the graphics engine to better support and portray multi-level facilities like oil platforms.
- Bilingual support for online operations.
- Multi-level security for up to 64 unique accounts.
- Project based development environment for managing multiple projects.
- Printing of comprehensive project documentation.
- Integral project backup and restore utility.
- Complete configuration logging for tracking changes to setpoints, device configurations, downloads, etc.

Requirements

The minimum S^3 workstation hardware requirements are:

Computer. The S^3 software suite is designed to run on an Intel® based computer with at least a 800 MHz Pentium III processor, running Microsoft Windows 2000 or Windows XP Professional. Although the software can be used with Windows 95/98 and Windows N 4.0, Windows 2000 or Windows XP Professional are the preferred operating systems. As with many modern programs, the faster the machine, the better the performance.

A hard drive with at least fifty megabytes free and a CD-ROM drive is also required for installation.

Memory. S^3 Safety System Software is a high performance Operator Interface System (OIS) environment and requires a minimum of 256 MB of physical memory. When custom graphics are included in a project the memory footprint grows by 1MB per screen, based on XGA screen resolution, higher resolutions require more memory. Det-Tronics typically provides a minimum of 512MB of physical RAM in its OIS installations.

Display. S^3 requires thousands of colors (16 bit) and a minimum display resolution of 1024 pixels wide by 768 pixels high (XGA). Software support for touchscreens is included.

Serial Ports. S^3 is designed to utilize up to ten high speed serial ports, all running at up to 57.6 kbps simultaneously — typically this includes the two serial ports available on the motherboard of the computer, plus up to eight additional ports on an expansion card with a serial co-processor. USB to serial converters are supported.

Ethernet. S^3 can communicate with some systems via a single or redundant Ethernet connection. Each network card must have a separate, fixed, TCP/IP address.

Printers. The system can utilize any properly installed printer for documentation purposes. For on-line alarm monitoring a serial printer port must be configured through the "Ports" screen, and the appropriate printer attached. S^3 is designed to work with a serial version of the Okidata ML590 four color, tractor feed, dot matrix printer.

S^3 Architecture

The S^3 software suite is divided into two distinct environments, Configuration and Online Monitoring.

The Configuration environment revolves around device/database configuration, graphics generation, project management and documentation.

The Online environment involves utilizing these configurations to collect distribute and display the information to operations personnel.

These two environments are summarized below.

S^3 Configuration Environment

This environment is utilized to configure the system for operation. The following primary functions are accessible:

- Configuration of communication ports which allow data to be collected from attached systems. This includes port type selection, protocol selection, and the manipulation of any adjustable parameters.
- Configuration of supported addressable field devices.
- Programming and simulation of supported logic solvers.
- Creation and editing of the second language database.
- Tag name development, alarm and event tracking configuration.
- Creation of custom graphics.
- Global operational parameter adjustments such as time & date format, touchscreen support, remote connection parameters, custom sound library management, etc.
- Project management tools to allow for multiple projects to be developed on one machine. This includes an integral project based backup and restore utility
- Security administration allowing for the creation and maintenance of user accounts.
- The ability to print selectable detailed project documentation.

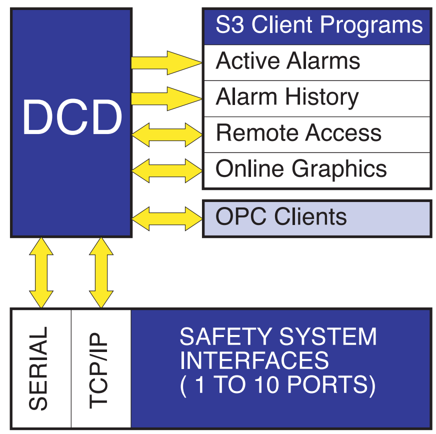
S^3 Online Environment

The S^3 software suite consists of a number of separate application programs that work together to collect, distribute and display data from a variety of sources.

At the center of the suite is an application program called the “Data Collector and Distributor” or “DCD” for short.

DCD

The DCD is the heart of all online operations. It handles all of the OIS communication processes including serial communications to attached systems, TCP/IP communication with attached systems, communication with OPC clients, and peer-to-peer communications with other S^3 application programs both local and remote.



The DCD can control up to ten communication ports, either individual serial ports or TCP/IP connections.

It collects data from these ports to update the tag database in accordance with the configurations of the individual attached systems.

Other S^3 application programs query the DCD to perform their individual functions such as, updating the active alarm list, generating the alarm history and daily log, providing dynamic data for the online graphics and servicing remote access requests.

Installation Options

There are three installation options available depending on how the workstation is to be used. They are; Operations, Development, and Demo.

Operations Installation Selection

This installation is designed for full time Operator Interface Station (OIS) operations where the system will be "online" around the clock and will be used by operations personnel as a window into the safety system.

If the "Operations" selection is used for installation, the system will be configured as a secure stand-alone OIS with tight security restrictions installed at the lowest levels of the operating system.

The user must be logged into the Windows-NT/2000/XP system as the "Administrator" in order to install this option.

When the "Operations" installation is used S^3 takes complete control of the workstation and when "Online" access to the operating system will not be allowed. In addition, access to other application programs or Windows functions such as "CTL-ALT-DEL", "ALT-TAB", etc. will not be available.

The "Operations" installation also configures the system so that on a loss of power (or other event that causes a system restart) the OIS will automatically return to its previous state. S^3 will automatically restart and if online prior to the event will return online with the last valid user logged in as the current user. If not online the station will return to the S^3 Main Screen.

Development & Demo Installation Selection

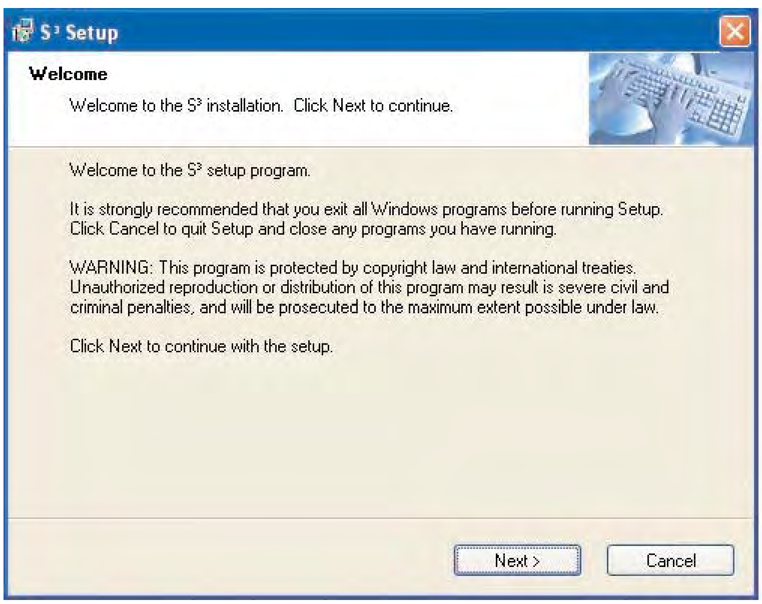
Either the "Development" or "Windows 95/98 Demo" installations do not install the low level security features of the "Operations" version. User level security is still utilized but full access to the operating system is available in a manner consistent with the given operating system.

When S^3 software is ordered with the OIS computer, the software will come already loaded on the hard disk of the computer. If S^3 software is ordered separately, if re-installation of the original software becomes necessary, or if a software update is to be installed, use the following procedure.

NOTE: If S^3 software is currently running, return to the System Overview screen and quit S^3 before installing the software.

Installation Procedure

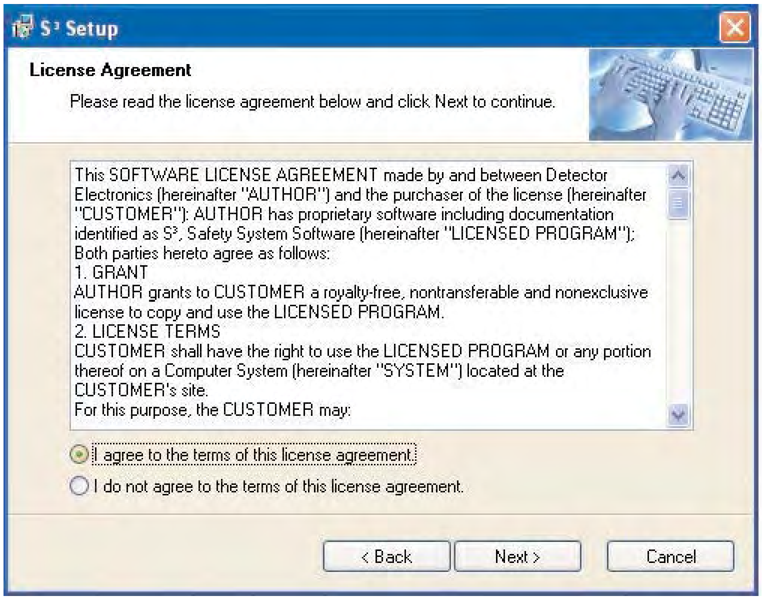
1. Insert the S^3 CD into the CD-ROM drive. Open the CD drive icon and double click on "install."



This will open the "Setup" dialog box with instructions on how to continue.

Clicking on the "Next" button will advance to the license screen.

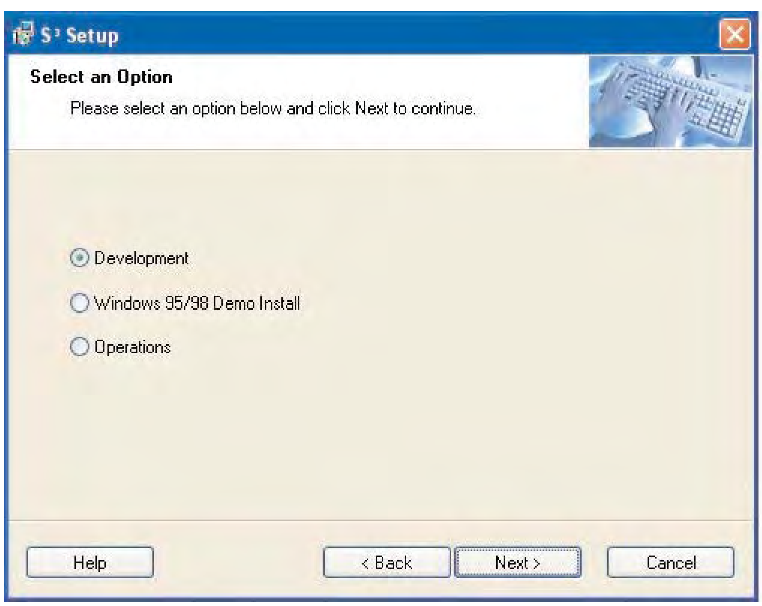
2. This step presents the Detector Electronics software license agree-



ment. Read the agreement and choose the appropriate radio button.

Use the "Next" button to continue.

3. Choose one of the three types of installation:
Click the Finish button.



4. A final message will inform of the location of the software. Click OK. Reboot the system as required.

Hardware Keys

A hardware key which attaches to the workstation determines the options that will be enabled on the station.

The hardware keys are available in two versions; one for the standard DB-25 Parallel printer port and the other for a USB port.

This “Standard” hardware key is programmable to enable a variety of options.

The “Standard” Configuration/Runtime Key

This key will allow communication with and the configuration of Detector Electronics Corporations “Eagle” addressable Fire & Gas systems. (EAGLE2000 “E2K”, Eagle Quantum “EQ”, Eagle Quantum Premier “EQP”)

The Configuration/Runtime key enables the following features:

The ability to utilize up to 10 serial ports to communicate with multiple Eagle systems.

The ability to configure any of the field devices and download this configuration to them.

The ability to program, simulate, monitor and document logic for the supported controllers.

The ability to look at the “real time status” of any attached Eagle field device through pre-built “point-displays”.

Enables the DCD program allowing it to run.

The ability to utilize a configuration engineered with the developers key to communicate via up to 10 ports.

The ability to display dynamic data on custom graphics.

The ability to log to screen, disk, and printer any configured events for any of the attached systems.

This key does not allow the development of custom graphics but does allow online operation with graphics created with a developers key.

Note

A variety of options are available and when purchased will be enabled by the key. These include the following:

- *Expansion of EQP network from 60 to 250 nodes.*
- *Enabling additional communication ports. Up to 10 total can be enabled.*
- *Enabling the EQP OPC Data Access Server feature imbedded in the DCD.*
- *Enabling Modbus RTU serial and/or Modbus TCP Ethernet ports.*
- *Enabling Triconex serial and/or TSAA Ethernet ports.*

Developer Key

This key is typically used on Engineering development stations or Operator Interface Stations where the ability to edit the online graphics is required.

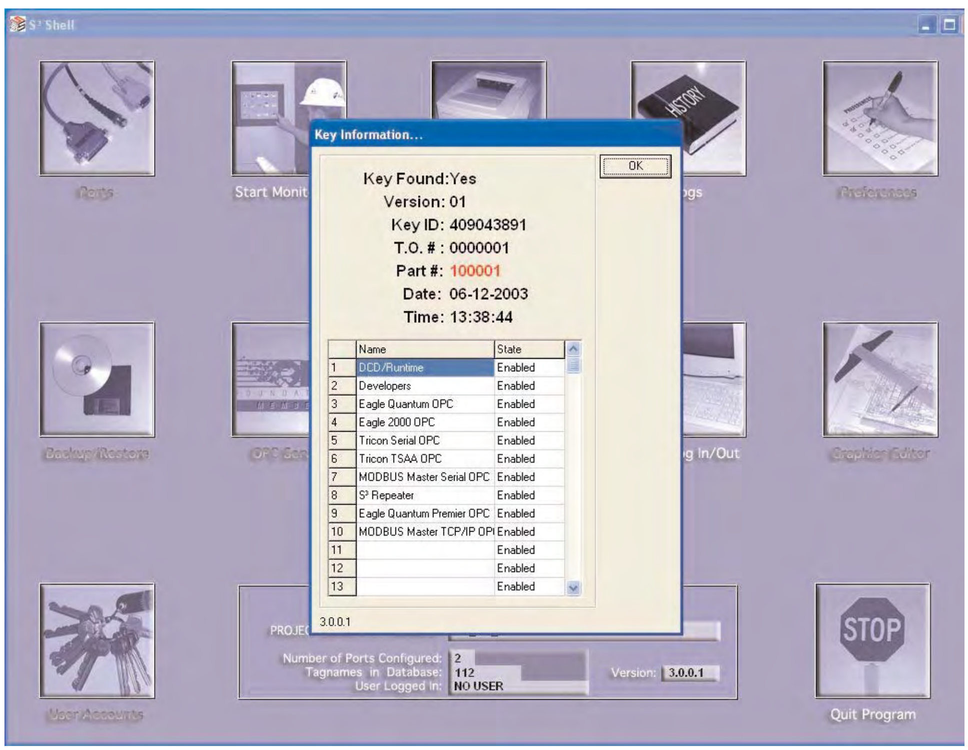
The developer key enables the following features:

All features listed for the “Standard” Configuration/Runtime key.

The ability to create or edit custom graphics.

Hardware “Key Check”

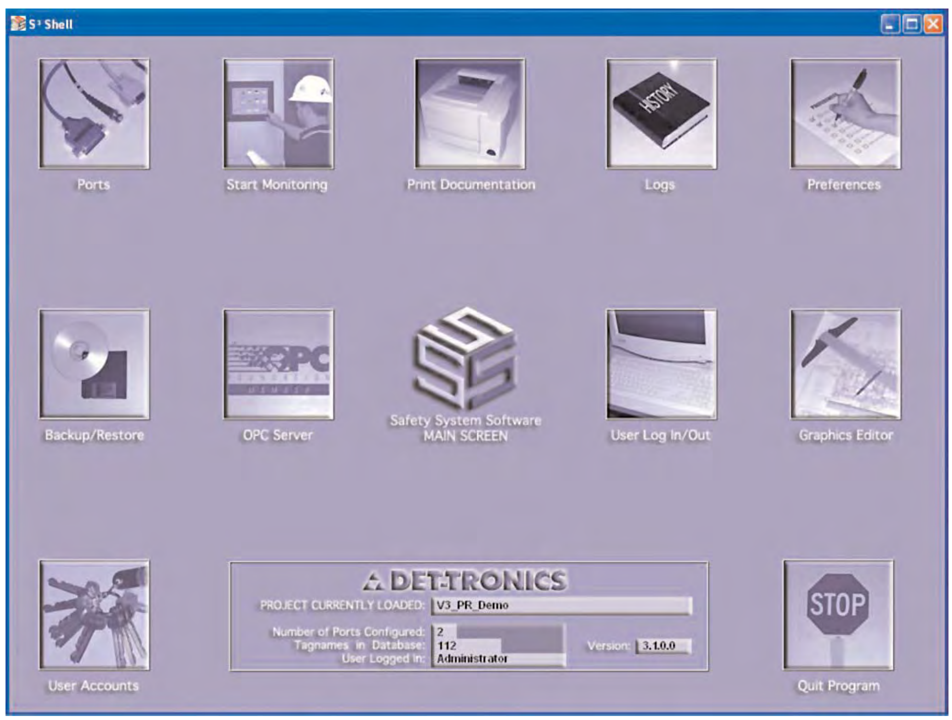
From the main screen, pressing the “K” key on the keyboard will querry the hardware key and display its configuration on screen.



S^3 Configuration

When the S^3 application program is started it will display its "MAIN SCREEN". From this screen you are able to access all of the engineering, configuration and utility programs that make up the S^3 application suite.

There are eleven buttons on this screen, each one provides access to a different area of the application suite.



Main Screen

Before any work can be done the user must "log in" to the system with a valid password utilizing the "Log In/Out" button.

The access privileges for the users account will determine what features will be available for access and the buttons for these features will then be enabled.

Ports

Provides access to the "Port Configuration" screen. From that screen up to ten (10) ports can be configured for access to attached systems via serial connection, or ethernet.

Start Monitoring

Launches the main online monitoring application (DCD) which starts continuous polling of all enabled ports and begins event monitoring, logging and printing. If so configured, it also displays custom graphics with dynamic data overlayed.

Print Documentation

Provides access to the project configuration documentation features of the system. Complete documentation of port, point, and event configurations for all attached devices can be selected for printing on the Windows default printer.

Logs

Allows access to both the configuration logs and daily log files. The configuration logs track all configuration changes made to the system while the daily logs store events monitored online and are stored by day.

Preferences

Provides access to a wide range of global preferences including the ability to select the currently active project, second language support, sound library configuration, day/date/time options, screensaver options and more.

Backups

Provides access to the project backup and restore utility. This automated utility allows a selected project to archived to or restored from floppy. Built in compression routines allow even large projects to be backed up.

Log In/Out

Provides access to the user “Log In” screen. Up to 64 unique password protected user accounts can be configured, each having different rights and privileges.

Passwords

Provides the system administrator with the tools for setting up and managing the individual user accounts. Individual users with valid accounts may also change their password from this utility.

Graphic Editor

Launches the S^3 graphic editor which is used to develop up to 256 custom graphics per project. The editor is a complete object based graphic development environment with easy to use “tag based” dynamic objects.

OPC Server

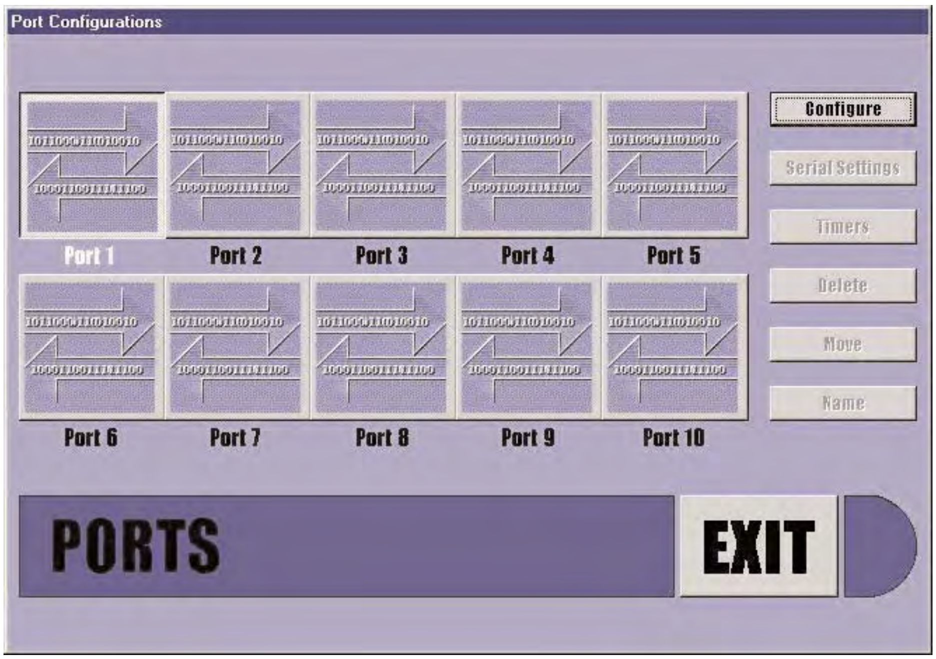
Allows the user to browse the tag name database and view the OPC properties of tags, to activate or deactivate either individual tags or groups of tags, and to document (print) the server configuration.

Basic Port Configuration

Clicking on the "Ports" button from the S^3 Navigation screen of the S^3 software brings up the Port Configurations dialog box:

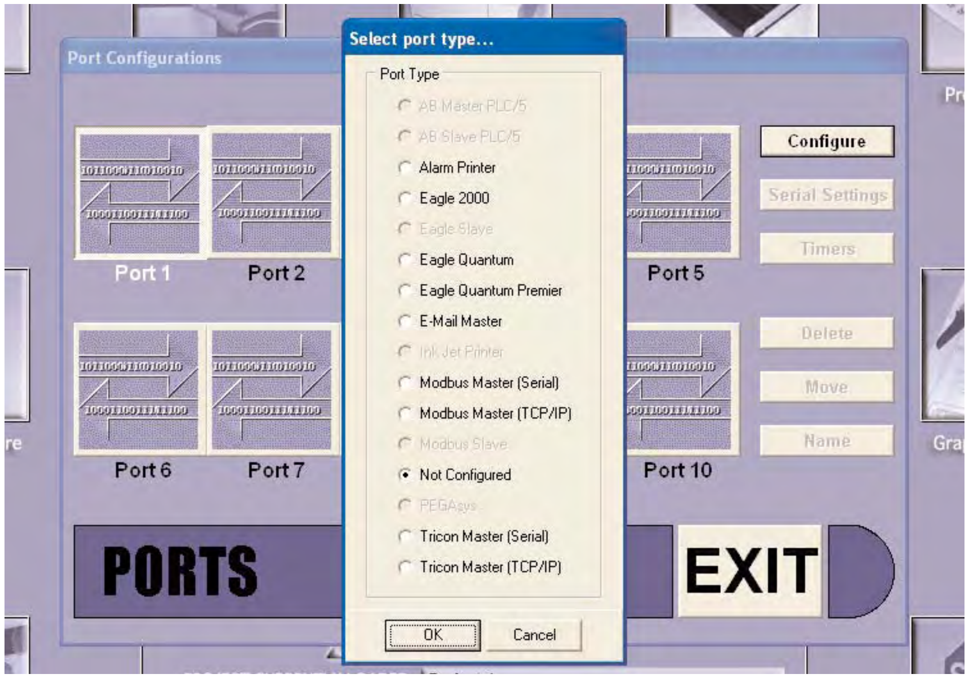
S^3 offers ten ports, each of which can be configured to a specific type of system or device.

By default, when the Port Configurations dialog box first appears, Port 1 is selected.



Choosing the "Configure" button from the "Port Configurations" dialog box, the "Select port type" dialog box appears.

The available choices are based on the S3 hardware key plugged into the computer. Only supported systems or devices are darkened.

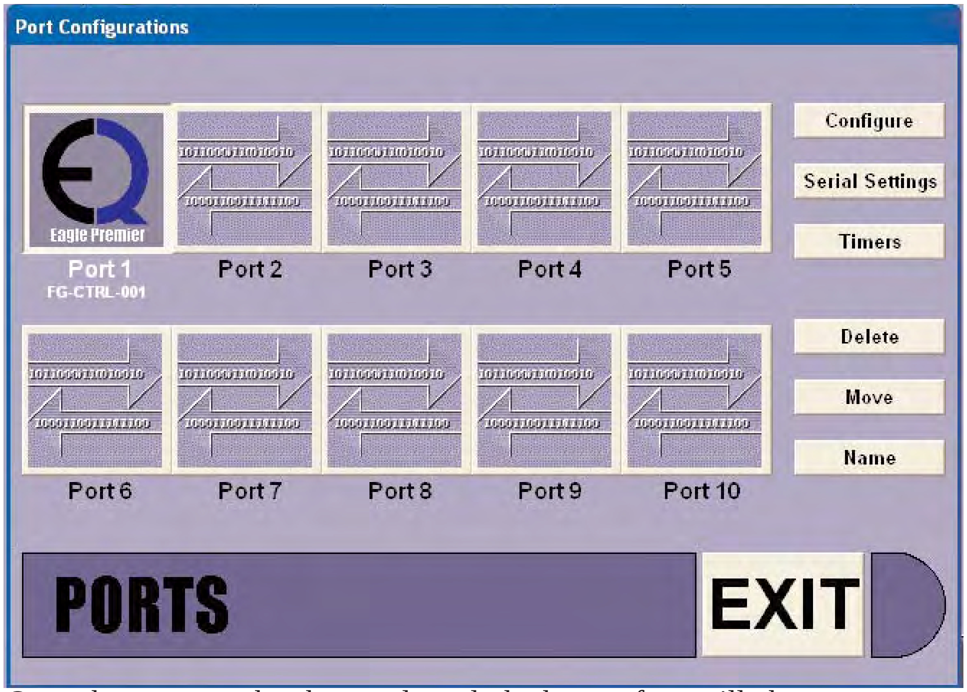


“Not Configured” is the default selection, simply select the radio button for the type of port to be created and click OK. This will take you to the main configuration screen for the selected port type. Clicking on Cancel will return to the Port Configurations dialog box without any change.

Refer to the appropriate section of this manual for details on specific port type configurations.

From the main configuration screen for the selected port type, choose “Exit” to return to the Port Configuration screen.

New port types are constantly under development. Information on new port type support and the latest information on S³ updates can be obtained through the Detector Electronics website at www.detronics.com.



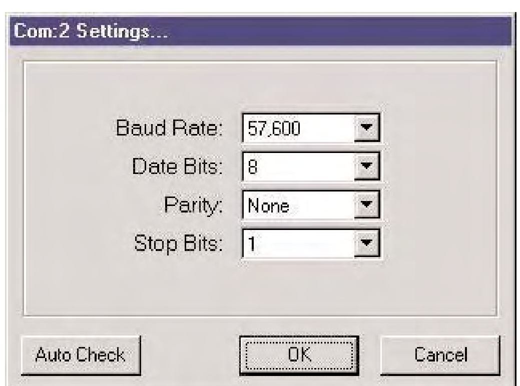
Once the port type has been selected, the button face will change to match the selection. In addition, six buttons on the right hand side of the window will be enabled. These buttons allow various parameters to be adjusted for any configured port.

Configuration of the device(s) attached to a port, data table reads, etc. are accessed by double-clicking on the port button, or selecting the “Configure” button.

Physical serial port configuration parameters like baud rate, the number of data bits, etc. can be accessed using the “Serial Settings” button. This will open a dialog box allowing the adjustment of the port parameters.

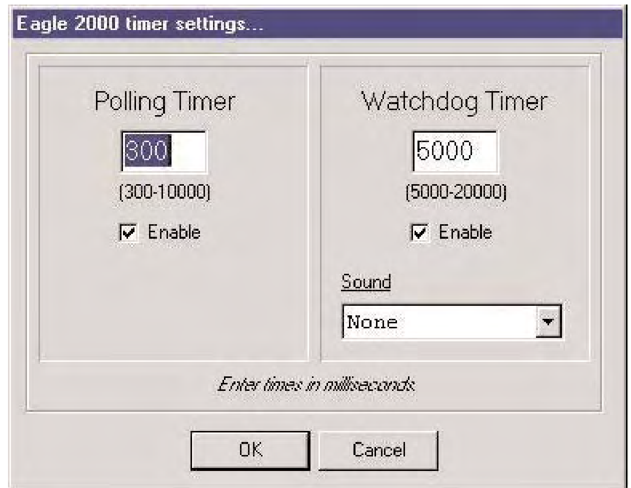
You can manually set the port parameters from the pull-down menus.

Selecting the “Auto Check” button will cause the software to cycle through all combinations until it can connect. It will then display the successful settings.

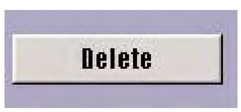


The “Timers” button will open a dialog box allowing the “Polling” and “Watchdog” timers for the port to be set. There are also checkboxes to enable each of these timers.

The Polling Timer determines how quickly the port will poll the attached slave.



The Watchdog Timer determines how long to wait for a response from the slave before logging a watchdog fault. A sound can be tied to this fault from a pulldown menu.



The “Delete” button allows the removal of a port from the system configuration. Port deletions are <u>final</u>, there is no “undo”, use with care.

The “Move” button allows a fully configured port to be relocated to a different port while preserving its configuration.

******NOTE******

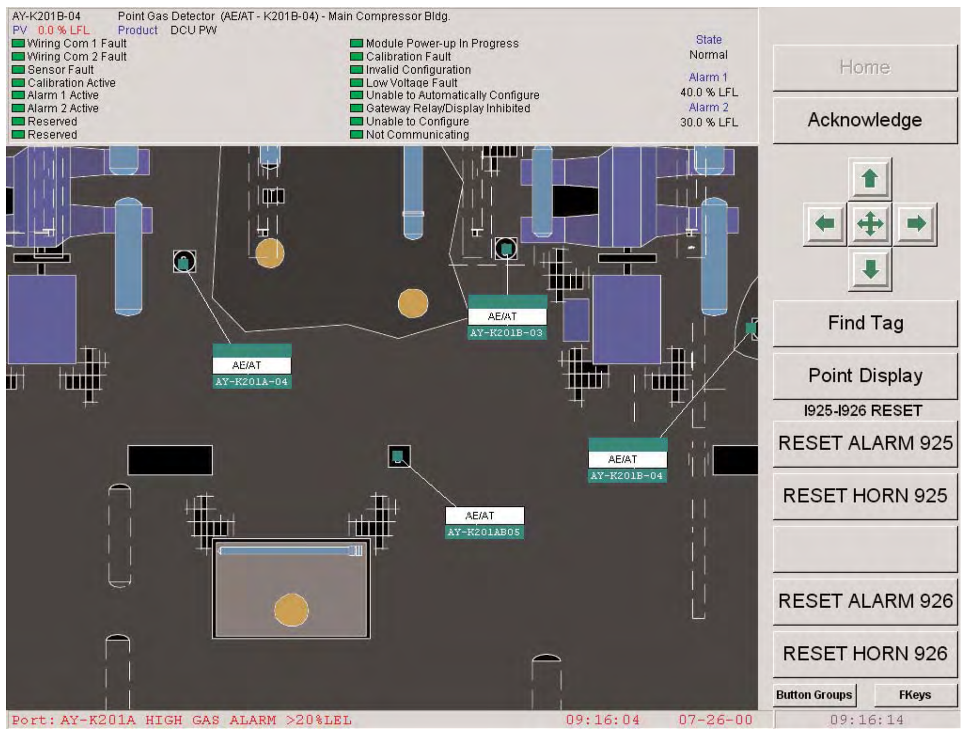
Moving a port will have no impact on the graphics since the dynamic and TAG objects are based on the tag name not the port.

The “Name” button allows a name to be associated with a port. This name will then show up in the printed documentation for the port. It has no other purpose except for the printed documentation.

Start Monitoring

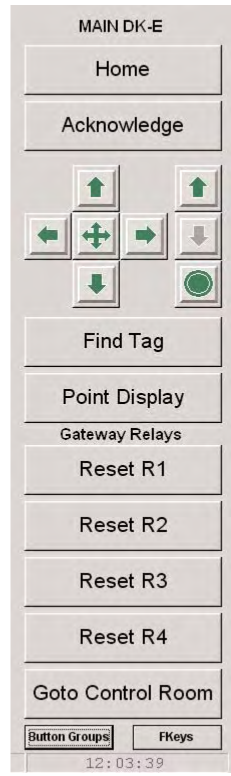
The “Start Monitoring” button launches the DCD entering the “Online Mode.” Online mode, provides the operator with continuously updated information about the attached systems and this data may be displayed on custom graphics typically depicting the facility.

The main window of the Online application is divided into four areas. Running across the top is the “Mini Point Display” which provides

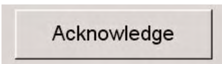


details on points selected in the graphic window. Running down the right side is the Navigation & Control area with buttons for moving around the graphics and initiating commands to the system. Filling the large center portion of the display is the Main Graphic Area showing the custom graphic. At the bottom of the screen is a “one-line” event display showing the most recent event. In the lower right corner is the clock.

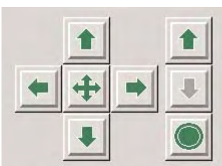
On the right side of the screen a series of navigation and command buttons will be shown, which are configured in the graphic editor. These are the Home, Acknowledge, Find Tag, Point Display, Button Groups, and Fkeys. Above the Home command button the name of the active screen is displayed as a label. Below the Point Display button the name of the active group of user-defined buttons is displayed.



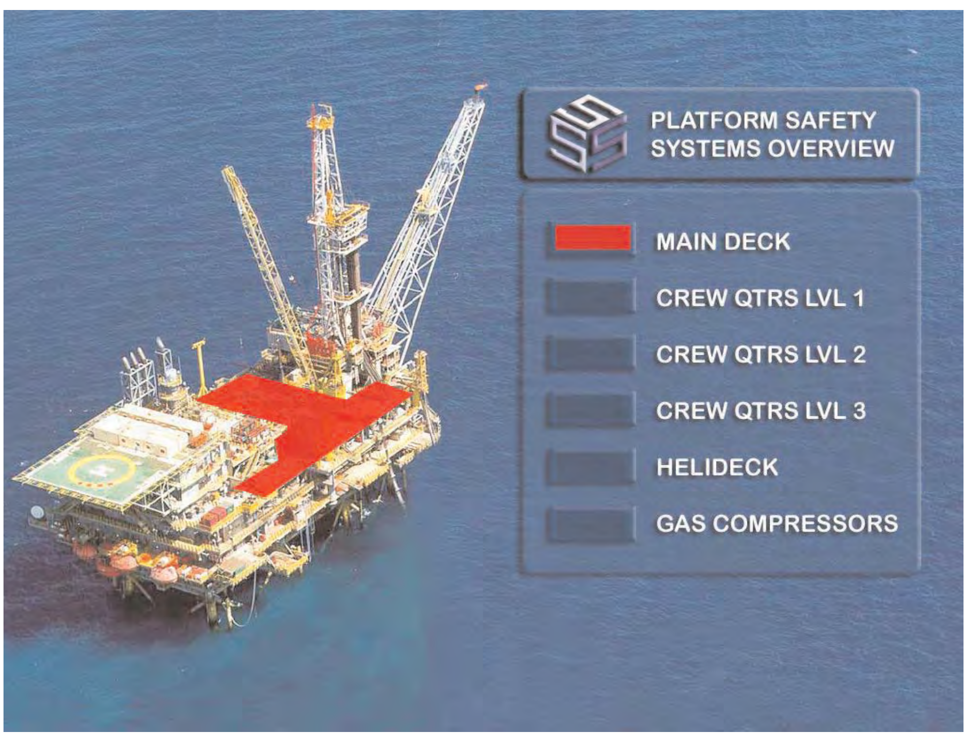
Takes the user directly to the screen defined as the "Home screen" in the graphic editor.



Silences audible alarms and causes TAG objects to go from a flashing "new alarm" state to a steady "acknowledged alarm" color, as defined in the graphic editor.

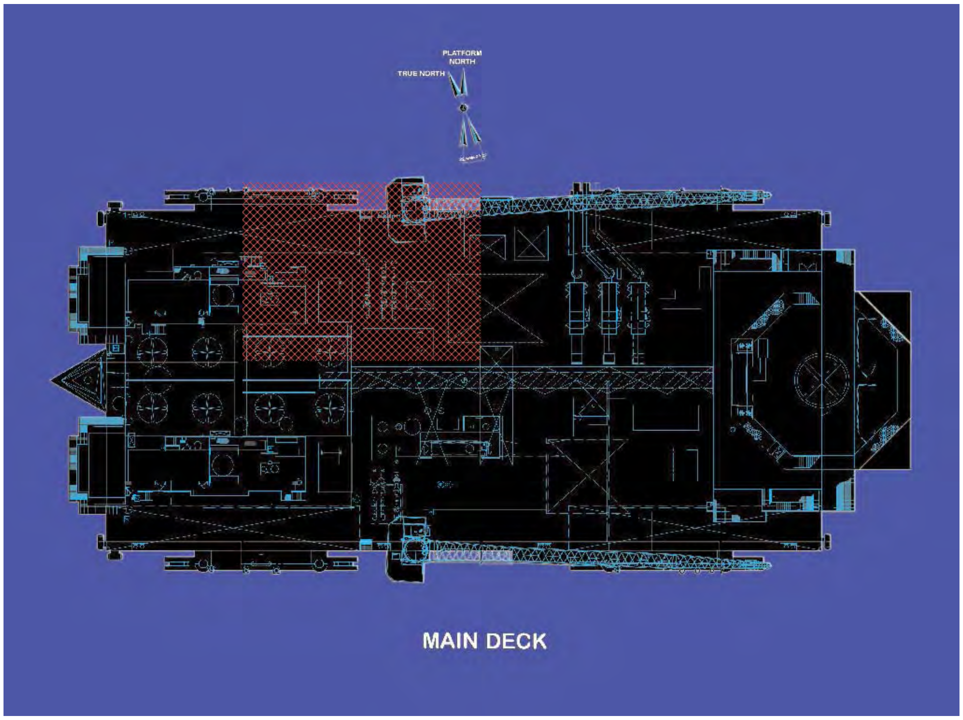


The arrow keys allow navigation between the different custom graphic screens. Green arrows indicate a screen exists in the direction of the arrow. Selecting the arrow will cause the display to scroll in the arrows direction, to the next screen. A gray arrow indicates there is no screen in that direction. The "arrow cross" in the center zooms out to the main overview display.

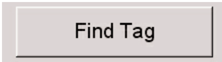


Above is a sample of a "Custom Overview" screen.

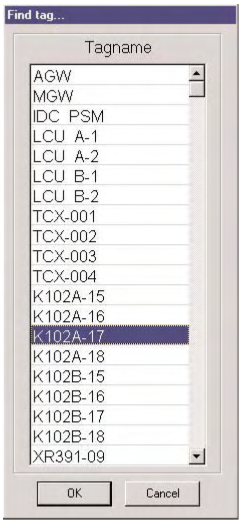
The three buttons on the right side of the arrow cross are for “Z-Axis” navigation, moving up or down when 3-D links are established. The bottom button with the green circle will zoom out to the Mid-Level overview if one exists.



Above is a sample “Mid-Level Overview” screen.



Is used to find the location of a particular tag on the custom graphics.



This method of navigation is used when an operator knows the tagname of a device and wants to quickly find out its status.

The “Find Tag” button opens a dialog box which displays the tagname database. The tagnames are displayed in alphabetical order.

Selecting a tag name from the scrolling list and clicking the “OK” button or double-clicking on a tag name will cause S^3 to display the nearest graphic screen that has a TAG object for that tagname.

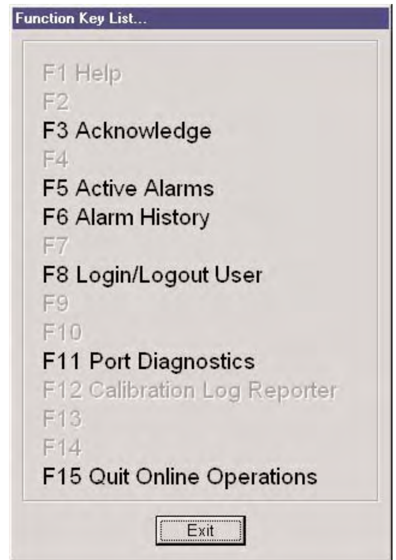
Shows the user detailed information about a selected TAG object. Each type of device, digital inputs, analog inputs, fire detectors, gas detectors etc. have a different type of point display, tailored to the amount and type of data available for that specific device.

The sample point display above is for an addressable combustible gas detector.

Displays a list of defined button groups so the user can select and display the group. Each button group has up to five buttons that can be used to change screens, send commands to attached systems, etc. The user can only select button groups that are "enabled" for the current graphic screen. Button groups are defined in the graphic editor.

Displays the "Function Key List" available online for faster execution of functions.

The program functions with assigned Fkeys include the Acknowledge, Alarm History, Log in/out, Port Diagnostics, Calibration Log Reporter, and Quit Online Operations.



Acknowledge (F3): Silences audible alarms, causes all TAG objects in a "New Alarm" state on the graphics to go to their "Acknowledged Alarm" state, and can also be configured to activate a user programmed button.

Active Alarms (F5): Opens the "Active Alarms" screen any "out of tolerance" conditions. Using the buttons at the bottom of the screen, these conditions can be sorted by communication port or viewed all together.

In the example below there are two active ports, Port 1 configured for Triconex system and Port 3 configured for a Quantum system. On the right side of the screen are a number of self-explanatory buttons for navigating the list, none are shown hilighted due to the shortness of the list in the example.

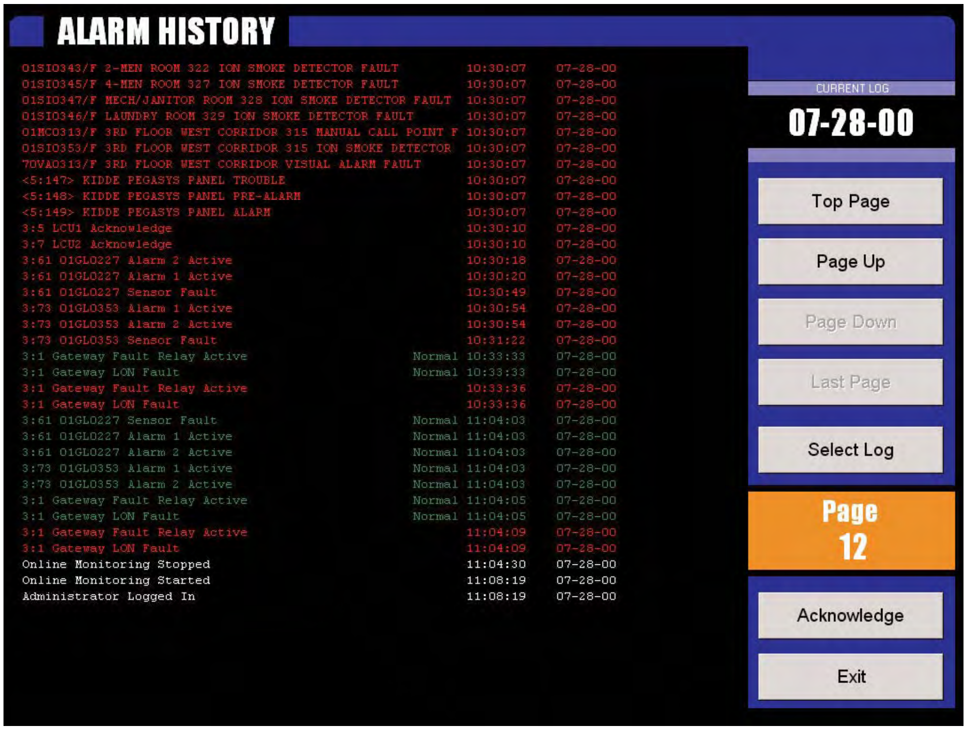
There is a counter at the top right indicating the current number of active

alarms. In the lower right there is a page indicator and buttons for Acknowledging alarms or exiting the display.

Alarm History (F6): Opens the “Alarm History” screen and displays the current days log. This daily log shows date and time stamped events for a 24 hour period.

It has two main areas, the historical display in the center and the navigation buttons running down the right side of the screen. In addition to viewing the current days log, the user can use the “Select Log” button to choose a log from another day.

The date of the log being displayed is shown at the top right of the display.

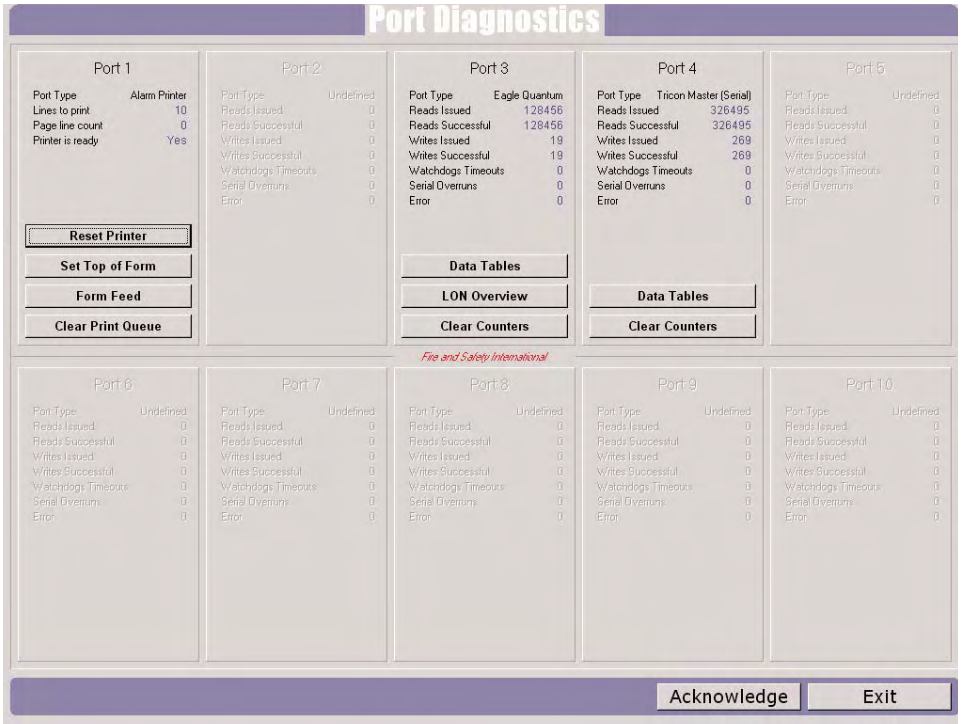


An acknowledge button is provided to acknowledge alarms without leaving the Alarm History screen.

Log in/out (F8): Up to 64 unique users can be configured, each having their own access privileges. This Fkey allows the current user to “log out”, or a new user to “log in” to the system. This action will be recorded in the Alarm History.

Port Diagnostics (F11): Opens the "Port Diagnostics" screen which displays the status of all ten communication ports.

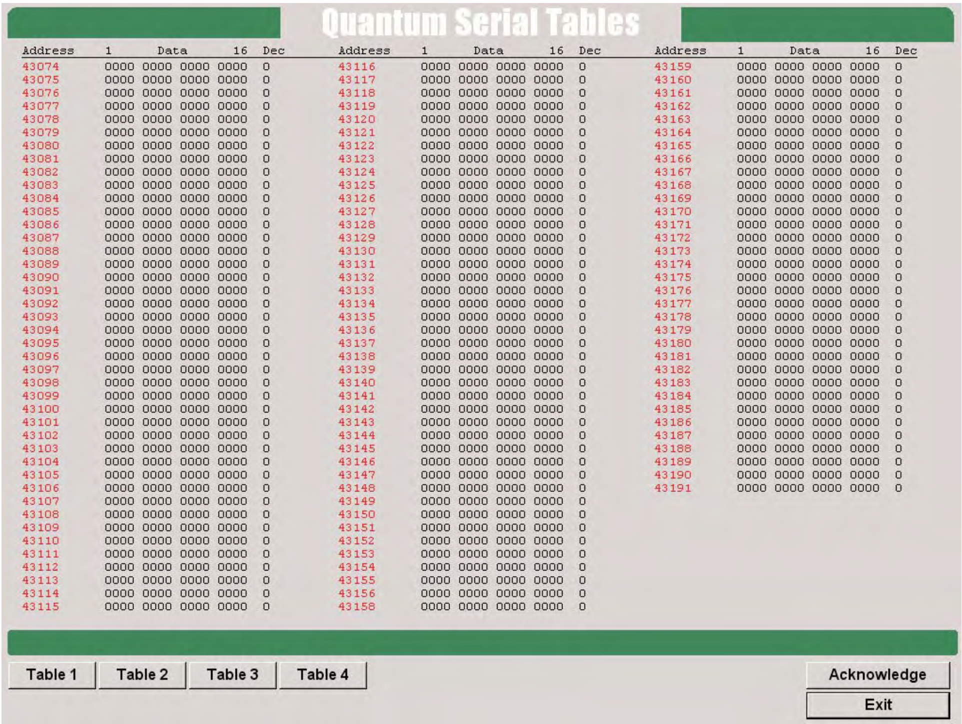
Dynamic counters display information on data reads issued and successful, writes issued and successful, and failures in communication between S^3 and the attached systems.



Each port type has buttons for accessing applicable features. These include a way display the ports data tables, a LON Overview for Eagle type ports and a way to clear the counters.

The "Printer" port type allows for printer control and maintenance. A "soft reset" of the printer can be performed as well as setting the top of form and initiating form feeds. In addition the printer event queue can be cleared.

Data Tables: The data tables show users the current information about addresses and bits being read from attached systems. stored in specific serial tables of a port.



Address	1 Data 16	Dec	Address	1 Data 16	Dec	Address	1 Data 16	Dec
43074	0000 0000 0000 0000	0	43116	0000 0000 0000 0000	0	43159	0000 0000 0000 0000	0
43075	0000 0000 0000 0000	0	43117	0000 0000 0000 0000	0	43160	0000 0000 0000 0000	0
43076	0000 0000 0000 0000	0	43118	0000 0000 0000 0000	0	43161	0000 0000 0000 0000	0
43077	0000 0000 0000 0000	0	43119	0000 0000 0000 0000	0	43162	0000 0000 0000 0000	0
43078	0000 0000 0000 0000	0	43120	0000 0000 0000 0000	0	43163	0000 0000 0000 0000	0
43079	0000 0000 0000 0000	0	43121	0000 0000 0000 0000	0	43164	0000 0000 0000 0000	0
43080	0000 0000 0000 0000	0	43122	0000 0000 0000 0000	0	43165	0000 0000 0000 0000	0
43081	0000 0000 0000 0000	0	43123	0000 0000 0000 0000	0	43166	0000 0000 0000 0000	0
43082	0000 0000 0000 0000	0	43124	0000 0000 0000 0000	0	43167	0000 0000 0000 0000	0
43083	0000 0000 0000 0000	0	43125	0000 0000 0000 0000	0	43168	0000 0000 0000 0000	0
43084	0000 0000 0000 0000	0	43126	0000 0000 0000 0000	0	43169	0000 0000 0000 0000	0
43085	0000 0000 0000 0000	0	43127	0000 0000 0000 0000	0	43170	0000 0000 0000 0000	0
43086	0000 0000 0000 0000	0	43128	0000 0000 0000 0000	0	43171	0000 0000 0000 0000	0
43087	0000 0000 0000 0000	0	43129	0000 0000 0000 0000	0	43172	0000 0000 0000 0000	0
43088	0000 0000 0000 0000	0	43130	0000 0000 0000 0000	0	43173	0000 0000 0000 0000	0
43089	0000 0000 0000 0000	0	43131	0000 0000 0000 0000	0	43174	0000 0000 0000 0000	0
43090	0000 0000 0000 0000	0	43132	0000 0000 0000 0000	0	43175	0000 0000 0000 0000	0
43091	0000 0000 0000 0000	0	43133	0000 0000 0000 0000	0	43176	0000 0000 0000 0000	0
43092	0000 0000 0000 0000	0	43134	0000 0000 0000 0000	0	43177	0000 0000 0000 0000	0
43093	0000 0000 0000 0000	0	43135	0000 0000 0000 0000	0	43178	0000 0000 0000 0000	0
43094	0000 0000 0000 0000	0	43136	0000 0000 0000 0000	0	43179	0000 0000 0000 0000	0
43095	0000 0000 0000 0000	0	43137	0000 0000 0000 0000	0	43180	0000 0000 0000 0000	0
43096	0000 0000 0000 0000	0	43138	0000 0000 0000 0000	0	43181	0000 0000 0000 0000	0
43097	0000 0000 0000 0000	0	43139	0000 0000 0000 0000	0	43182	0000 0000 0000 0000	0
43098	0000 0000 0000 0000	0	43140	0000 0000 0000 0000	0	43183	0000 0000 0000 0000	0
43099	0000 0000 0000 0000	0	43141	0000 0000 0000 0000	0	43184	0000 0000 0000 0000	0
43100	0000 0000 0000 0000	0	43142	0000 0000 0000 0000	0	43185	0000 0000 0000 0000	0
43101	0000 0000 0000 0000	0	43143	0000 0000 0000 0000	0	43186	0000 0000 0000 0000	0
43102	0000 0000 0000 0000	0	43144	0000 0000 0000 0000	0	43187	0000 0000 0000 0000	0
43103	0000 0000 0000 0000	0	43145	0000 0000 0000 0000	0	43188	0000 0000 0000 0000	0
43104	0000 0000 0000 0000	0	43146	0000 0000 0000 0000	0	43189	0000 0000 0000 0000	0
43105	0000 0000 0000 0000	0	43147	0000 0000 0000 0000	0	43190	0000 0000 0000 0000	0
43106	0000 0000 0000 0000	0	43148	0000 0000 0000 0000	0	43191	0000 0000 0000 0000	0
43107	0000 0000 0000 0000	0	43149	0000 0000 0000 0000	0			
43108	0000 0000 0000 0000	0	43150	0000 0000 0000 0000	0			
43109	0000 0000 0000 0000	0	43151	0000 0000 0000 0000	0			
43110	0000 0000 0000 0000	0	43152	0000 0000 0000 0000	0			
43111	0000 0000 0000 0000	0	43153	0000 0000 0000 0000	0			
43112	0000 0000 0000 0000	0	43154	0000 0000 0000 0000	0			
43113	0000 0000 0000 0000	0	43155	0000 0000 0000 0000	0			
43114	0000 0000 0000 0000	0	43156	0000 0000 0000 0000	0			
43115	0000 0000 0000 0000	0	43158	0000 0000 0000 0000	0			

This feature is typically used by maintenance personnel to determine if the selected port is reading the correct addresses and to do detailed troubleshooting.

Some port types allow for the configuration and polling of multiple data tables. All configured data tables are available for viewing by pressing the appropriate button at the lower left of the screen.

An “Acknowledge” button is provided to allow alarms and events to be acknowledged without leaving the data table screen.

LON Overview: Is a specialized diagnostic screen which displays a schematic representation of the addressable Eagle Quantum Premier, Eagle Quantum or EAGLE2000 loop.

Each device on the loop is represented by a rectangle containing the device tag and other information. The color of the rectangle represents the current status of the device.

Double clicking on the rectangle representing a particular point will display the “Point Display” for that unit. From the “Point Display” all of the available status and diagnostic details on a nodes can be viewed.

Additional viewing options that can display more information are accessed through a group of buttons in the lower right of the display.

State: The State button will display current condition of each device on the LON. There are five possible states, Normal, Fault, Alarm, New Fault, or New Alarm. Each state is represented by the color of the rectangle representing the device.

Direction: The "Direction display mode" is a troubleshooting tool designed to simplify finding LON based problems. In order to provide full value, the display must first be properly configured. The configuration involves reconciling the differences between the physical and logical addresses of the nodes.

Displays the devices color coded by the direction of the last received transmission. If a devices last message arrived from the left side of the LON its rectangle will be green, if from the right side it will be red.

In a properly operating LON there is no pattern to the colors and the device rectangles will appear to randomly change color. If there is a problem with the LON all devices on one side of the problem will be red and on the other side will be green. The transition point is where the problem is.

Display Type: It displays devices by devices name.

Acknowledge: It silences an activated alarm while being in the LON overview screen.

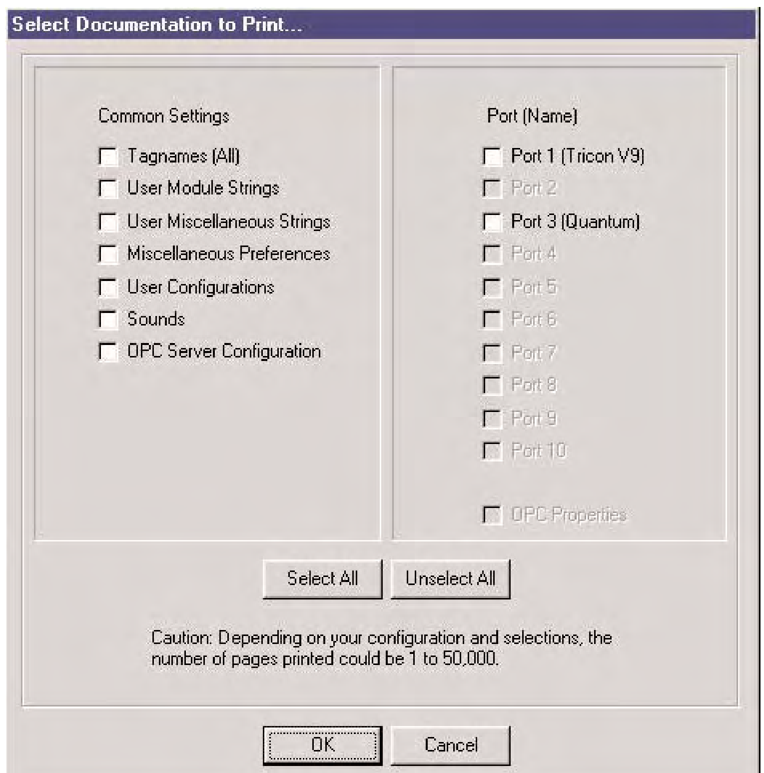
Exit: Takes the user out of the LON overview screen.

Acknowledge: Silences an activated alarm from the Port Diagnostics screen.

Print Documentation

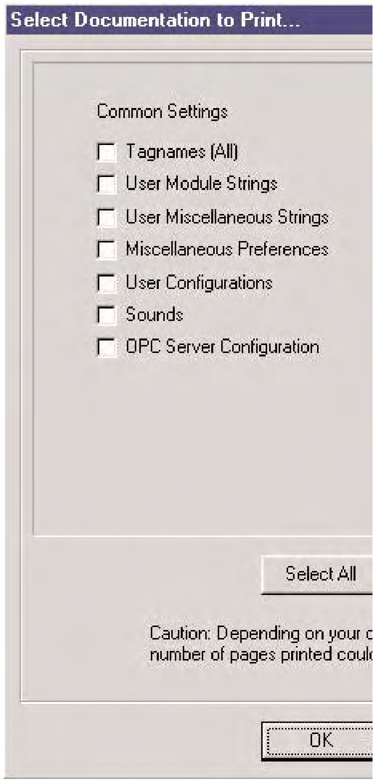
Using the Windows default local or network printer, S^3 can be print comprehensive documentation of port, point, and event configurations for all attached devices.

Selecting the “Print Documentation” button from the main screen will open a dialog box which allows the user to configure which portions of the documentation to print.



Choices are made using check boxes for both the type of documentation and the ports to be included. Using the select all button will provide total documentation of the system configuration. This could easily reach into hundreds of pages of printed documentation depending on the number of ports configured and their point configurations.

Tagnames
This selection prints a list of all tagnames used in the system.



User Module Strings
This selection prints the factory default and user configured "event descriptions" associated with the individual points.

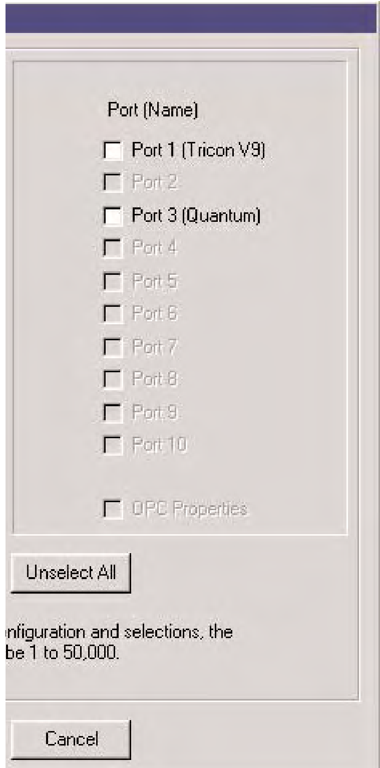
User Miscellaneous Strings
This selection prints the factory default and user configured substitutes for the descriptions of buttons and text used by the system in the "Online" mode. Examples of miscellaneous strings include the navigation button descriptions, function key list.and user configured buttons.

Miscellaneous Preferences
This selection prints certain configuration parameters in the graphic editor and online applications. In the graphic editor this includes the graphic grid spacing and polygon tool settings. In the online application it includes whether or not the acknowledge button silences custom sounds first, how may days alarm logs will be kept, whether the alternate language dictionary is configured to be used or not and whether to use a twelve or twenty four hour clock.

User Configuration
S^3 supports up to sixty four (64) unique user accounts, this selection prints all user account information except passwords. This includes whether or not the user can access the configuration programs, initiate send commands to attached devices, access port diagnostics and quit online operations.

Sounds
This selection prints a list of the custom sound library. Up to 64 custom sounds can be recorded and used by the system.

OPC Server Configuration
Prints a list of "Active" tags available to OPC Clients.



Port 1 - 10

S[3] supports up to ten ports. Each port can be physical serial port or an Ethernet connection.

Note: A single Ethernet card can support multiple ports!

In the example to the left, ports one and three are configured and therefore selectable. The unconfigured ports are grayed out.

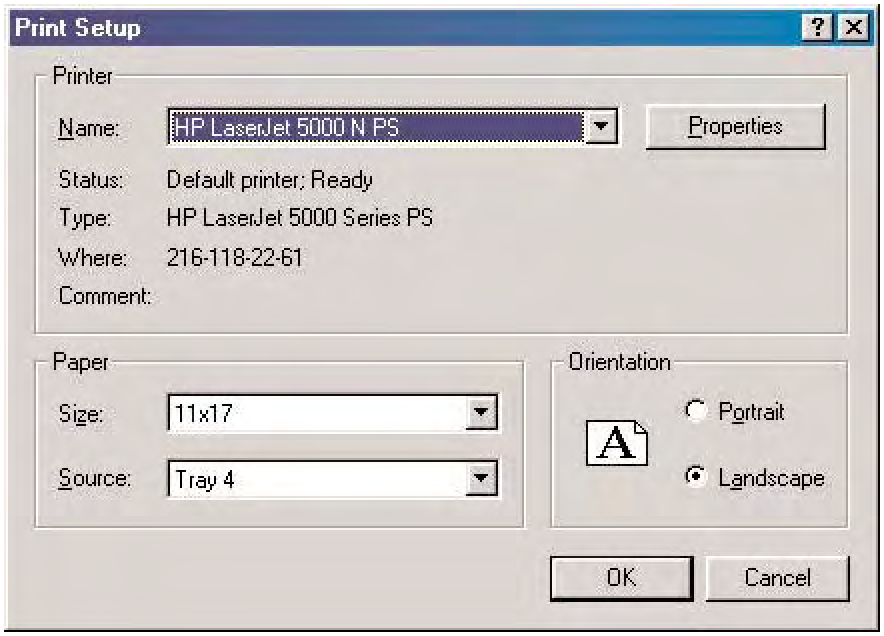
Each selected port will have its documentation printed.

Port documentation includes all aspects of the configuration including the communication parameters and any configured points, events, alarms, setpoints, custom event names, etc. Each configured point has one page of printed configuration data.

Once all of the selections for the documentation and ports to print have been made, select the “OK” button to access the “Print Setup” dialog box for the Windows-NT/2000/XP default printer and continue the printing process.

Once the print configuration is set, selecting OK will display the "Print Setup" dialog box for the Windows-NT/2000/XP default printer.

In the example below an HP LaserJet 5000 network printer is the Windows-NT/2000/XP default.



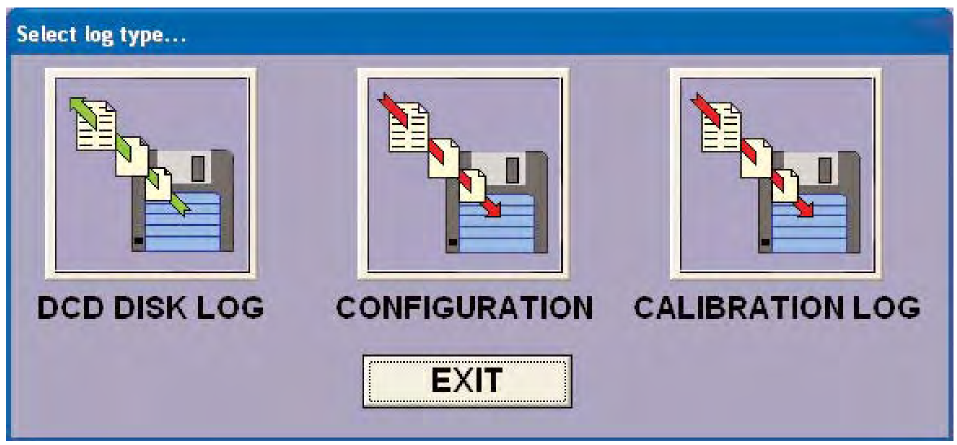
Depending on the default printer in your installation the dialog box and choices available will vary.

Note: The Okidata event and alarm printer specified for use with S^3 can be configured as the Windows-NT/2000/XP default printer and used for documentation. However, due to the volume of paper and printer speed it is not recommended.

Logs

S[3] maintains three different types of logs, disk, configuration and calibration. All can be viewed and printed from this utility.

Selecting the “Logs” button will display the “Select Log Type” window to choose which type of logs are to be accessed.



DCD Disk Log’s are a chronological list of alarms and events that have occured during a 24 hour period while the DCD was online. Each log runs from midnight to midnight and each days log is stored by date.

Configuration logs track all configuration changes made to the system including point creation and deletion, setpoint changes, etc.

Calibration logs are the collation of data from querries of the distributed calibration histories of field devices on the network. The user determines what port, what type of device, a time frame and S[3] will retrieve the data from the field devices and put it into a report.

You can view and print the daily disk or configuration log, or any previous logs from this utility.

Configuration Logs

Below is a sample configuration log. Running down the right hand side is the log name (which is the date), navigation buttons, a button to select a different log for viewing, the page indicator for the currently viewed log, a print button and an exit button.

The purpose for the configuration log is to provide an audit trail for safety related changes to the system. By examining the configuration log you can tell if tagnames were changed, if alarm setpoints were changed in the detector configurations, if these changes were downloaded to the system or not.

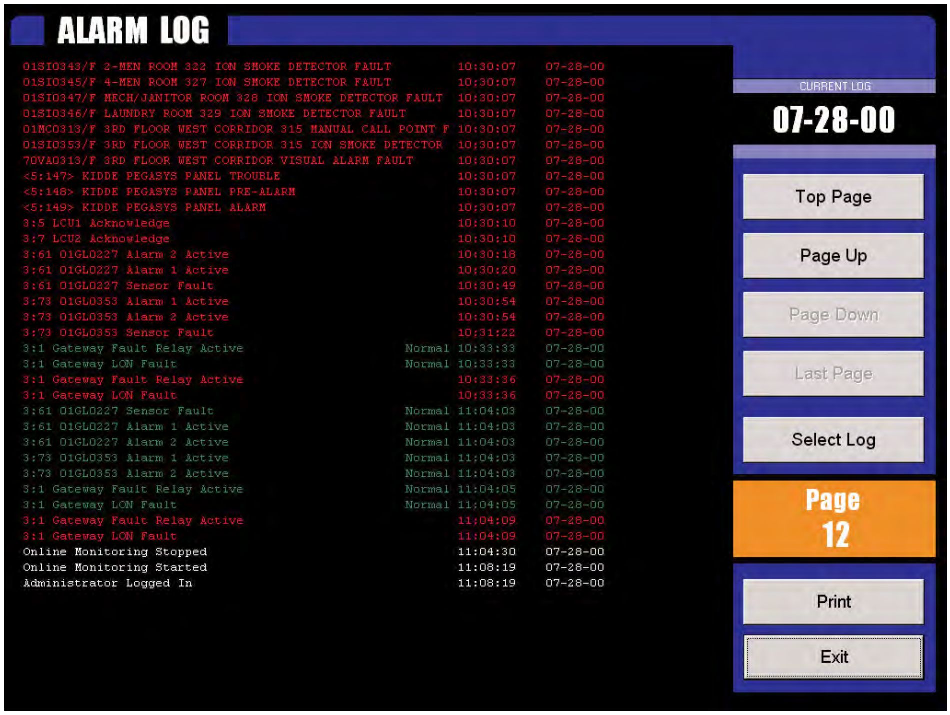
The log is formatted in three columns, the first contains the time, the second the date and the third a description of the change.

The change column may use two lines to log the change. In these cases the first line contains the port number, point number, and tag name. The second line contains the description of the change.

Note: The configuration log tracks changes related to operation and safety only. Changes to graphics are not logged.

Alarm Logs

Below is a sample alarm log. Running down the right hand side is the log name (which is the date), navigation buttons, a button to select a different log for viewing, the page indicator for the currently viewed log, a print button and an exit button.



The purpose for the alarm log is to allow a provide a chronological history of events related to the system. These recorded "events".can indicate alarms, diagnostic information, or just out of tolerance conditions as defined by the user.

During the detailed port configuration process events are configured and their destinations determined. One of these destinations is the daily log.

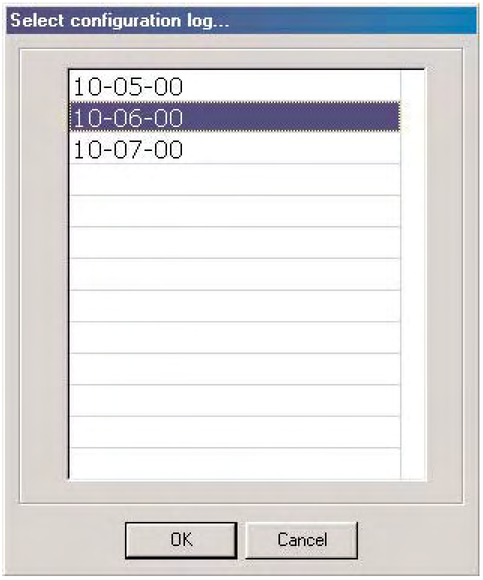
Events can appear in any of four colors, red, green, blue, and white.

Note: Events configured as "white" that also go to the alarm printer will print in "black".

The log is formatted in four columns, the first contains the event name, the second a return to "Normal" indicator, the time and date are displayed in columns three and four.

With either the Configuration or Alarm log, you can choose to open, view and print previous logs by using the “Select Log” button.

This will display a standard Windows-NT/2000/XP file navigation dialog box showing the content of the configuration or alarm log sub-directory, which ever is applicable.



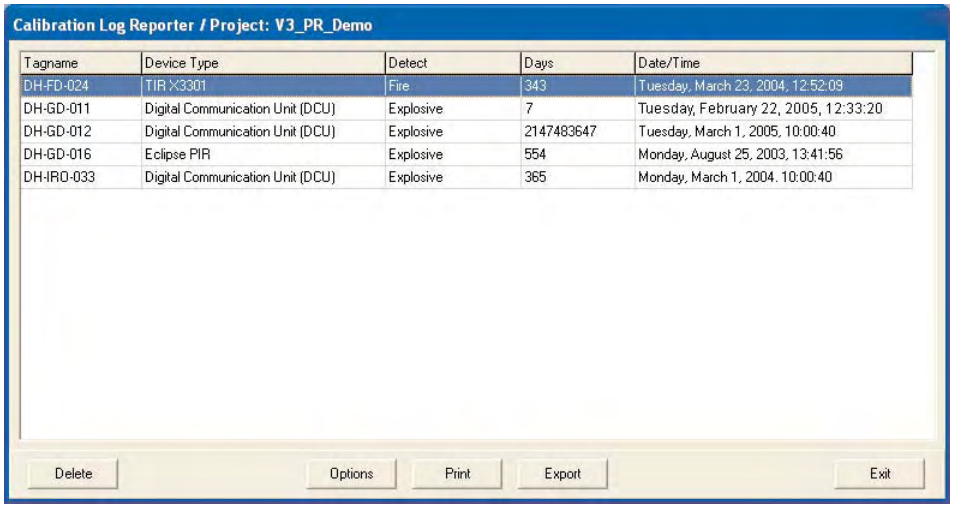
The logs are listed in chronological order, with the date as their name.

Select the date of interest and OK to open the log for viewing and / or printing.

The “Print” button will display the standard Windows-NT/2000/XP printer dialog box for the default printer.

Calibration Logs

Below is a sample calibration log. The calibration log reporter is a configurable database querry tool designed to allow a user to quickly determine if periodic calibration of field devices is being conducted.



Calibration Log Reporter / Project: V3_PR_Demo

Tagname	Device Type	Detect	Days	Date/Time
DH-FD-024	TIR X3301	Fire	343	Tuesday, March 23, 2004, 12:52:09
DH-GD-011	Digital Communication Unit (DCU)	Explosive	7	Tuesday, February 22, 2005, 12:33:20
DH-GD-012	Digital Communication Unit (DCU)	Explosive	2147483647	Tuesday, March 1, 2005, 10:00:40
DH-GD-016	Eclipse PIR	Explosive	554	Monday, August 25, 2003, 13:41:56
DH-IRO-033	Digital Communication Unit (DCU)	Explosive	365	Monday, March 1, 2004. 10:00:40

Delete Options Print Export Exit

The log displays the Tagname, Device Type, Detector type, Days since the last calibration and the Date/Time of the last calibration. If the device has never been calibrated, the Date/Time will show the time the calibration log reporter was accessed and the “Days” field will have the maximum integer value of 2147483647.

Whenever a calibration log is collected from a field device, online or in configuration, it is stored in a database. This database is currently viewable only on the computer were the database file is located.

It is viewable from the "Logs" button on the main screen, the DCD and Online Graphics.

If viewed from the "Logs" button a choice of project/database is available. If via the DCD it is the current active project. If via Online Graphics it is the current active project.

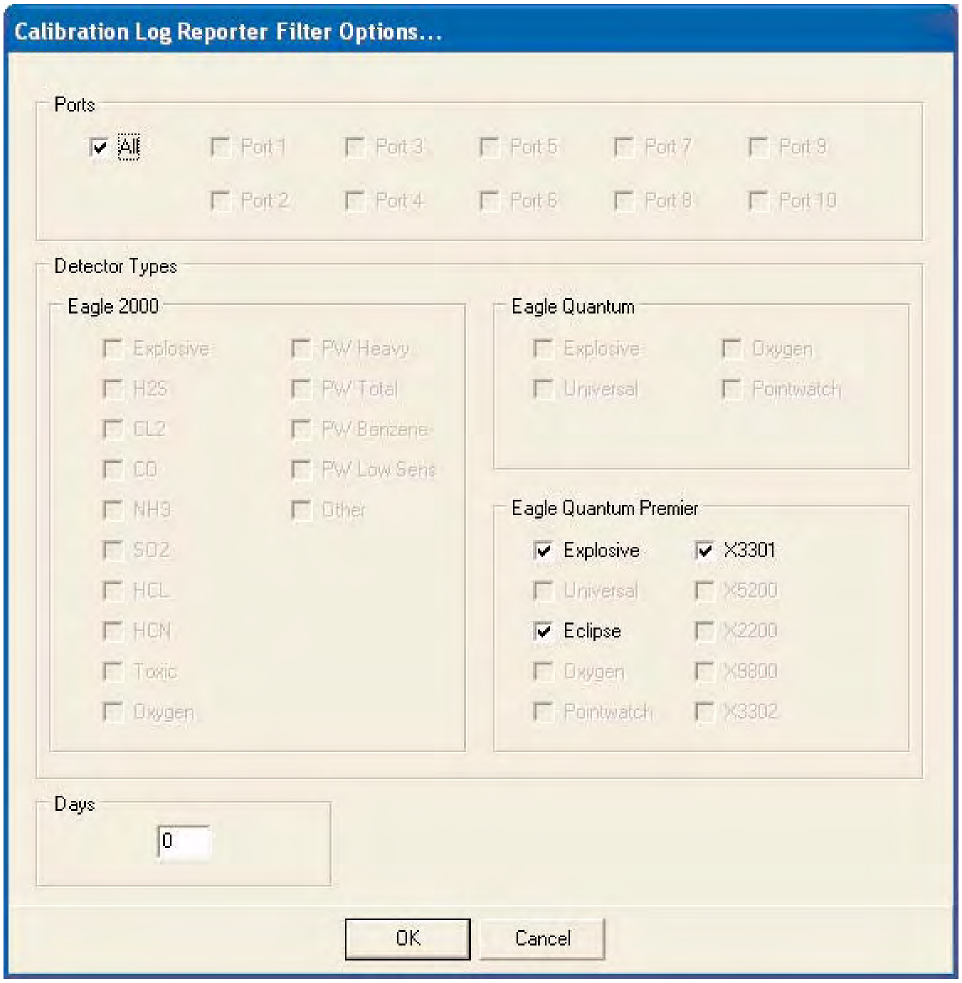
If Online Graphics is not on the computer running the DCD, i.e. a remote operator station accessing data via a network, viewing is disabled.

Printing is supported to any "windows" configured printer.

Calibration Log Reporter Options

The options button opens the “Filter Options..” dialog box allowing for the S^3 database querry to be configured. This allows the user to configure a report that provides just the specific information required.

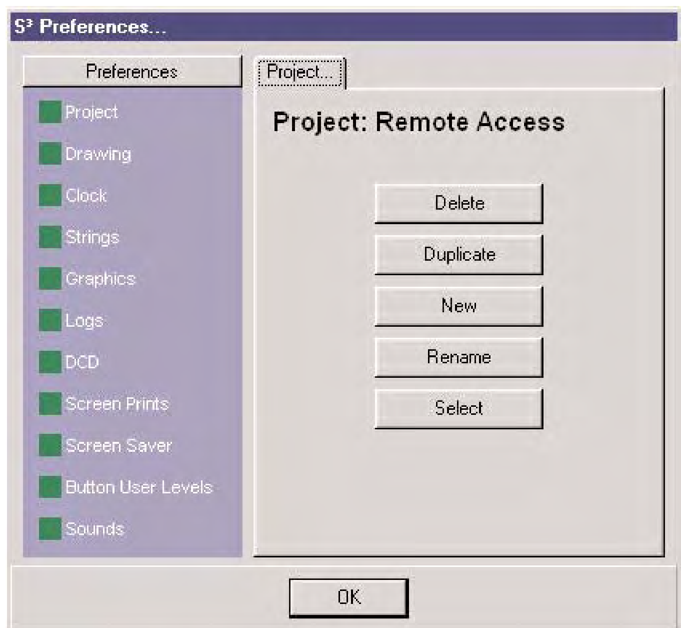
The top section, labeled “Ports” provides check boxes for the ten potential ports. “All” is the default, deselecting it will hilite all available ports for which logs exist.



Eagle devices (2000, Quantum, Premier) store their calibration histories in local non-volatile memory. Whenever S^3 accesses this data it stores it in a database thus creating a “Log” linked to the port of origin. This happens whenever a point display is accessed, from the configuration environment, or by the DCD when running. In the example above, log information for Explosive, Eclipse and X3301 detectors exist in the database and a calibration report can be created for this information.

Preferences

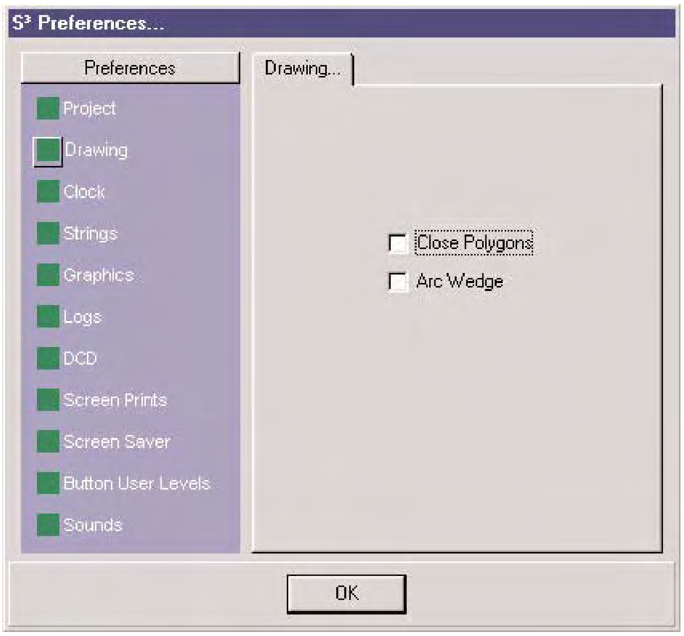
The preferences button provides access to a variety of project management and global attributes and settings. They are accessed from a dialog box called "S^3 Preferences". Arranged down the left side are eleven categories, starting with "Project". Once the project is selected, the other ten categories apply only to that project.



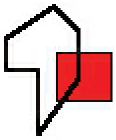
Project: Shown above, the project category allows for the top level selection and manipulation of the project to be worked on. The currently active project is displayed at the top right, in this example "Remote Access".

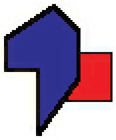
Multiple projects can be in development on the same machine and this tab provides resources for deleting projects, duplicating projects, creating new projects, renaming existing projects, and selecting an existing project.

Drawing: The drawing tab allows for the setting of the default operation of two drawing tools in the graphic editor. The “Polygon” and “Arc” tools.



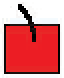
Close Polygons: By default, this check box is de-selected. This means that when a polygon is drawn in the graphic editor, when finished it has no fill color or pattern. If selected, the finished polygon will become a solid object with adjustable fill color and pattern attributes.

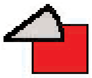




Within the graphic editor, any polygons drawn will be “open” or “closed” based on the settings of this check box. However, once drawn individual polygons can be changed as required.

Arc Wedge: By default, this check box is de-selected. This means that when an arc is drawn in the graphic editor, when finished it has no fill color or pattern. If selected, the finished arc will become a solid object (wedge) with adjustable fill color and pattern attributes.

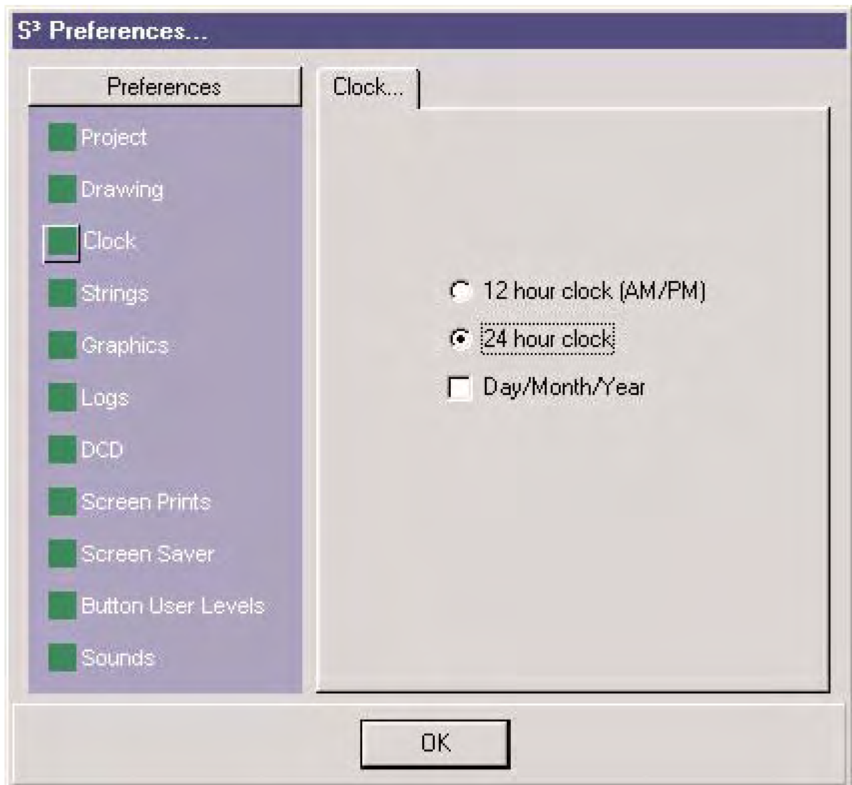




Within the graphic editor, any arc drawn will be “open” or “closed” based on the settings of this check box. However, once drawn individual arcs can be changed as required.

Clock: The purpose of the clock tab is to accommodate the two different methods for displaying the time and date around the world.

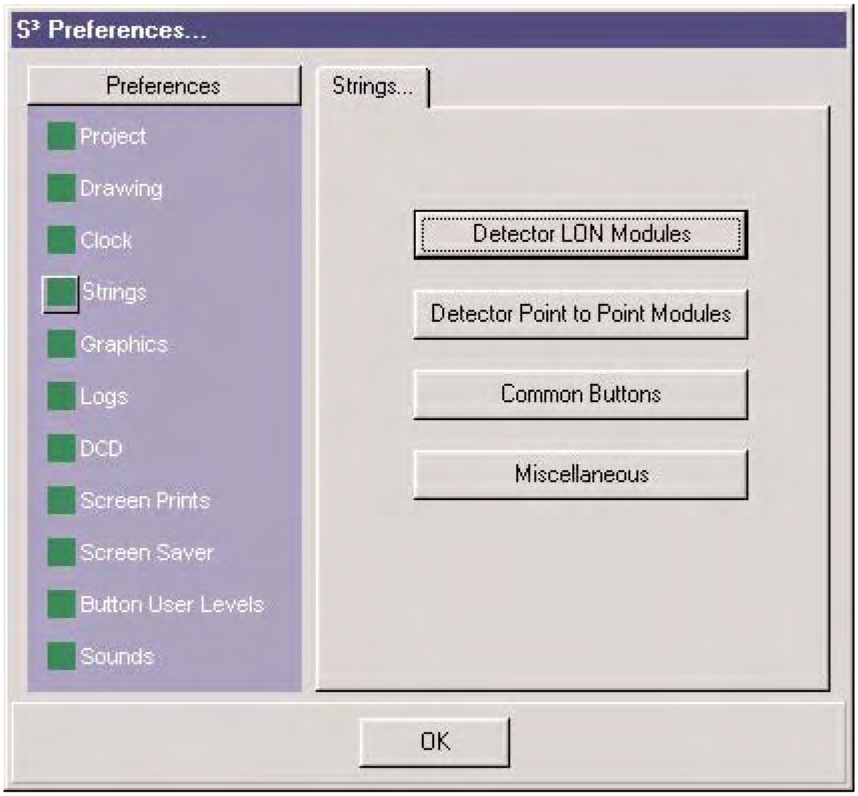
Time: A radio button is provided to choose between a twelve hour clock with AM and PM suffix or a 24 hour clock.



Date: A check box is provided to format the date using the “Day/Month/Year” method. The default is “Month/Day/Year”.

These time and date settings apply to all logs and printouts created by S^3.

Strings: The “Strings tab” provides access to a very powerful feature, the Second Language Dictionary (SLD). The SLD is used to provide second language support to the “Online” aspects of the systems operation.



The four databases in the SLD are accessed through the buttons on the preferences dialog box. Each database provides the factory default, in English, with a field to substitute a second language equivalent.

Detector LON Modules: Supports all Detector Electronics Corporation EAGLE2000™, Eagle Quantum and Eagle Quantum Premier devices.

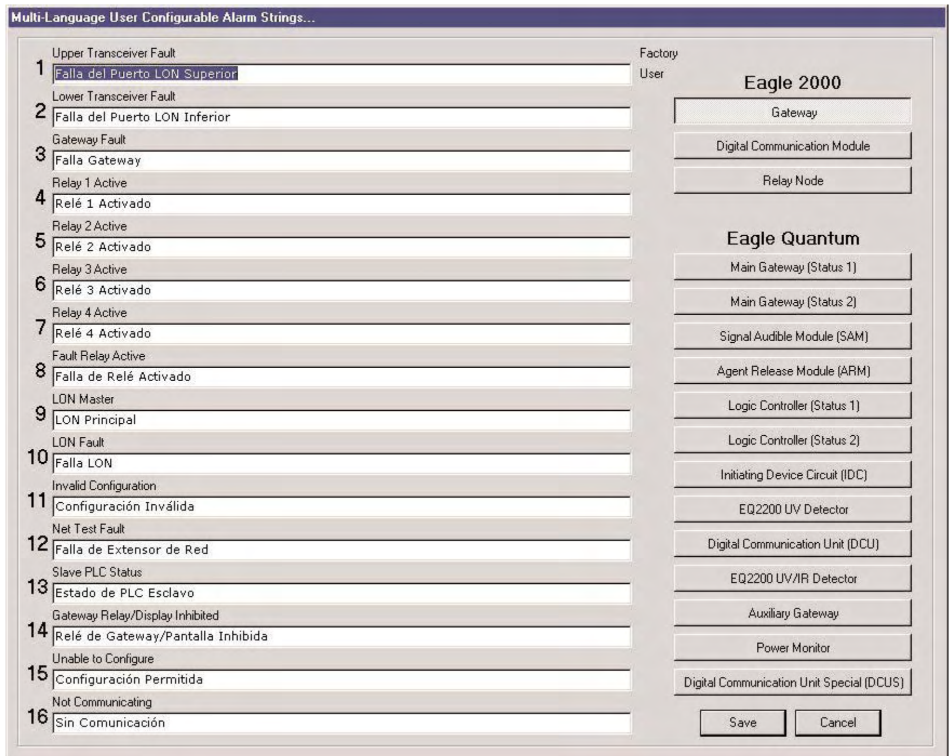
Detector Point to Point Modules: Supports a variety of commonly used Detector Electronics Corporation conventional gas detectors and optical flame detectors.

Common Buttons: Substitutes for all operator interface buttons found in the online application of S^3.

Miscellaneous: Substitutes for a variety of text descriptions found throughout the S^3 online application.

Examples: Below is an example of EAGLE2000/Eagle Quantum SLD configuration.

On the right hand side of the dialog box are a series of buttons for the different products.



In this example, the EAGLE2000 Gateway is selected. That causes a list of the available events for that device that can be configured for tracking. The English factory default description is displayed above a field where you can enter a substitute description. In this example it is a Spanish description but it could be any Roman character language.

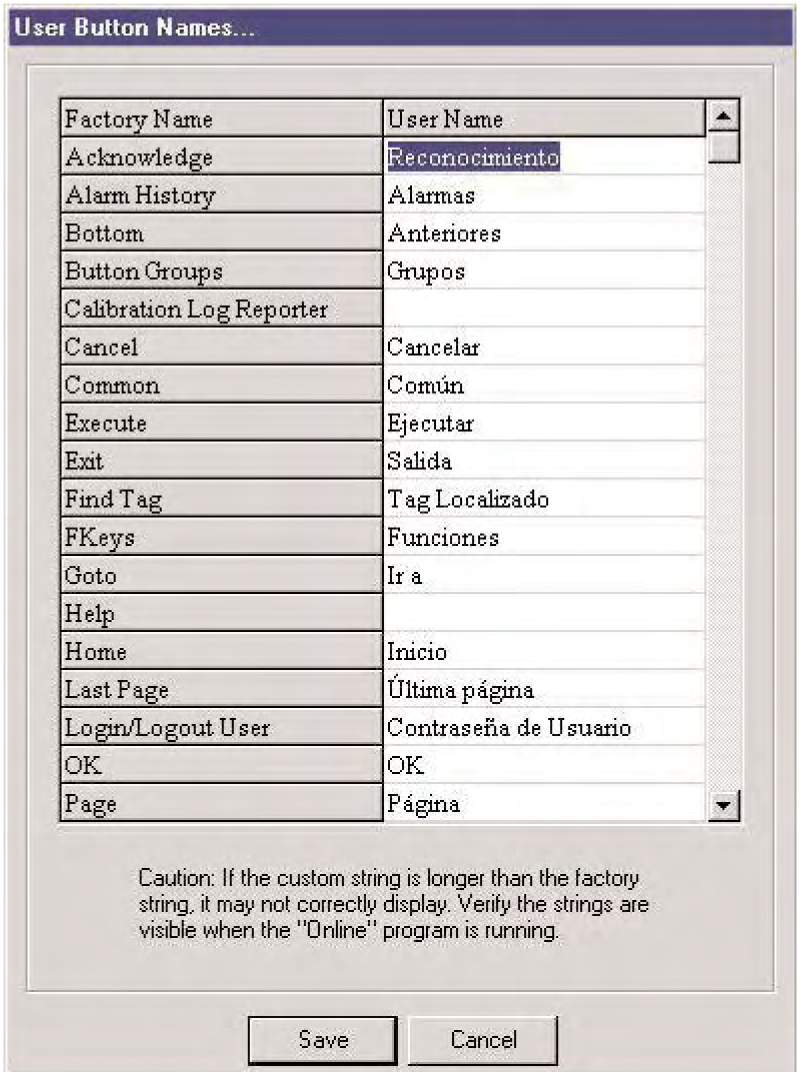
Note: Cyrillic font support is included for Russian speaking countries.

Once the appropriate substitute descriptions have been entered, selecting the “Save” button will record the new descriptions.

The descriptions entered in the SLD’s will be made available for use when points are configured in the “Ports” configuration area.

SLD descriptions for the user interface buttons used by the online application are presented in the “Factory Name” column of the “User Button Names...” dialog box.

Substitutes are entered in the “User Name” column. In the example below the configuration is incomplete, some buttons do not yet have a substitute string.

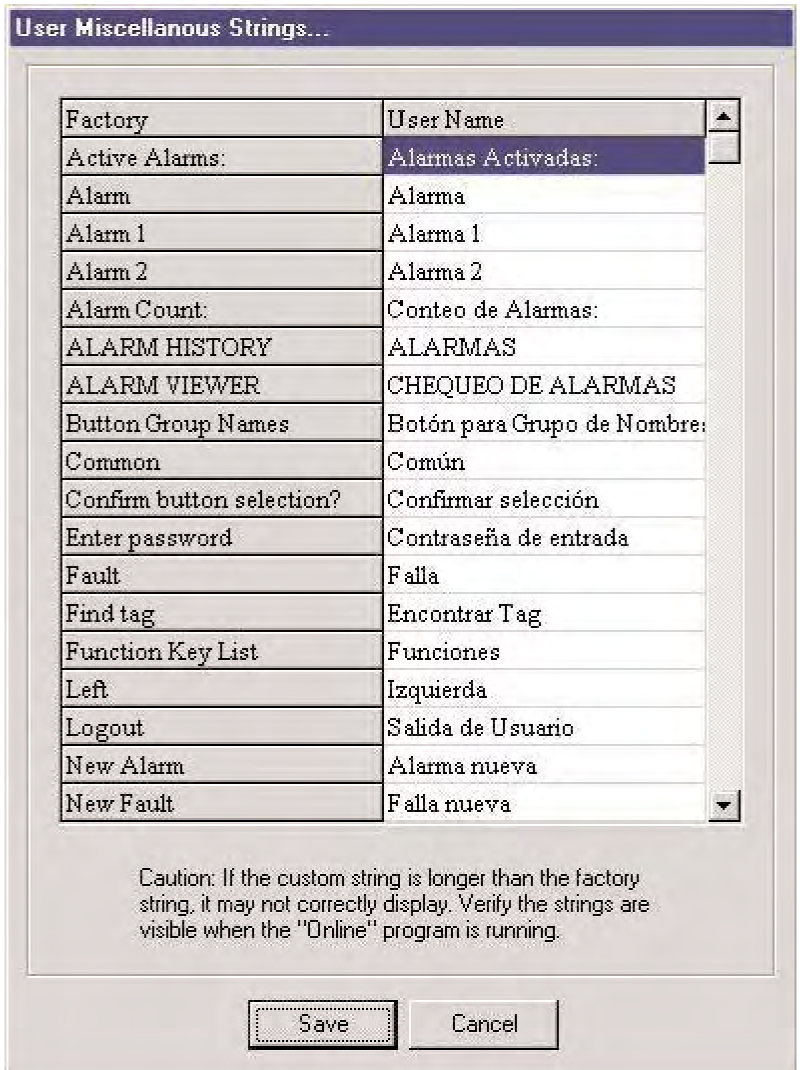


If left blank, these buttons will have no name when online.

“Miscellaneous Strings” are pieces of descriptive text used in a variety of online locations like dialog boxes, window names and data entry fields.

Substitutes are entered in the “User Name” column.

Like the user buttons, all fields must be filled out or “blank spaces” will appear at these locations when online.


User Miscellanous Strings...

Factory	User Name
Active Alarms:	Alarmas Activadas:
Alarm	Alarma
Alarm 1	Alarma 1
Alarm 2	Alarma 2
Alarm Count:	Conteo de Alarmas:
ALARM HISTORY	ALARMAS
ALARM VIEWER	CHEQUEO DE ALARMAS
Button Group Names	Botón para Grupo de Nombre:
Common	Común
Confirm button selection?	Confirmar selección
Enter password	Contraseña de entrada
Fault	Falla
Find tag	Encontrar Tag
Function Key List	Funciones
Left	Izquierda
Logout	Salida de Usuario
New Alarm	Alarma nueva
New Fault	Falla nueva

Caution: If the custom string is longer than the factory string, it may not correctly display. Verify the strings are visible when the "Online" program is running.

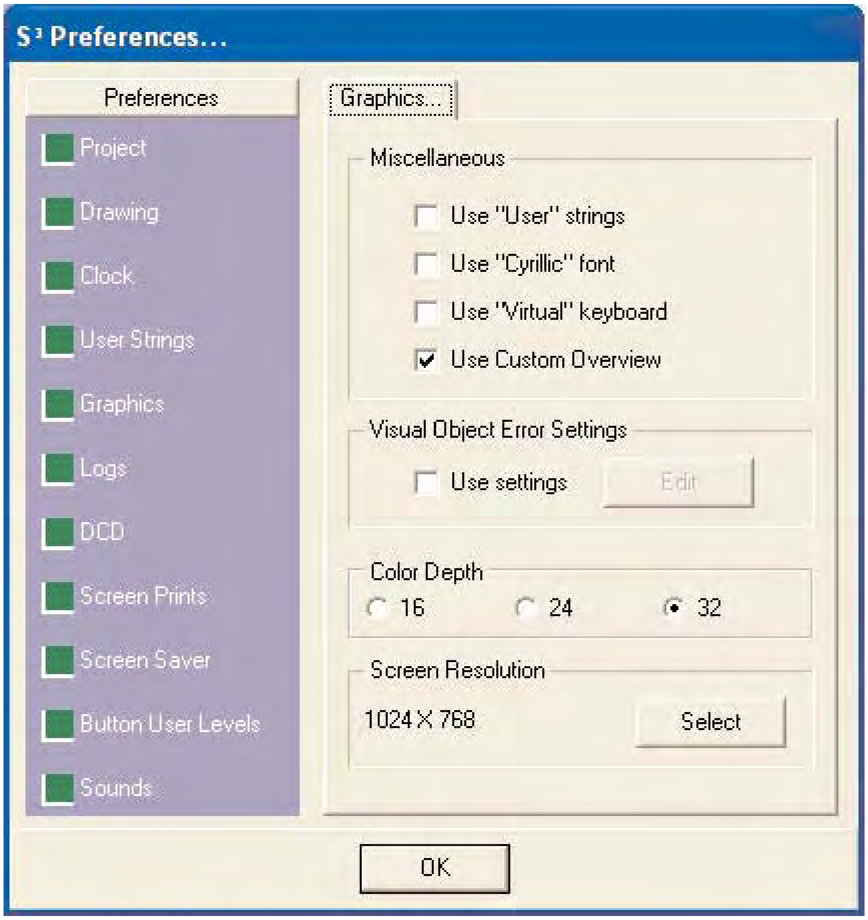
Save Cancel

When translating button names or miscellaneous strings into other languages the text may be too long for the button or space causing problems.

Take care to test thoroughly to ensure a “proper fit” for substitute strings.

Graphics: This category pertains to the operation of the "Online" application. This application displays custom graphics with an overlay of dynamic information from various attached systems. This is the main operational mode used by plant operators and other personnel monitoring the safety systems.

There are four global attributes that are configured by check box selections in the Miscellaneous portion of the dialog box and two other settings pertaining to the online color selections.

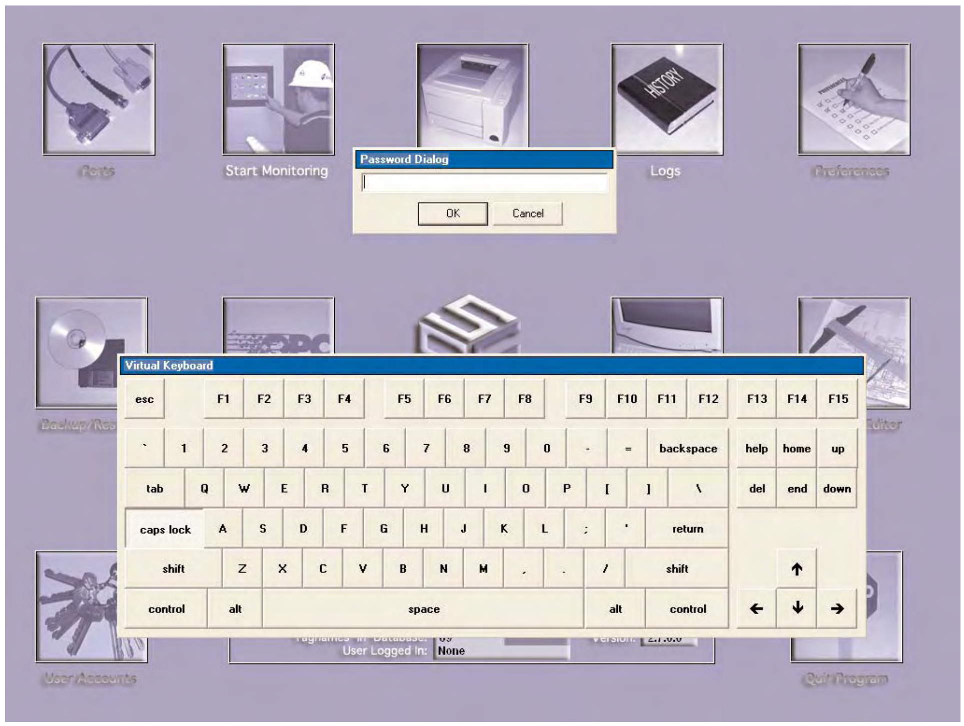


User Strings: When this check box is selected, the Online application will substitute the factory defaults for button descriptions, miscellaneous text, and device alarm and event data with user configured Second Language Dictionary (SLD) data.

To revert back to the English factory default values, stop the online application and de-select this checkbox. This provides an easy means of switching back and forth between the defaults and SLD.

Cyrillic Font: S^3 supports the use of Cyrillic in the SLD for both display and printing purposes when used with the recommended alarm printer.

Virtual Keyboard: When this option is selected S^3 provides an onscreen keyboard whenever data entry is required, such as for user login, password entry, etc.



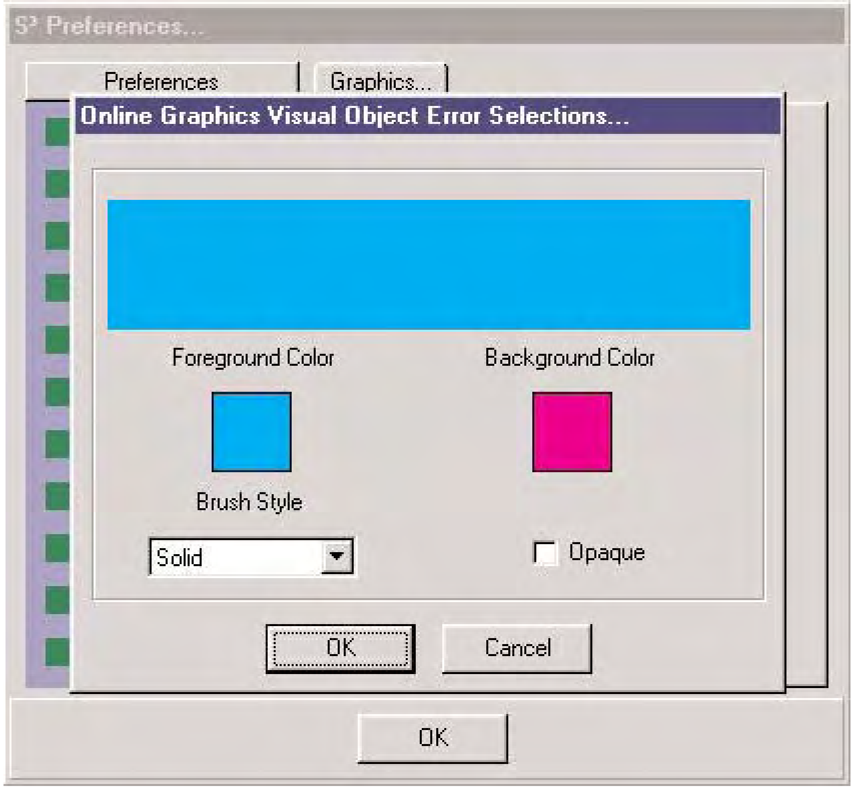
This is primarily to provide user input on systems equipped with a touchscreen as the operators primary interface.

Custom Overview: When this option is selected a custom full-screen overview is substituted for the automatically generated scaled composite of custom screens. This custom overview must be created in the graphic editor and can be generated using the editors tools, from imported graphics, or a combination of the two.

Visual Object Error Settings: This checkbox selection enables an online feature that changes the color of any dynamic objects that are tied to data that has been flagged as invalid by S^3. For example, if a port is "unloaded" for diagnostic or configuration work, all of the data for that port would be unavailable to the Online Graphics application.

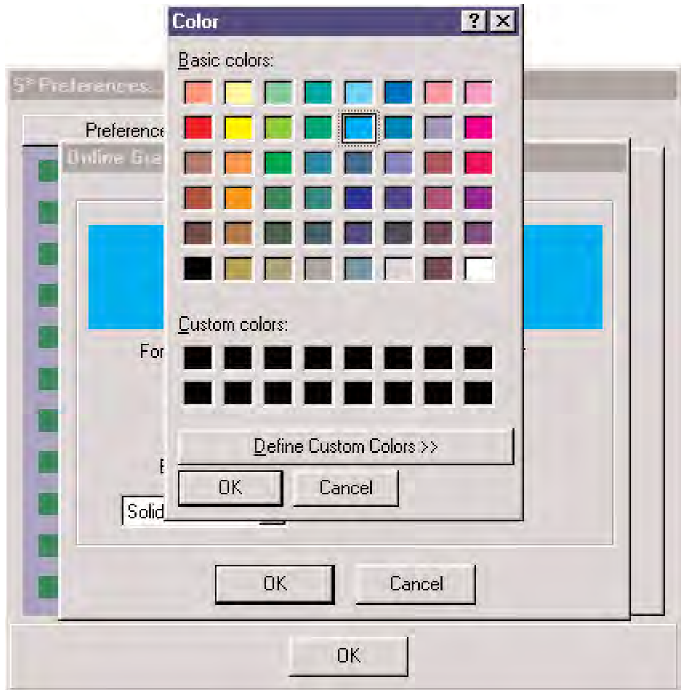
With this feature enabled, when viewing the online graphics any dynamic objects tied to data on the unloaded port would change to the selected color making it clear that the data is invalid.

To change the "error" color select the "Edit" button and S^3 will display the color selection dialog box. The default error colors will initially be

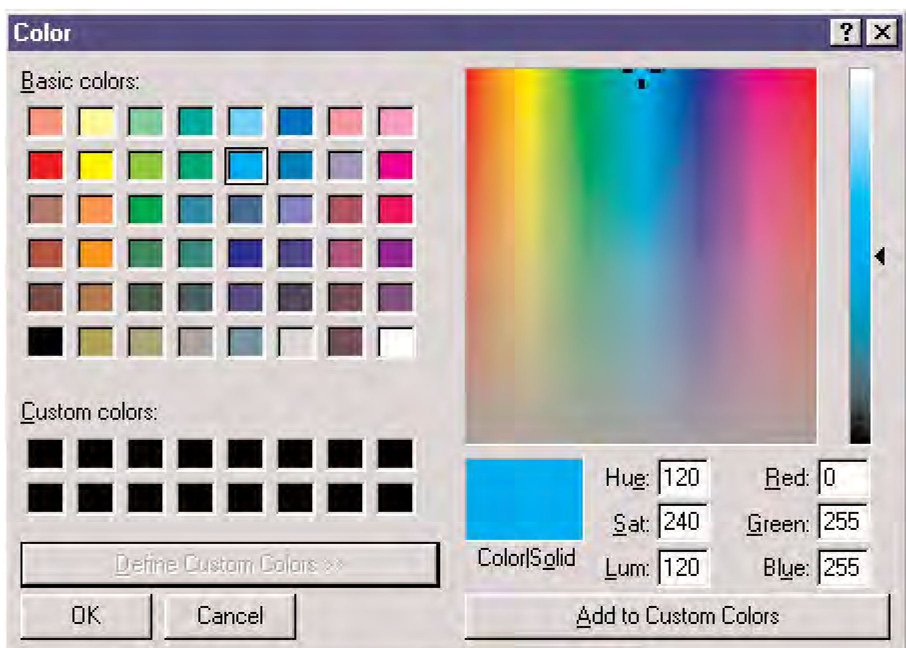


selected with Aqua for the foreground, Magenta for the background, and a solid brush. To change these selections click on the sample block for the color to be changed and a color picker will be displayed.

Choose from any of the 48 standard color definitions displayed, or from the 16 custom colors.

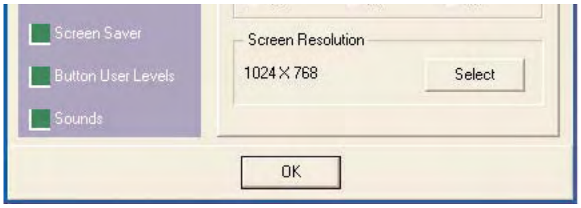


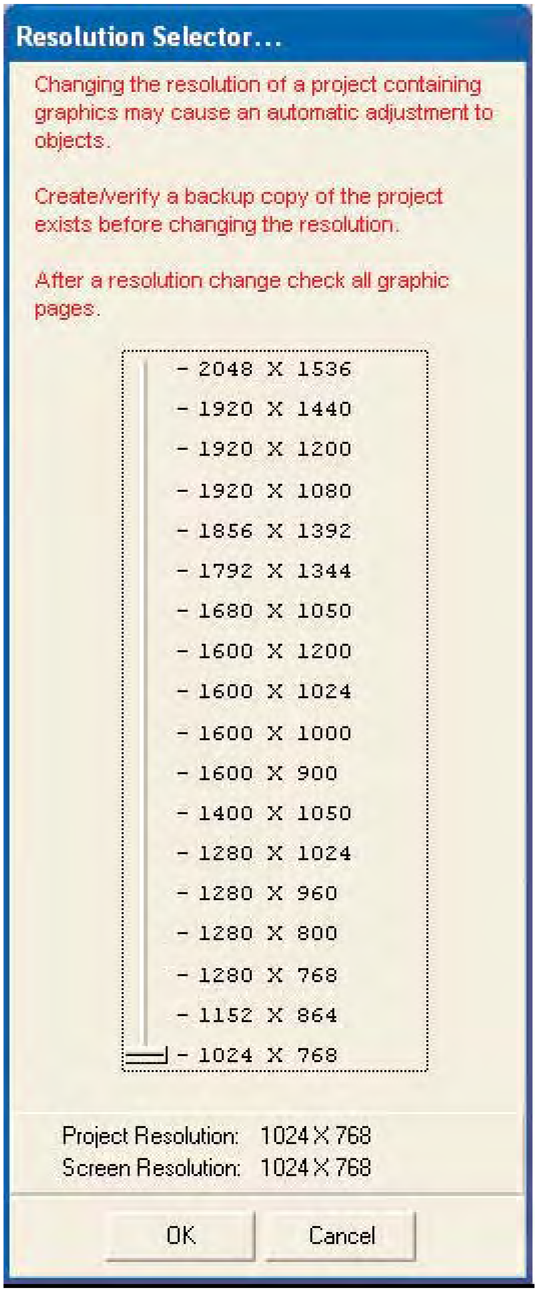
Select the “Define Custom Colors” button to display an expanded color picker dialog box that allows any desired color to be added to the



“Custom Colors” selections. Up to 16 can be configured.

Screen Resolution: The selected screen resolution for the custom graphics on the active project is displayed and a "Select" button to open the "Resolution Selector" dialog box where the screen resolution can be set.





Resolution Selector: This dialog box has an adjustable slider where the screen resolution for the online custom graphics can be set for the project.

At the bottom of the dialog box the project resolution is displayed along with the screen resolution of the computer S^3 is currently running on.

In some cases, the graphic development may be done on a computer with a different resolution than the "target" machine for the project.

The minimum resolution is XGA or 1024 X 768 pixels. All online graphics will be in fixed windows with this resolution. At XGA resolution the task bar must be configured to "Auto Hide" or buttons in certain areas of the configuration environment will be hidden.

Note: The list of supported resolutions to the left may have grown since this issue of the manual as PC vendors are constantly adding support for additional screen sizes.

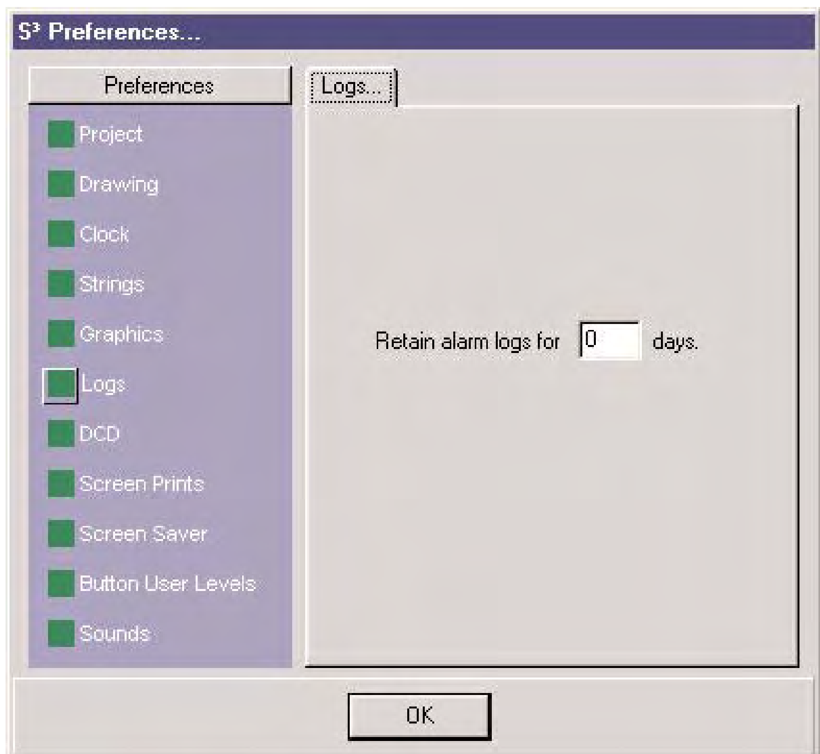
Color Depth Settings: There are three choices for the displayed color depth, 16, 24 and 32. This corresponds to the maximum number of colors used by the operating system and the computers video card to display

the graphics by the "Online Graphics" application program.

16 bit = 65,636 colors
24 bit = 16, 777, 216 colors
32 bit = True color

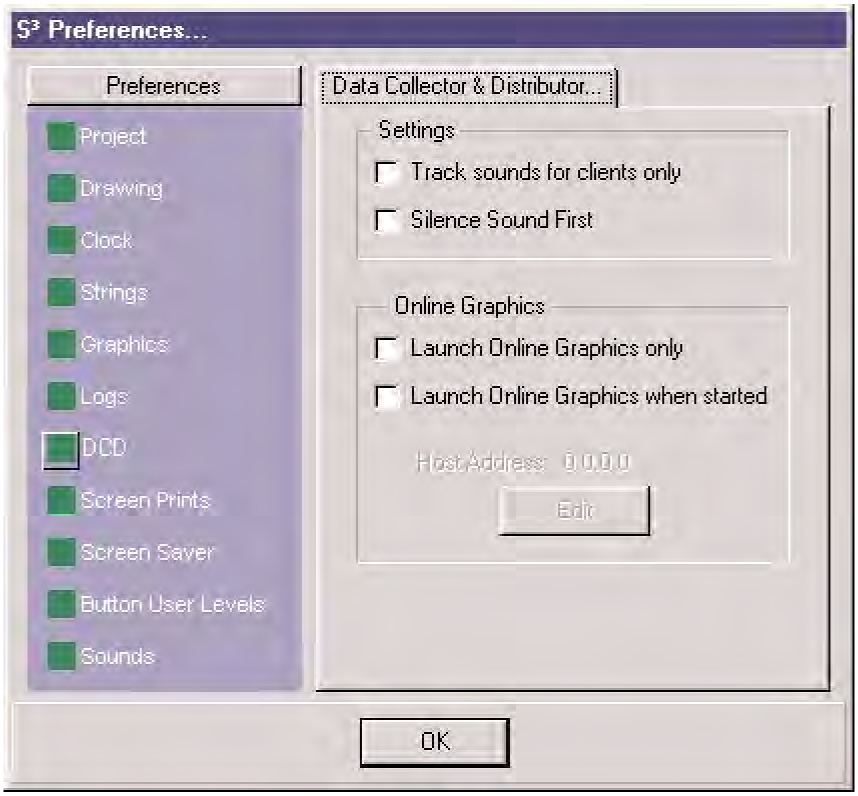
16 bit is the default and minimum requirement.

Logs: This tab allows the setting of the log retention time. This adjustment determines how long the system will keep daily log files.



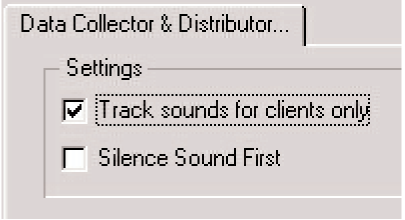
When set to zero (the default) all files will be kept and the user must ensure the hard disk does not fill up. If a number is entered in the field, the system will save that number of log files and then delete the oldest when that number is exceeded.

DCD: The Data Collector and Distributor application program has five configurable parameters that can be used to modify its behavior.

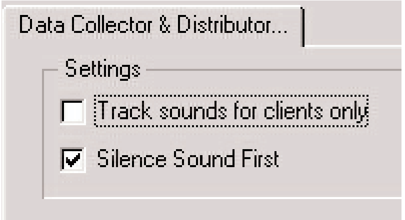


Settings: There are two settings relating to how sounds are handled.

The first one, “Track sounds for clients only” is used in configurations where the local machines DCD is unattended and is used primarily to send data to other S^3 client machines. In this situation the configured sounds play and are acknowledged by the remote clients and the local machine does not play sounds.



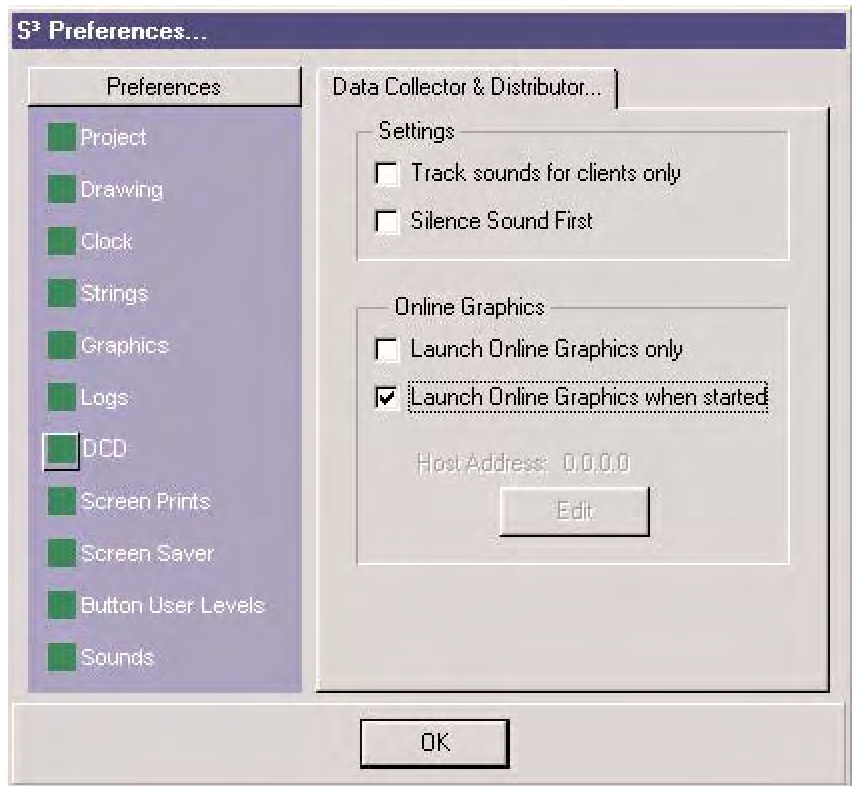
The second setting, “Silence Sound First” configures the DCD to silence the active sound(s) prior to any additional functions that may be configured to be executed when the “Acknowledge” button is activated.



Both settings can be used concurrently.

Online Graphics: There are three selections that pertain to Online Graphics.

The first, “Launch Online Graphics when started” automatically starts the “Online Graphic” application program when the “Online” button is cho-

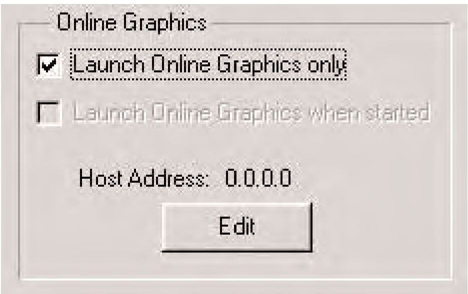


sen from the S3 main screen. If this checkbox is not selected, activating the “Online” button will start the DCD only. The Online Graphics application can then be started from a button on the DCD.

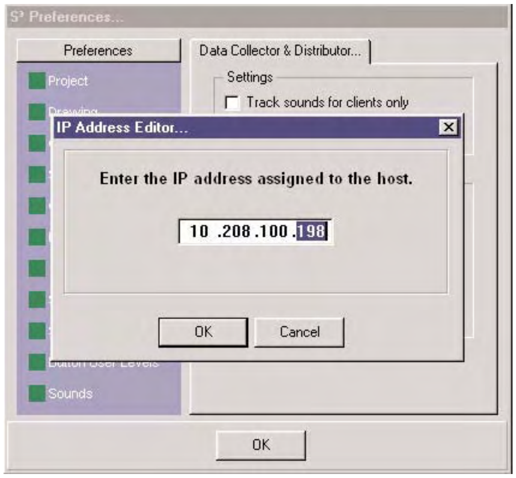
Remote Access: S^3 supports remote access via TCP/IP connections. The connections should be high speed (10 Mbps or faster) for optimum performance. In a remote access configuration, the DCD of one S^3 workstation attached to the safety systems allows multiple S^3 remote access clients to access its information.

To configure an S^3 workstation for remote access select "Launch Online Graphics only."

In this configuration when the "Online" button is selected from the S^3 main screen, the local DCD will not start but the Online Graphics application will. Once it starts it will connect to a specified remote DCD for its data.



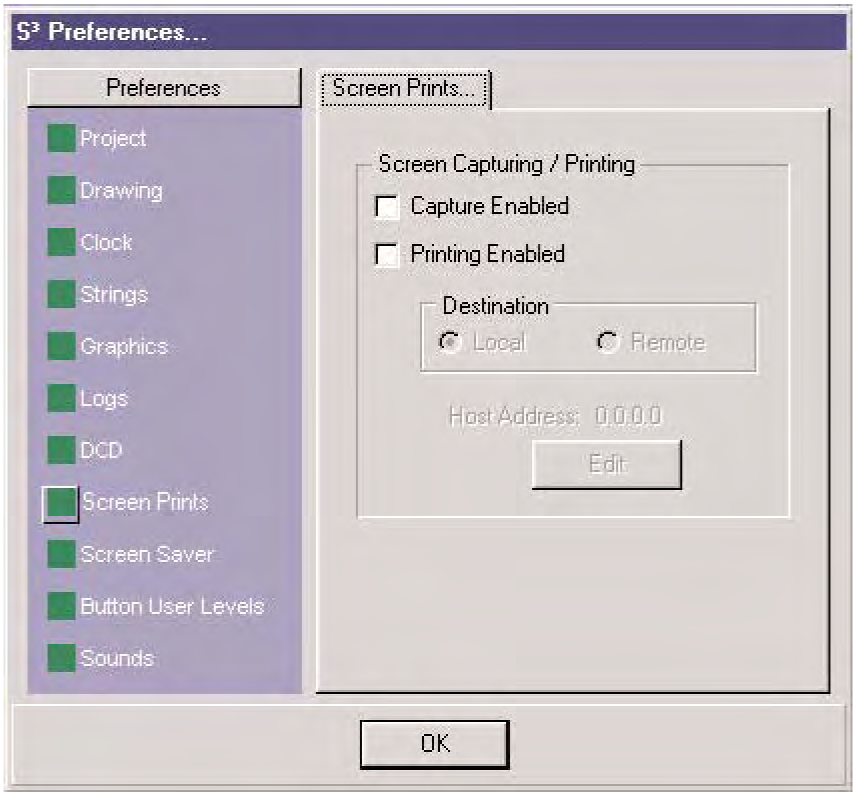
The remote DCD must be on the same TCP/IP network and is specified by entering the appropriate "Host Address" address.



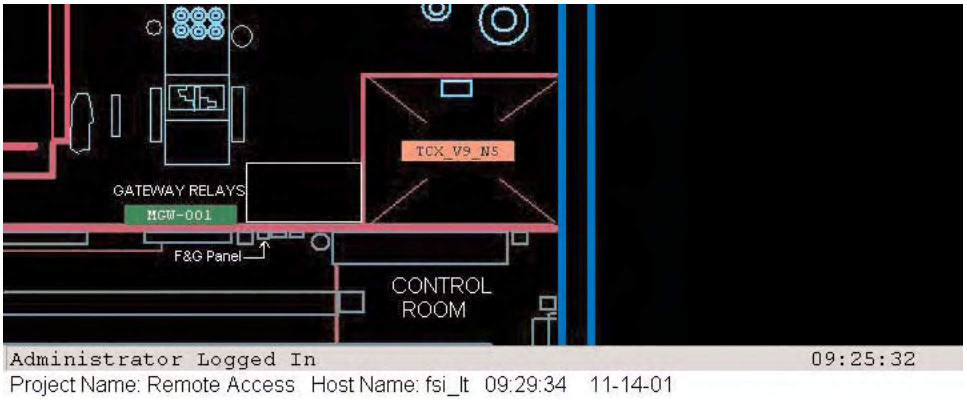
Host Address: Selecting the "Edit Host Address" button displays the IP Address Editor allowing the proper Host address to be set.

This feature allows a local machine which is connected to the safety systems to send information to other S^3 clients in the facility or elsewhere.

Screen Prints: S3 supports capturing and printing full color screens from the Online Graphics application.



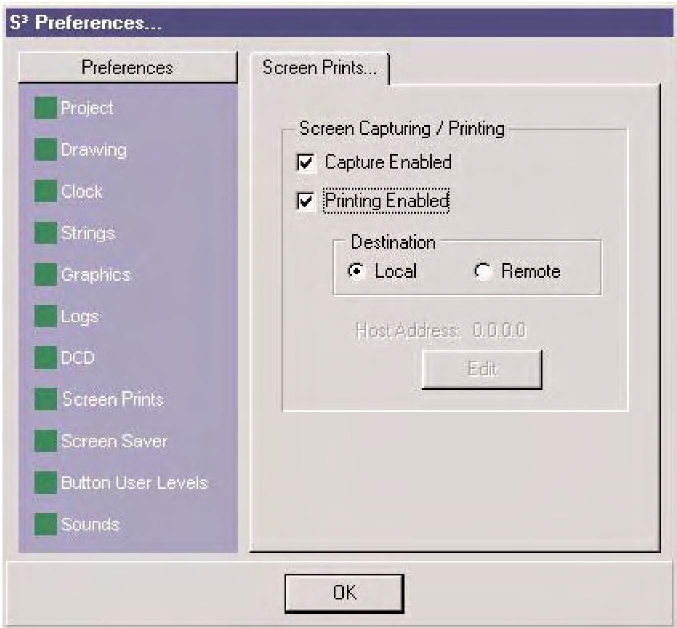
Capture Enabled: When screen capture is enabled, S^3 will intercept the "Print Screen" key from the keyboard, capture the displayed dynamic graphic with all displayed data. In addition at the bottom of the captured



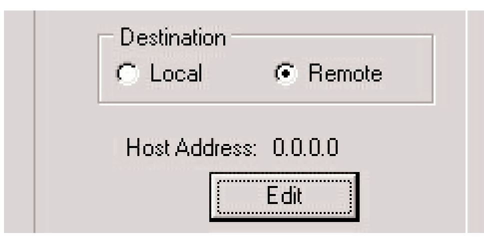
image, S^3 will insert the active users name, the project name, the host S^3 machines name, and the time and date. The actual file name will be a random number and the file will be stored in the "Screen Prints" subdirectory of the DEC folder.

Screen Printing: In addition to capturing screens S^3 they can be sent to either a local or remote printer for output.

Local Printing: With "Local" selected as the destination, the screen will print on the default Windows printer.

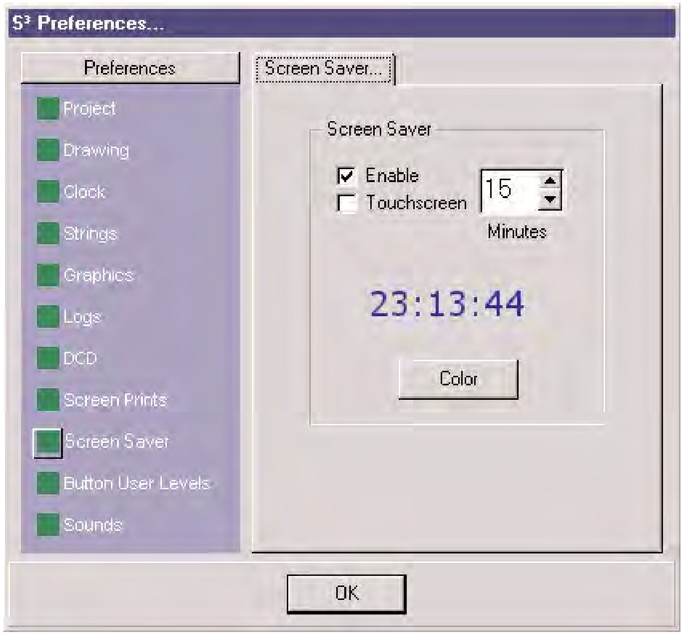


Remote Printing: If "Remote" is selected as the destination, a "Host Address" for another S^3 workstation that is running either a DCD or Online Graphics must be specified by its TCP/IP address.



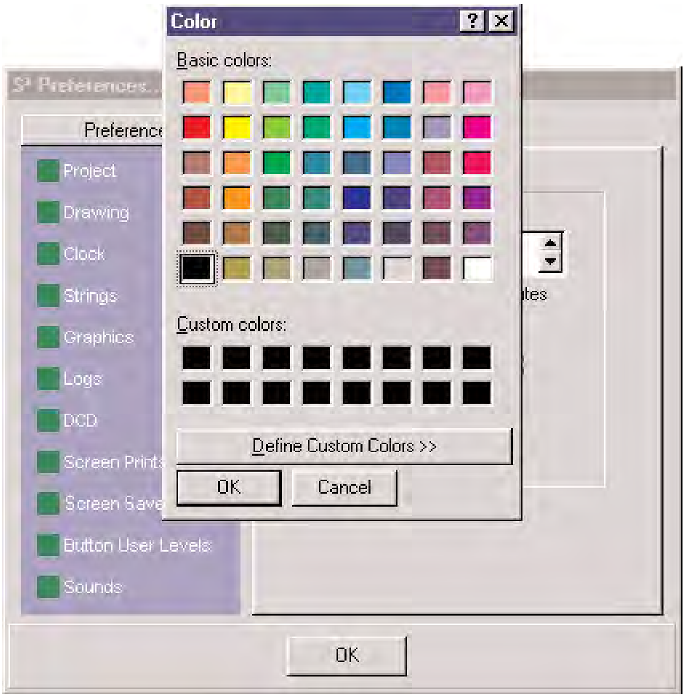
Specifying a Printer: Clicking the "Edit" button will allow the TCP/IP address to be entered.

Screen Saver: S3 provides a screen saver feature that will display the current time on a black background after a user configurable time period has elapsed without any activity.



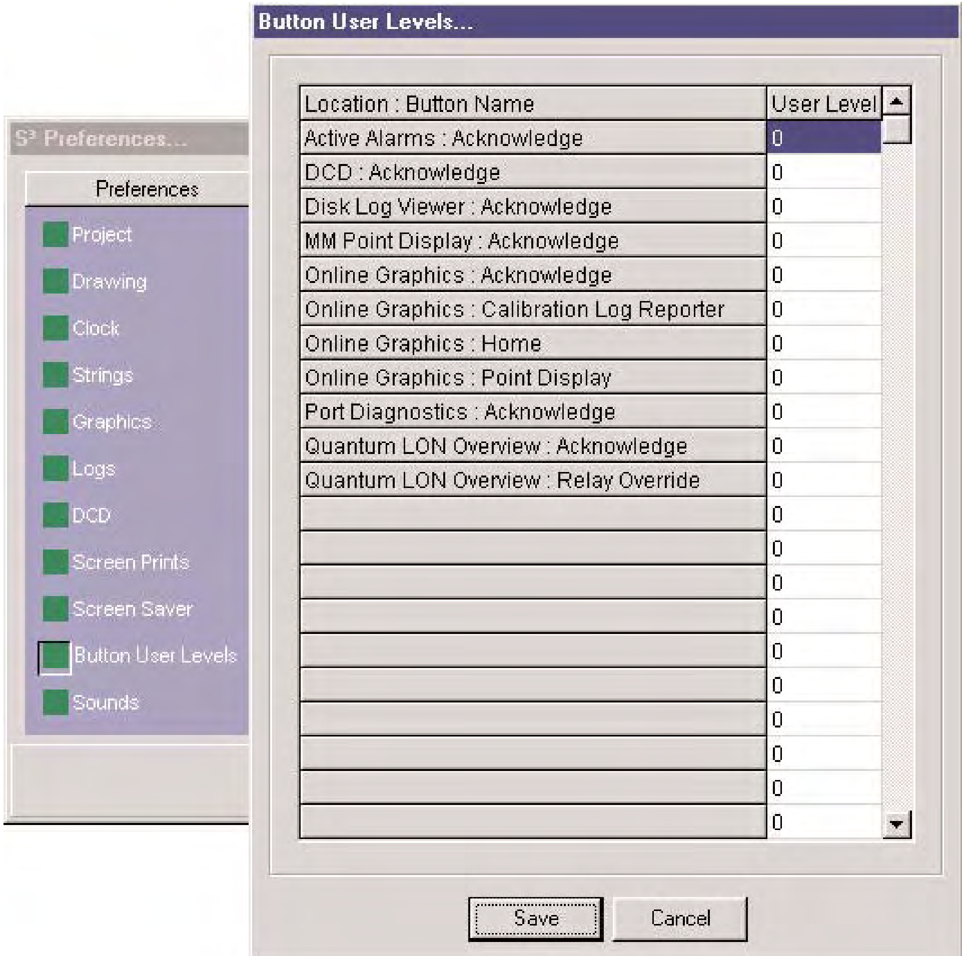
There is also a "Touchscreen" check-box to allow the user to exit the screen saver by touching anywhere on the screen, without causing any screen navigation response.

The color of the displayed time can be changed by clicking on the "Color" button. This will open the standard "color picker" dialog box that allows the selection of any of



the 48 pre-set colors. Custom colors can also be defined and added to the 16 color custom color pallet.

Button User Levels: This feature allows the Online Graphic and DCD application program user interface buttons to be assigned a “User Level” for security or operational control purposes.



The default value is “0” and has a range of 0-65535. The user level is set in the “Passwords” configuration section of S3.

If the user logged in has a user level greater than or equal to the setting of the button, the button will be available. Otherwise, it will be grayed out.

Sounds: The sounds tab allow access to the custom sounds database and integrated sound editor.

Selecting the "Edit" button will open the "Sound Editor" dialog box.

S^3 supports up to sixty four sounds that can be attached to events in the system. One sound, "Warning," is included with S^3 the other sixty three slots can be used to build a project specific sound library.

To access the editor, select a sound database slot, numbered 1 through 64 on the left side of the "Sound Names" scrolling list, and then select the "Edit" button.

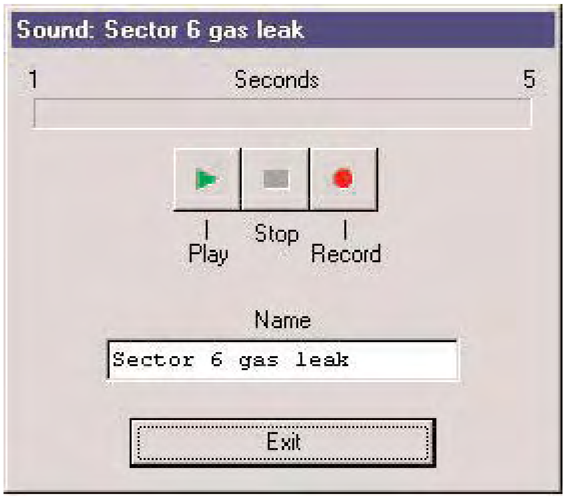
This will launch the "Sound Editor".

The sound editor makes use of the standard Windows based sound card and microphone to allow for the recording and playback of custom sounds.

Custom sounds are limited to a maximum recording time of five seconds.

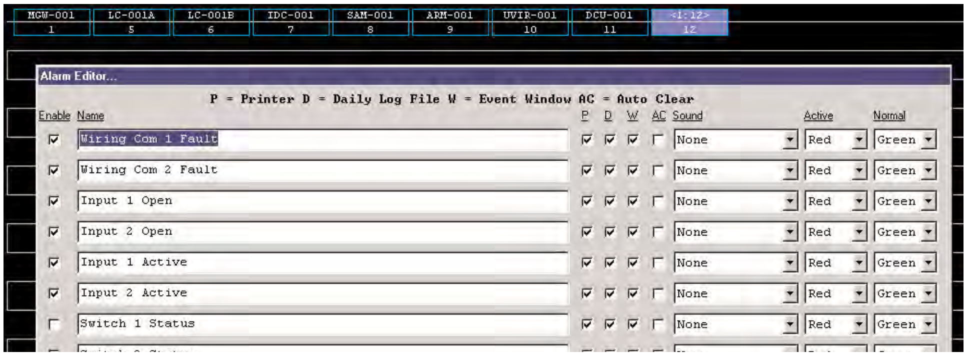
This is to accommodate the fact that more than one sound may be in the queue at any given time.

The recording time is displayed in the horizontal bar graph at the top of the dialog box.



Use the “Record” button to begin recording. The horizontal bargraph will display the elapsed time. Press the “Stop” button to end the recording. Use the “Play” button to play back the recorded sound.

Sounds from this library are then attached to events in the system during point configuration in the “Ports” area of the system.

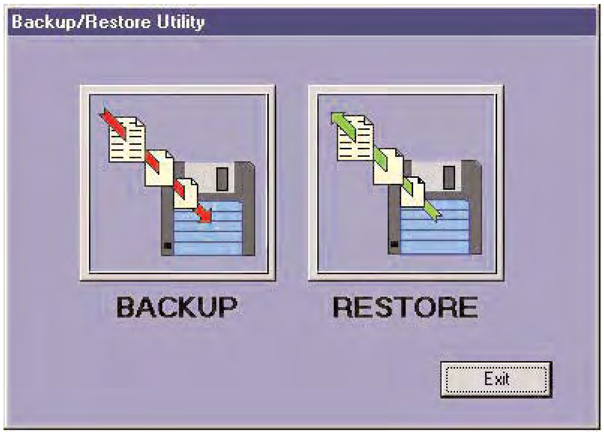


During online operation, when sounds are played the acknowledge button found on the point displays and online graphic pages are used to silence them.

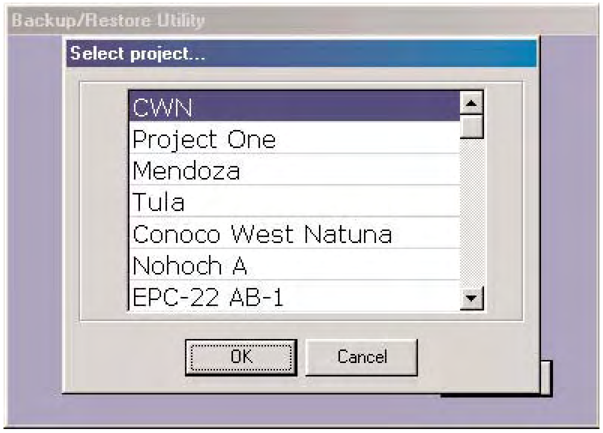
Backups

This button provides access to S^3's built in project Backup and Restore utilities. These utilities allow whole projects to be archived or restored for backup purposes or to be moved to another workstation.

Selecting either the "BACKUP" or "RESTORE" button will open the "Select Project" dialog box prompting for a selection.

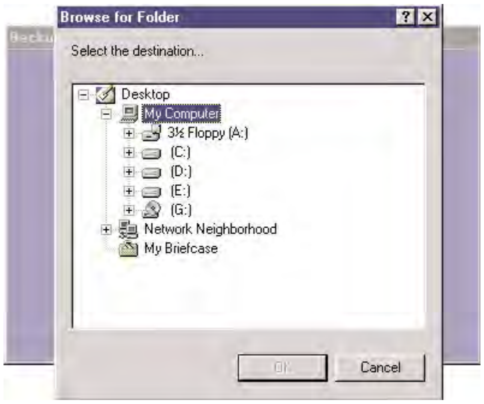


Select the appropriate project from the scrolling list and the select "OK" to begin the process.

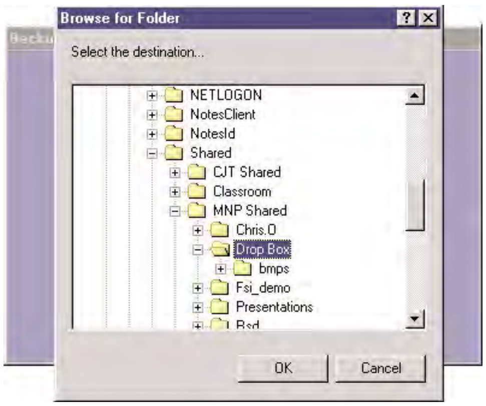


Backup: Once the project is selected a dialog box will be displayed allowing you to browse the file system and select a destination for the backup.

This can be on local hard drives, a network drive, or the local floppy disk drive.

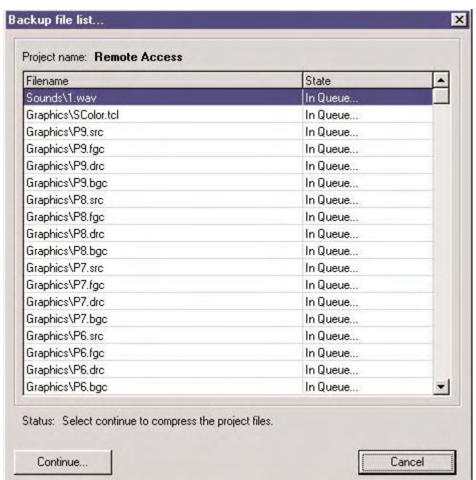


Procedure for backing up to a Network Drive: Once the destination is chosen for backup, the system will display the “Backup File List” dialog box which displays the files to backup and the status of the procedure.



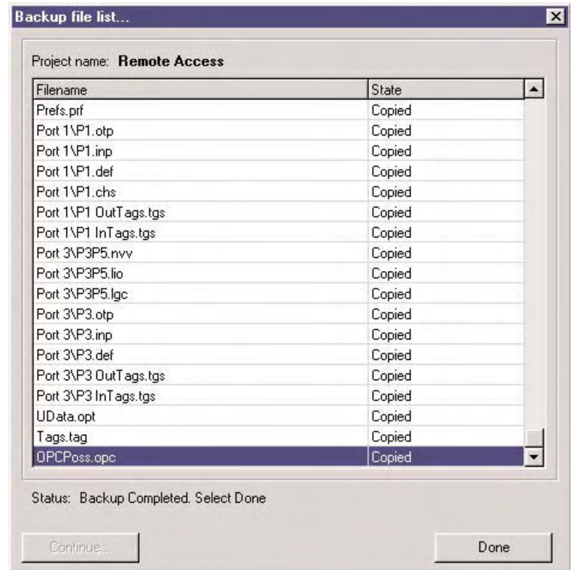
The dialog box is formatted with two columns, the left one containing the file name, the right one displaying the status of the file.

When the “Continue” button is selected S^3 will begin the backup process by compressing all of the files to reduce disk space requirements. This highly efficient compression algorithm allows even large projects with dozens of custom graphic pages to be backed up to a single 1.4MB floppy disk.



After the files have been compressed they will be copied to the destination volume, the status will indicate “Backup Completed Select Done” and the “Done” button will hilight.

Clicking on the “Done” button will return you to the Backup/Restore main dialog box.

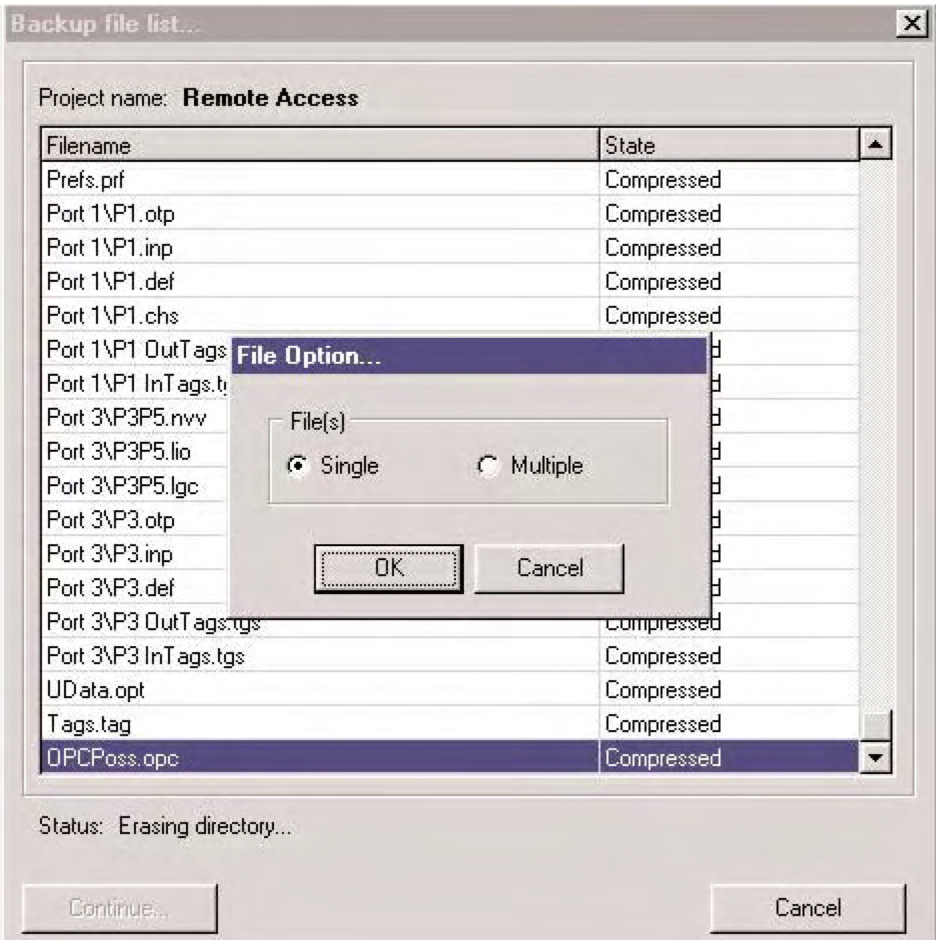


Backing up to Floppy Disk: If the “A” drive was selected as the destination, S^3 will prompt you to confirm that the drive is removable and whether it should be erased before copying the project onto it.

In some cases, it may be desirable to backup more than one project to the floppy disk(s) in which case select “No” to the prompt.

In most cases, the disk should be erased and this is the default choice. Select “Yes” and the program will prompt you for a formatted disk to be inserted into “A” drive.

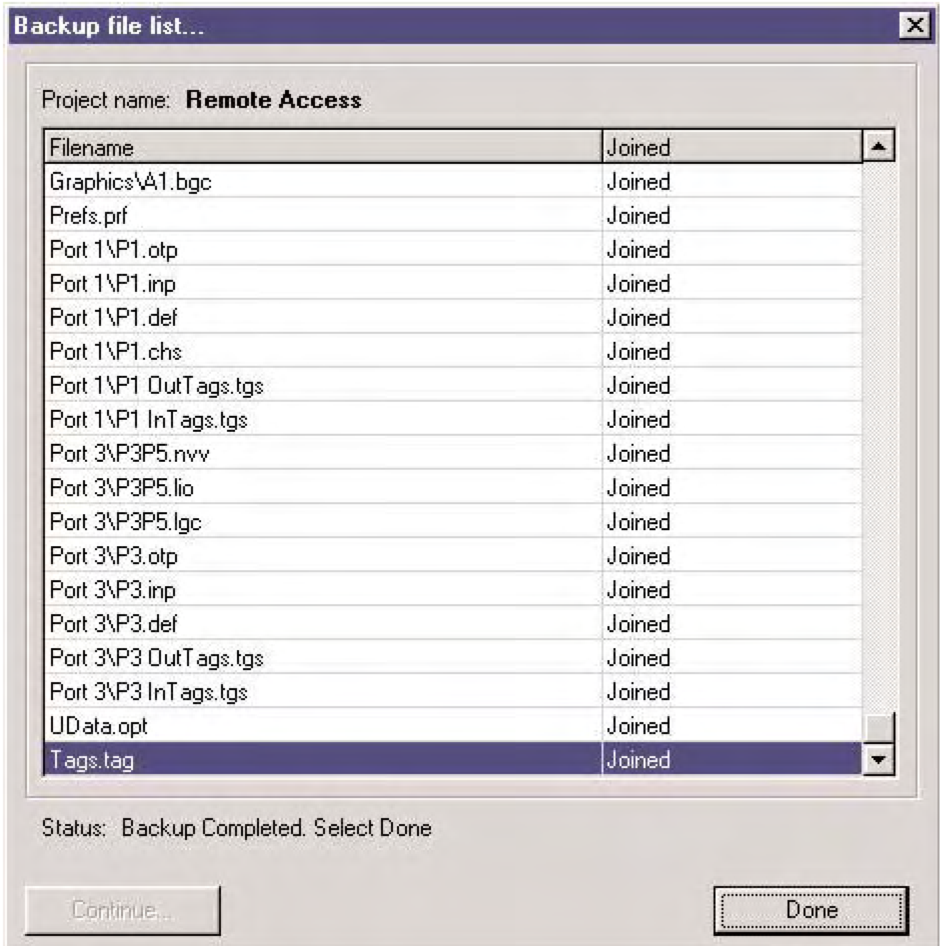
Once the disk is in place, choose the desired file option, either “Single” or “Multiple”. The default is “Single” and will combine all of the compressed project files into a single project backup file and copy it to the selected destination. This option is significantly faster when backing up



to a floppy disk. The “Multiple Files” option is available when access to the individual files might be preferred.

Once the file option selection is made select the “Continue” button and the utility will copy the files to the floppy. If the project is too large to be backed up to a single floppy, the program will prompt you for additional disks as required.

When all files have been successfully backed up, the “Cancel” button will change to a “Done” button which when selected will exit the backup utility.

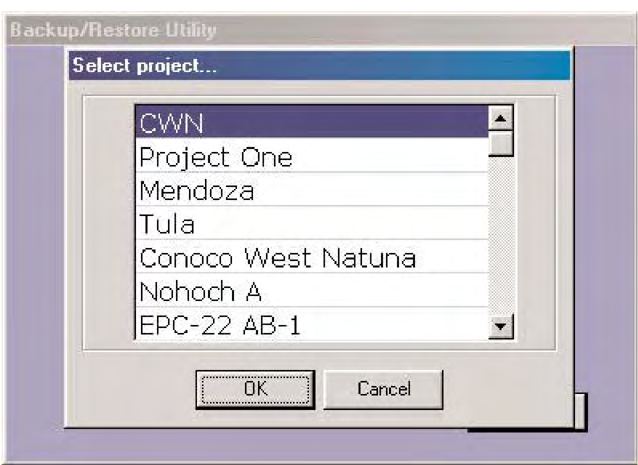


Restore: To restore an archived project from either a floppy disk or network, select the "Restore" button from the Backup/Restore Utility dialog box.

Once the "Restore" button is selected the "Restore Selection" dialog box is displayed.

Select either "Existing" or "New" to begin the process.

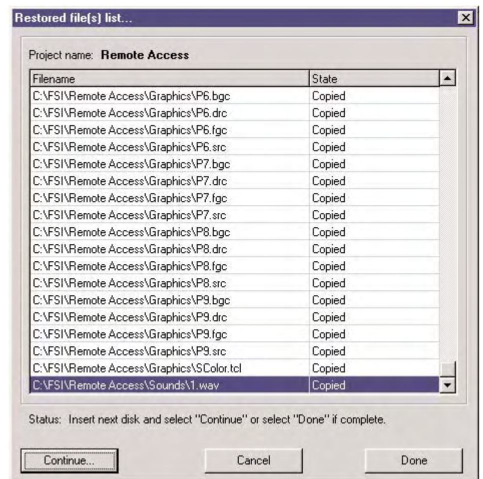
If "New" is selected a dialog box prompting the entry of the project name is displayed.



If "Existing" is chosen the "Select Project" dialog box is displayed. Select the appropriate project from the scrolling list and the select "OK" to begin the process.

Once the project to be restored has been chosen and the "OK" button selected file system browser dialog box is displayed prompting for the selection of the project source.

When the source has been chosen select the "Continue" button to begin the restoration procedure.



As files are restored they will show up in the "Filename" column of the dialog box with their status displayed to the right.

When the process is complete, the "Done" button will hilight. Select "Done" to exit the restoration utility.

OPC Server

S^3 is designed to simply and efficiently “integrate” data from a variety of multi-vendor safety solutions into a common Operator Interface Station (OIS) where it can be viewed, tracked, and presented to the operator.

We have chosen “OPC” as the mechanism for sharing this concentrated safety system data with other systems throughout the facility.

Traditionally, each software or application developer was required to write a custom interface, or server/driver, to exchange data with hardware field devices. OPC eliminates this requirement by defining a common, high performance interface that permits this work to be done once, and then easily reused by HMI, SCADA, Control and custom applications.

What is OPC? OPC (OLE for Process Control) is an industry standard created with the collaboration of a number a leading worldwide automation and hardware software suppliers working in cooperation with Microsoft.

The organization that manages this standard is the OPC Foundation. The Foundation has over 220 members from around the world, including nearly all of the world's major providers of control systems, instrumentation, and process control systems.

OPC Defined: OPC is based on Microsoft's OLE (now Active X), COM (Component Object Model) and DCOM (Distributed Component Object Model) technologies. It consists of a standard set of interfaces, properties, and methods for use in process-control and manufacturing-automation applications.

The Active X/COM technologies define how individual software components can interact and share data. OPC provides a common interface for communicating with diverse process-control devices, regardless of the controlling software or devices in the process.

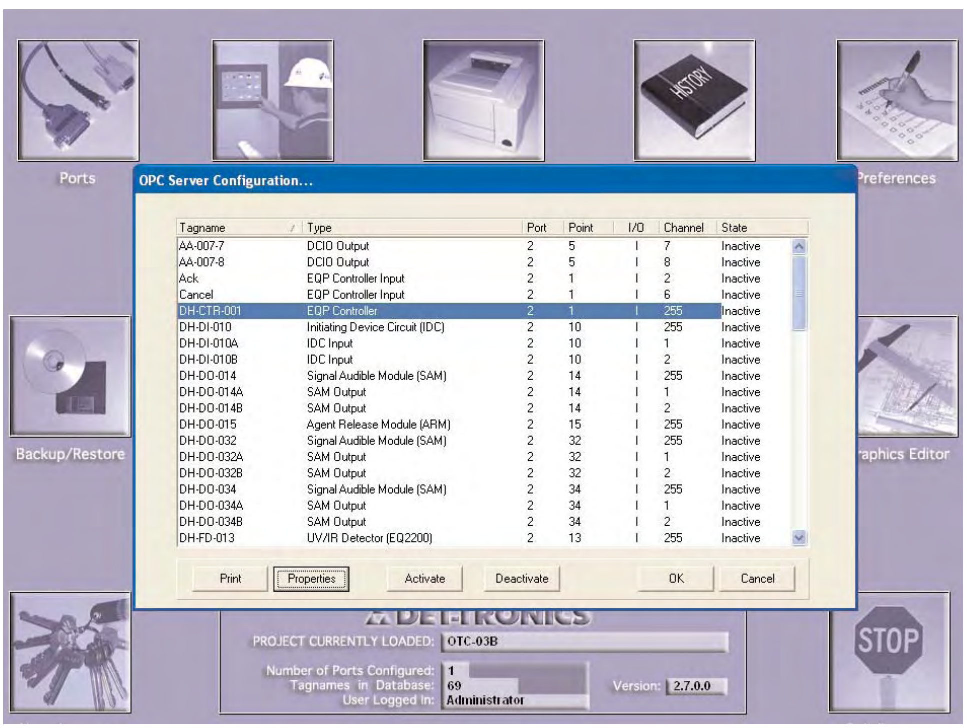
OPC in S³: The OPC option for S³ is one of the easiest ways to provide safety system data from many sources to the distributed control system or other OPC compliant system.

With the OPC option S³ becomes a “Version 2.03 Data Access Server” to make available, under user configuration, any information being tracked by the S³ event handling database.

The S³ server setup is a model of simplicity. The user is presented with a tag list showing all of the points being tracked by the system and the user can then choose what to “activate” for OPC clients to access. Using this simple tag based method it is possible to share complex data knowing little more that the tag name. OPC clients don’t need to know anything about the port type, serial or ethernet settings, memory register locations, addresses, or any of a number of technical details, just the tag name.

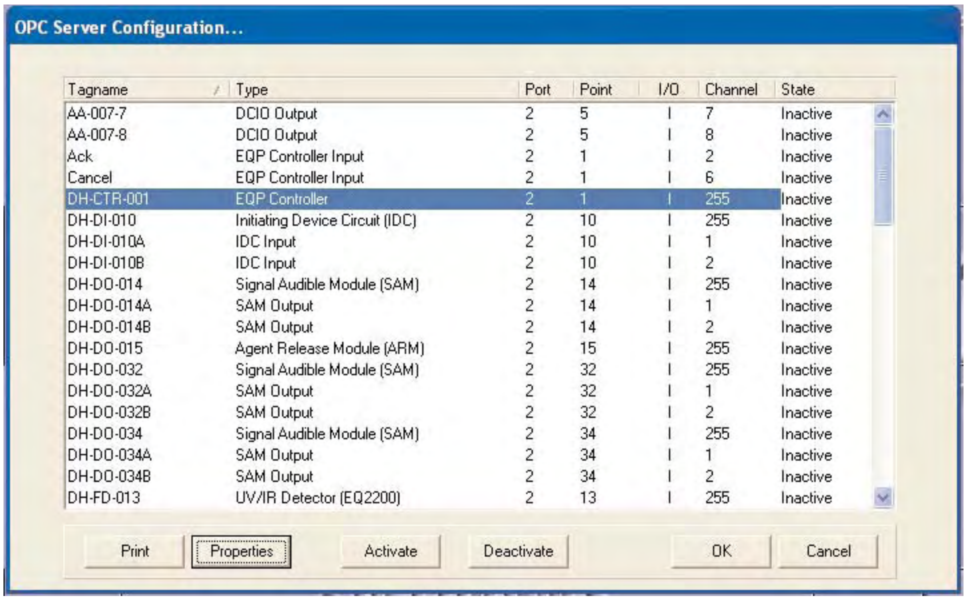
OPC Server configuration
To configure OPC data points, select the OPC Server button from the S³ Main Screen.

This will display the OPC Server Configuration dialog box which lists all of the tags available for activation by the server.



The available tags shown, were created during the port configuration process. When a Modbus, Triconex, Eagle or other device is configured it is added to the S^3 tag name database. All of the points in this tag name database are automatically set up by S^3 for use by the OPC server. This greatly simplifies OPC tag management.

The OPC Server Configuration dialog box displays the tagname, type and origin information along with its OPC status, either Active or Inactive.



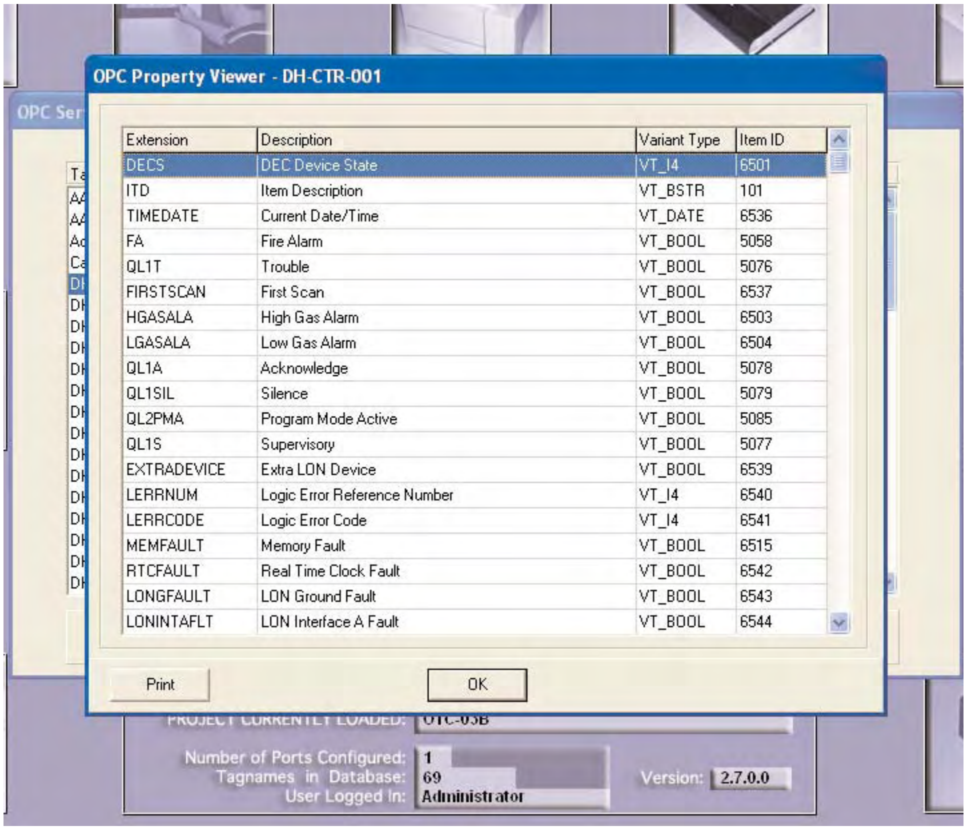
To make a tagname available to OPC Clients, select the tagname and click on the “Activate” button.

In the example above, an Eagle Quantum UV/IR Optical fire detector is selected. Its tagname is “K201AB-10”, it originates at S^3 port 3 point 65, is an “I” (input), and has an OPC State of “Active”.

This is a “top level” view of the devices and their status. In the above example this single point “K201AB-10” actually is a compound point with a variety of subordinate data available to the OPC client.

To view this data, select the “Properties” button.

OPC Property Viewer: The properties button at the bottom of the OPC Server Configuration dialog box will open the "OPC Property Viewer" and display the properties for the selected point.



The individual property extension, description and variant type are displayed.

These properties were configured automatically by S^3 for inclusion by the OPC server when the point was created within the Port Configuration process.

In the above example, because it was an intelligent addressable device, it has a great deal of data indexed to it.

Simple analog or discrete values will have far less available data.

NOTE:

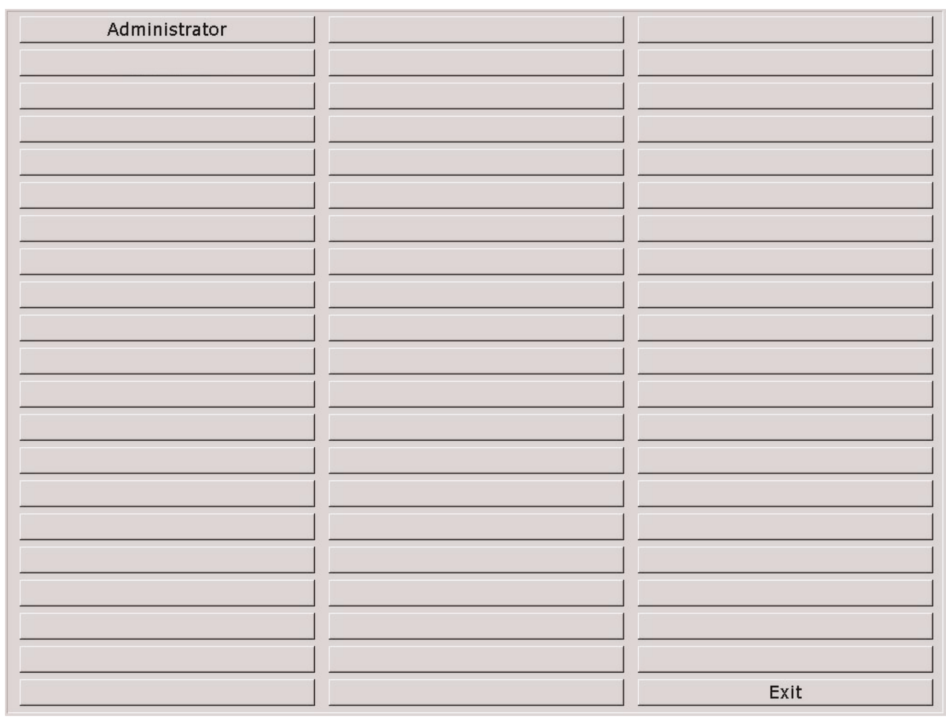
OPC Clients: *In order for OPC clients to be able to connect to the S^3 OPC Server, S^3 must have been installed on the client machine.*

User Log In/Out and User Accounts

These buttons are part of the S[3] security system. The “Log In/Out” button is used to log in or change users, the “Passwords” button allows the system administrator to create or modify user accounts.

S[3] supports up to sixty three unique user accounts, each capable of having a different password and access privileges. These user accounts are controlled by the S[3] system administrator.

Selecting either the log in or passwords button will display the user selection screen.



In the sample above two users are configured, the Administrator and an Operator account.

The administrator account is automatically created by the system and cannot be deleted.

The person logged in as the Administrator is the only one who can create, modify or delete user accounts. In addition, the Administrator may also change the configuration and password for his/her own account.

The default password for the Administrator is "DEC"

CAUTION: If the Administrator changes his/her password and loses it, there is no way to restore the account.

To set up or modify user account parameters, click on the button blank or user to be edited. This will open the "User settings..." dialog box.

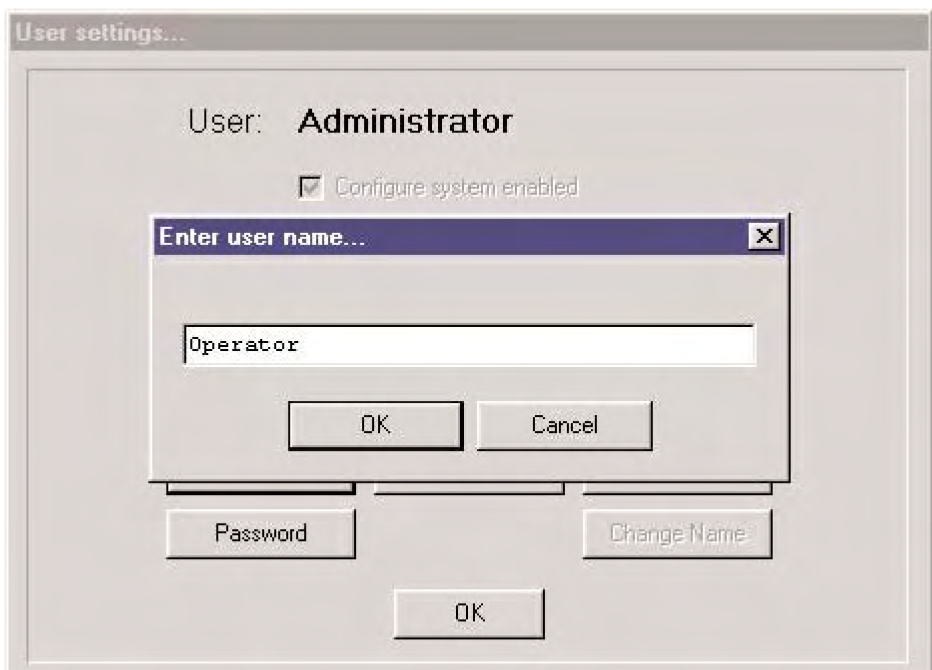
Five buttons allow for selecting, creating, renaming and deleting user accounts, one button is for entering or changing an accounts password.

Above the buttons are four check boxes and a "User Level" field that determine the rights the user is allocated. These rights include the user level and whether or not the he/she is able to access diagnostics or configuration utilities and a "restricted access" mode for viewing but not changing configuration data.

Creating User Accounts: To create a new user, select the “New” button from the “User Settings” dialog box. The user selection screen will appear

Select any blank button to be configured as a new user.

This will display a dialog box for entering the new users name. Enter the name of the new user.



Enter the name of the new user, in our example above “Operator” was chosen.

After entering the new users name, select “OK” to accept the name and display the “User settings...” dialog box.

There are four check boxes and one field that are used to configure the users account.

User Level: A user level between 0 and 65535 is used to determine what a user can do. Each command or button which a user can interact with in S^3 has a user level assigned to it. The higher the number, the higher the “privileges” for that user. A user level of “0” would allow “browsing” only with no command capability.

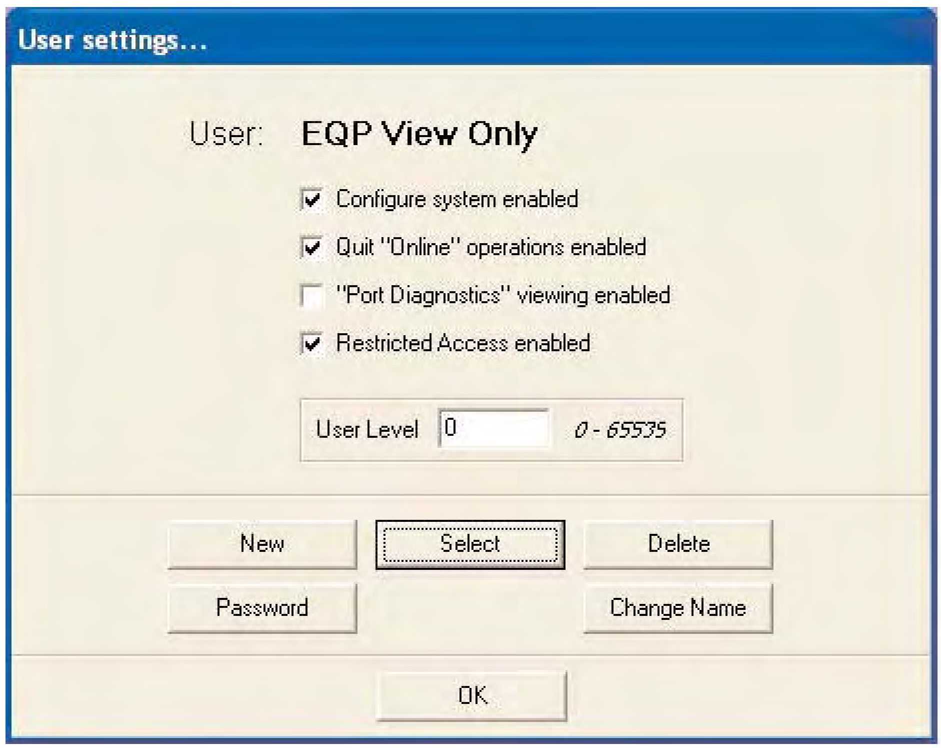
Configure system enabled: When selected, this option allows the user access to the engineering and configuration aspects of the S^3 software suite. This includes the ability to make, move, configure and delete ports. The ability to create or modify points like fire detectors, gas detectors, analog transmitters, digital inputs, etc. attached to one or more of the available ports.

Quit “Online” operations enabled: When selected, the user is able to quit online operations and return to the S^3 main screen for access to the various engineering and maintenance utilities.

Port Diagnostics viewing enabled: When selected, when online the user can access the port diagnostics screen (F11). This screen allows the user to view details about the operation of all active communication ports, whether serial or ethernet. This would typically be used by a technician responsible for troubleshooting connectivity between the S3 station and any attached systems.

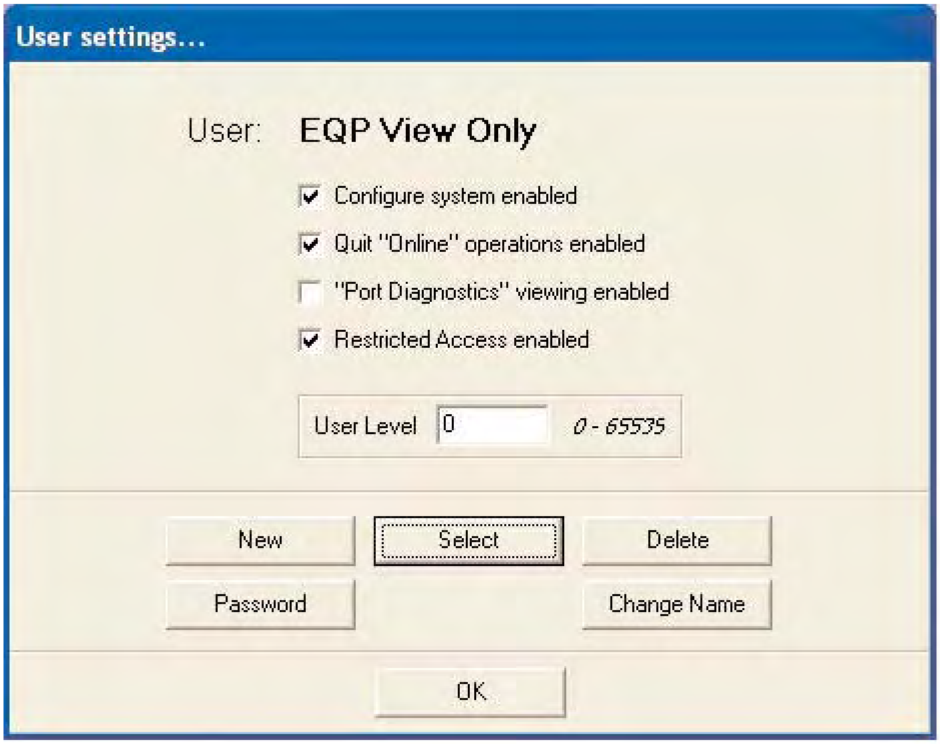
Restricted Access enabled: This feature applies only to Det-Tronics Eagle Quantum Premier systems and is intended to give limited access of the EQP port configurations for viewing and documentation purposes.

User accounts can be created with only the “restricted access” checkbox selected, or combined with the other checkboxes; configure system, quit online, port diagnostics.



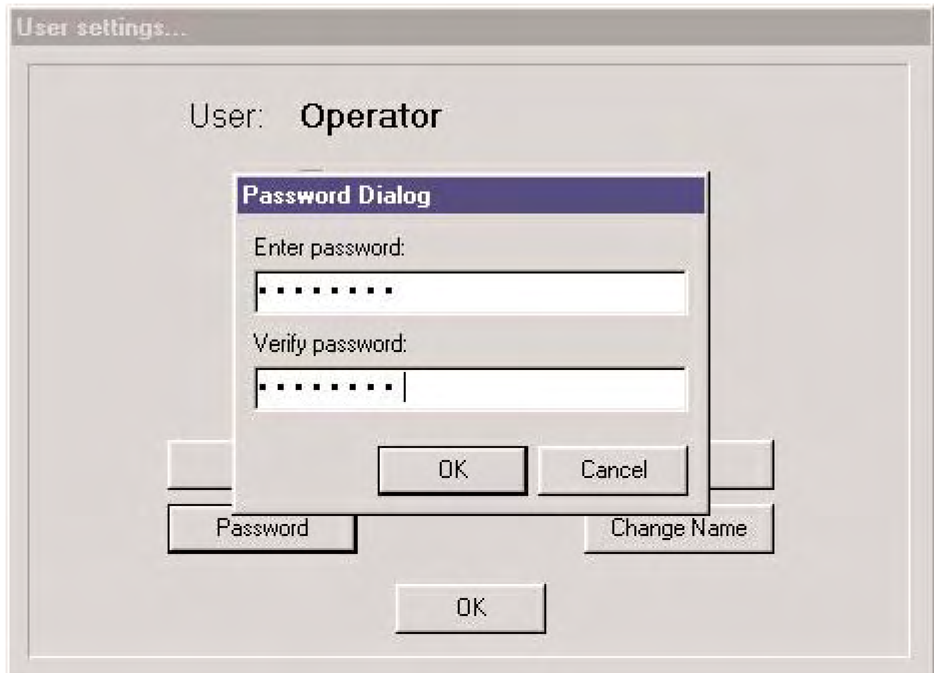
When a user account is created using only the restricted access checkbox, the user can log in and view the configuration and calibration logs as well as configure and initiate the print-out of system documentation but cannot access any other S^3 features.

If “restricted access” is combined with “configure system” the user can also create project backups using the “Backup/Restore” utiliity and view the LON configuration of an EQP port but cannot edit or view the LON devices details.



If combined with “Quit Online operations” a restricted access user could log in while the graphics environment was online, be able to navigate the graphics and be able to quit the graphics environment returning to the configuration environment and the view and document the project as described above but not be able to make changes or return online.

Password: After the selection of the options assigned to the user, a user password must be created. This password is used to log on to the system at startup or when online during shift changes etc.



Select the "Password" pushbutton to access the "Password" dialog box. The password must first be entered into the "Enter password:" field and then again into the "Verify password:" field to validate the entry.

Note: Only the Administrator may change passwords!

If a password is lost it cannot be retrieved and the user account must be deleted and then recreated as a new user.

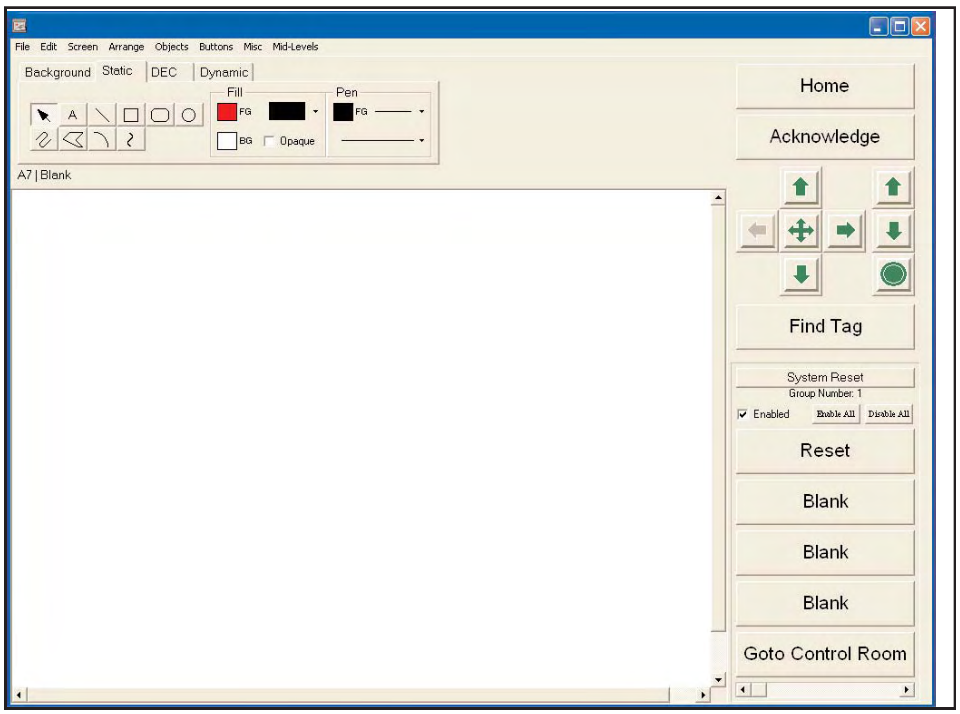
Change Name: This button allows a users login name to be changed without effecting the account configuration. For instance "Operator" could be changed to "John Doe" while retaining the password and privileges previously configured.

Graphic Editor

The graphic editor allows for the creation, programming, and maintenance of up to 256 custom graphic screens overlayed with dynamic data from any attached port.

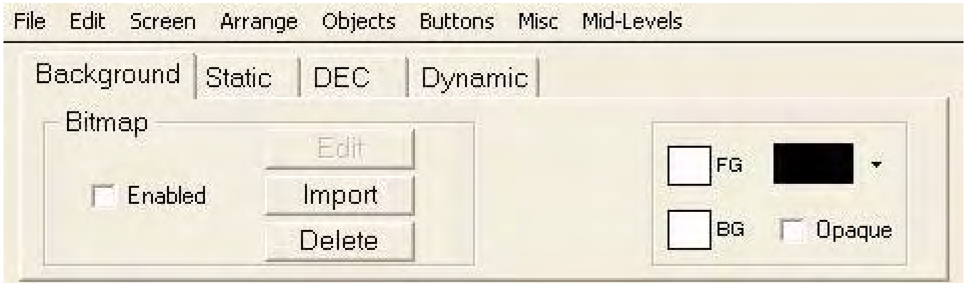
These screens are then compiled and used by the "Online" application to present the data to the operators.

The layout of the graphic editor simulates the "Online" environment so that you have a better idea of how things will look when finished.



The drawing environment is divided into four main areas. The top area holds drawing tools and access to the layer tabs. The top right area has the navigation buttons and the lower right area has the user defined buttons. The fourth area is the drawing area, a rectangle in the center of the screen whose size will vary based on the selected project resolution. In addition there are pull down menu selections for additional features.

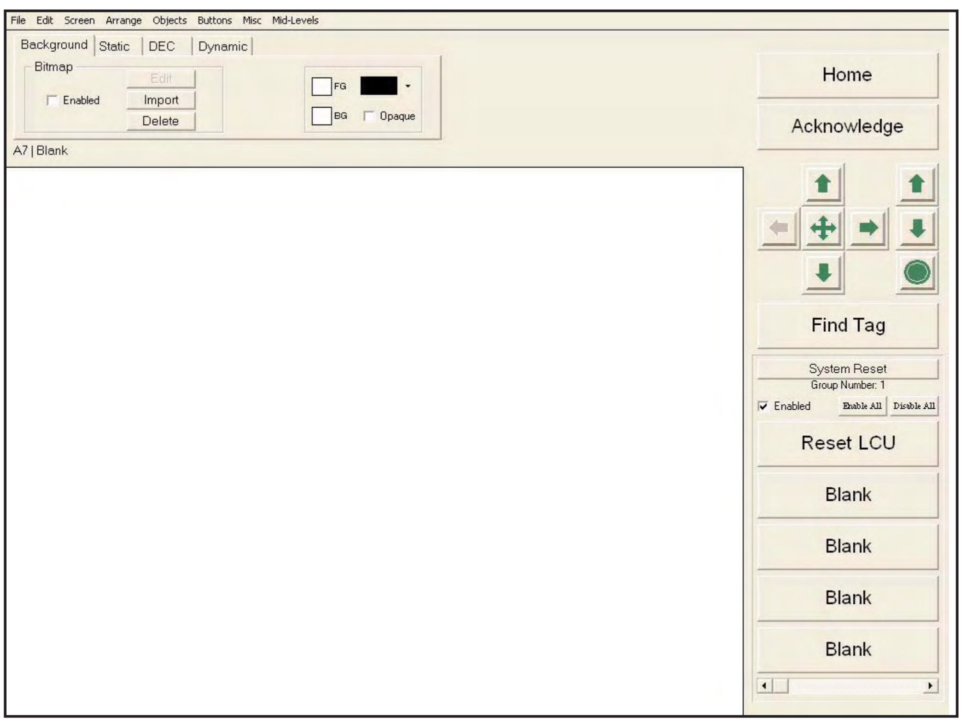
Drawing Layers: The S^3 drawing environment utilizes layers to keep like data constructs separated. There are four layers in the environment.



The layers are accessed by "Tabs" at the top left of the screen. In the sample above, you can see the four tabs; Background, Static, F.S.I. and Dynamic. The Background layer is currently selected.

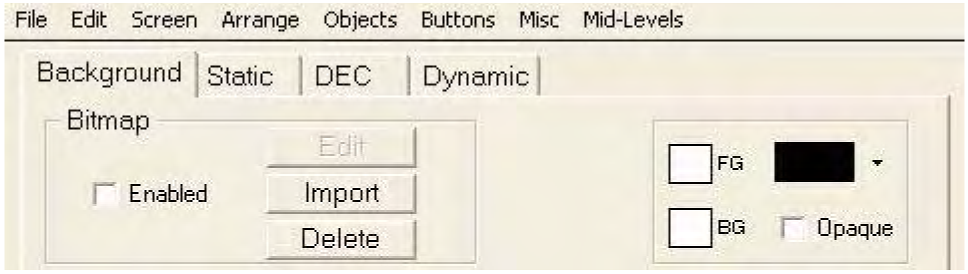
Each layer has a different set of tools and provides a unique capability for the drawing environment. The use of each layer is described below.

Background Layer: The background constitutes the lowest layer of the drawing environment. Objects built on all other layers will be "on top" of the background layer. The background layer is typically used to pro-



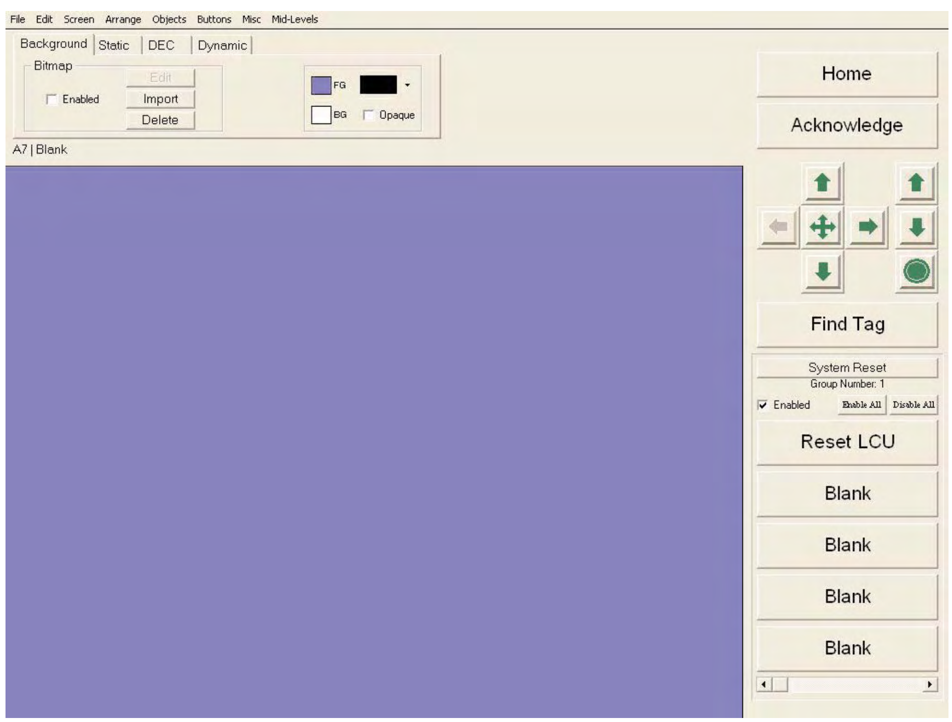
vide a consistent color, patterned or photographic background upon which to draw objects in higher layers.

The default background is a plain white with no pattern. To change the background color or pattern, select the FG or BG box.

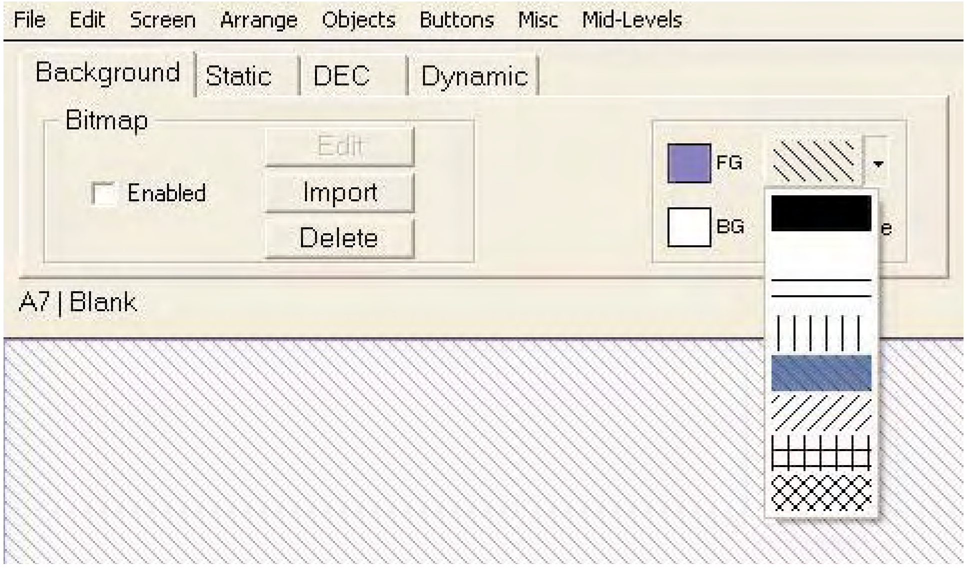


The FG (Foreground) and BG (Background) selection box will open a color pallet for selecting different colors. There are 48 solid colors available on the "Color" pallet with the ability to add an additional 16 custom colors using the "Define Custom Colors" feature.

In the sample to the right, an intermediate blue is selected (Row 3, Column 6). When the desired color has been picked, selecting the "OK" button will change the entire drawing area of the background layer to that color.

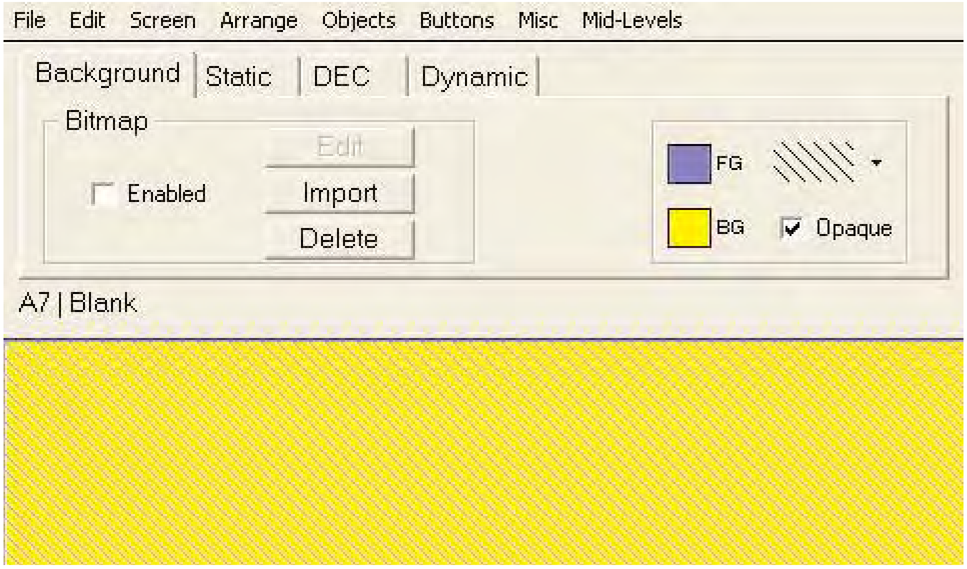


A pattern can be applied using the selected foreground color by clicking on the "pattern pull down menu" to the right of the FG selection square.



In the sample above, a diagonal pattern has been applied to the background of the drawing area.

The BG square allows for the selection of a background color when used in conjunction with a pattern selected from the pattern pulldown menu and with the "Solid" checkbox selected.

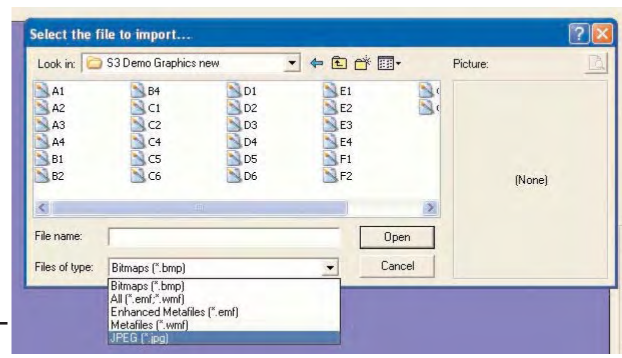


In the sample above, a yellow BG was selected and the "Opaque" check box is enabled. This yields a diagonal pattern with the FG color over the BG color.

Importing Graphic Files: The background layer can also be used to display a photo or drawing developed in another application. For instance, a plot plan of the facility taken from AutoCad and converted to a bitmap. This can save time in graphic development but trades off the ability to easily edit the background later.

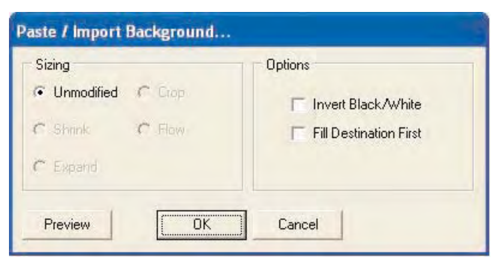
To place a bitmap file, select the "Import" button in the "Bitmap" area of the background tab.

This will display a dialog box allowing navigation to the graphic file to be imported. File types supported for importing include; bitmaps (.bmp), Windows Meta-File (.wmf), and Enhanced Meta-File (.emf) and standard JPEG (.jpg).



Regardless of the original file type, the import function converts it into a bitmap (.bmp).

Once the file is selected the "Paste/Import Background..." dialog box displays the available preprocessing options for bitmap imports.



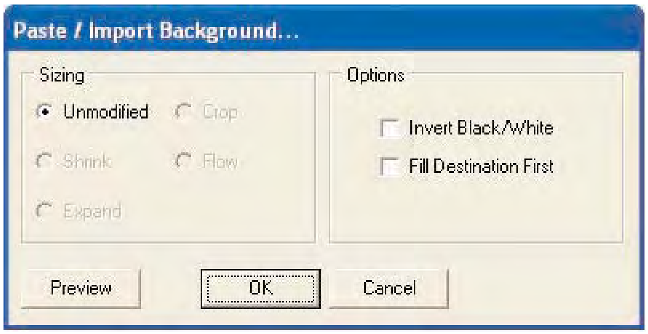
There are two main option areas associated with bitmap importing. The "Sizing" area determines what kind of scaling or cropping will be applied to the bitmap.

The "Options" area can invert black and white pixels and / or fill the destination screens with a color (as selected in the FG & BG squares) prior to importing the bitmap.

Sizing options: Each graphic screen is 800 pixels wide by 600 pixels high. If the bitmap to be imported is not the same size, you can apply several different options to it as it is being imported.

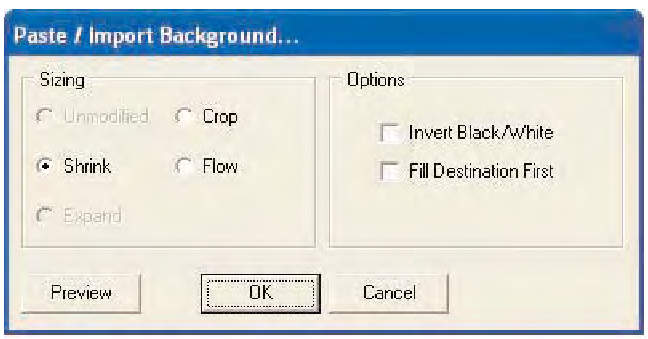
Unmodified: If the graphic is exactly 800 x 600, the import dialog box will open with the “Unmodified” radio button selected.

This option is usually applicable when the graphic to be imported has been pre-processed in another application like Photoshop or Paint.

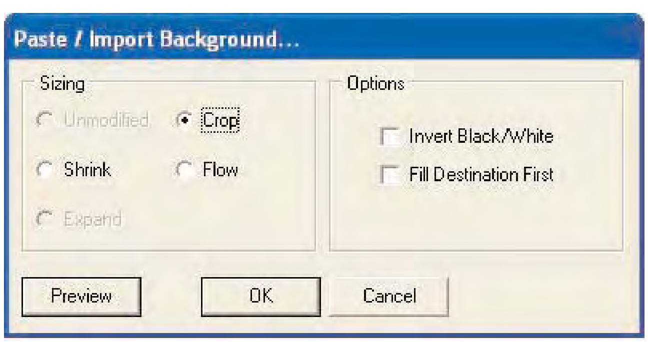


If the graphic to be imported is larger than 800 x 600 then when the import dialog box opens the “Shrink”, “Crop” and “Flow” graphic import modifier radio buttons will be enabled for selection.

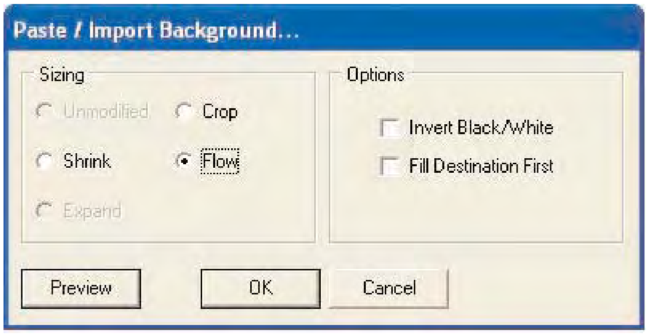
Shrink: When the graphic to be imported is larger than standard, the Shrink option is automatically selected. This will scale the graphic to fit inside the standard graphic window (800 x 600).



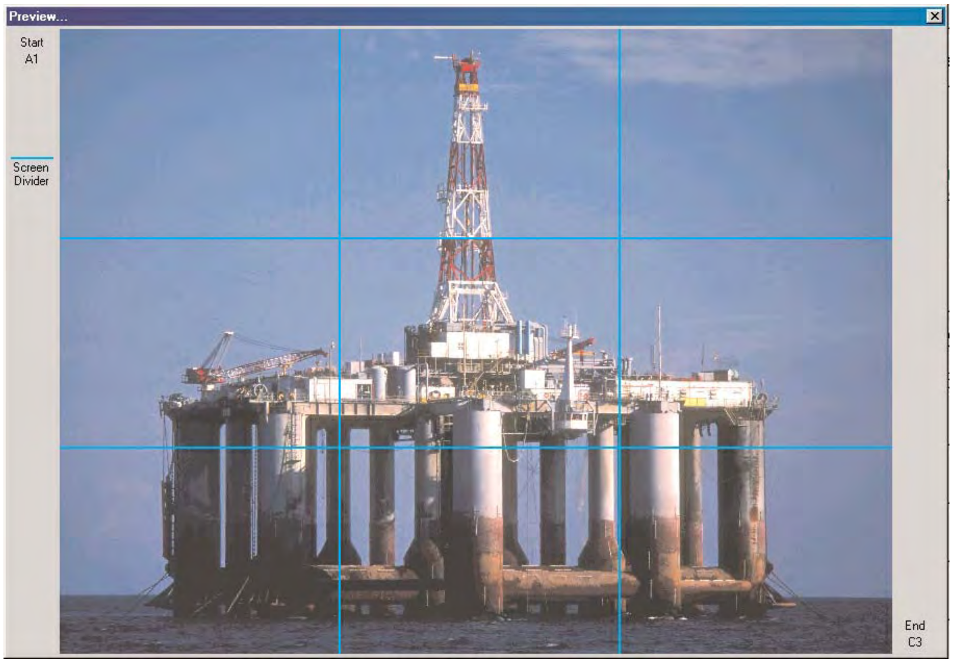
Crop: This option is available when the graphic to be imported is larger than the standard graphic window (800 x 600). When selected, using the upper left pixel of the graphic to be imported as a reference, everything beyond 800 pixels in width and 600 pixels in height will be deleted.



Flow: This option is available when the graphic to be imported is larger than the standard graphic window (800 x 600).



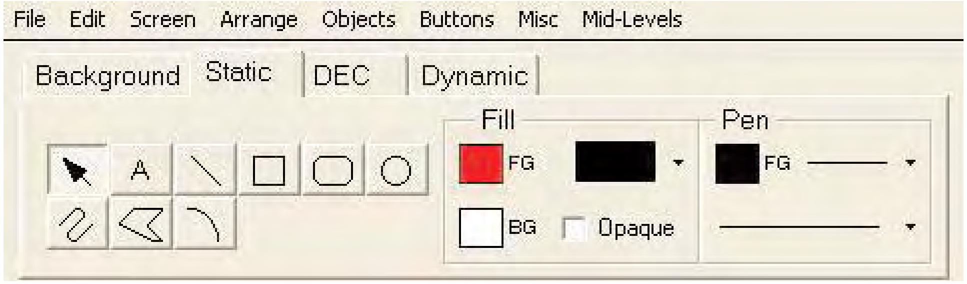
When selected, the graphic to be imported will be divided into a series of standard graphic windows that encompass the entire graphic. A preview button is provided that shows how the graphic will be divided.
If the graphic being imported is not evenly divisible by 800 x 600, the remainder will be filled with white.



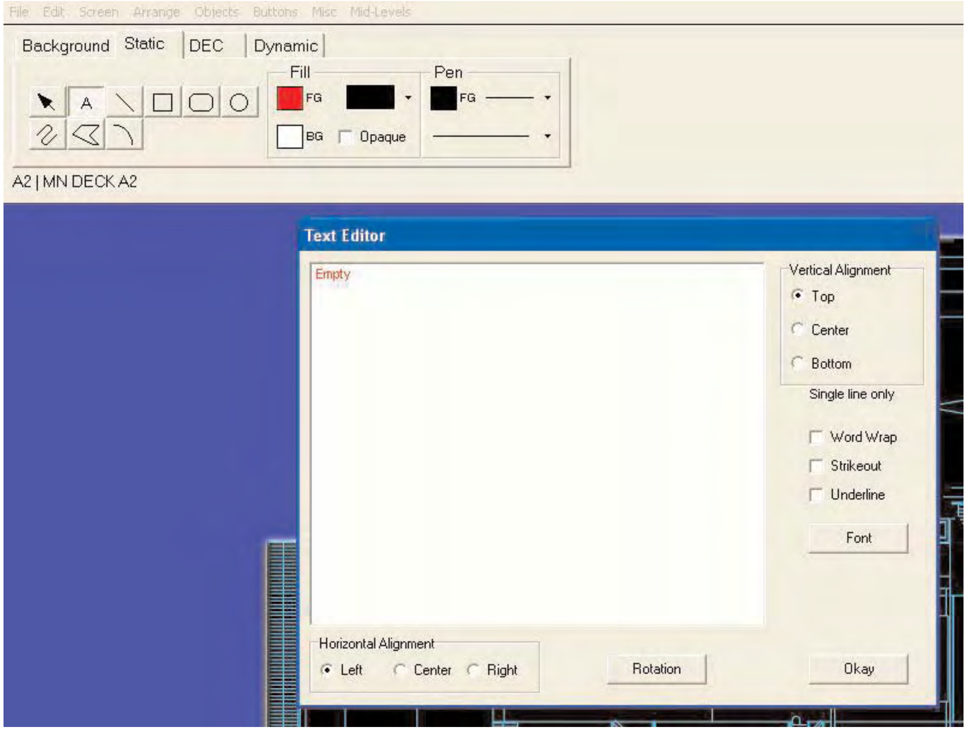
If the graphic to be imported has a particular background color, the "Fill Destination First" checkbox in conjunction with the FG color selection box can be used to fill the remainder with a selected color.

Static Layer: The "Static Layer"provides a selection of drawing tools for the creation of graphics that do not change. For instance, the outlines of buildings or machinery representing the facility or areas within it.

There are eight graphic creation tools and a pointer. In addition to these tools there are modifiers for lines, colors and patterns.



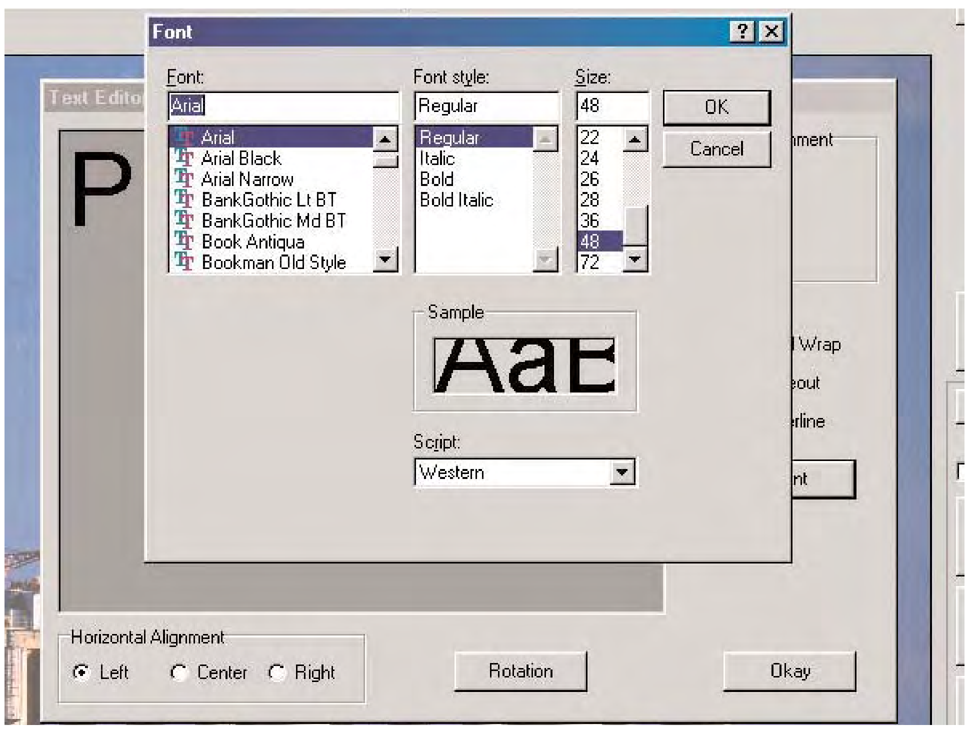
Text tool: The text tool allows descriptive text to be added to the graphic screen. The alignment, angle, color and fill pattern for the "text object" can be adjusted in the dialog box.



Selecting the text tool will open the "Text Editor" dialog box. Within this dialog box text is entered and formatted. Formatting options include text alignment, rotation, font selection and sizing, and special formatting like underline and strikeout.

Text Object Creation Example:
When a new text object is being created, the text editor dialog box opens and displays the default text “empty”. You then enter the desired text and apply the desired formatting options.

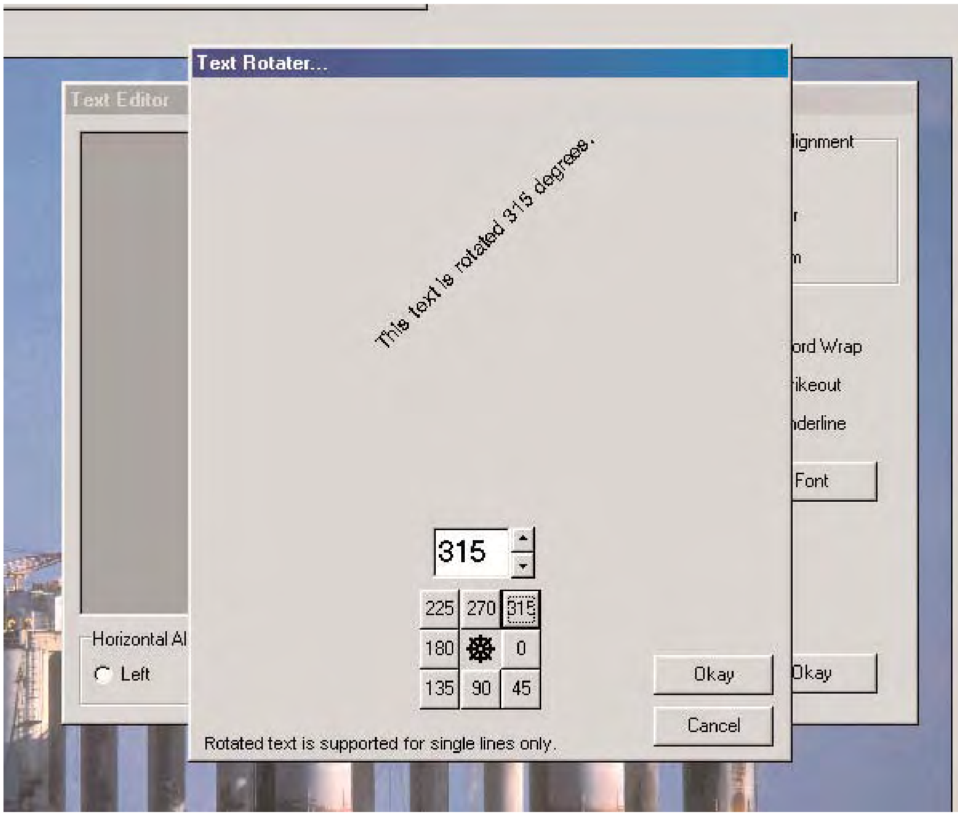
Above, the “empty” text has been replaced with our example“PP-NA-1”. This text can then be modified. Next, the “Font” button is selected allowing the font type and size to be changed.



For our example, Arial Regular in a 48 point size is selected. Other font styles such as Italic, Bold and Bold Italic could also have been selected at this point.

NOTE: Since this is a “Text Object” and not a bitmap, any of these modifiers can be changed later;
“Right-click” on the text object to access the editor.

After the font size and style are selected a rotation will be applied by selecting the Rotation button and selecting the angle.



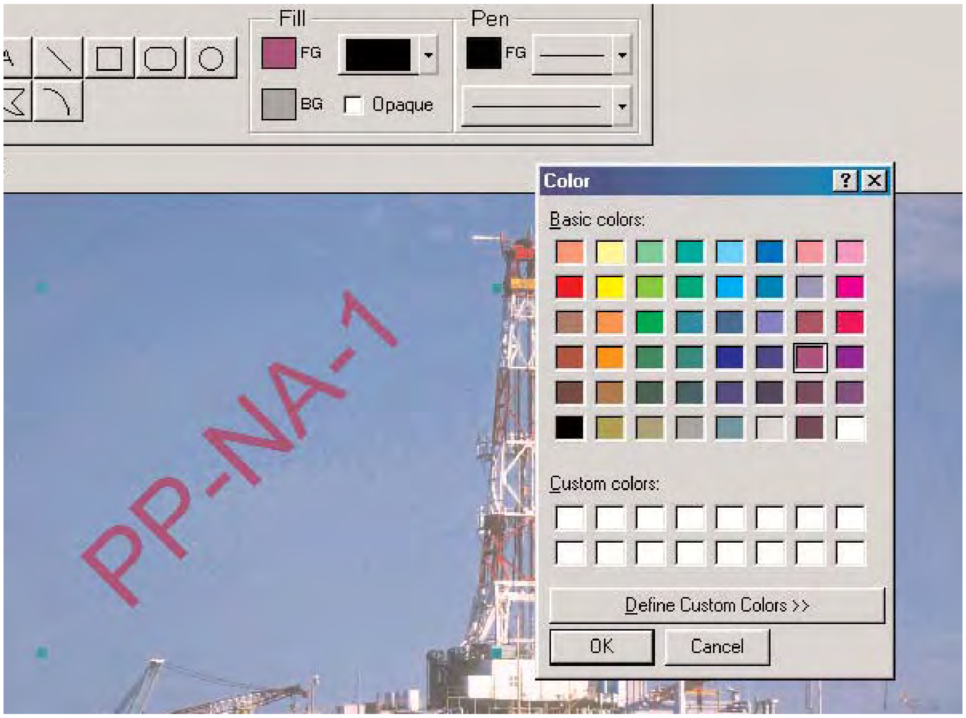
The text angle is adjusted by selecting one of the defaults, located at the compass cardinal points, or be manually entering the angle.

NOTE: Rotated text is supported for single lines only.

Once the angle is selected, the Okay button will close the dialog boxes taking you back to the main screen of the graphic editor, with the new text object in place.

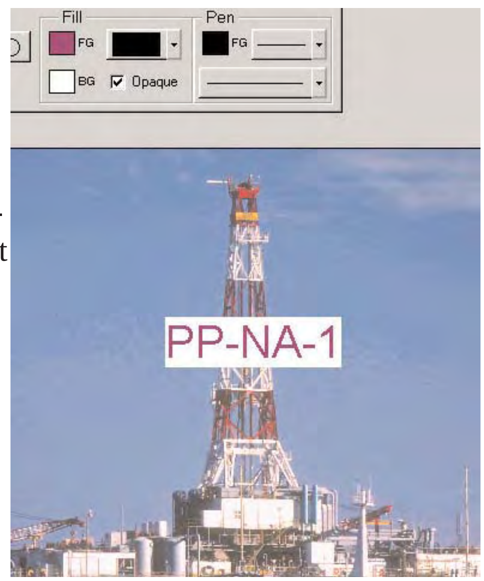
The color of the text object can be changed from the main window by selecting the object and the FG or

BGbox. This will open the color pallet from which any of 48 default colors can be assigned. The "FG" box in the "Fill" selection area just to the right of the tool selection buttons is used to change the color of the actual text in the text object (PP-NA-1 in this example).



The "BG" box used in conjunction with the "Opaque" checkbox allows changing the color of background of the text object but not the text.

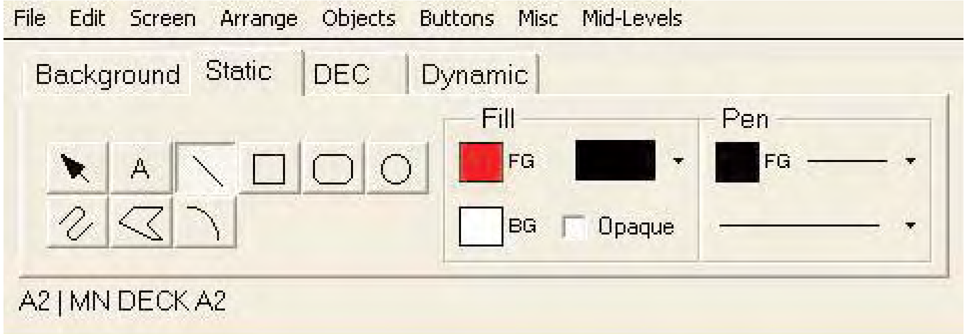
When the "Opaque" checkbox is selected the background of the text object will be what ever color is selected in the "BG" box.



In the example to the right, the background of the text object has been set to Opaque and White.

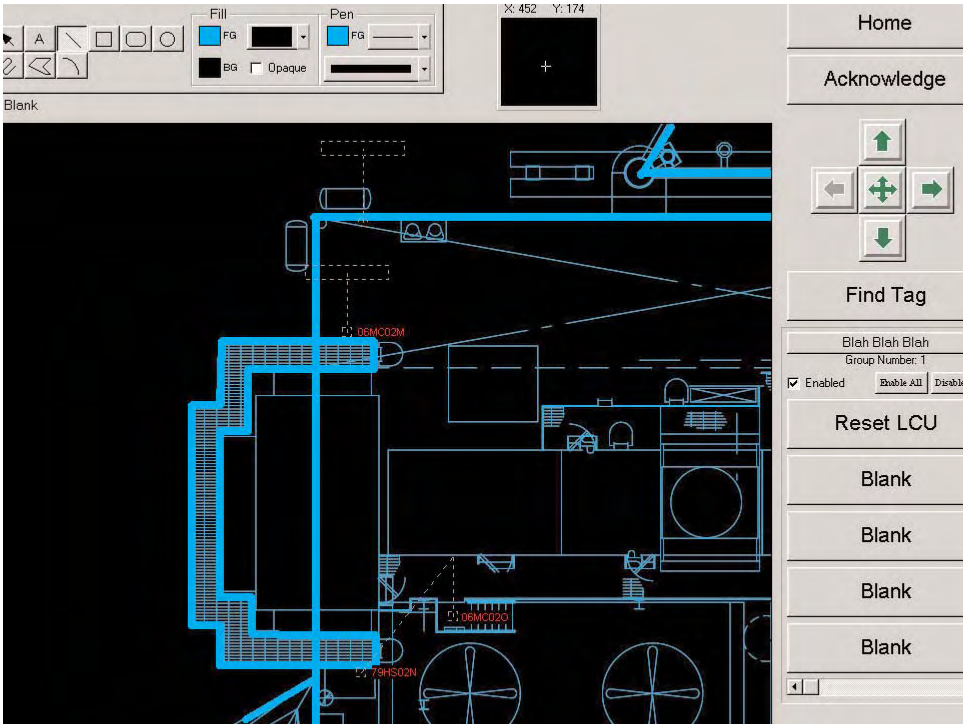
This is useful when text is placed over a visually complicated object that in some cases can make text more difficult to read.

In addition, 16 custom colors can be created for use in the project. These are created by selecting the "Define Custom Colors" button which displays a standard color selection wheel.

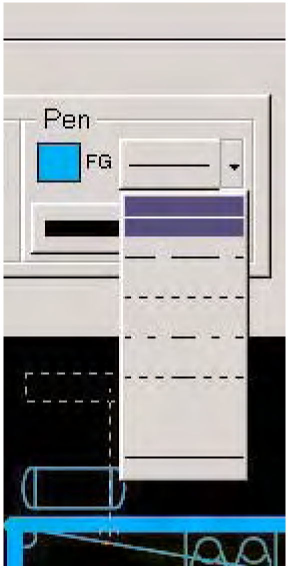


Line tool: The line tool allows "straight lines" of various widths and colors to be created. These can be used to draw facility layouts or other static representations to help the operators better understand the system.

The example below is from an offshore platform project and the line tool was used in conjunction with other static tools to build a representation of the platform.



Changing the thickness or type of line is done using the pull-down menus in the "Pen" section to the right of the tools. The line color is set using the "FG" box in the "Fill" section to the right of the tools.



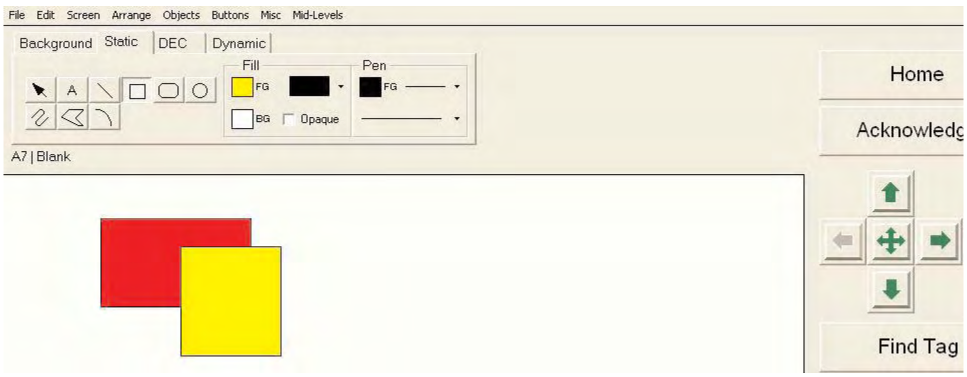
The "Pen" area to the right of the static tool buttons contains three modifiers for lines. A selection box and two pull down menus.

The "FG" box allows the line color to be chosen.

A variety of different "line types" and sizes can be selected from the appropriate pull down menu.

As with other "objects" on the static layer, these color, type and thickness attributes can be changed later as required.

Rectangle tool: This tool allows squares and rectangles to be created in the development of custom graphics.

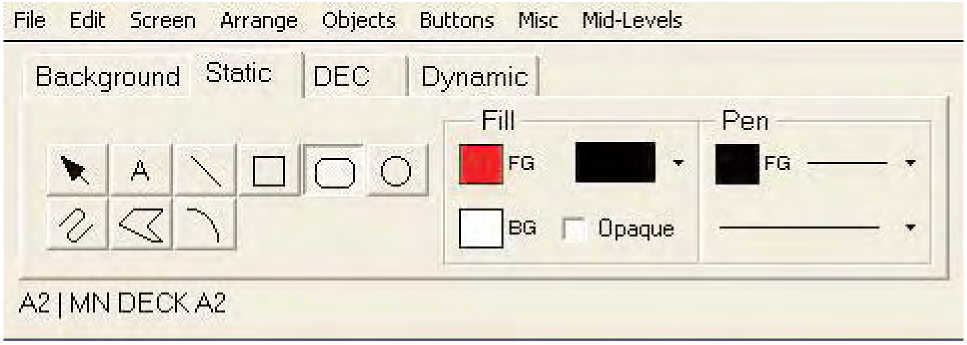


To create a rectangle, select the tool, position the mouse pointer at the location in the drawing window where the rectangle will begin, click and drag the mouse to create a rectangle in the desired size.

The location of the rectangle in the drawing window can be changed by clicking and dragging. The size and aspect ratio can also be changed. To do so, click on the rectangle to select it and then click and drag on one of the "selection handles" until the desired size is reached.

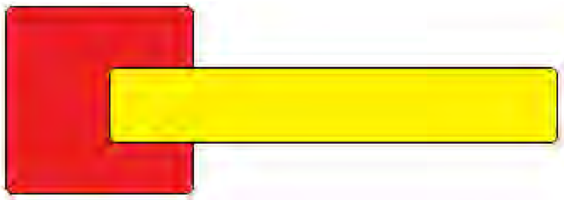
Once created the "Fill" and "Pen" modifiers can be used to change the rectangles color, pattern and line thickness.

Rounded rectangle tool: This tool allows squares and rectangles with rounded corners to be created in the development of custom graphics. To create a rounded rectangle, select the tool, position the mouse pointer



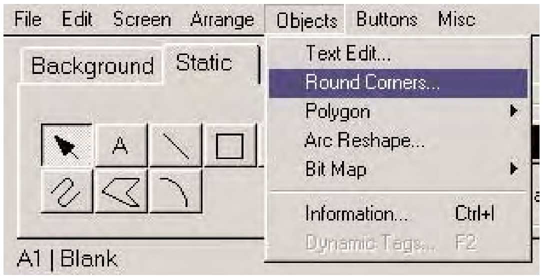
at the location in the drawing window where the rounded rectangle will begin, click and drag the mouse to create a rectangle in the desired size.

The location of the rounded rectangle in the drawing window can be changed by clicking and dragging. The size and aspect ratio can also be changed. To do so, click on the rectangle to select it and then click and drag on one of the "selection handles" until the desired size is reached.



Once created the "Fill" and "Pen" modifiers can be used to change the rectangles color, pattern and line thickness.

In addition, the radius of the rounded corners can be adjusted by selecting "Round Corners..." from the Objects menu.

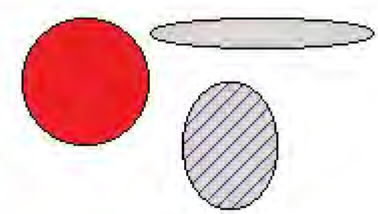


This will open a dialog box allowing the radius (in pixels) of the rectangle corners to be entered.

Circle tool: This tool allows circles to be created in the development of custom graphics.

To create a circle, select the tool, position the mouse pointer at the location in the drawing window where the circle will begin, click and drag the mouse to create a circle in the desired size.

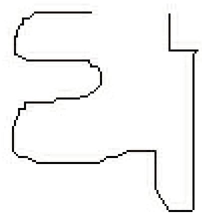
The location of the circle in the drawing window can be changed by clicking and dragging. The size and aspect ratio can also be changed. To do so, click on the rectangle to select it and then click and drag on one of the "selection handles" until the desired size is reached.



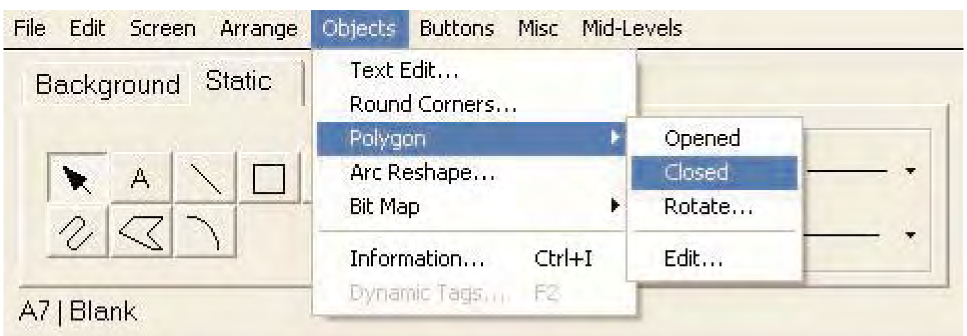
Once created the "Fill" and "Pen" modifiers can be used to change the circle color, pattern and line thickness.

Freehand line tool: This tool allows custom shapes, either filled or open, to be created in the development of custom graphics.

To create a freehand object, select the tool, position the mouse pointer at the location in the drawing window where the object will begin, click and drag the mouse to create to create a custom "freehand" object. The object may be "open" as shown in the example to the right, or closed, where a fill pattern and color is applied to the inside area of the object.

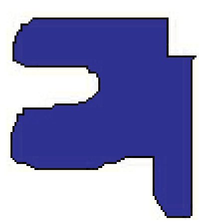


A closed freehand object is created by first making the object as an outline and then modifying its parameters. To do so, select the object by



clicking on its outline, then from the "Objects" menu select "Polygon" and "Closed".

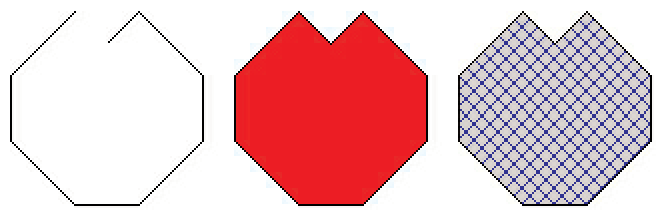
This will fill the interior area of the freehand object with the color and pattern preferences currently selected in the "Fill" and "Pen" areas. These can be easily changed by selecting different choices.



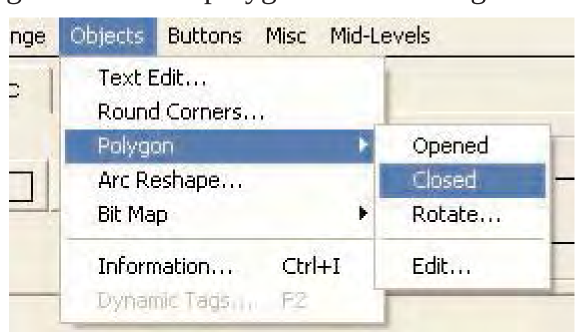
Polygon tool: This tool allows the creation of polygons, either filled or open, in the development of custom graphics. A polygon is a flat, or

plane closed figure made up of at least 3 lines. Triangles, rectangles, octagons, and all other flat figures that have 3 or more sides are polygons.

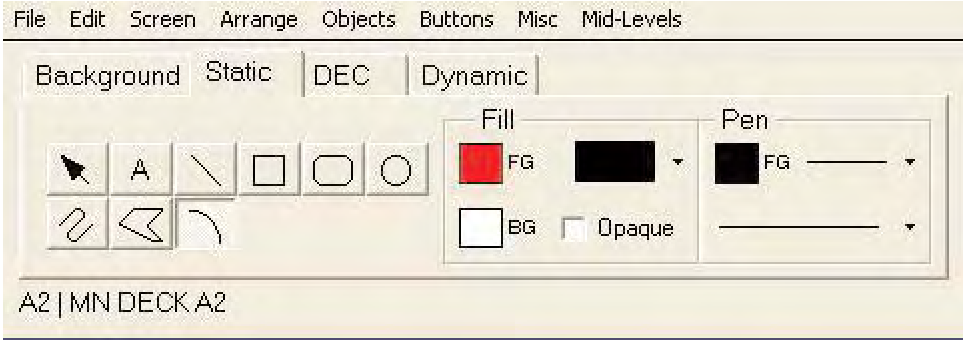
To create a polygon object, select the tool, position the mouse pointer at the location in the drawing window where the object will begin, click the mouse to create the first point of the polygon and then drag the mouse to the location of the next "break-point" and click. This creates another anchor point and allows you to then change the direction of the next line. Continue this process until the polygon is complete and on the last point double-click to finish the object.

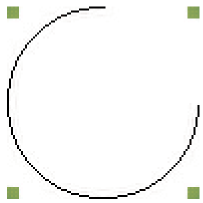


In the examples above, the left-most polygon is an "open polygon" and the other two are "closed polygons". Closed polygons can be assigned an interior color and pattern. To "close" a polygon, select the completed "open polygon" object by clicking on its outline, then from the "Objects" menu select "Polygon" and "Closed". This will fill the interior area of the polygon object with the color and pattern preferences currently selected in the "Fill" and "Pen" areas. These can be easily changed by selecting different choices.

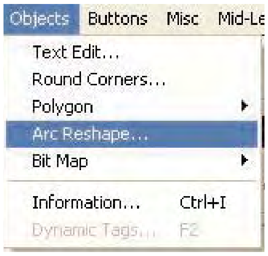


Arc tool: When a segment of a circle is required this tool allows either open or filled arcs to be created.



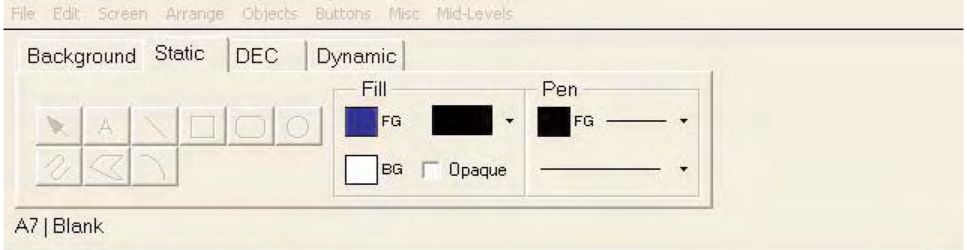


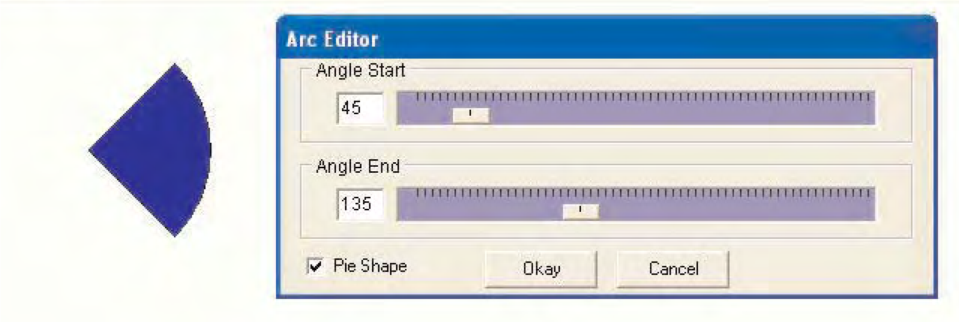
Creating an arc is a two step procedure. First, select the "Arc" tool, as show above, then click and drag from upper-left to lower-right to create the arc editing box, as shown to the right. The arc editing box will always initially consist of a 270° arc starting at 90° and continuing through 360°.



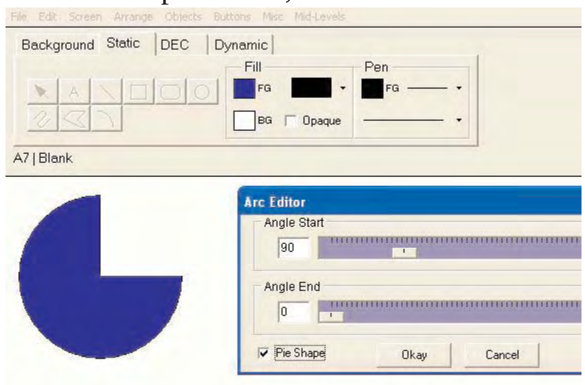
Second, select "Arc Reshape" from the "Objects" menu. This will open the "Arc Editor" dialog box. This dialog box, shown below, depicts the current arc along with its starting and ending angles.

There is also a "Pie Shape" check box. When selected, this causes the area inside of the arc to take on the currently selected Fill and Pen attributes. The sample below shows the arc with pie shape fill enabled and the start and end changed.



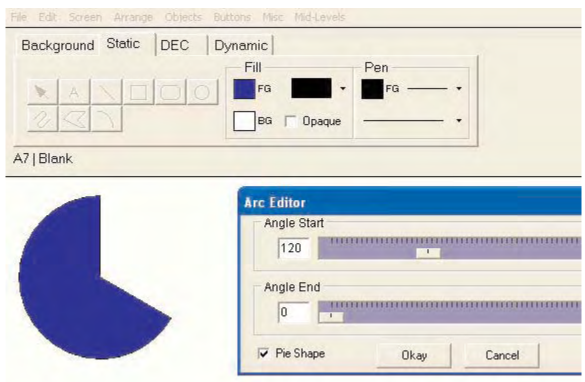


In the example below, the initial arc has not been changed but the "Pie



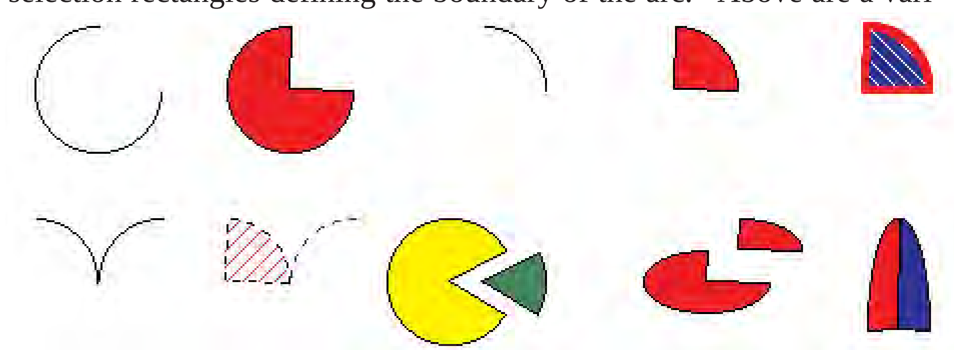
Shape" check box is selected, causing the arc to become "filled".

Note that even though the results of arc editing are shown as adjustments are being made, the arc being edited doesn't change until the "Okay" button is selected in the Arc Editor dialog box. "Cancel" on the other hand, leaves the original arcs attributes unchanged and it returns to its configuration before the Arc Editor was opened.



Entering a new number in either or both fields will change the arc shape. The new shape is displayed graphically as numbers are entered or the sliders are adjusted. In the example to the left, the angle start and end have changed and the arc has been reshaped.

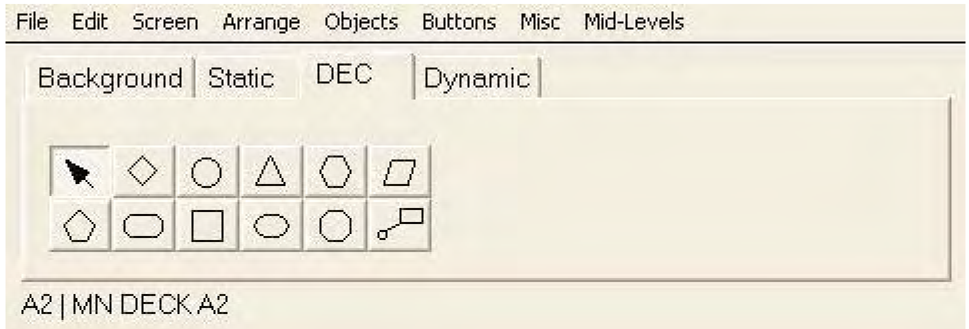
Once the arc is of the desired size and shape, it's pen and fill attributes can be modified to suit. The aspect ratio (height to width ratio) of arcs, like rectangles, circles, polygons, and other objects can be changed by simply selecting the completed arc and resizing it by dragging one of the selection rectangles defining the boundary of the arc. Above are a vari-



ety of arc samples demonstrating what can be done by manipulating the pen, fill, angle attributes, and aspect ratio.

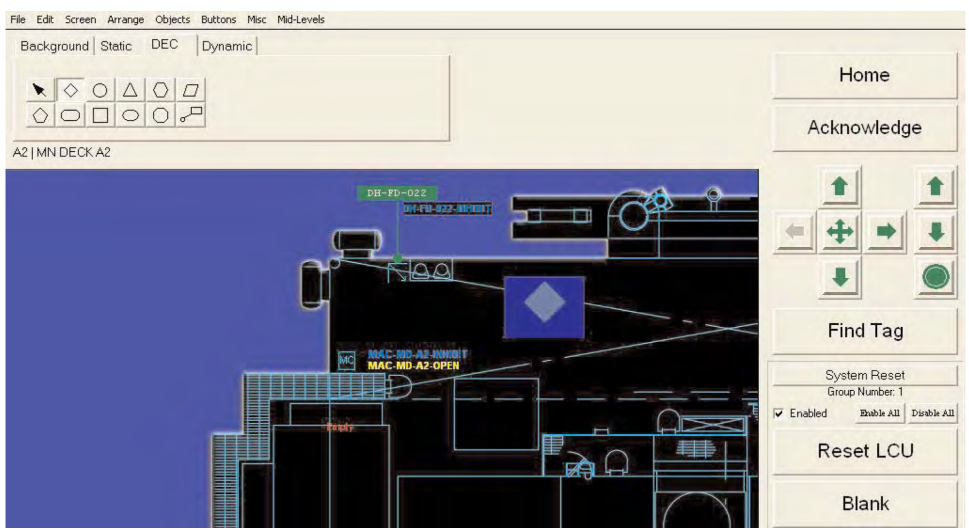
DEC Layer: This layer of the S3 drawing environment allows for the selection, configuration and placement of symbols on the drawing that represent the status of certain field devices.

These symbols can be configured to change color combinations depending on the “State” of the field device.



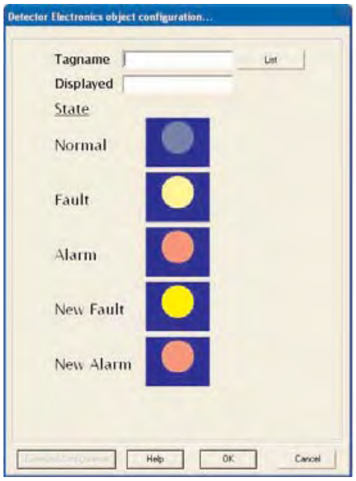
Eleven symbol shapes are provided so that different types of devices can be represented by different symbols if desired. For example, a diamond for fire detectors, a circle for gas detectors, a triangle for manual call points, etc.

Select the desired symbol and then “click” on the desired destination location for the symbol within the graphic window. Once placed, the symbol may be freely moved with either the arrow keys or mouse.



In the sample above, the “diamond” symbol shape was selected and placed on the graphic. The next step is to “link” the symbol to the field device database and set its color attributes.

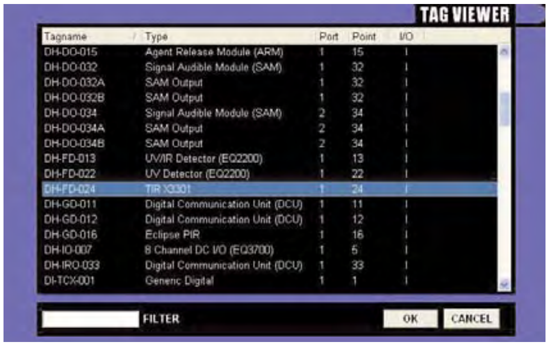
DEC Object Configuration: Double-click on the placed symbol to open the “Detector Electronics object configuration” dialog box.



This dialog box presents a “Tagname” field for creating linkage between the symbol and the field device database and it also provides controls for setting the color combinations that will represent the various “states” of the linked field device.

If the desired tagname is known for the field device to be linked, it can be entered directly into the “tagname” field at the top of the dialog box.

If the exact tagname is not known, select the “Find” button to the right of the tagname field to open the “Tag Viewer”.



The “Tag Viewer” dialog box contains a scrolling list of all of the field devices in the database as well as a “filter” field to help locate the desired tag.

Once the desired tagname is located, select it and choose “OK” or double-click on the tagname. This will make the selection and dismiss the tag viewer dialog box, returning the object configuration dialog box where the selected tagname is now displayed.

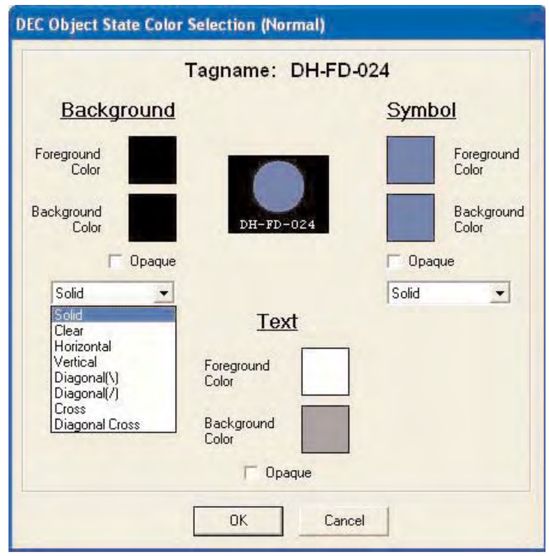
DEC Object Visible Attribute Selection: The foreground color, background color, foreground pattern and background pattern can each be individually selected for the symbol and its surrounding background.

In addition the color text displaying the tagname and its background color can also be adjusted.

All of these settings are done via simple “point-and-click” selections within the objects “state color selection” dialog box. To access these settings, double-click on the symbol next to the state being edited.

In the example below, the “Normal State” is being edited. In the center of the dialog box is a representation of the symbol utilizing the currently selected colors and patterns.

Symbol Background: On the left side of of the dialog box are selections for the foreground and background colors of the “background” of the symbol. This is the square area surrounding the actual symbol.



Below this are an “Opaque” check box and a pull down menu for the pattern of the background. The “Opaque” checkbox works in conjunction with the selected pattern. It applies the selected background color to the background of a pattern. If no pattern is selected, it has no meaning. By default, “opaque” is deselected.

Symbol: On the right side are similar selections for the foreground color, background color and the pattern of the symbol itself.

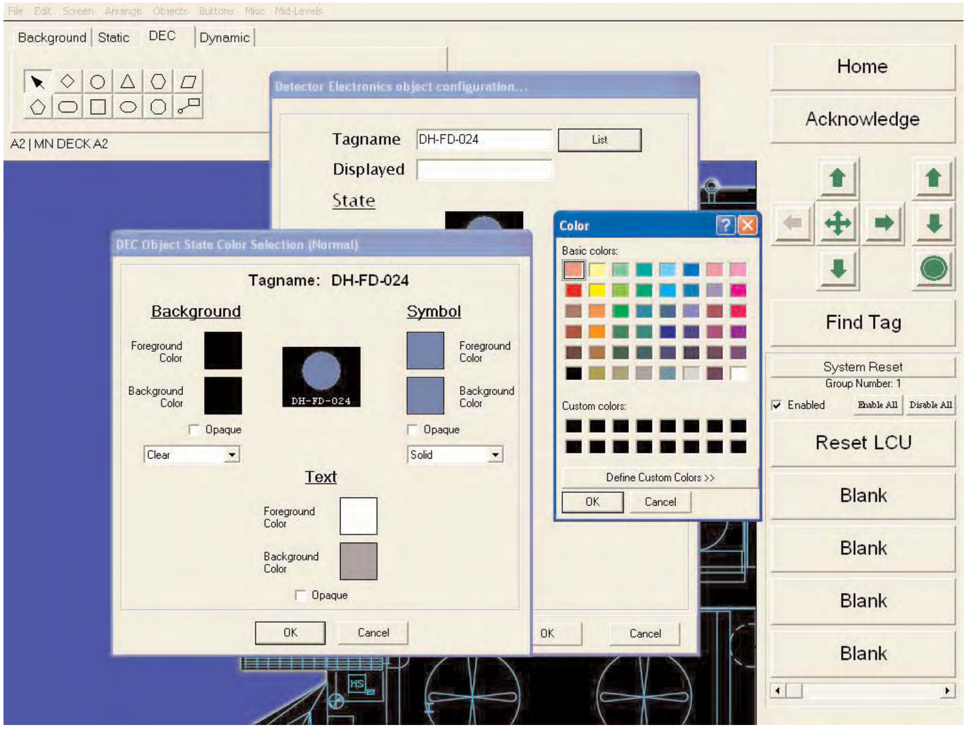
Text: The foreground and background colors of the text displaying the tagname of the symbol can be changed as required. The foreground color controls the actual text color, the background color controls a rectangle surrounding the tagname. This can be used to make the tagname easier to read when its symbol is over complex graphics.

With text, the “Opaque” check box must be selected to enable the background color.

Color Selections: All foreground and background color selections are made using S3’s standard color selection dialog box. This dialog box provides 48 predefined “standard colors” along with the ability to create up to 16 custom colors.

The “Define Custom Colors” button will expand the dialog box to allow selection of any desired color.

In the example below, all three of the editing dialog boxes for the "Normal State" of a symbol are shown.

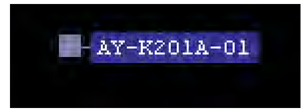


Below is an example of a "completed" symbol, with all color and pattern attributes selected, placed on a graphic screen.

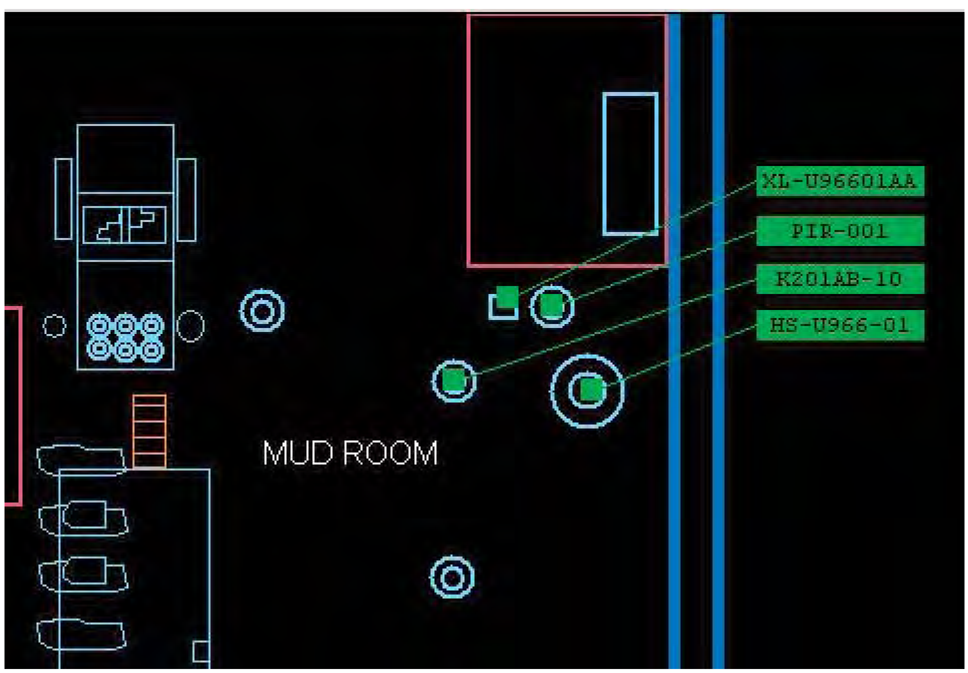
Once the desired color and pattern selections are made for a symbol, it may be easily duplicated with either the "Duplicate" command under the

"Edit" menu. Once duplicated simply double click on the new symbol and change the tagname selection. You may also cut/copy and paste a symbol from one location or screen to another.

Callout Symbol: Of the eleven symbols available, ten are simple one piece geometric shapes. One however, is a "two-piece" symbol called a "Call-out". It consists of a rectangle containing the tag name and a small pointer connected by an elastic line that can be moved away from the tag-name to indicate device location.



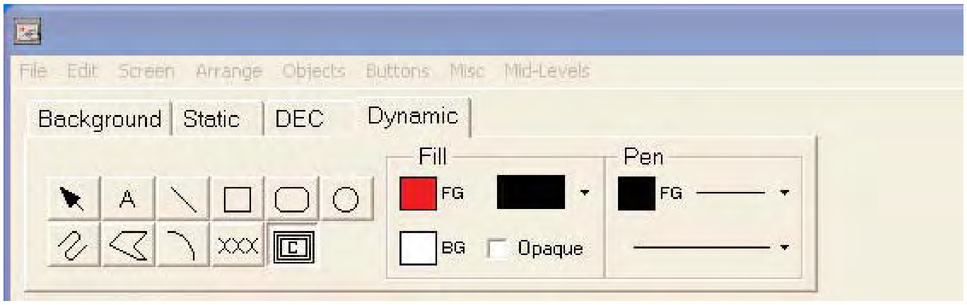
Call-outs are typically useful when a large number of field devices are in close proximity to each other on the graphics, as in the sample below.



Dynamic Layer: The “Dynamic Layer”provides a selection of drawing tools for the creation of graphics that can be linked to the tagname database and the status of devices connected to the system can then influence the look, size and position of dynamic objects on the screen.

For instance, the “Sensor Fault” status bit of a gas detector can cause a descriptive text string to appear on screen next to its DEC tag object, or a valve position switch tied to an input can cause a polygon shaped like a valve to change color.

There are the same eight graphic creation tools and a pointer as found on the Static Layer editor plus two additional ones, the “Dynamic Text” tool and the “Complex Object” tool. In addition to these tools there are the standard S³ modifiers for lines, colors and patterns.

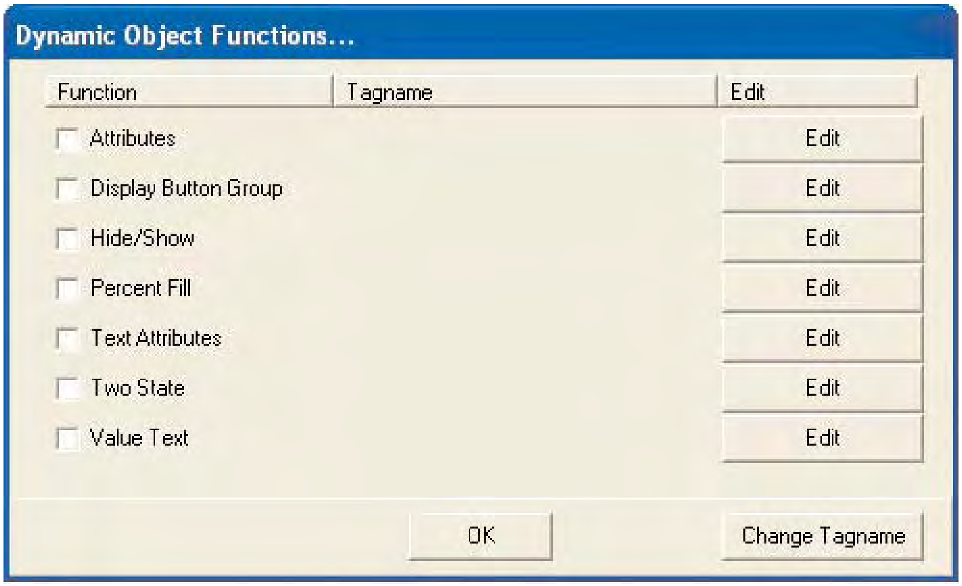


The creation of objects and setting of their color, pattern, line attributes and position is identical to that described for the Static Layer using the following tools:

- Text Tool
- Line Tool
- Rectangle Tool
- Rounded Rectangle Tool
- Circle/Ellipse Tool
- Freehand Tool
- Polygon Tool
- Arc Tool

For detailed instructions on the use of these tools to create objects refer back to the Static Layer portion of this chapter.

Dynamic Object Linking & Attribute Choices: Once a dynamic object has been created and placed in its initial position on the screen it can then be linked to the tagname database and configured to perform certain object specific dynamic changes.



Double clicking on a dynamic object that has been created will open the "Dynamic Object Functions..." dialog box which presents the options that are available for the selected object and allowing it/them to be configured.

Note: In the example above all functions are shown for clarity even though no single dynamic object type has access to all functions.

Most dynamic objects will be configured to utilize a single function from those available for the selected type, some types can utilize more than one function concurrently. The chart below shows function availability by dynamic objects type:

DYNAMIC OBJECT MODIFIERS	Text	Line	Rectangle	Rounded Rectangle	Oval	Freehand	Polygon	Arc	Value Text
Attributes		X	X	X	X	X	X	X	
Display Button Group	X	X	X	X	X	X	X	X	X
Hide / Show	X	X	X	X	X	X	X	X	X
Percent Fill			X	X	X	X	X		
Text Attributes	X								
Two State	X	X	X	X	X	X	X	X	
Value Text									X

Function Overview: Following is a brief overview of each available dynamic function along with an example of how the function might commonly be applied.

Attributes: Attributes include the size, shape, location, fill color, pattern, line thickness and pen color of a dynamic object. Any or all of these parameters can be changed in response to changes in data coming from the linked tag.

An example would be to change the color of a dynamic object from green to yellow when the status the device it is linked to in the tagname database changed from “Normal” to “Fault”.

Display Button Group: This function is designed to allow clicking on an area of the graphic screen to call up a specific set of user configured buttons.

For example, the polygon tool could be used to outline a pump created on the static layer and then when the user clicked on the pump, the button set for the pump controls would be called up allowing the pump to be started or stopped.

This function is “exclusive” meaning that it cannot be used in conjunction with any other functions.

Hide/Show: This function can be used alone or in combination with other functions depending on the object type and desired effect. As the name implies, it will either “hide” or “show” the object based on a change in data from the linked tag.

For example, the polygon tool could be used to outline the area around some “value text” in red when the associated tag went into the alarm state. In the normal state the polygon would be hidden.

Percent Fill: Causes an object to “fill” with a user selectable color based on the analog value of the linked tagname.

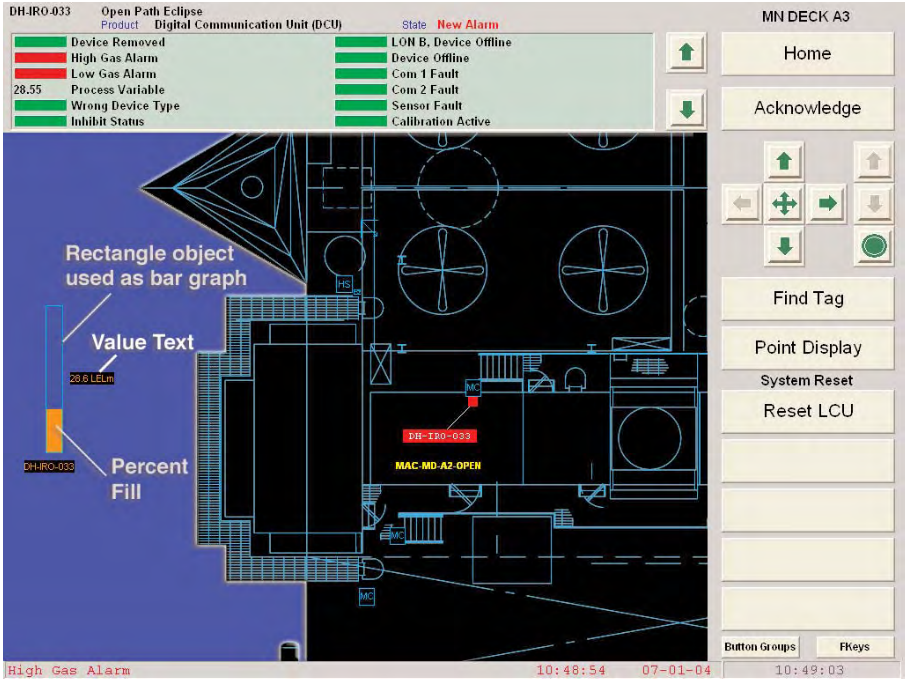
Used primarily to show things like the level in a storage tank or to create bargraph type displays.

Text Attributes: Allows text to be configured to change any and all of its attributes, including the text itself, based on changes in the linked tagname. For instance, text could be configured to say “OK” and be green when the tag was normal and then change to say “NEW ALARM” in red following the state of the linked tag.

Two State: Causes an object to "blink" between two different sets of attributes based on satisfying a logical condition established during the objects configuration.

Typically used to hilite a condition or bring attention to an area of the graphic display.

Value Text: Displays the analog process variable of a linked tagname onscreen. The value can be configured to display with or without a decimal point and with or without the engineering units.



The value will update in sync with the polling of the port associated with the linked tagname.

The text used to display the value can be configured to change any and all of its attributes, based on changes in the linked tagname. For instance, the font, font size, color and background could all be configured to change in 10% increments as the process variable changed.

Other than the fact that the actual value cannot be edited, and the ability to select whether or not to display the engineering units and decimal point for the value, configuration of "Value Text" is identical to standard "Dynamic Text" as described in the following pages.

DYNAMIC TEXT CONFIGURATIONS

There are four functions available that can be applied to text. They can be used in the following combinations.

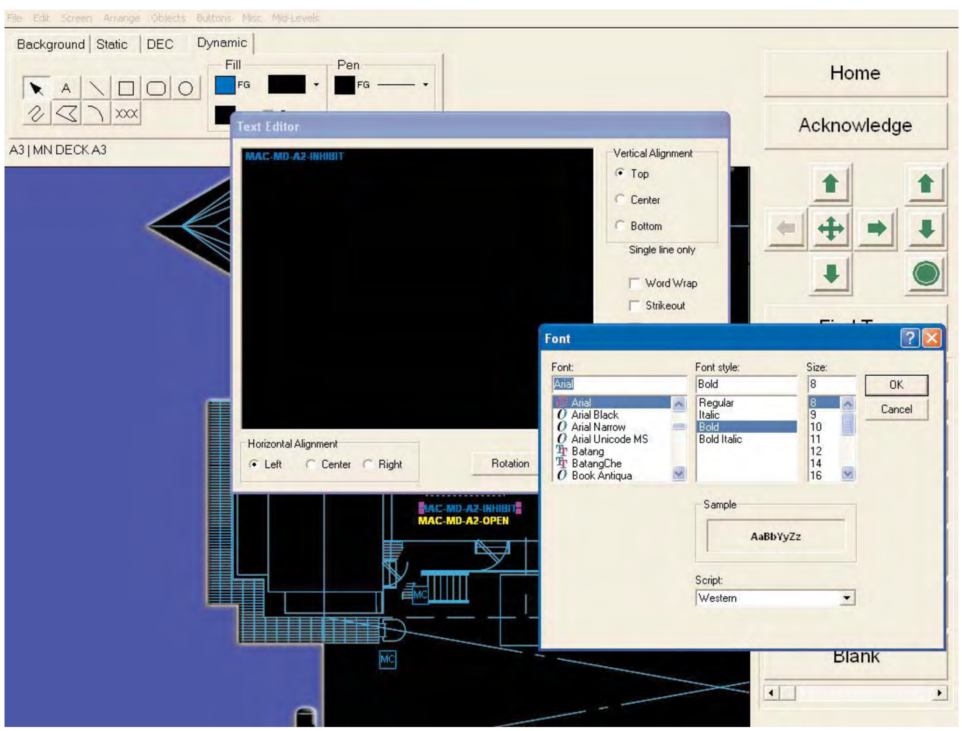
DYNAMIC OBJECT MODIFIERS	Text
Attributes	
Display Button Group	X
Hide/Show	X
Percent Fill	
Text Attributes	X
Two State	X
Value Text	

Display Button Group: If selected, this function is exclusive and the other options will no longer be available.

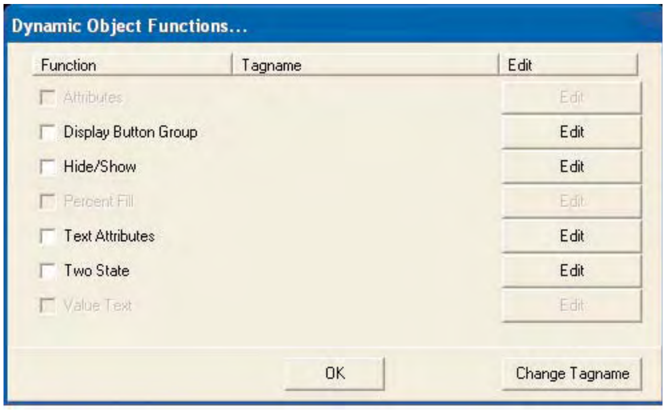
Hide/Show: This function can be used in combination with either **"Text Attributes"** or the **"Two State"** functions.

The "Hide/Show" function takes precedence over either of the other two functions it can be used with and will always be evaluated first.

Create Dynamic Text: Before configuring any functions, a "Dynamic Text" object must be created. Follow the same procedure described earlier in this chapter for text creation on the "Static Layer". Shown below is the text object being created for this example.

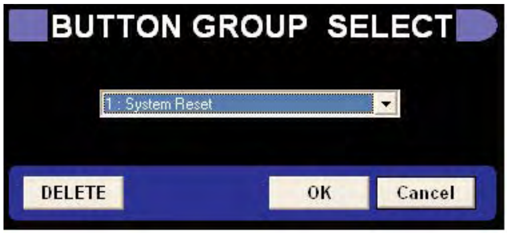


Configuring the “Display Button Group” function for Dynamic Text:
Using the “Dynamic Text” tool create a piece of text with the desired message and place it as required on the graphic.

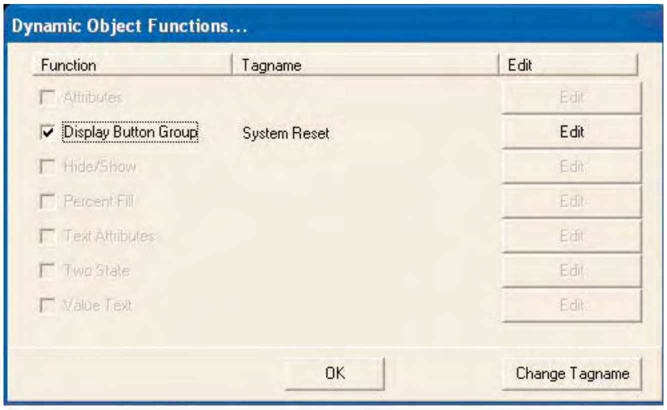


Double-click on the text object to open the “Dynamic Object Functions...” dialog box which shows the available functions for the object type.

The four available functions for text are shown for selection via “checkbox” on the left side of the dialog box. Checking the “Display Button Group” box will open the “Button Group Select” dialog box which has a pop-up menu in the middle which will display a list of all configured button groups.



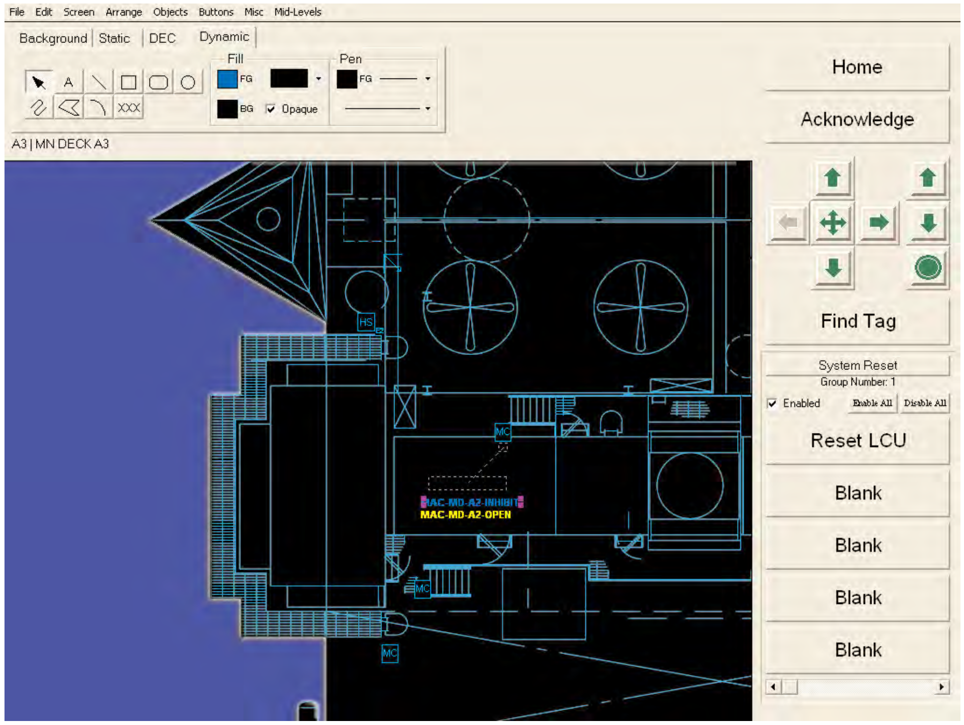
Select the desired button group and then the “OK” button to complete the configuration process.
In this example the button group “System Reset” was selected and since the “Display Button Group” function is exclusive, all other selections are now grayed out.



The tagname for the selected button group is displayed to the right of the selected function.

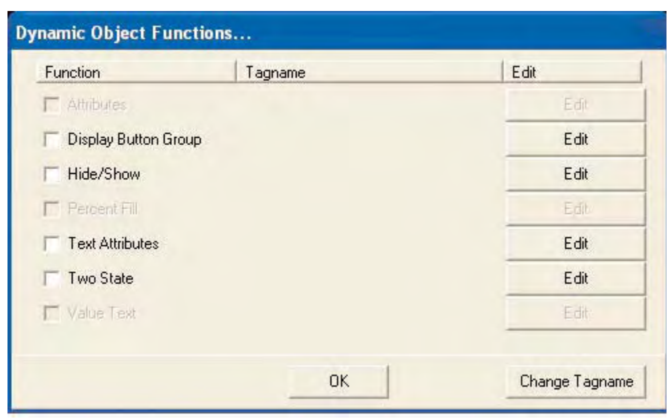
To change the selected tagname, use the “Edit” button to the right of the selection to re-enter the “Button Group Select” dialog box.

Configuring the "Hide/Show" function for Dynamic Text: Using the "Dynamic Text" tool create a piece of text with the desired message and place it as required on the graphic.



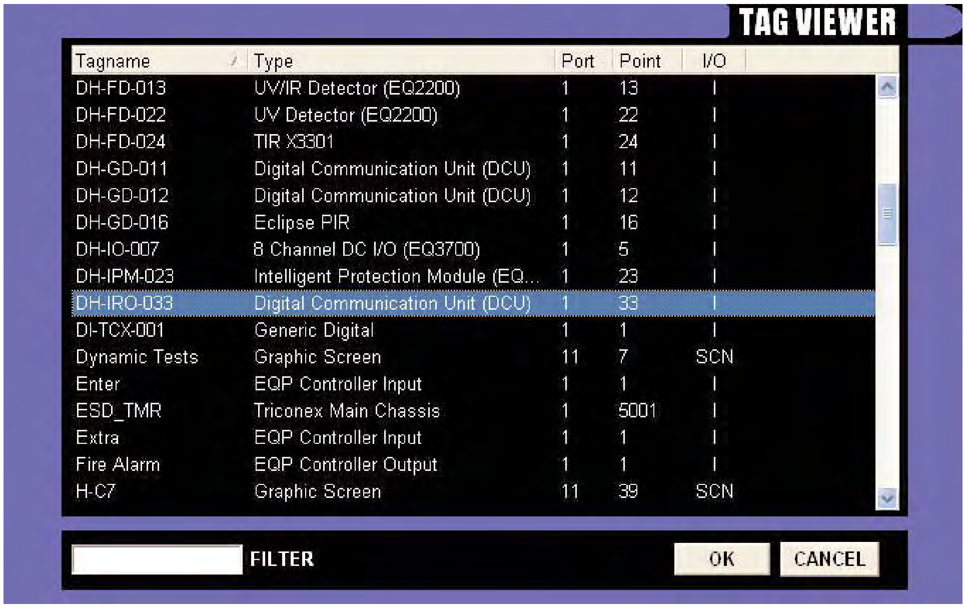
Double-click on the text object to open the "Dynamic Object Functions..." dialog box which shows the available functions for the object type.

The four available functions for text are shown for selection via "checkbox" on the left side of the dialog box.

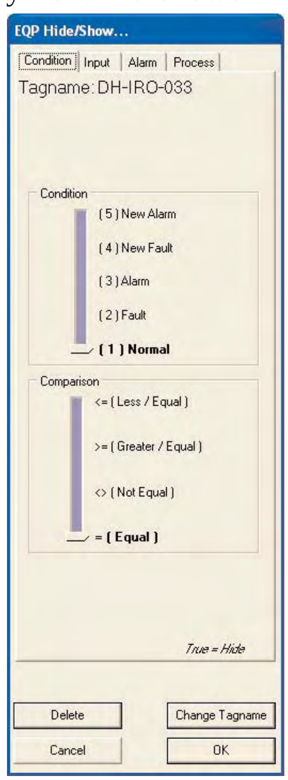


Checking the "Hide/Show" selection will open the database "Tag Viewer" dialog box to allow for the selection of a tagname to link to the text and be used to trigger the "Hide/Show" function.

The “Tag Viewer” dialog box displays a scrolling list of tagnames in the database, regardless of their point of origin. Browse the database to locate the desired tagname. Information on the type of device, its port and point identification, and I/O type are shown.



To more easily locate the desired tagname in a large database a “Filter” feature is provided. Place the cursor in the data entry field in the lower left of the dialog box and begin typing the tagname. The list will dynamically sort allowing the desired tagname to be quickly located.



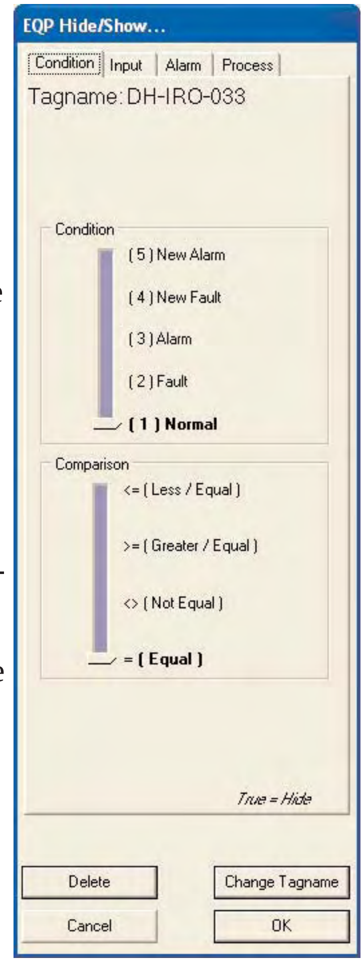
Once the tagname is selected, the “OK” button will close the Tag Viewer and open the “Hide/Show...” dialog box.

The dialog box shows the selected tagname below four selectable tabs: Condition, Input, Alarm and Process.

The “Hide/Show” feature can be configured to work from any one of these tabs.

The tab that is active (on top) when the “OK” button is selected will be the configuration used to control the “Hide/Show” feature.

Hide/Show - Condition Tab: This tab allows a configuration where the "State" of the tagname will Hide or Show the selected piece of dynamic text.



There are two "sliders" that are used to set up a logical comparison between the "state" of the tagname as chosen with the top slider, and the comparison option selected with the bottom slider.

On the lower right side of the dialog box there is a small legend that says "True = Hide".

This means that when the condition selected meets the comparison selected the text will be hidden.

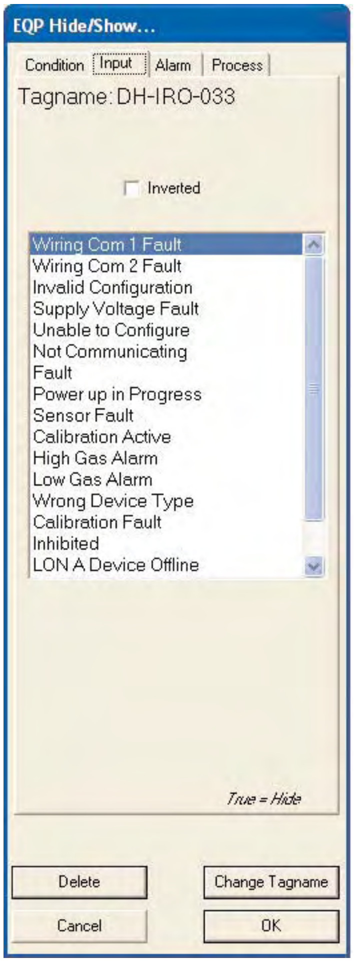
In the example to the right, the condition slider is in the "Normal" position and the comparison slider is in the "Equal" position.

With these selections, the dynamic text will be hidden when the tagname DH-IRO-033 is in the "Normal" state and the text will be shown when the tag state is any other condition; fault, alarm, new fault, new alarm.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.
- The "Cancel" button aborts the configuration.
- The "OK" button accepts the configuration and closes the dialog box.

Hide/Show - Input Tab: This tab allows a configuration where any one of the status or diagnostic "inputs" of the tagname will Hide or Show the selected piece of dynamic text. A check box is provided to "Invert" the logical state of the selected input if necessary.



The list box shows the available inputs that pertain to the linked tagname. Different devices may have a different list.

On the lower right side of the dialog box there is a small legend that says "True = Hide".

This means that when the condition selected meets the comparison selected the text will be hidden.

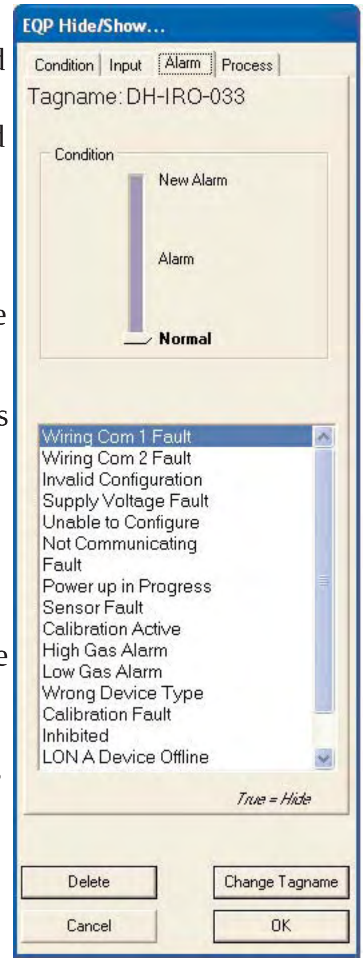
In the example to the right, the input "Wiring Com 1 Fault" is selected.

With this selection, the dynamic text will be hidden when the tagname DH-IRO-033 has a Com.1 wiring fault and the text will be shown when the wiring fault is gone.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.
- The "Cancel" button aborts the configuration.
- The "OK" button accepts the configuration and closes the dialog box.

Hide/Show - Alarm Tab: This tab allows a configuration where the "Alarm State" of the tagname will Hide or Show the selected piece of dynamic text.



Configuration involves a condition setting and an input selection. The condition is set using a three position slider and the input is selected from a scrolling list. When the selected input meets the selected condition the hide/show event occurs.

On the lower right side of the dialog box there is a small legend that says "True = Hide".

This means that when the condition selected is true for the selected input, the text is hidden.

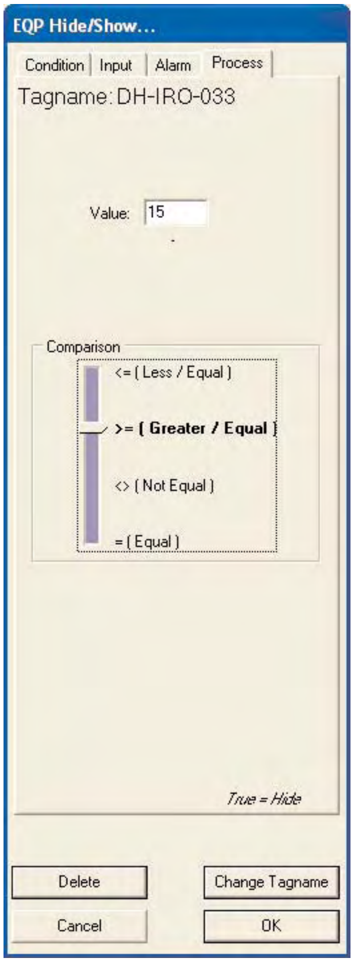
In the example to the right, the condition slider is in the "Normal" position and the input selected is "Wiring Com 1 Fault".

With these selections, the dynamic text will be hidden when the "Wiring Com 1 Fault" input of tagname DH-IRO-033 is in the "Normal" state. The text will be shown when its state is either "New Alarm" or "Alarm".

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.
- The "Cancel" button aborts the configuration.
- The "OK" button accepts the configuration and closes the dialog box.

Hide/Show - Process Tab: This tab allows a configuration where the value of the tagnames process variable is used to Hide or Show the selected piece of dynamic text.



Configuration involves a “Value” setting and a “Comparison” setting.

The “Value” is entered into a field, in engineering units and the “Comparison” is selected using a four position slider.

On the lower right side of the dialog box there is a small legend that says “True = Hide”.

This means that when the “True/False” evaluation of the process variable value against the entered value and comparison is true, the selected text will be hidden.

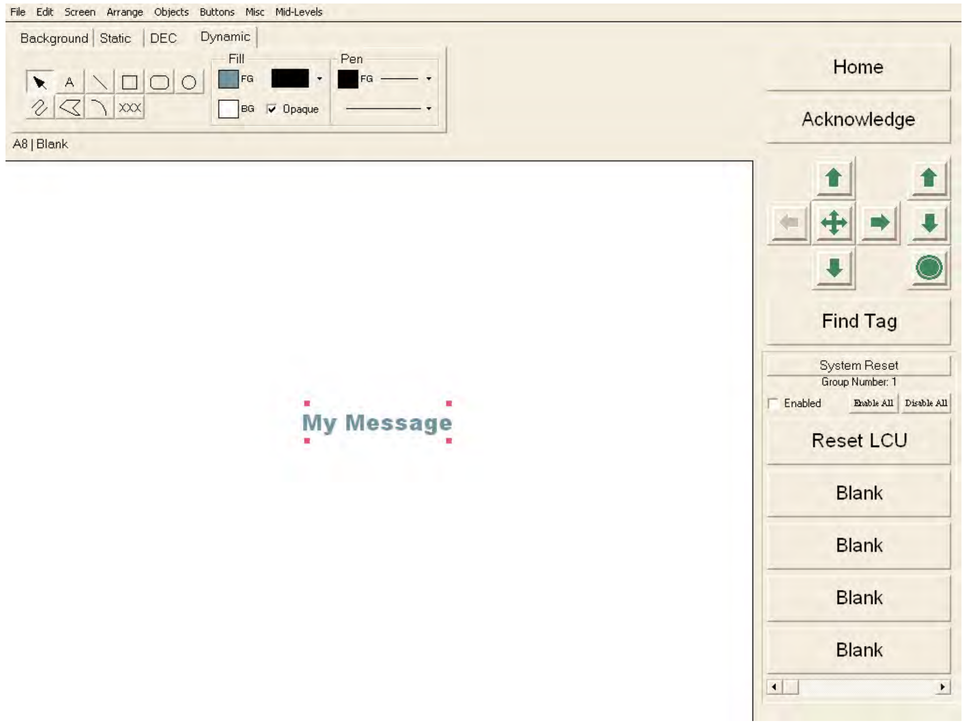
In the example to the right, the value is “15” and the comparison slider is in the “>= greater than or equal to” position.

With these selections, the dynamic text will be hidden when the process variable for tagname DH-IRO-033 is greater than or equal to “15” and the text will be shown when the value is less than “15”

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

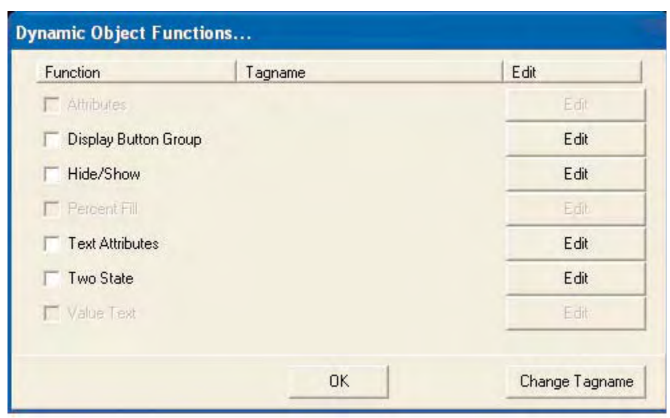
- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.
- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box.

Configuring the "Text Attributes" function for Dynamic Text: Using the "Dynamic Text" tool create a piece of text with the desired message and place it as required on the graphic.



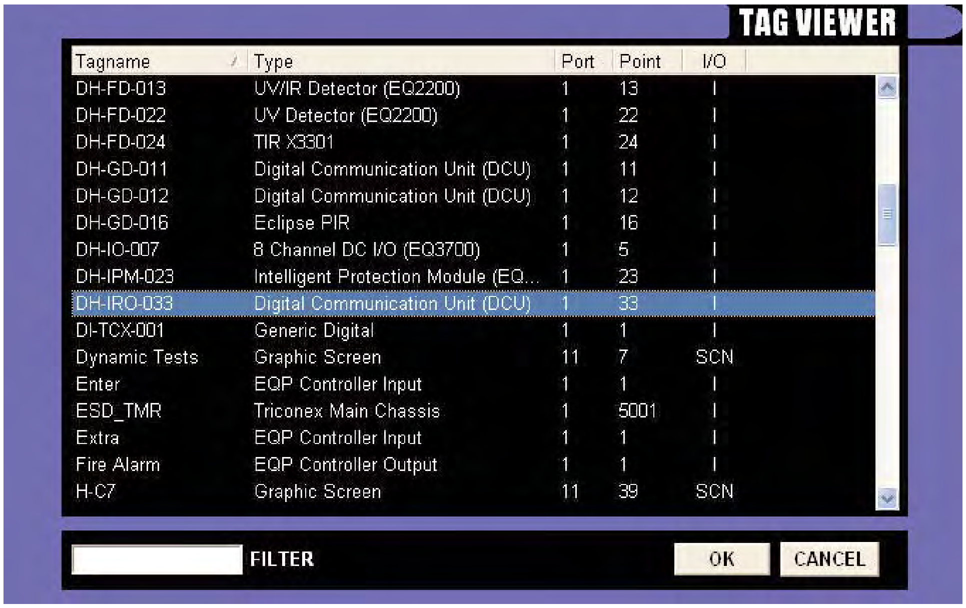
Double-click on the text object to open the "Dynamic Object Functions..." dialog box which shows the available functions for the object type.

The four available functions for text are shown for selection via "checkbox" on the left side of the dialog box.

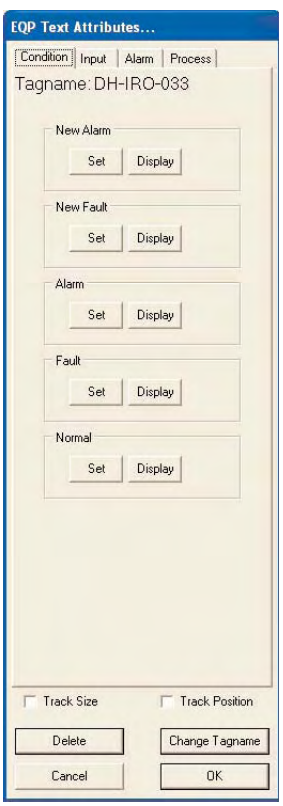


Checking the "Text Attributes" selection will open the database "Tag Viewer" dialog box to allow for the selection of a tagname to link to the text and be used to trigger the "Hide/Show" function.

The “Tag Viewer” dialog box displays a scrolling list of tagnames in the database, regardless of their point of origin. Browse the database to locate the desired tagname. Information on the type of device, its port and point identification, and I/O type are shown.



To more easily locate the desired tagname in a large database a “Filter” feature is provided. Place the cursor in the data entry field in the lower left of the dialog box and begin typing the tagname. The list will dynamically sort allowing the desired tagname to be quickly located.



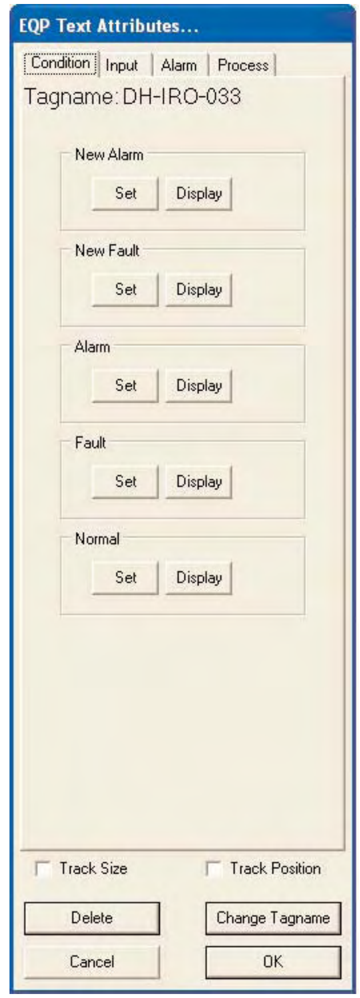
Once the tagname is selected, the “OK” button will close the Tag Viewer and open the “Text Attributes...” dialog box.

The dialog box shows the selected tagname below four selectable tabs: Condition, Input, Alarm and Process.

The “Text Attributes” feature can be configured to work from any one of these tabs.

The tab that is active (on top) when the “OK” button is selected will be the configuration used to control the “Text Attributes” feature.

Text Attributes - Condition Tab: This tab allows a configuration where each “State” of the tagname will have a set of text attributes applied to the selected piece of dynamic text.



The five potential states of an object are shown, each having a “Set” and “Display” button.

These will be used in conjunction with the normal text editing tools to assign and test the configuration.

Below these settings are two check boxes, one called “Track Size” the other “Track Position” which when selected allow these attributes to be dynamically changed based on the state of the object.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.

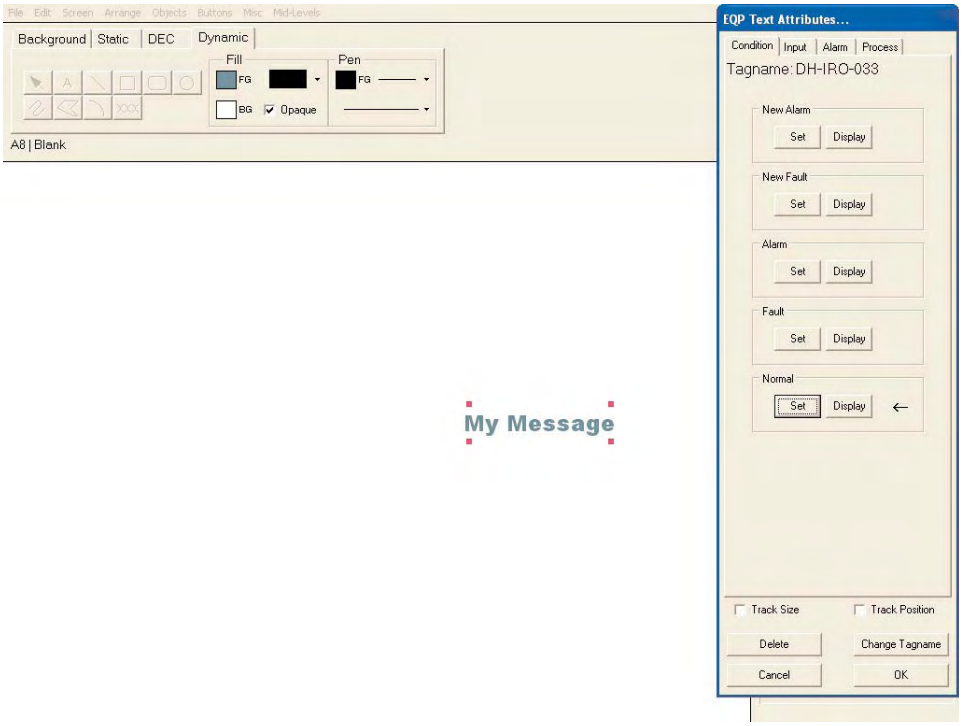
The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.

The “Cancel” button aborts the configuration.

The “OK” button accepts the configuration and closes the dialog box.

In the example below, the text object “My Message” has been configured to the desired font, font size and color for the “Normal” condition.

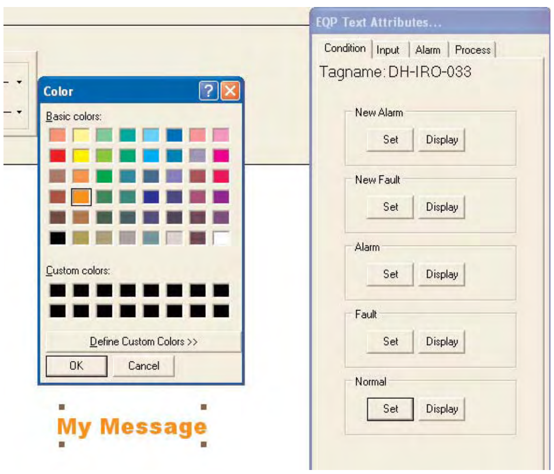
Selecting the “Set” button in the “Normal” condition area assigns these attributes to the text for this condition.



The “attribute set” being currently shown on the “My Message” text object is designated by a small arrow pointing at the “Set” and “Display” buttons in the “Normal” configuration area.

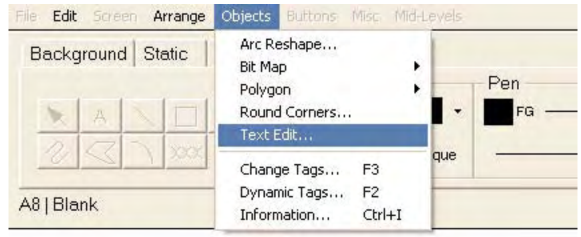
Use the standard text editing tools, such as the color pallet, to change the look of the text object for each of the five different conditions.

In the example to the right a different color has been applied to the “My Message” text object.

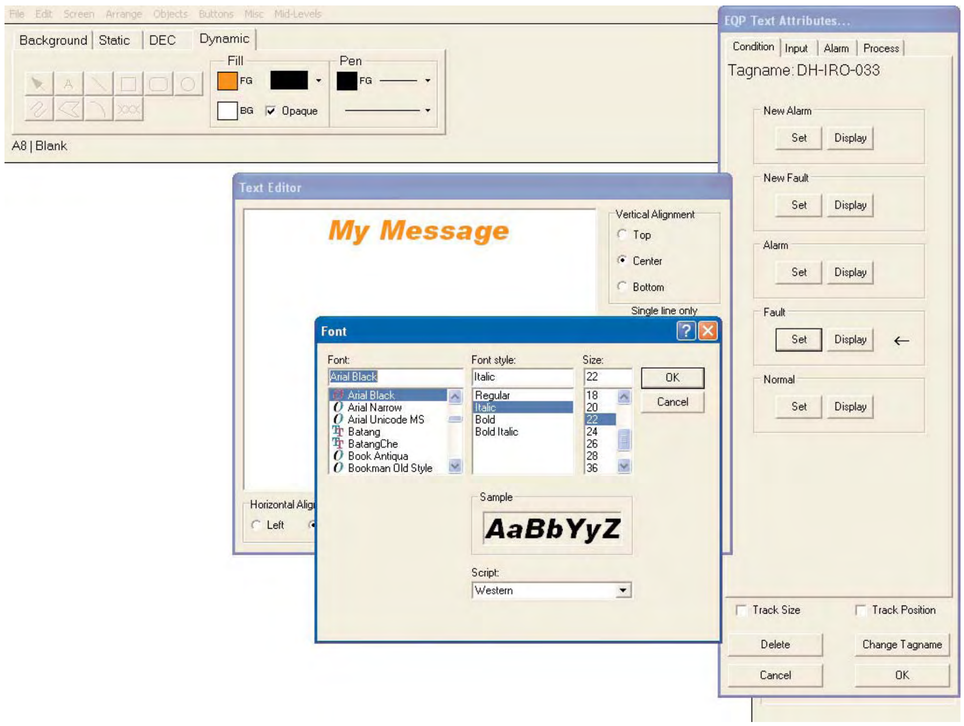


Once the text object has the desired look, select the “Set” button for the condition (or conditions) which this attribute set will apply.

The “Text Edit” item in the “Objects” menu can be used to access the font attributes.



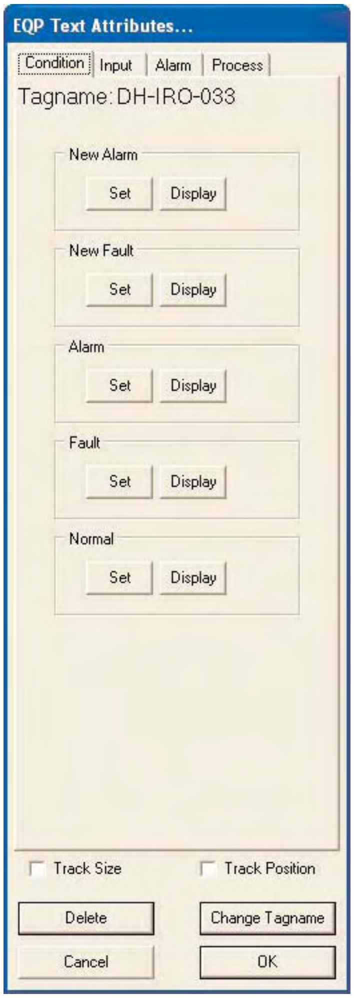
In the example below, the “My Message” text object has been modified by applying a different font size and an italic style.



Once the desired attribute set has been configured, click on the “Set” button for the condition(s) it will apply to.

In the example to the right, the “Set” button for the “Alarm” condition has been selected, and the attribute set has been recorded.

The arrow to the right of the buttons in the “Alarm” condition area indicates that the currently displayed attributes for “My Message” are for the “Alarm” condition.

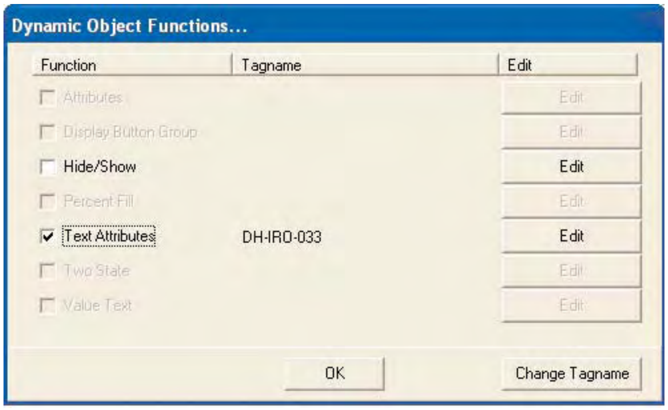


The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.
- The "Cancel" button aborts the configuration.
- The "OK" button accepts the configuration and closes the dialog box.

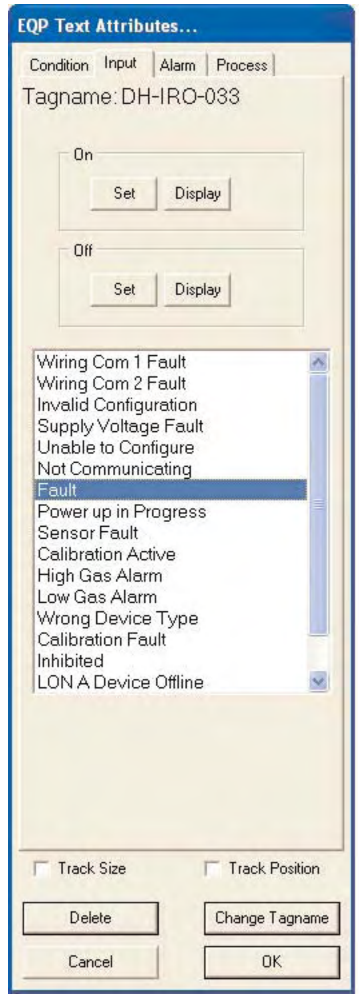
Once attribute sets have been assigned for each of the five potential states of the tagname, test them by sequencing through the "Display" buttons. This will show the applied attribute sets for each state. If satisfied, finalize the configuration by choosing the "OK" button in the bottom right area of the dialog box.

This will close the "Text Attributes" dialog box and take you back to the "Dynamic Object Functions..." dialog box. Here the checkbox for "Text Attributes" will now be filled and the tagname will be listed in the appropriate column.



Also note that the "Hide/Show" function is still available for configuration. It can be used in conjunction with the Text Attributes function.

Text Attributes - Input Tab: This tab allows a configuration where the "On/Off" state change in the selected status or diagnostic "input" of the tagname will change the attribute set of a selected piece of dynamic text.



The list box shows the available inputs that pertain to the linked tagname. Different devices may have a different list. Configuration involves selecting the desired input from the list and then setting the attribute set for the on and off states.

Use the standard text editing tools to select the font, font size, font style, color etc. for each state using the "Set" buttons to save the settings.

Test the configuration using the "Display" buttons to toggle the On/Off state.

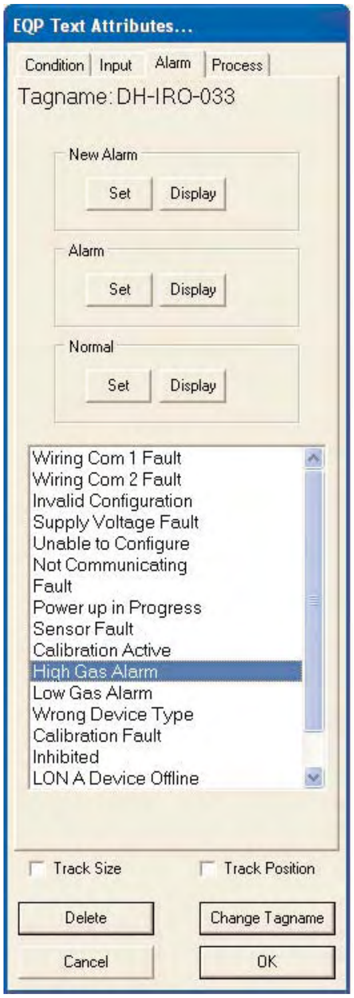
In the example to the right, the input "Fault" is selected. The text attribute sets have been configured so that the dynamic text will say "OK" in green when the "Fault" input for tagname DH-IRO-033 is OFF and the text will say "Fault" in yellow when it is ON.

Below these settings are two check boxes, one called "Track Size" the other "Track Position" which when selected allow these attributes to be dynamically changed based on the state of the object.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.
- The "Cancel" button aborts the configuration.
- The "OK" button accepts the configuration and closes the dialog box.

Text Attributes - Alarm Tab: This tab allows a configuration where the state change in the selected status or diagnostic “input” of the tagname will change the attribute set of a selected piece of dynamic text.



The list box shows the available inputs that pertain to the linked tagname. Different devices may have a different list. Configuration involves selecting the desired input from the list and then setting the attribute set for each of the three states.

Use the standard text editing tools to select the font, font size, font style, color etc. for each state using the “Set” buttons to save the settings.

Test the configuration using the “Display” buttons to toggle the On/Off state.

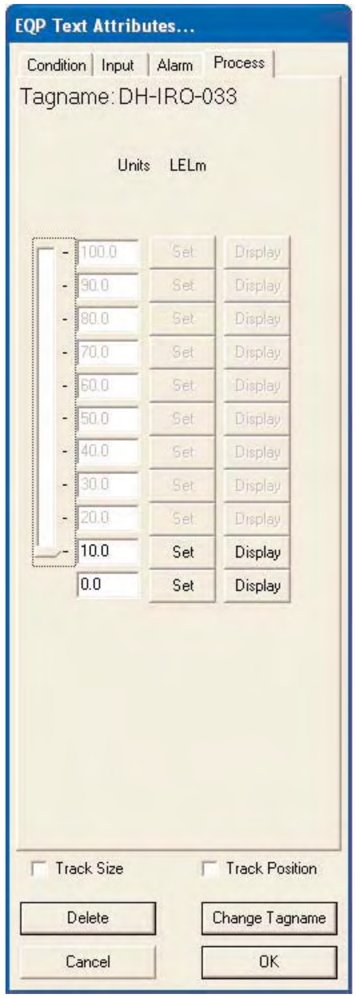
In the example to the right, the input “High Gas Alarm” is selected and the text attribute sets have been configured so that the dynamic text will have a unique message for each of the three states.

Below these settings are two check boxes, one called “Track Size” the other “Track Position” which when selected allow these attributes to be dynamically changed based on the state of the object.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.
- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box.

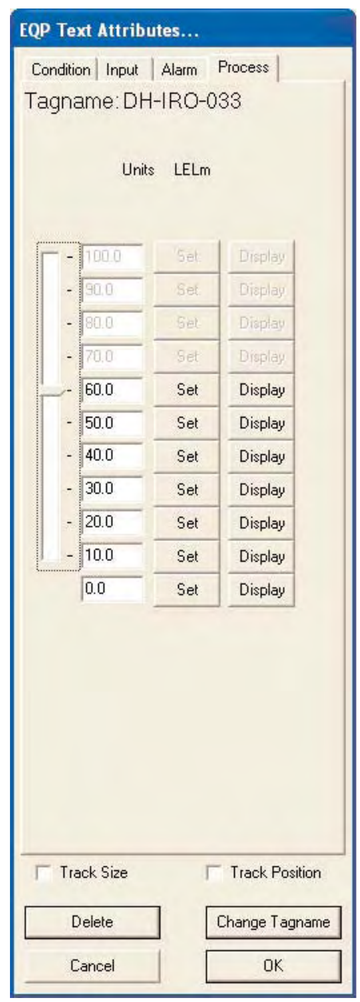
Text Attributes - Process Tab: This tab allows a configuration where the value of the tagnames process variable is used to change the attribute set of the selected piece of dynamic text.



Configuration consists of utilizing a slider to control how many "attribute sets" to use. Up to ten can be configured with default values set in 10% increments from 0-100%.

Note: Both the default values and any user edits to these setpoints are in engineering units. The units of measure are shown below the tagname in the "Text Attributes..." dialog box.

These default values can be changed to any desired value.



In the sample to the right, the slider control has been positioned to give six changes in the dynamic text.

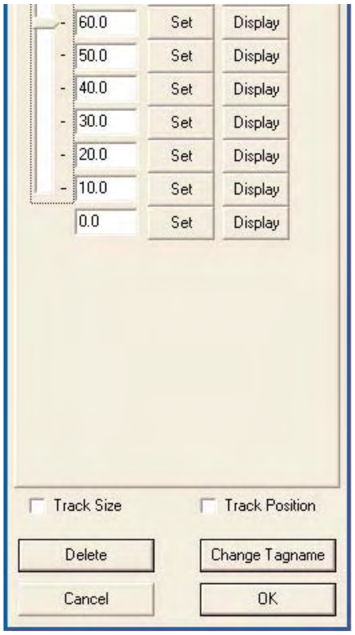
A different "attribute set" can be utilized for each of these six setpoints.

The example shows the default setpoints which are in 10% increments.

To assign an attribute set to a particular setpoint, use the standard text editing tools to modify the dynamic text to the desired condition and then select the appropriate "Set" button.

Use the "Display" buttons to test the configuration.

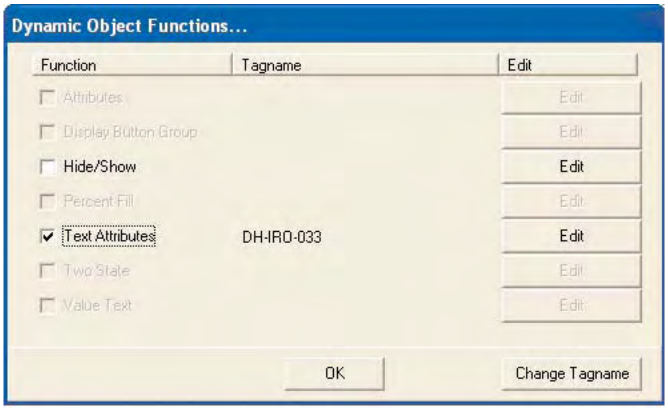
The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.



- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tag-name database.
- The "Cancel" button aborts the configura-tion.
- The "OK" button accepts the configura-tion and closes the dialog box.

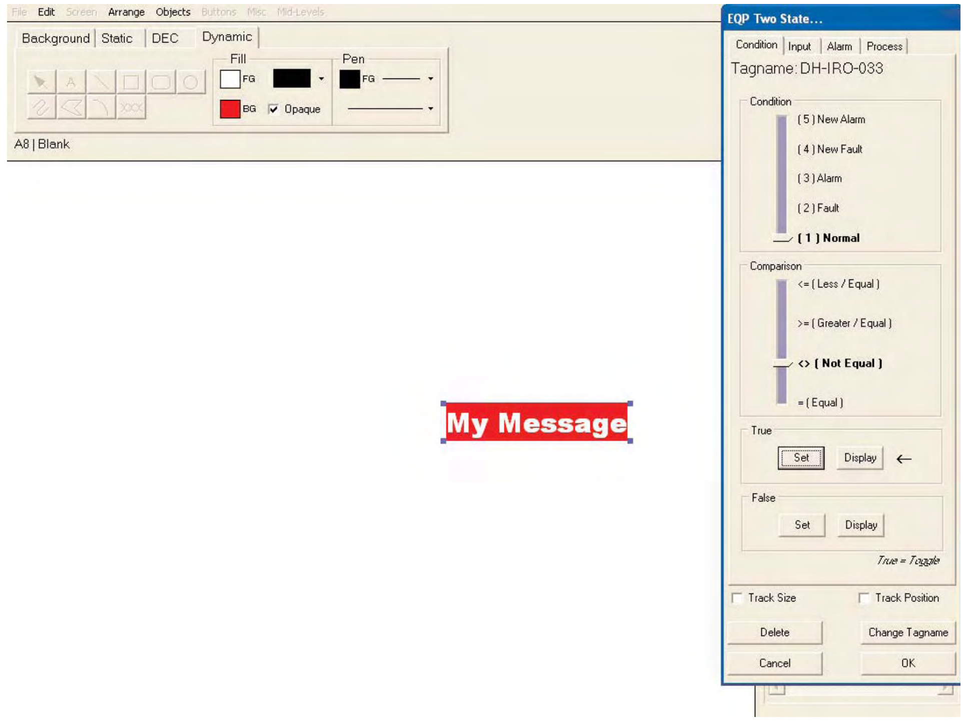
Once attribute sets have been assigned for each of the five potential states of the tagname, test them by sequencing through the "Display" buttons. This will show the applied attribute sets for each state. If satisfied, final-ize the configuration by choosing the "OK" button in the bottom right area of the dialog box.

This will close the "Text Attributes" dia-log box and take you back to the "Dynamic Object Functions..." dialog box. Here the checkbox for "Text Attributes" will now be filled and the tag-name will be listed in the appropriate col-umn.



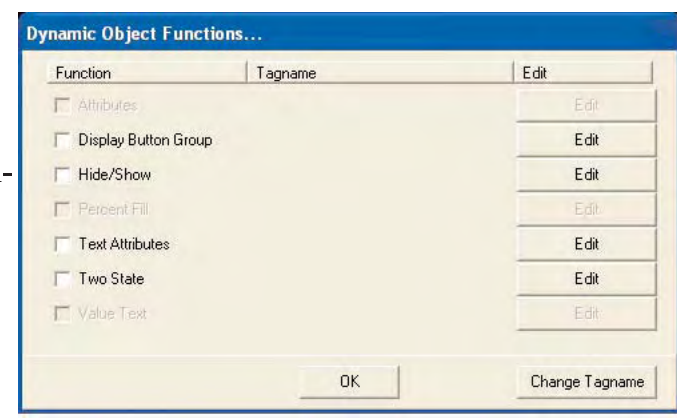
Also note that the "Hide/Show" function is still available for configura-tion. It can be used in conjunction with the Text Attributes function.

Configuring the "Two State" function for Dynamic Text: Using the "Dynamic Text" tool create a piece of text with the desired message and place it as required on the graphic.



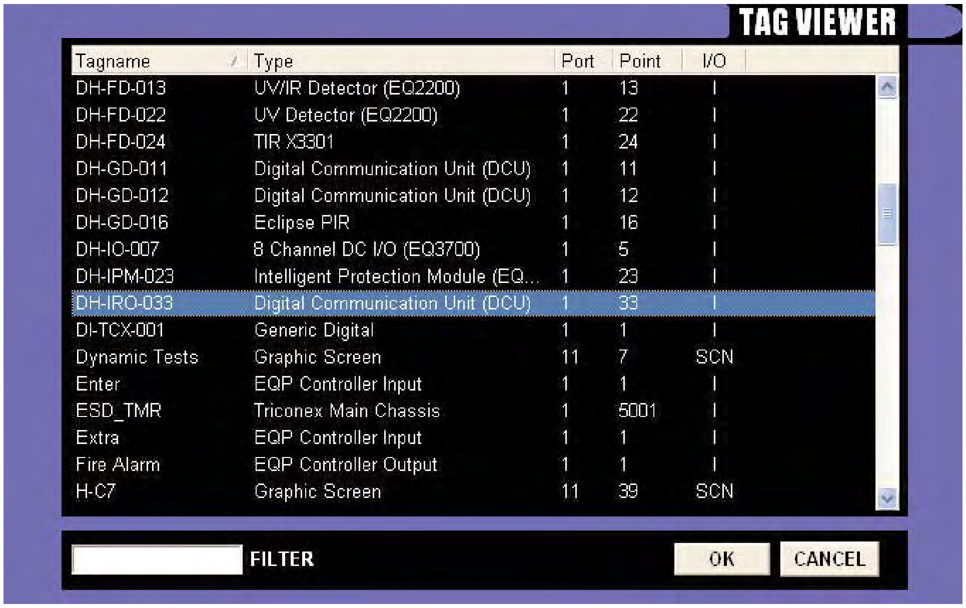
Double-click on the text object to open the "Dynamic Object Functions..." dialog box which shows the available functions for the object type.

The four available functions for text are shown for selection via "checkboxes" on the left side of the dialog box.



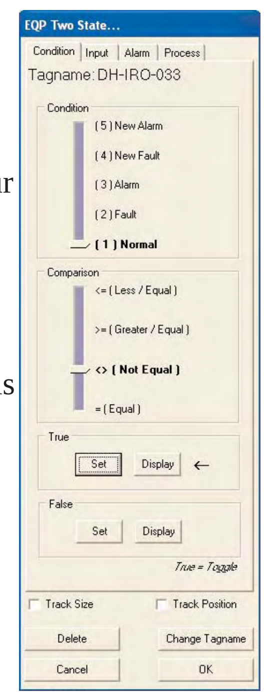
Checking the "Two State" selection will open the database "Tag Viewer" dialog box to allow for the selection of a tagname to link to the text and be used to trigger the "Two State" function.

The "Tag Viewer" dialog box displays a scrolling list of tagnames in the database, regardless of their point of origin. Browse the database to locate the desired tagname. Information on the type of device, its port and point identification, and I/O type are shown.



To more easily locate the desired tagname in a large database a "Filter" feature is provided. Place the cursor in the data entry field in the lower left of the dialog box and begin typing the tagname. The list will dynamically sort allowing the desired tagname to be quickly located.

Once the tagname is selected, the "OK" button will close the Tag Viewer and open the "Two State..." dialog box.

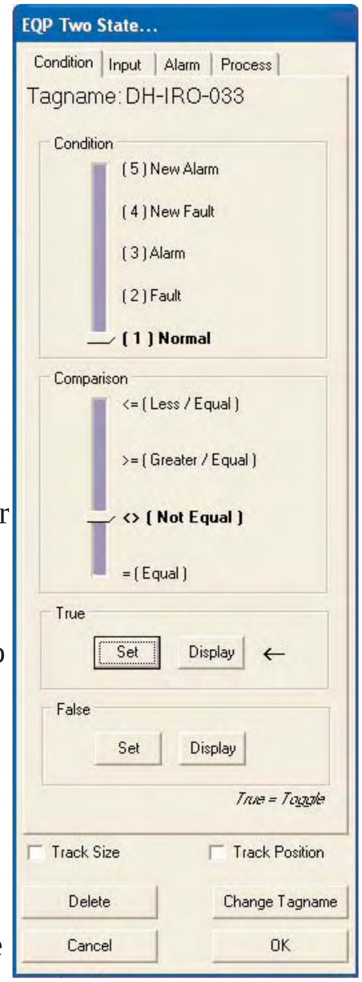


The dialog box shows the selected tagname below four selectable tabs: Condition, Input, Alarm and Process.

The "Two State" feature can be configured to work from any one of these tabs.

The tab that is active (on top) when the "OK" button is selected will be the configuration used to control the "Text Attributes" feature.

Dynamic Text: Two State - Condition Tab: This tab allows a configuration where the “State” of the tagname will cause the dynamic text to flash between its True and False attribute sets.



There are two “sliders” that are used to set up a logical comparison between the “state” of the tagname as chosen with the top slider, and the comparison option selected with the bottom slider.

On the lower right side of the dialog box there is a small legend that says “True = Toggle”.

This means that when the condition selected meets the comparison selected the text will be toggle between its True and False attributes.

In the example to the right, the condition slider is in the “Normal” position and the comparison slider is in the “<>Not Equal” position.

In the example to the left, the “My Message” text object was configured to be red text on a white background when False and white text on a red background when True.

With these selections, the dynamic text will be steady when the tagname DH-IRO-033 is in the “Normal” state and will toggle between the configured True and False states in any other condition; fault, alarm, new fault, new alarm.

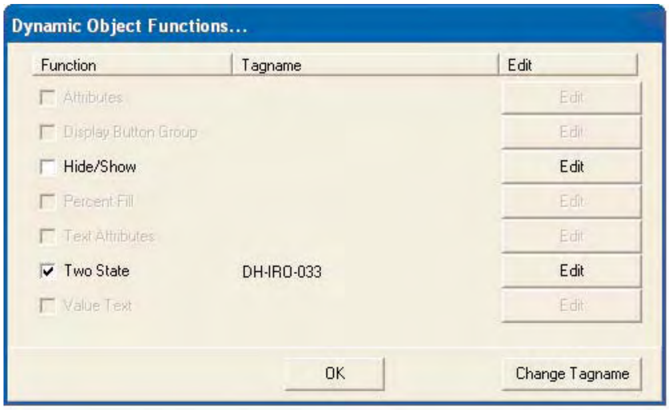
The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.
- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box.

Once attribute sets have been assigned for two states of the selected condition for the tagname, test them with the “Display” buttons.

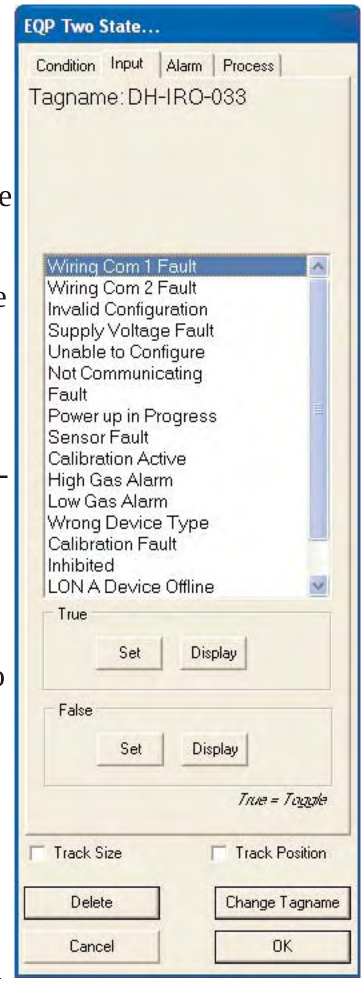
This will show the applied attribute sets for each state. If satisfied, finalize the configuration by choosing the “OK” button in the bottom right area of the dialog box.

This will close the “Two State” dialog box and take you back to the “Dynamic Object Functions...” dialog box. Here the checkbox for “Two State” will now be filled and the tagname will be listed in the appropriate column.



Also note that the “Hide/Show” function is still available for configuration. It can be used in conjunction with the Two State function.

Dynamic Text: Two State - Input Tab: This tab allows a configuration where the "On/Off" state change in the selected status or diagnostic "input" of the tagname will cause the dynamic text to flash between its True and False attribute sets.



The list box shows the available inputs that pertain to the linked tagname. Different devices may have a different list.

Configuration involves selecting the desired input from the list and then setting the attribute set for the on and off states.

Use the standard text editing tools to select the font, font size, font style, color etc. for each state using the "Set" buttons to save the settings.

Test the configuration using the "Display" buttons to toggle the On/Off state.

In the example to the right, the input "Wiring Com 1 Fault" is selected.

The text attribute sets have been configured so that the dynamic text will say "Com 1" in green for the "False" state and "Fault" in orange for the "True" state.

The effect is that green text saying "Com 1" will be visible normally and then when the input is true and the text will alternate or appear to flash between "Com 1" in green and "Fault" in orange thus highliting the problem.

Below these settings are two check boxes, one called "Track Size" the other "Track Position" which when selected allow these attributes to be dynamically changed based on the state of the object.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.

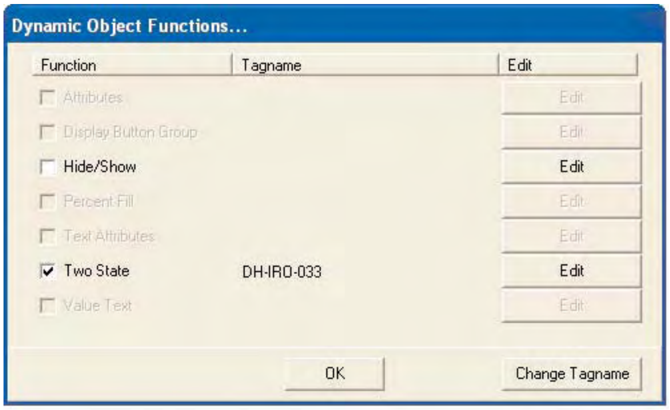
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.

- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box.

Once attribute sets have been assigned for two states of the input selected for the tagname, test them with the “Display” buttons.

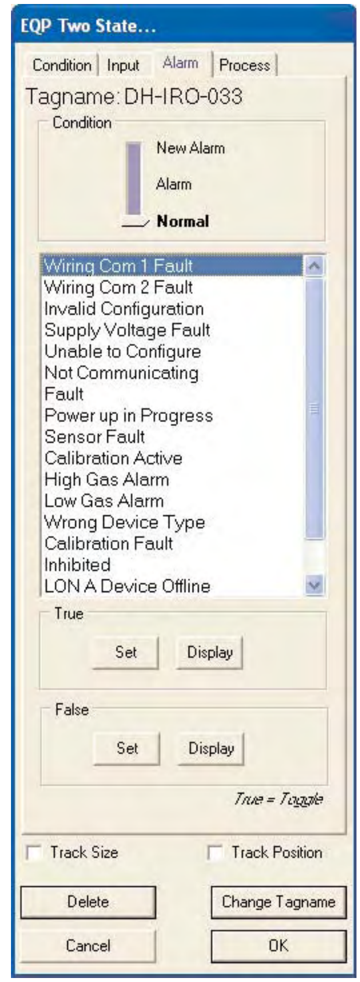
This will show the applied attribute sets for each state. If satisfied, finalize the configuration by choosing the “OK” button in the bottom right area of the dialog box.

This will close the “Two State” dialog box and take you back to the “Dynamic Object Functions...” dialog box. Here the checkbox for “Two State” will now be filled and the tagname will be listed in the appropriate column.



Also note that the “Hide/Show” function is still available for configuration. It can be used in conjunction with the Two State function.

Dynamic Text: Two State - Alarm Tab: This tab allows a configuration where the state change in the selected status or diagnostic “input” of the tagname will change the attribute set of a selected piece of dynamic text.



The list box shows the available inputs that pertain to the linked tagname. Different devices may have a different list.

Configuration involves selecting the desired input from the list, using the slider control to select the condition to compare the input against and then setting the text attribute set (font, color, etc.) for each of the two states.

Use the standard text editing tools to select the font, font size, font style, color etc. for each state using the “Set” buttons to save the settings.

Test the configuration using the “Display” buttons to toggle the On/Off state.

In the example to the right, the input “Wiring Com 1 Fault” is selected.

The text attribute sets have been configured so that the dynamic text will say “Com 1” in green for the “False” state and “Fault” in orange for the “True” state.

The effect is that green text saying “Com 1” will be visible normally and then when the input is true and the text will alternate or appear to flash between “Com 1” in green and “Fault” in orange thus highliting the problem.

Below these settings are two check boxes, one called “Track Size” the other “Track Position” which when selected allow these attributes to be dynamically changed based on the state of the object.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.

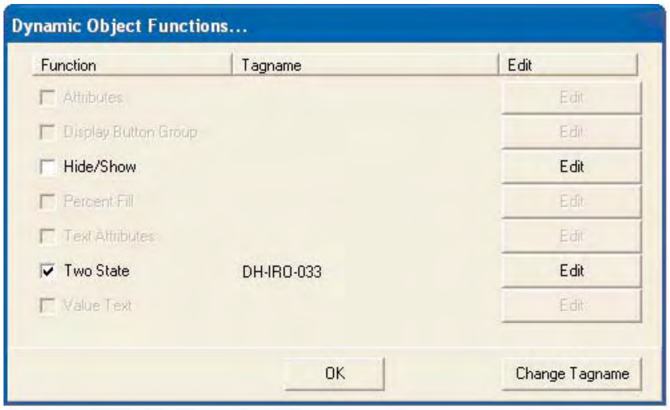
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.

- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box.

Once attribute sets have been assigned for two states of the selected condition for the tagname, test them with the “Display” buttons.

This will show the applied attribute sets for each state. If satisfied, finalize the configuration by choosing the “OK” button in the bottom right area of the dialog box.

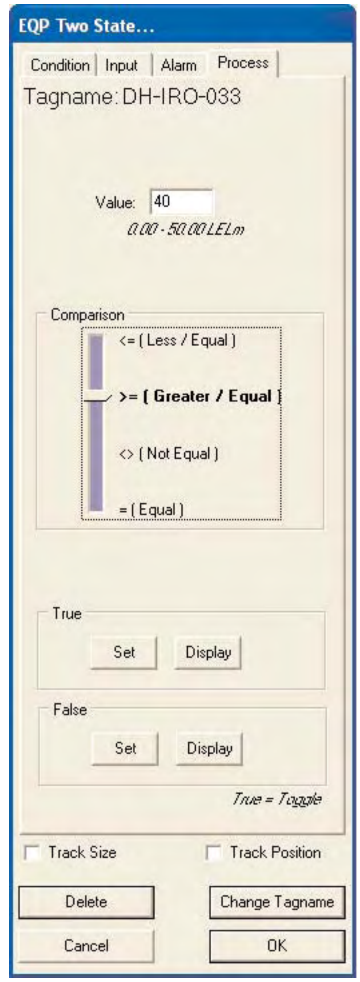
This will close the “Two State” dialog box and take you back to the “Dynamic Object Functions...” dialog box. Here the checkbox for “Two State” will now be filled and the tagname will be listed in the appropriate column.



Also note that the “Hide/Show” function is still available for configuration. It can be used in conjunction with the Two State function.

Dynamic Text: Two State - Process Tab: This tab allows a configuration where the value of the tagnames process variable is used to flash the selected piece of dynamic text.

Configuration involves a “Value” setting and a “Comparison” setting.



The “Value” is entered into a field, in engineering units and the “Comparison” is selected using a four position slider.

On the lower right side of the dialog box there is a small legend that says “True = Toggle”.

This means that when the “True/False” evaluation of the process variable value against the entered value and comparison is true, the selected text will be flash between its True and False attribute sets.

In the example to the right, the value is “40” and the comparison slider is in the “>= greater than or equal to” position.

With these selections, the dynamic text will be flash when the process variable for tagname DH-IRO-033 is greater than or equal to “40” and the text will be solid, with the “False” attribute set, when the value is less than “40”

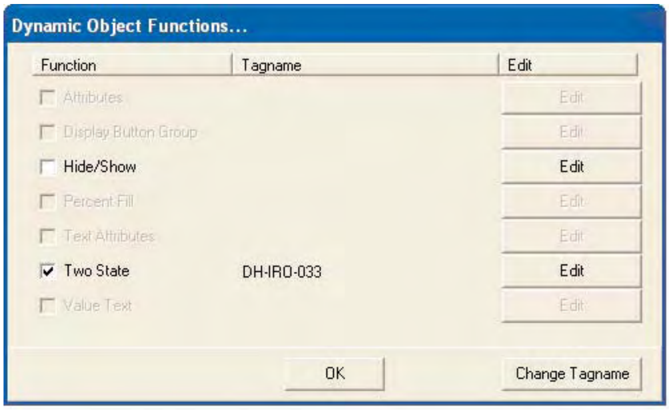
The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.
- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box.

Once attribute sets have been assigned for two states of the selected condition for the tagname, test them with the "Display" buttons.

This will show the applied attribute sets for each state. If satisfied, finalize the configuration by choosing the "OK" button in the bottom right area of the dialog box.

This will close the "Two State" dialog box and take you back to the "Dynamic Object Functions..." dialog box. Here the checkbox for "Two State" will now be filled and the tagname will be listed in the appropriate column.



Also note that the "Hide/Show" function is still available for configuration. It can be used in conjunction with the Two State function.

CONFIGURATION OF DYNAMIC "GRAPHIC PRIMITIVES"

There are seven graphic primitives; line, rectangle, rounded rectangle, oval, freehand object, polygon and arc. The creation of these objects are covered in detail earlier in this chapter under the "Static Layer" descriptions.

While these object types on the "Dynamic Layer" are identical in their creation and visual properties, they can be configured to utilize one or more functions to dynamically alter their appearance, based on field device changes.

DYNAMIC OBJECT MODIFIERS	Text	Line	Rectangle	Rounded Rectangle	Oval	Freehand	Polygon	Arc	Value Text
Attributes		X	X	X	X	X	X	X	
Display Button Group	X	X	X	X	X	X	X	X	X
Hide / Show	X	X	X	X	X	X	X	X	X
Percent Fill			X	X	X	X	X		
Text Attributes	X								
Two State	X	X	X	X	X	X	X	X	
Value Text									X

The chart above lists the objects and their potential modifiers. All of these objects share the same available modifiers which in S^3 are called "Dynamic Object Functions" except the line and arc which do not permit configuration of the "Percent Fill" function.

Due to their similarity the "Rectangle" will be used as the example to describe the configuration for all seven of the "graphic primitive" object types. The description and methods used for the "Rectangle" object apply equally to the other six object types.

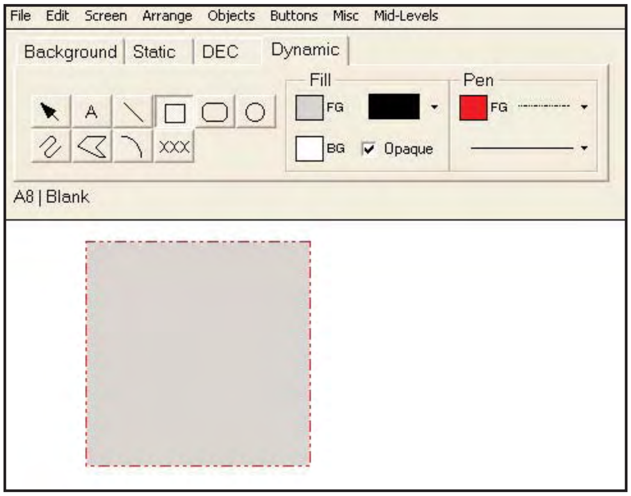
NOTE

Display Button Group: *If selected, this function is exclusive and the other options will no longer be available.*

Hide/Show: *This function can be used in combination with either* ***"Attributes"*** *or the* ***"Two State"*** *functions.*

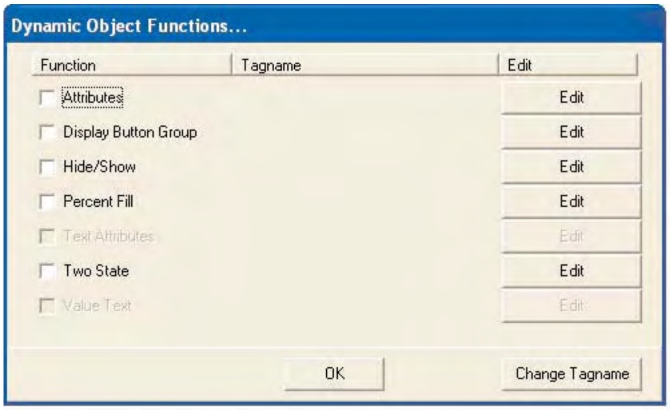
Create Dynamic Object: Before configuring any functions, a dynamic object must be created. Follow the same procedure described earlier in this chapter for object creation on the "Static Layer".

In the example to the right, a rectangle was created using the appropriate tool and its color, line type and other visual attributes were then set.



Double-clicking on the "rectangle" object will open the "Dynamic Object Functions..." dialog box which shows the available functions for the object type.

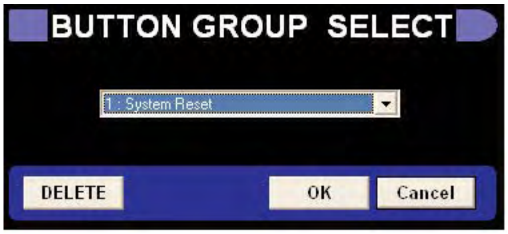
The available functions for dynamic objects are shown for selection via "checkboxes" on the left side of the dialog box.

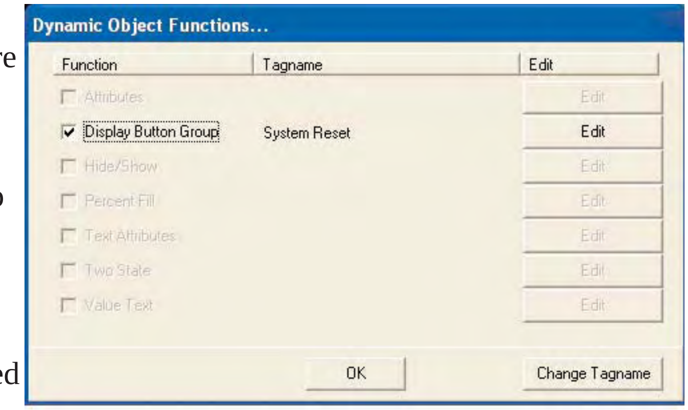


Selecting any of the available choices except "Display Button Group" will open the "Tag Viewer" for linking to the database.

Display Button Group function: The "Display Button Group" choice is unique and will open the open the "Button Group Select" dialog box which has a pop-up menu in the middle which will display a list of all configured button groups enabled for the current graphic screen.

Select the desired button group and then the "OK" button to complete the configuration process. In this example the button group "System Reset" was selected and since the "Display Button Group"





function is exclusive, all other selections are now grayed out.

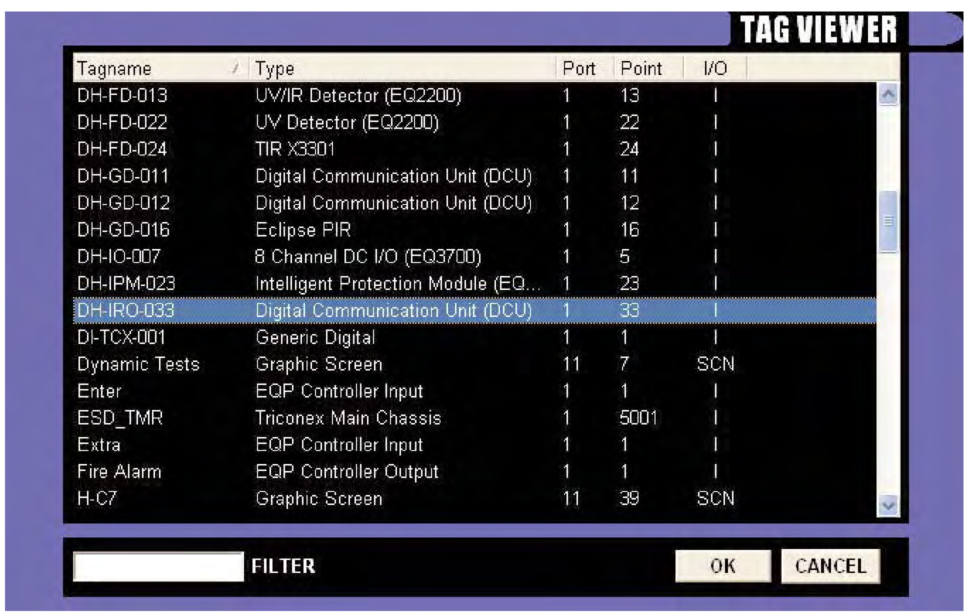
The tagname for the selected button group is displayed to the right of the selected function.

To change the selected tagname, use the "Edit" button to the right of the selection to re-enter the "Button Group Select" dialog box.

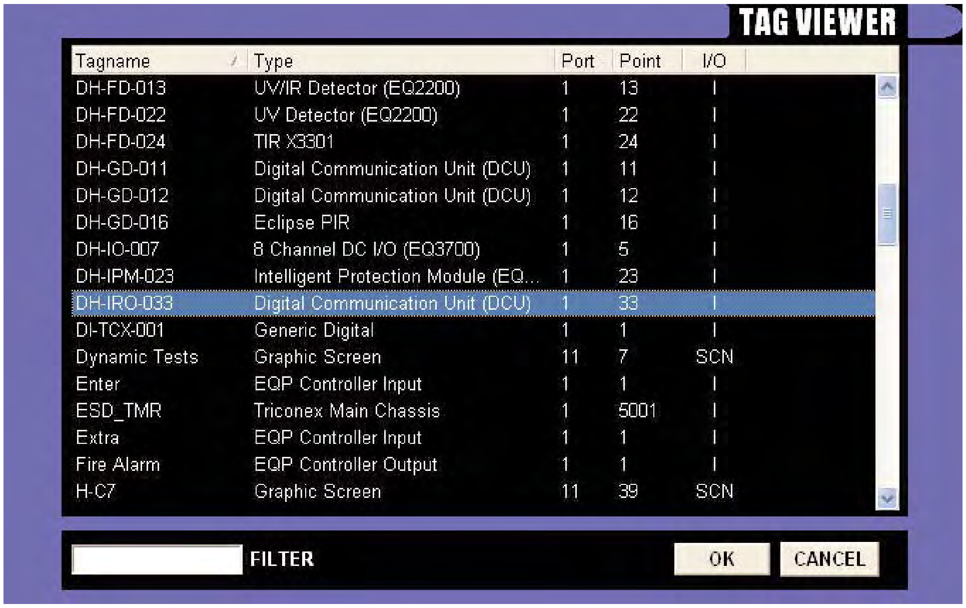
Database Linking of Dynamic Objects: The following functions require linking the dynamic object to a tagname in the S³ database to function; *Attributes, Hide/Show, Percent Fill, Two State.*

Selecting any of these functions will open the "Tag Viewer".

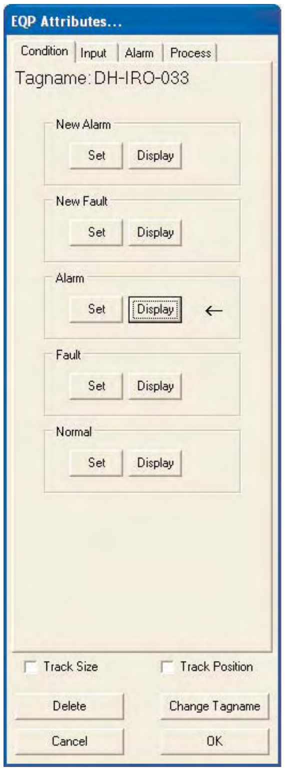
The "Tag Viewer" dialog box displays a scrolling list of tagnames in the database, regardless of their point of origin. Browse the database to locate the desired tagname. Information on the type of device, its port and point identification, and I/O type are shown.



To more easily locate the desired tagname in a large database a "Filter" feature is provided. Place the cursor in the data entry field in the lower left of the dialog box and begin typing the tagname. The list will dynamically sort allowing the desired tagname to be quickly located.



Once the tagname is selected, the "OK" button will close the Tag Viewer and open the appropriate dialog box for configuring the selected function; "Attributes, Hide/Show, Percent Fill or Two State".



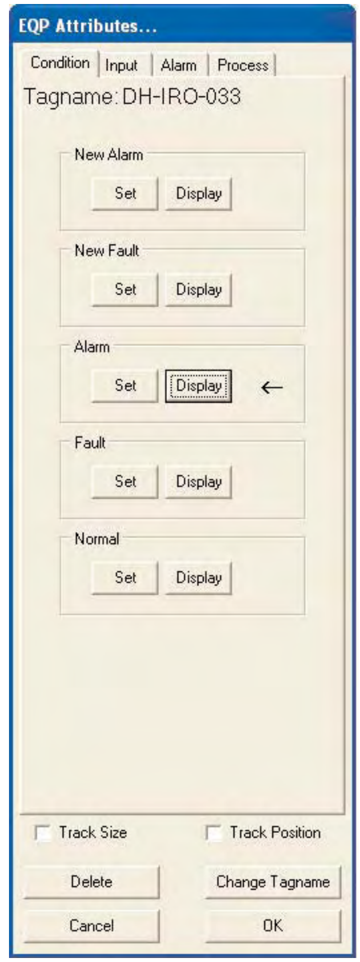
In this case the "Attribute" feature has been selected and it can be configured to work from any of four selectable tabs; Condition, Input, Alarm and Process.

The tab that is active (on top) when the "OK" button is selected will be the configuration used to control the dynamic object.

Graphic Primitives - Attributes Condition Tab: This tab allows the dynamic object to be configured to have up to five different looks corresponding to the five potential states of an object; Normal, Fault, Alarm, New Fault, New Alarm.

The five potential states of an object are shown, each having a "Set" and "Display" button.

These will be used in conjunction with the normal object editing tools to assign and test the configuration.



Attribute assignments: Using the editing tools available for the graphic primitive being configured, adjust its size, shape, color, position etc. to match a desired standard for the "Normal" condition and then select the "Set" button to save this "Attribute Set".

Repeat this procedure for every other condition.

Note: A single "attribute set" can be used multiple times. For instance, an object can be configured to look exactly the same for Normal, Fault, Alarm and New Fault but different for the New Alarm condition. Simply configure the object and select the "Set" button for each state using that attribute set.

Below these settings are two check boxes, one called "Track Size" the other "Track Position" which when selected allow these attributes to be dynamically changed based on the state of the object.

Once an attribute set has been assigned for each condition using the "Set" buttons, use the "Display" buttons to test the configuration and ensure the desired results are achieved.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.

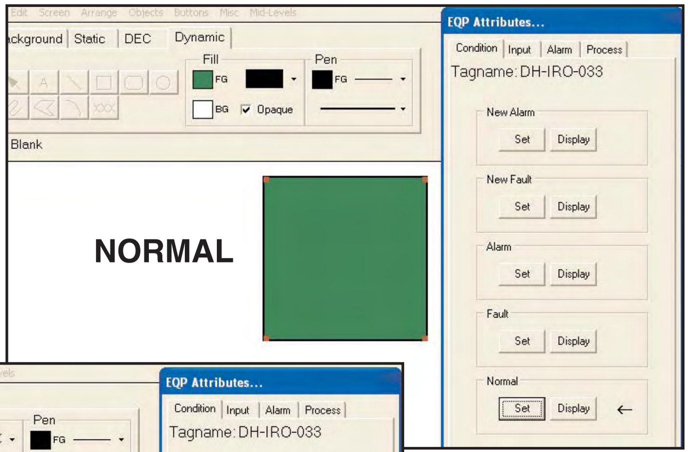
The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.

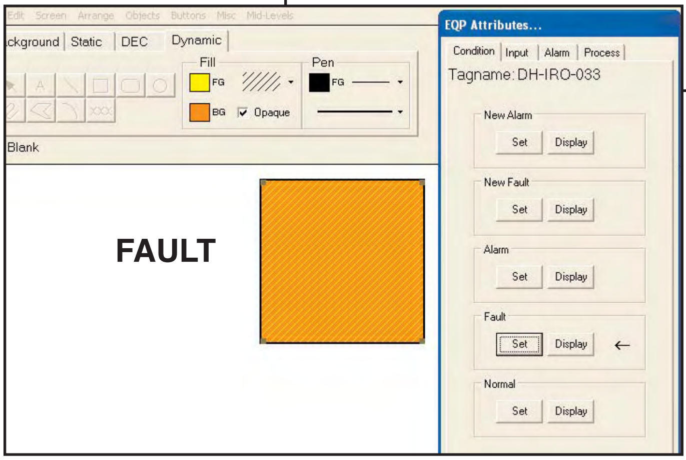
The "Cancel" button aborts the configuration.

The "OK" button accepts the configuration and closes the dialog box.

In the examples below, a "rectangle object" has been configured to the desired height, width, pen size, color and pattern for different conditions.

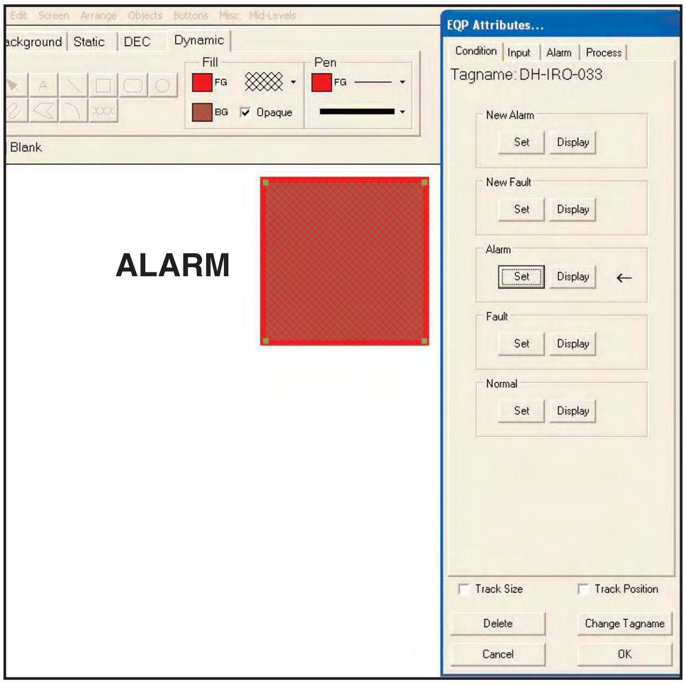
Selecting the "Set" button in the "Normal" condition area assigns these attributes to the object for this condition.





The "attribute set" being currently shown on the object is designated by a small arrow pointing at the "Set" and "Display" buttons in the configuration area.

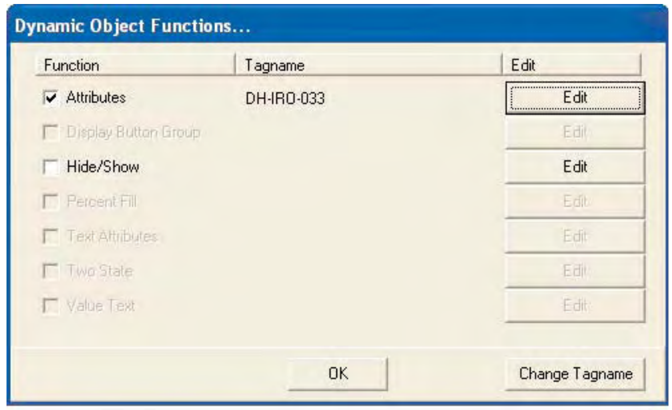
Use the standard line editing tools, such as the color pallet, to change the look of the object for each of the five different conditions.



In the examples on this page different colors and patterns have been applied to the object and these attribute sets saved with the "Set" button for each.

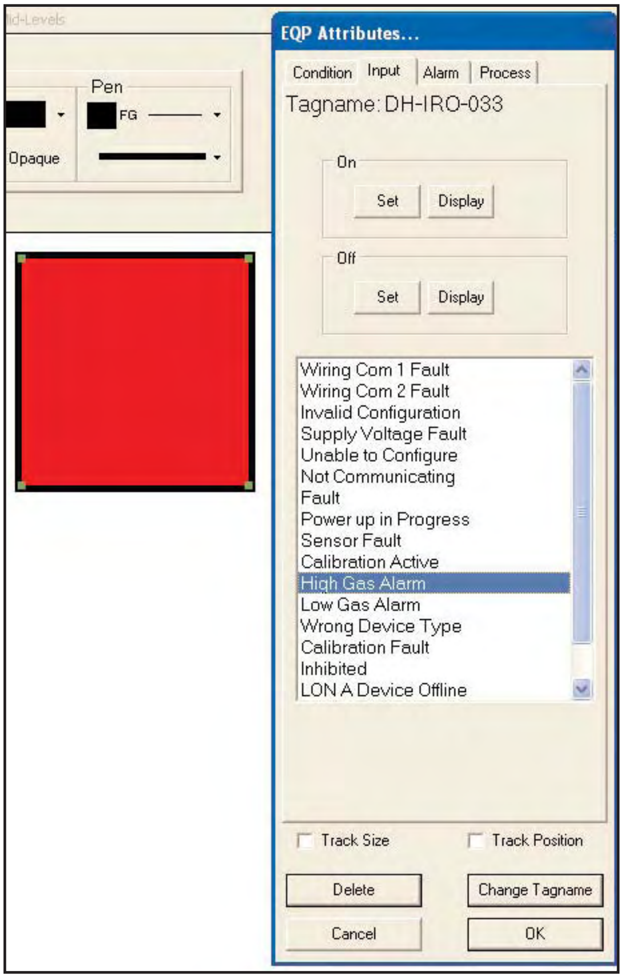
Once attribute sets have been assigned for each of the five potential states of the tagname, test them by sequencing through the "Display" buttons. This will show the applied attribute sets for each state. If satisfied, finalize the configuration by choosing the "OK" button in the bottom right area of the dialog box.

This will close the "Attributes" dialog box and take you back to the "Dynamic Object Functions..." dialog box. Here the checkbox for "Attributes" will be filled and the tagname shown in the appropriate column.



Also note that the "Hide/Show" function is still available for configuration. It can be used in conjunction with the "Attributes" function.

Graphic Primitives - Attributes Input Tab: This tab allows a configuration where the **"<u>On/Off" state change</u>** in the selected status or diagnostic "input" of the tagname will change the attribute set of a dynamic object.



The list box shows the available inputs that pertain to the linked tagname. Different devices may have a different list. Configuration involves selecting the desired input from the list and then setting the attribute set for the on and off states.

Use the standard object editing tools to select the attribute set for each state using the "Set" buttons to save the settings.

Test the configuration using the "Display" buttons to toggle the On/Off state.

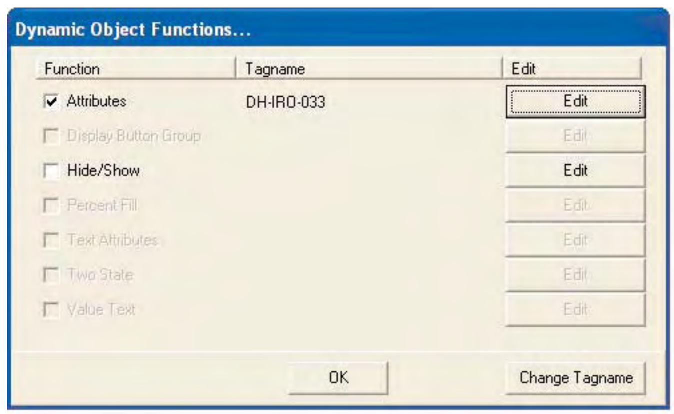
In the example to the right, the input "High Gas Alarm" is selected. The objects attribute sets have been configured so that the object will be green when the "High Gas Alarm" input for tagname DH-IRO-033 is OFF and red when it is ON.

Below these settings are two check boxes, one called "Track Size" the other "Track Position" which when selected allow these attributes to be dynamically changed based on the state of the object.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

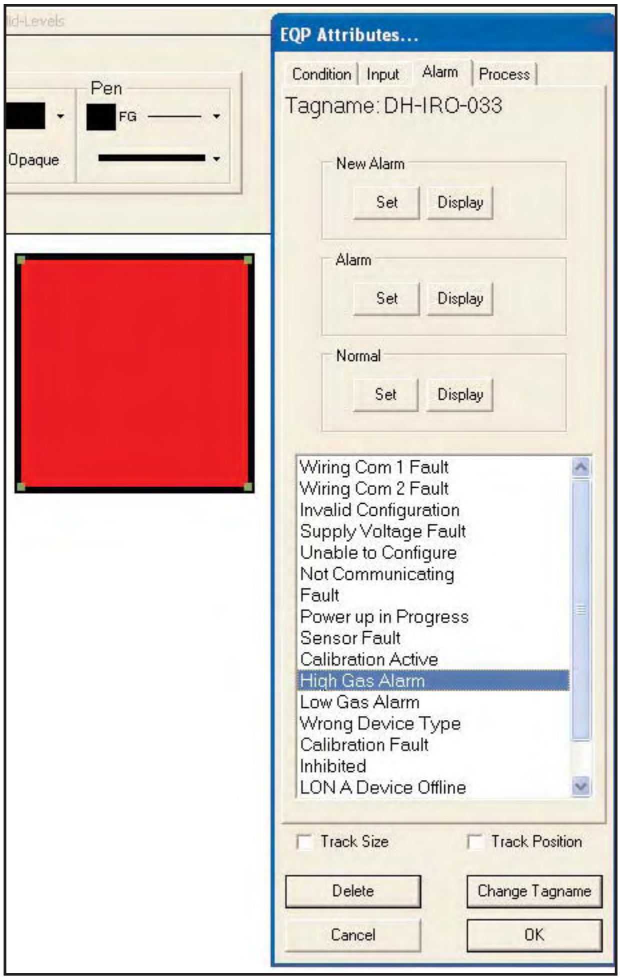
- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.
- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box and take you back to the “Dynamic Object Functions...” dialog box.

Here the checkbox for “Attributes” will be filled and the tagname shown in the appropriate column.



Also note that the “Hide/Show” function is still available for configuration. It can be used in conjunction with the “Attributes” function.

Graphic Primitives - Attributes Alarm Tab: This tab allows a configuration where the **alarm state change** in the selected status or diagnostic "input" of the tagname will change the attribute set of a dynamic object.



The list box shows the available inputs that pertain to the linked tagname. Different devices may have a different list. Configuration involves selecting the desired input from the list and then setting the attribute set for each of the three states.

Use the standard object editing tools to select the attribute set for each of the three states using the "Set" buttons to save the settings.

Test the configuration using the "Display" buttons to toggle the three states.

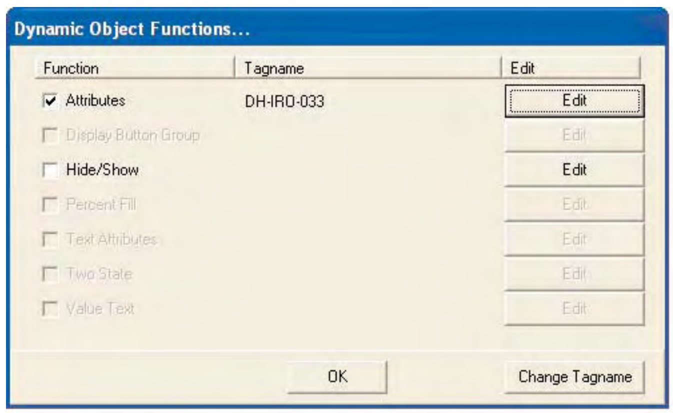
In the example to the right, the input "High Gas Alarm" is selected and the objects attribute sets have been configured so that the it will be green when "Normal", bright red in "New Alarm" and dark red in the acknowledged "Alarm" state.

Below these settings are two check boxes, one called "Track Size" the other "Track Position" which when selected allow these attributes to be dynamically changed based on the state of the object.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

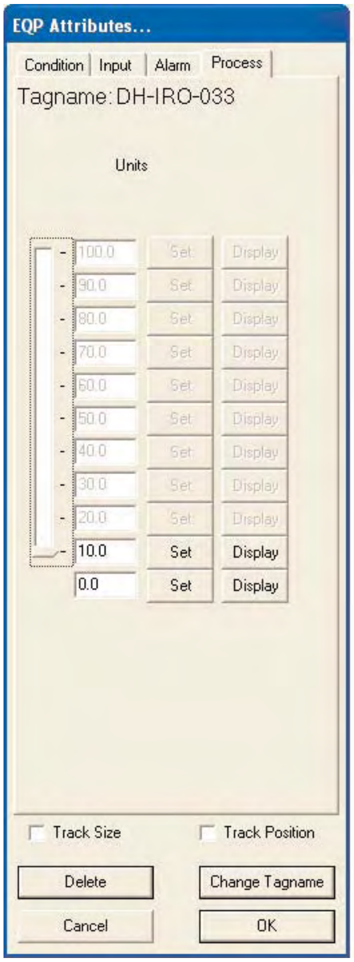
- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.
- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box and take you back to the “Dynamic Object Functions...” dialog box.

Here the checkbox for “Attributes” will be filled and the tagname shown in the appropriate column.



Also note that the “Hide/Show” function is still available for configuration. It can be used in conjunction with the “Attributes” function.

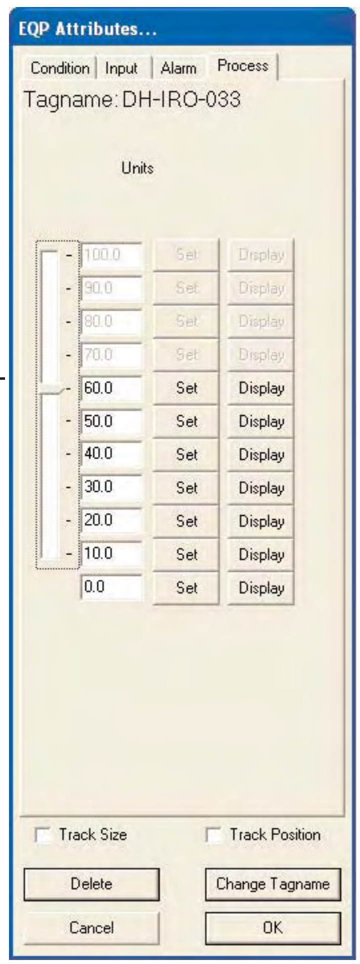
Graphic Primitives - Attributes Process Tab: This tab allows a configuration where the value of the tagnames process variable is used to change the attribute set of the selected dynamic object.



Configuration consists of utilizing a slider to control how many "attribute sets" to use. Up to ten can be configured with default values set in 10% increments from 0-100%.

Note: Both the default values and any user edits to these setpoints are in engineering units. The units of measure are shown below the tagname in the "Attributes..." dialog box.

These default values can be changed to any desired value.



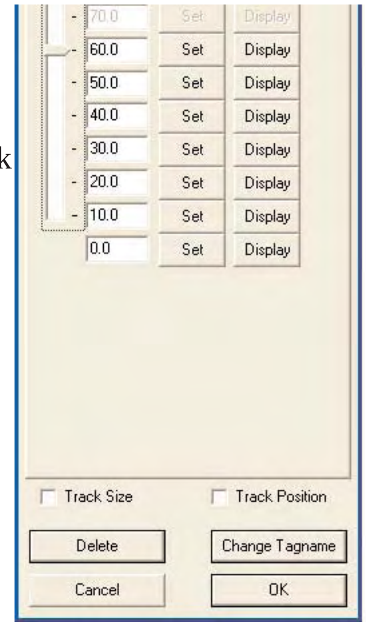
In the sample to the right, the slider control has been positioned to give six changes in the dynamic object.

A different "attribute set" can be utilized for each of these six setpoints.

The example shows the default setpoints which are in 10% increments.

To assign an attribute set to a particular setpoint, use the standard object editing tools to modify the dynamic object to the desired condition and then select the appropriate "Set" button.

Use the "Display" buttons to test the configuration.



The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

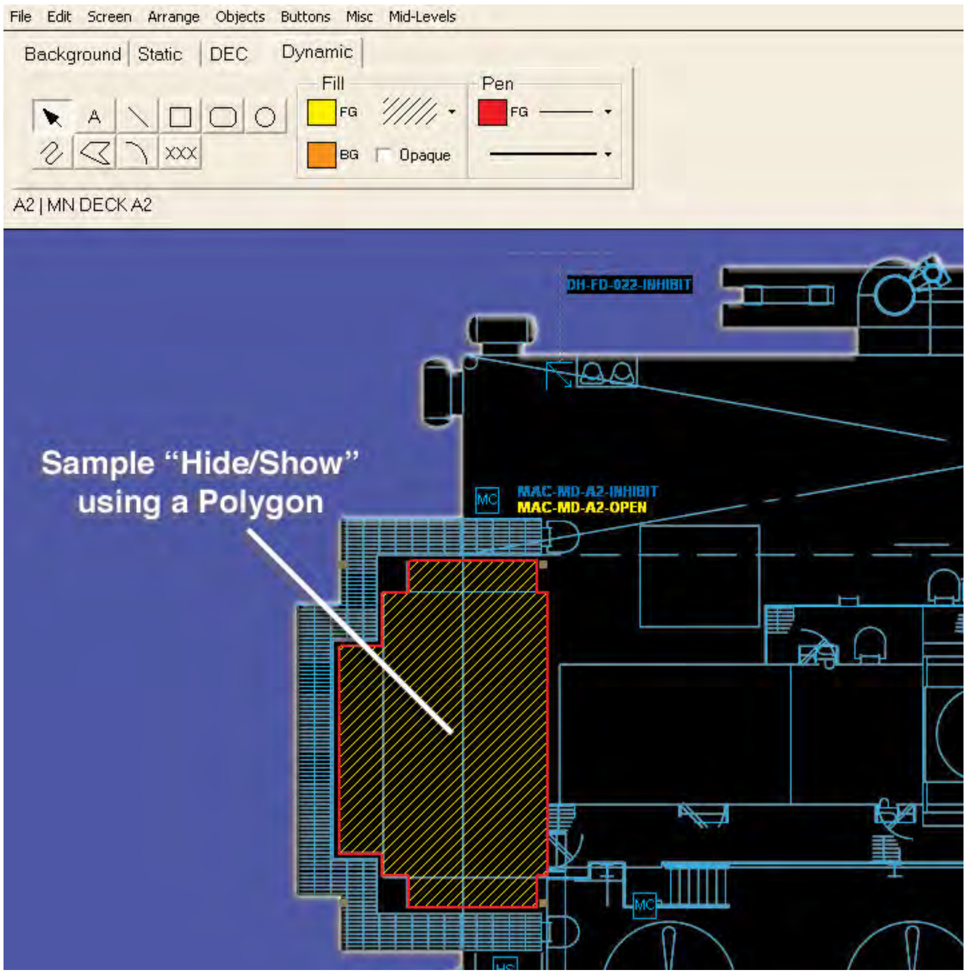
- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.
- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box.

Once attribute sets have been assigned for each of the six potential states of the tagname, test them by sequencing through the “Display” buttons. This will show the applied attribute sets for each state. If satisfied, finalize the configuration by choosing the “OK” button in the bottom right area of the dialog box.

This will close the “Attributes” dialog box and take you back to the “Dynamic Object Functions...” dialog box. Here the checkbox for “Attributes” will now be filled and the tagname will be listed in the appropriate column.

Also note that the “Hide/Show” function is still available for configuration. It can be used in conjunction with the Attributes function and takes precedence over the other functions it can be used with and will always be evaluated first.

Configuring the "Hide/Show" function for Graphic Primitives:
Using the appropriate tool create a dynamic object such as a line, rectangle, rounded rectangle, freehand object, polygon or arc and place it as required on the graphic.

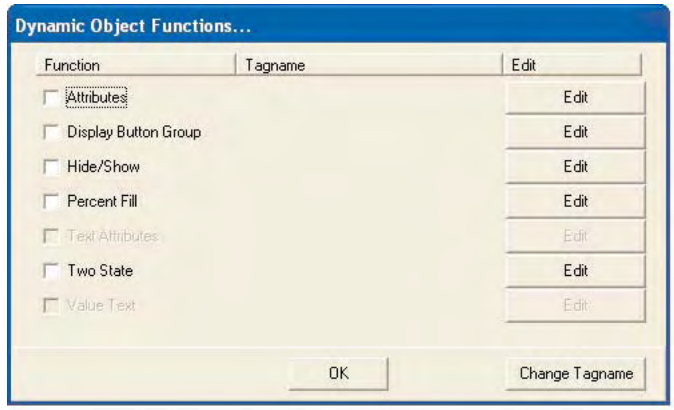


In the example above, a polygon was created outlining an area of the drawing and configured to have a thick red border with a yellow diagonal pattern.

The object will normally be hidden and the "Hide/Show" function will be used to show this object, hilighting the area, under user configured conditions.

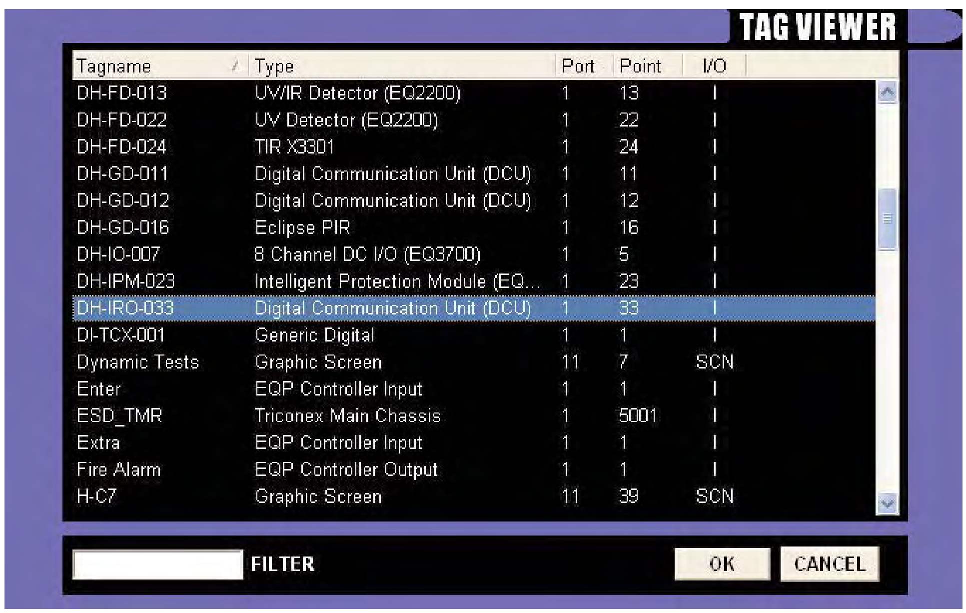
Although the above example utilizes a polygon, any of the seven graphic primitive types can be used with the hide/show function.

Double-click on the dynamic object to open the “Dynamic Object Functions...” dialog box which shows the available functions for the object type.



The five available functions for graphic primitives are shown for selection via “checkbox” on the left side of the dialog box.

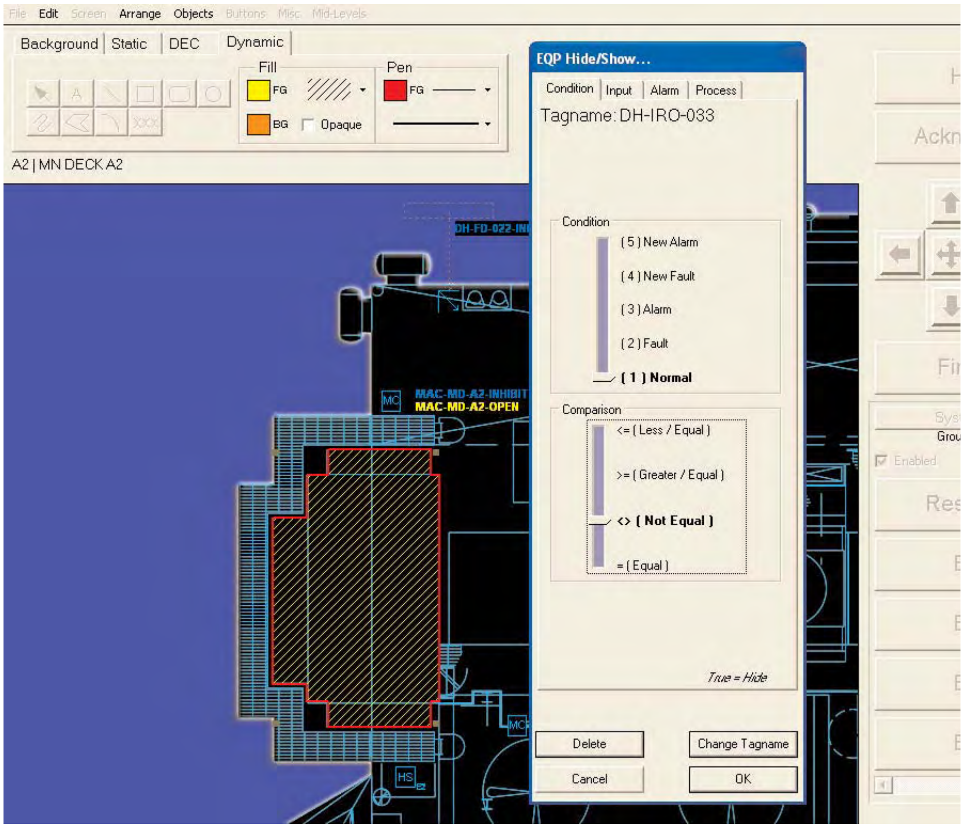
Checking the “Hide/Show” selection will open the database “Tag Viewer” dialog box to allow for the selection of a tagname to link to the object and be used to trigger the “Hide/Show” function. The “Tag Viewer” dialog box displays a scrolling list of tagnames in the database, regardless of their point of origin. Browse the database to locate the desired tagname. Information on the type of device, its port and point identification, and I/O type are shown.



To more easily locate the desired tagname in a large database a “Filter” feature is provided. Place the cursor in the data entry field in the lower left of the dialog box and begin typing the tagname. The list will dynamically sort allowing the desired tagname to be quickly located.

Once the tagname is selected, the “OK” button will close the Tag Viewer and open the “Hide/Show...” dialog box.

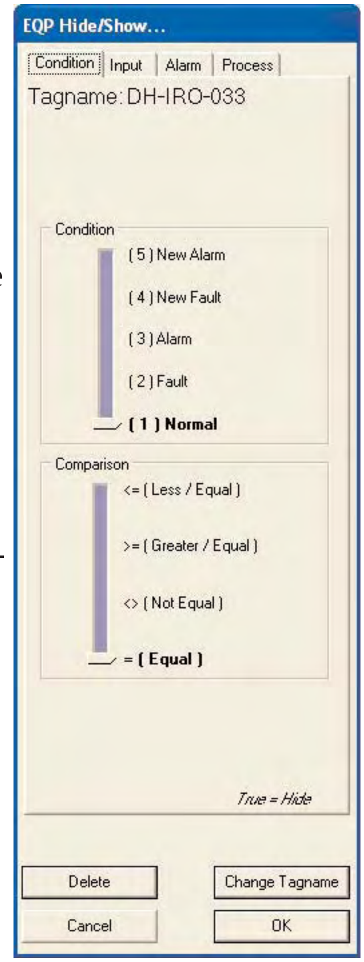
The dialog box shows the selected tagname below four selectable tabs: Condition, Input, Alarm and Process.



The “Hide/Show” feature can be configured to work from any one of these tabs.

The tab that is active (on top) when the “OK” button is selected will be the configuration used to control the “Hide/Show” feature.

Graphic Primitives: Hide/Show - Condition Tab: This tab allows a configuration where the "State" of the tagname will Hide or Show the selected dynamic object.



There are two "sliders" that are used to set up a logical comparison between the "state" of the tagname as chosen with the top slider, and the comparison option selected with the bottom slider.

On the lower right side of the dialog box there is a small legend that says "True = Hide".

This means that when the condition selected meets the comparison selected the object will be hidden.

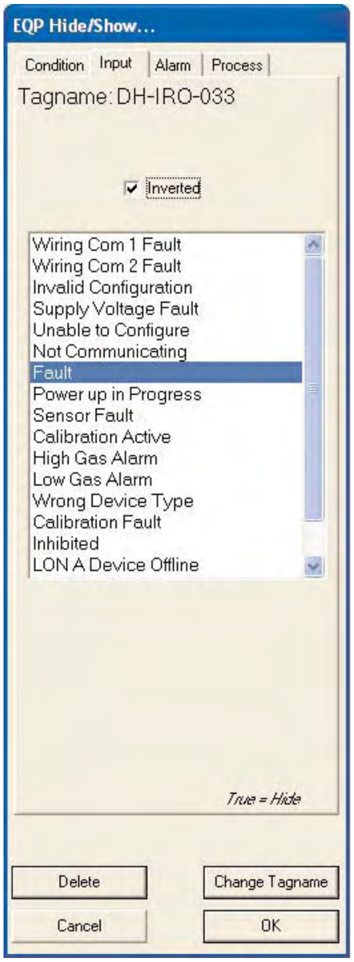
In the example to the right, the condition slider is in the "Normal" position and the comparison slider is in the "Equal" position.

With these selections, the dynamic object will be hidden when the tagname DH-IRO-033 is in the "Normal" state and the object will be shown when the tag state is any other condition; fault, alarm, new fault, new alarm.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.
- The "Cancel" button aborts the configuration.
- The "OK" button accepts the configuration and closes the dialog box.

Graphic Primitives: Hide/Show - Input Tab: This tab allows a configuration where any one of the status or diagnostic "inputs" of the tagname will Hide or Show the selected dynamic object. A check box is provided to "Invert" the logical state of the selected input if necessary.



The list box shows the available inputs that pertain to the linked tagname. Different devices may have a different list.

On the lower right side of the dialog box there is a small legend that says "True = Hide".

This means that when the condition selected meets the comparison selected the object will be hidden.

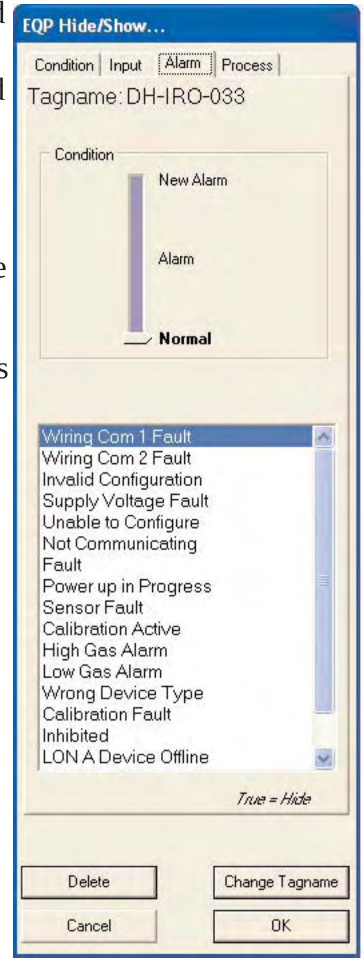
In the example to the right, the "Inverted" checkbox is checked and the input "Fault" has been selected.

With these selections the object will be shown when the tagname DH-IRO-033 has a "Fault" and the object will be hidden when the "Fault" is gone.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.
- The "Cancel" button aborts the configuration.
- The "OK" button accepts the configuration and closes the dialog box.

Graphic Primitives: Hide/Show - Alarm Tab: This tab allows a configuration where the “Alarm State” of the tagname will Hide or Show the selected dynamic object.



Configuration involves a condition setting and an input selection. The condition is set using a three position slider and the input is selected from a scrolling list. When the selected input meets the selected condition the hide/show event occurs.

On the lower right side of the dialog box there is a small legend that says “True = Hide”.

This means that when the condition selected is true for the selected input, the dynamic object is hidden.

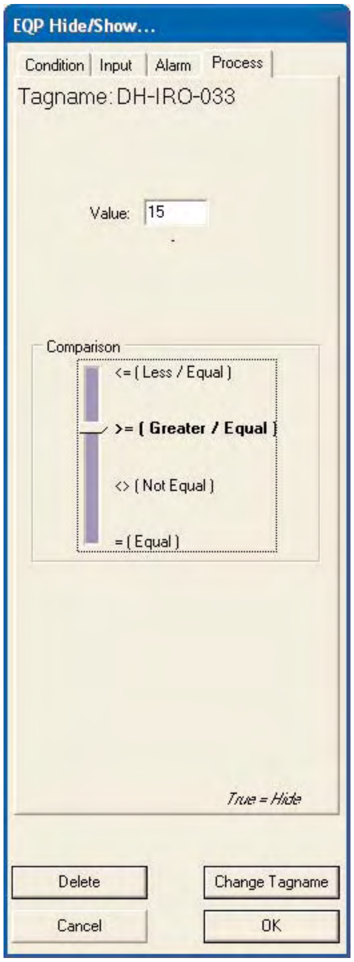
In the example to the right, the condition slider is in the “Normal” position and the input selected is “Wiring Com 1 Fault”.

With these selections, the dynamic object will be hidden when the “Wiring Com 1 Fault” input of tagname DH-IRO-033 is in the “Normal” state. The object will be shown when its state is either “New Alarm” or “Alarm”.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.
- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box.

Graphic Primitives: Hide/Show - Process Tab: This tab allows a configuration where the value of the tagnames process variable is used to Hide or Show the selected dynamic object.



Configuration involves a “Value” setting and a “Comparison” setting.

The “Value” is entered into a field, in engineering units and the “Comparison” is selected using a four position slider.

On the lower right side of the dialog box there is a small legend that says “True = Hide”.

This means that when the “True/False” evaluation of the process variable value against the entered value and comparison is true, the selected object will be hidden.

In the example to the right, the value is “15” and the comparison slider is in the “>= greater than or equal to” position.

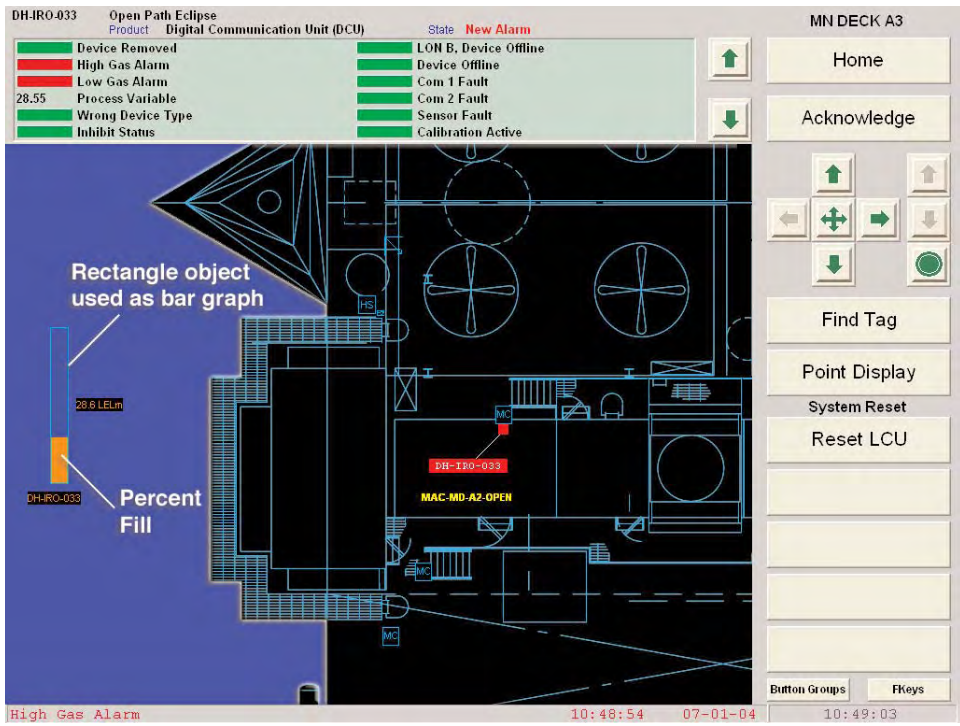
With these selections, the dynamic object will be hidden when the process variable for tagname DH-IRO-033 is greater than or equal to “15” and the object will be shown when the value is less than “15”

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.
- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box.

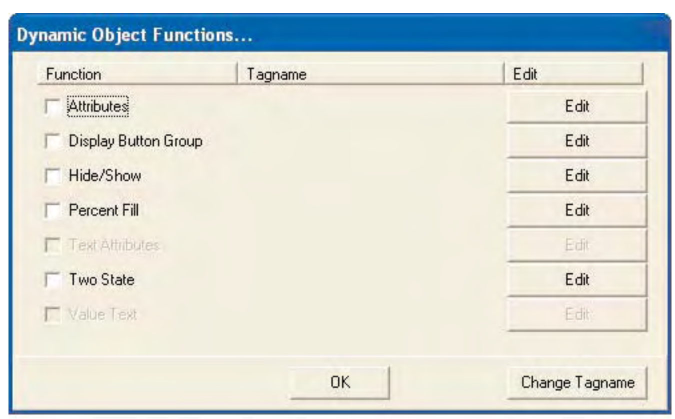
Graphic Primitives: Percent Fill The “Percent Fill” function can be applied to Rectangle, Rounded Rectangle, Oval, Freehand and Polygon dynamic object types. The function will “fill” the object based on the analog value of the process variable for the tagname linked to the object. The color, pattern and direction of fill can be user configured.

Typical uses for this function would be to create a bar graph or to show the level in a tank. In the example below, a rectangle is being used to create a bar graph which is linked to the analog value of a gas detector.



In this example the height of the bargraph is proportional to the analog value of the process variable which is shown as value text to the right of the bargraph and in the “mini point display” at the top of the screen.

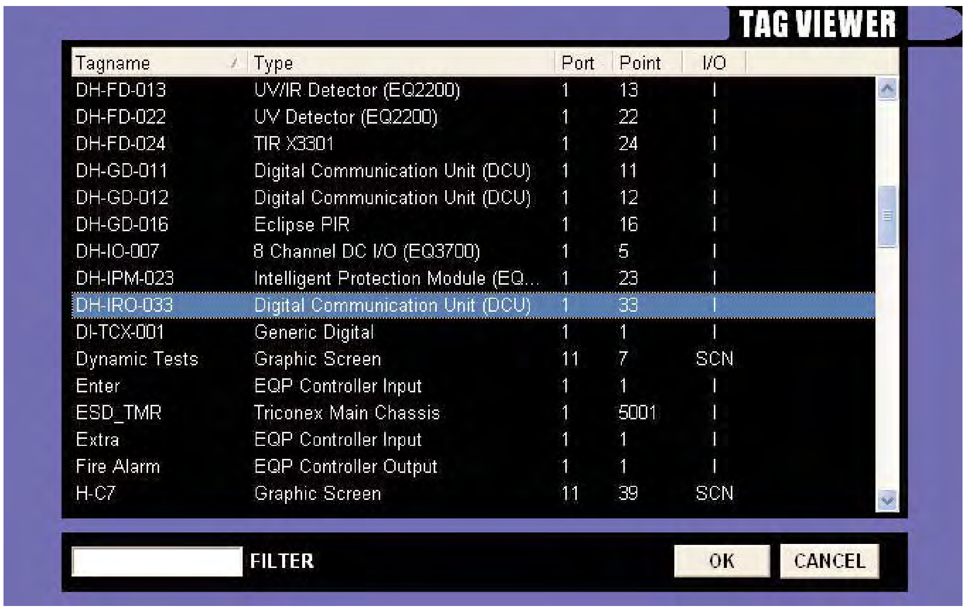
To configure the percent fill function use the appropriate tool to create a dynamic object on the screen, then double click on the object to open the “Dynamic Object Functions...” dialog box.



The five available functions for graphic primitives are shown for selection via “checkbox” on the left side of the dialog box.

Checking the “Percent Fill” selection will open the database “Tag Viewer” dialog box to allow for the selection of a tagname to link to the object and be used to feed data to the “Percent Fill” function.

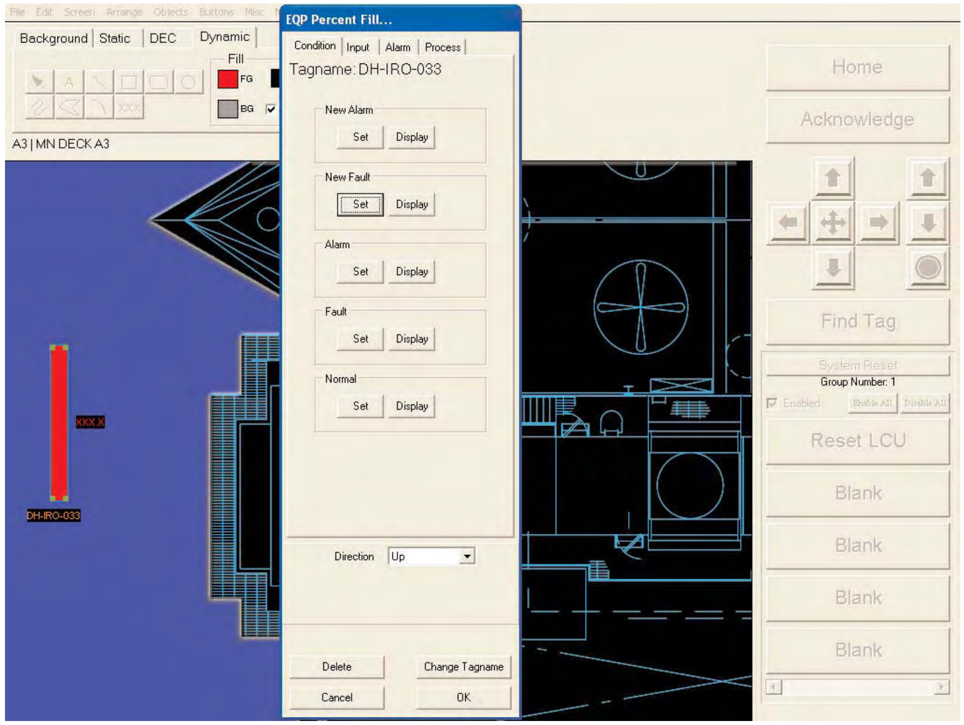
The “Tag Viewer” dialog box displays a scrolling list of tagnames in the database, regardless of their point of origin. Browse the database to locate the desired tagname. Information on the type of device, its port and point identification, and I/O type are shown.



To more easily locate the desired tagname in a large database a “Filter” feature is provided. Place the cursor in the data entry field in the lower left of the dialog box and begin typing the tagname. The list will dynamically sort allowing the desired tagname to be quickly located.

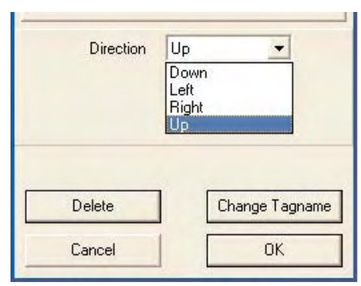
Once the tagname is selected, the “OK” button will close the Tag Viewer and open the “Percent Fill...” dialog box.

The dialog box shows the selected tagname below four selectable tabs: Condition, Input, Alarm and Process.

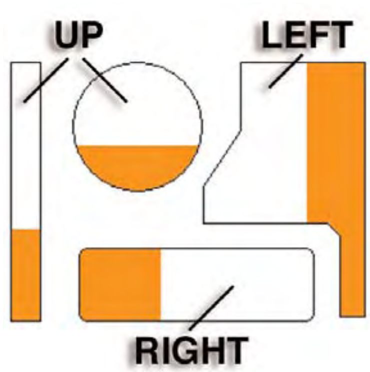


The “Percent Fill” feature can be configured to work from any one of these tabs.

Toward the bottom of the dialog box on each tab is a “Direction” pop-up menu. This is used to control the direction of the “Percent Fill” function.



Their are four choices; Down, Left, Right and Up. The selection determines from which direction the fill function occurs.

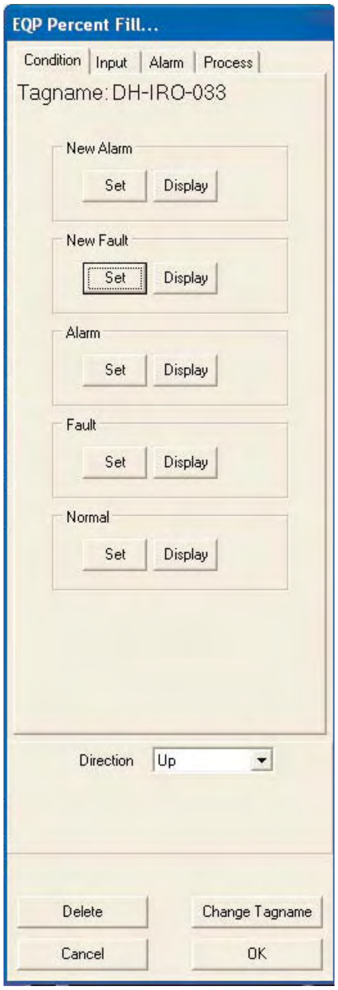


In the four examples to the left, each object is shown 40% filled. The rectangle and circle are filling “Up”, the rounded rectangle is filling to the “Right” and the polygon is filling to the “Left”.

The tab that is active (on top) when the “OK” button is selected will be the configuration used to control the “Percent Fill” feature.

Graphic Primitives: Percent Fill - Condition Tab:

Allows for the configuration of a dynamic object that will "Fill" in a user configurable direction, based on the process variable of a selected tagname and have the filled area of the object change its visible attributes based on the state of the selected tagname.



The percent fill is automatically tied to the analog value and the visible attributes of the fill area is user configurable for each of the five potential states of the selected tagname.

Configuration: Using the normal object editing tools configure the dynamic object to the desired attribute set (color, pattern, line weight etc.) for each state and then use the "Set" buttons to save these configurations.

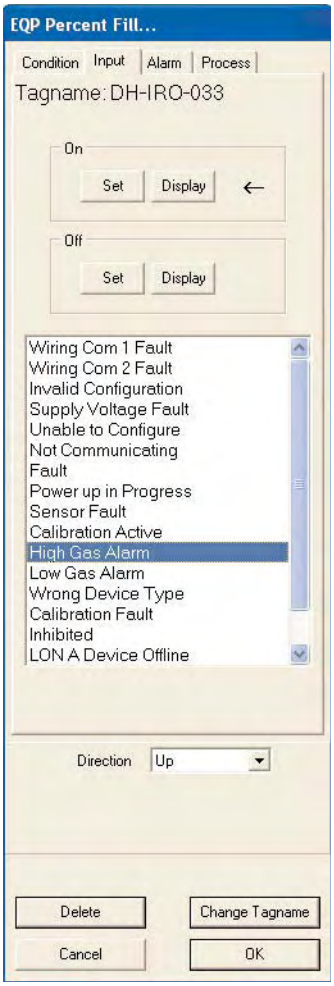
After each of the five states have been configured, the "Display" buttons can be used to test the configuration. As mentioned earlier, the "Direction" selection determines if the "Fill" will grow up, down, left or right.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.
- The "Cancel" button aborts the configuration.
- The "OK" button accepts the configuration and closes the dialog box taking you back to the "Dynamic Object Functions..." dialog box.

Here the checkbox for "Percent Fill" will now be filled and the tagname will be listed in the appropriate column. Also note that the "Hide/Show" function is still available for configuration. It can be used in conjunction with the "Percent Fill" function and takes precedence over the other functions it can be used with and will always be evaluated first.

Graphic Primitives: Percent Fill - Input Tab:



Allows for the configuration of a dynamic object that will "Fill" in a user configurable direction, based on the process variable of a selected tagname and have the filled area of the object change its visible attributes based on the state of an input from the selected tagname.

The percent fill is automatically tied to the analog value and the visible attributes of the fill area is user configurable for both the "ON" and "OFF" states of the selected input.

Configuration: Using the normal object editing tools configure the dynamic object to the desired attribute set (color, pattern, line weight etc.) for each state and then use the "Set" buttons to save these configurations.

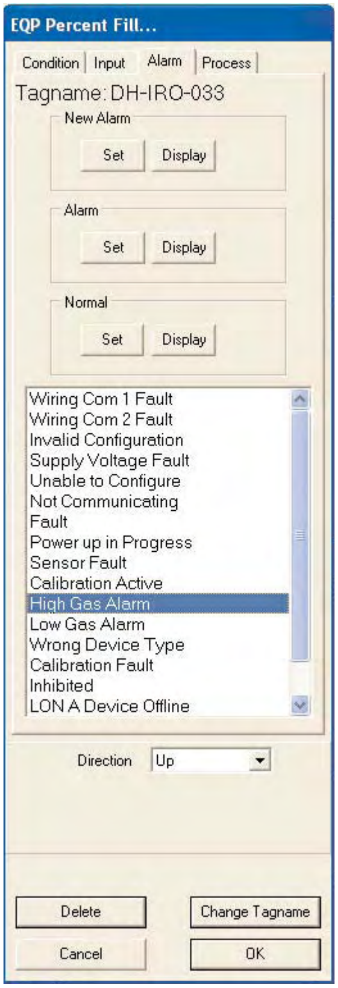
After both the "ON" and "OFF" states have been configured, the "Display" buttons can be used to test the configuration. As mentioned earlier, the "Direction" selection determines if the "Fill" will grow up, down, left or right.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.
- The "Cancel" button aborts the configuration.
- The "OK" button accepts the configuration and closes the dialog box taking you back to the "Dynamic Object Functions..." dialog box.

Here the checkbox for "Percent Fill" will now be filled and the tagname will be listed in the appropriate column. Also note that the "Hide/Show" function is still available for configuration. It can be used in conjunction with the "Percent Fill" function and takes precedence over the other functions it can be used with and will always be evaluated first.

Graphic Primitives: Percent Fill - Alarm Tab:



Allows for the configuration of a dynamic object that will “Fill” in a user configurable direction, based on the process variable of a selected tagname and have the filled area of the object change its visible attributes based on the three alarm states of the selected tagname.

The percent fill is automatically tied to the analog value and the visible attributes of the fill area is user configurable for the “Normal”, “New Alarm” and “Alarm” states of the selected tagname.

Configuration: Using the normal object editing tools configure the dynamic object to the desired attribute set (color, pattern, line weight etc.) for each state and then use the “Set” buttons to save these configurations.

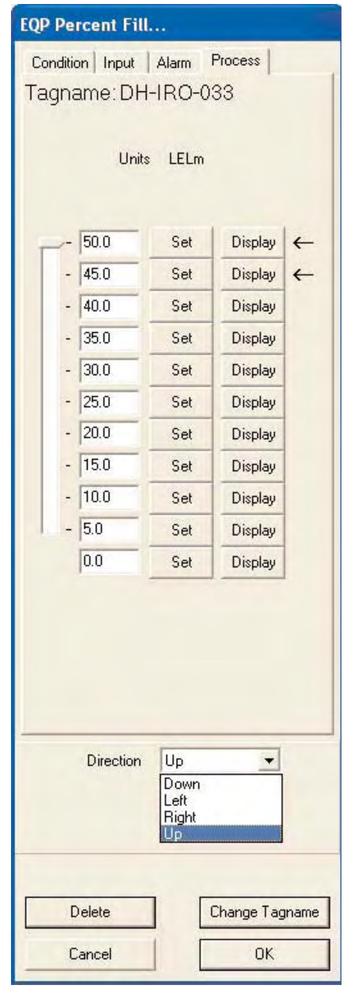
After the three states have been configured, the “Display” buttons can be used to test the configuration. The “Direction” selection sets the “Fill” to grow up, down, left or right.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.
- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box taking you back to the “Dynamic Object Functions...” dialog box.

Here the checkbox for “Percent Fill” will now be filled and the tagname will be listed in the appropriate column. Also note that the “Hide/Show” function is still available for configuration. It can be used in conjunction with the “Percent Fill” function and takes precedence over the other functions it can be used with and will always be evaluated first.

Graphic Primitives: Percent Fill - Process Tab:



Allows for the configuration of a dynamic object that will "Fill" in a user configurable direction, based on the Process Variable (PV) of a selected tagname and have the filled area of the object change its visible attributes based on up to 10 configurable breakpoints in the PV.

Both the percent fill and fill area are automatically tied to the analog value. Up to 10 breakpoints can be configured with each capable of having its own display attributes.

Configuration: Using the normal object editing tools configure the dynamic object to the desired attribute set (color, pattern, line weight etc.) for each state and then use the "Set" buttons to save these configurations.

After the desired number of breakpoints have been configured, the "Display" buttons can be used to test the configuration. The "Direction" selection sets the "Fill" to grow up, down, left or right.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.
- The "Cancel" button aborts the configuration.
- The "OK" button accepts the configuration and closes the dialog box taking you back to the "Dynamic Object Functions..." dialog box.

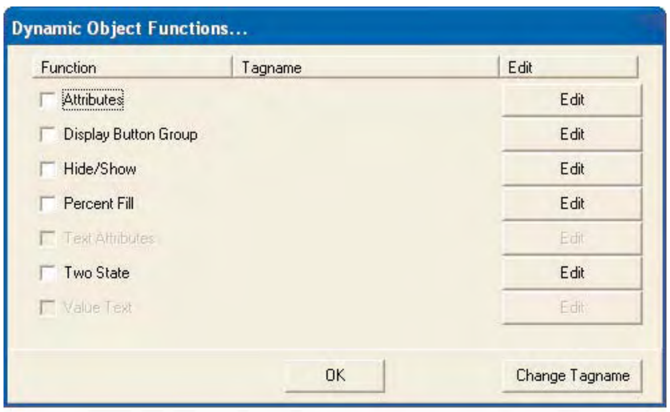
Here the checkbox for "Percent Fill" will now be filled and the tagname will be listed in the appropriate column. Also note that the "Hide/Show" function is still available for configuration. It can be used in conjunction with the "Percent Fill" function and takes precedence over the other functions it can be used with and will always be evaluated first.

Graphic Primitives: Two State - The “Two State” function can be applied to Rectangle, Rounded Rectangle, Oval, Freehand and Polygon dynamic object types. The function will “flash” between two user configured sets of graphic attributes based on the state of the linked tagname.

This function is typically used to draw attention to an area of the graphic page with a flashing object.

Configuring the “Two State” function for Graphic Primitives:

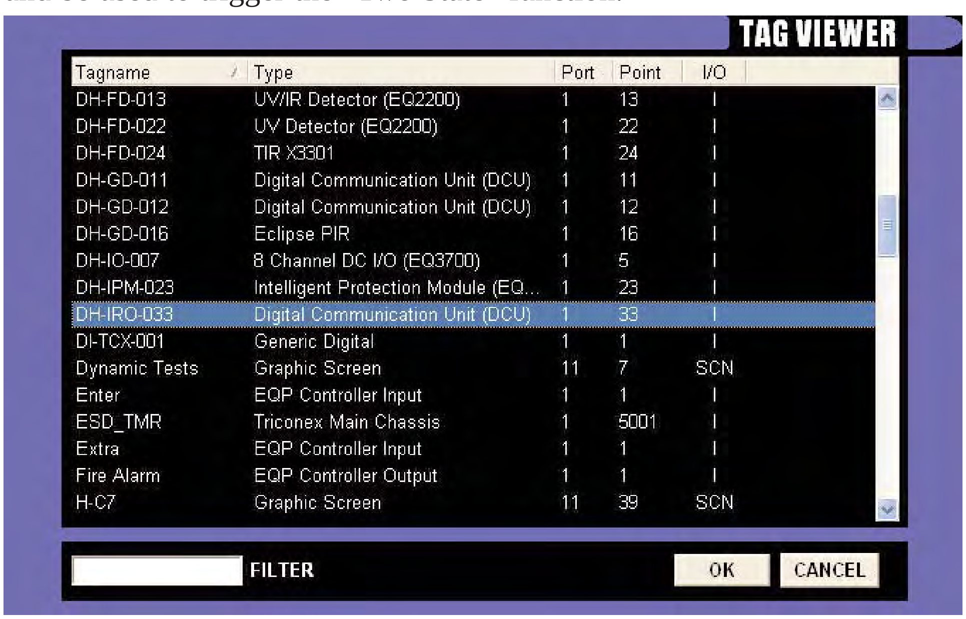
Using the appropriate tool create a dynamic object and place it as required on the graphic.



Double-click on the object to open the “Dynamic Object Functions...” dialog box which shows the available functions for the object type.

The five available functions for dynamic objects are shown for selection via “checkboxes” on the left side of the dialog box.

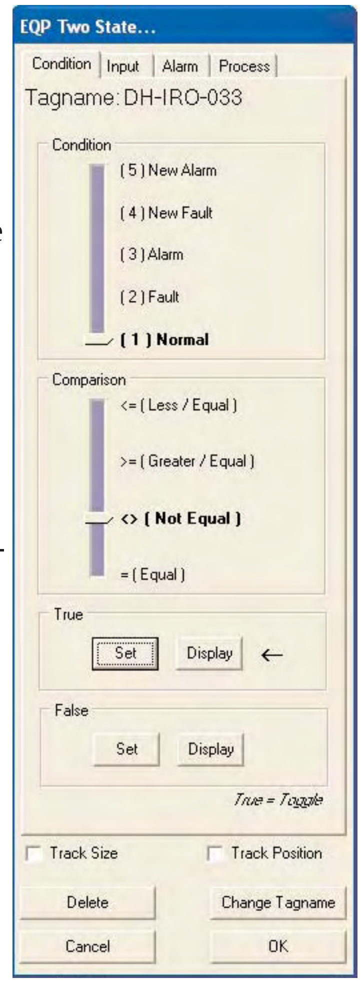
Checking the “Two State” selection will open the database “Tag Viewer” dialog box to allow for the selection of a tagname to link to the object and be used to trigger the “Two State” function.



The dialog box shows the selected tagname below four selectable tabs: Condition, Input, Alarm and Process.

The “Two State” feature can be configured to work from any one of these tabs.

Graphic Primitives: Two State - Condition Tab: This tab allows a configuration where the “State” of the tagname will cause the dynamic object to flash between its True and False attribute sets.

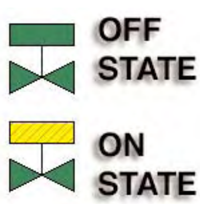


There are two “sliders” that are used to set up a logical comparison between the “state” of the tagname as chosen with the top slider, and the comparison option selected with the bottom slider.

On the lower right side of the dialog box there is a small legend that says “True = Toggle”.

This means that when the condition selected meets the comparison selected the object will be toggle (flash) between its True and False attributes.

In the example to the right, the condition slider is in the “Normal” position and the comparison slider is in the “<>Not Equal” position.



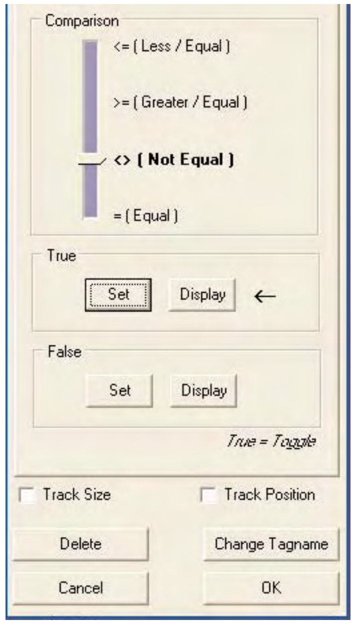
In the example to the left, the actuator portion of the valve symbol created from a polygon object was configured to be green when in the “OFF” or “False” state and yellow with diagonal stripes when in the “ON” or True state.

With these selections, the dynamic object will be steady when the tagname DH-IRO-033 is in the “Normal” state and will toggle (flash) between the configured True and False states in any other condition; fault, alarm, new fault, new alarm.

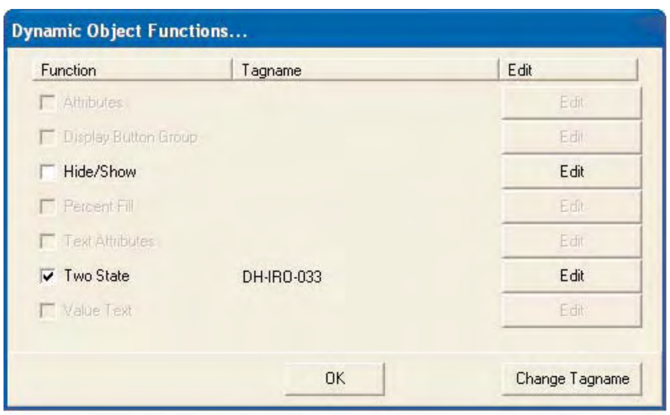
Below these settings are two check boxes, one called “Track Size” the other “Track Position” which when selected allow these attributes to be dynamically changed based on the state of the object.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.
- The "Cancel" button aborts the configuration.
- The "OK" button accepts the configuration and closes the dialog box.

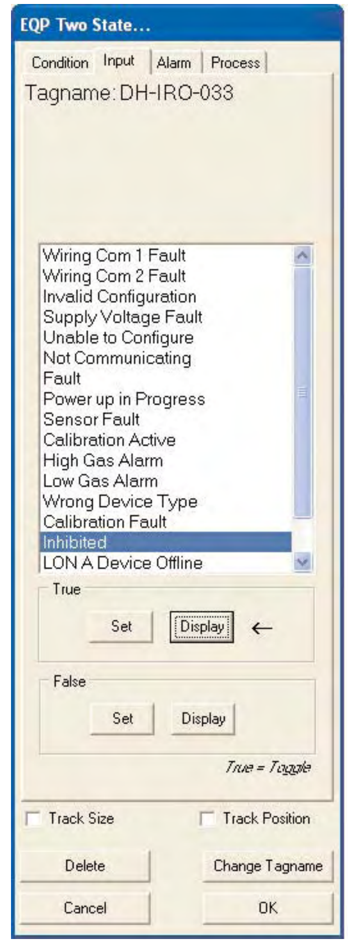


This will close the "Two State" dialog box and take you back to the "Dynamic Object Functions..." dialog box. Here the checkbox for "Two State" will now be filled and the tagname will be listed in the appropriate column.



Also note that the "Hide/Show" function is still available for configuration. It can be used in conjunction with the Two State function.

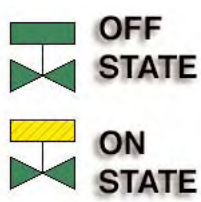
Graphic Primitives: Two State - Input Tab: This tab allows a configuration where the "On/Off" state change in the selected status or diagnostic "input" of the tagname will cause the dynamic object to flash between its True and False attribute sets.



The list box shows the available inputs that pertain to the linked tagname. Different devices may have a different list.

Configuration involves selecting the desired input from the list and then setting the attribute set for the on and off states.

In the example to the right, the input "Inhibited" is selected. Use the standard object editing tools to select the size, color, pattern, line weight and color of the object for each state and then use the "Set" buttons to save the settings. Test the configuration using the "Display" buttons to toggle the On/Off state.



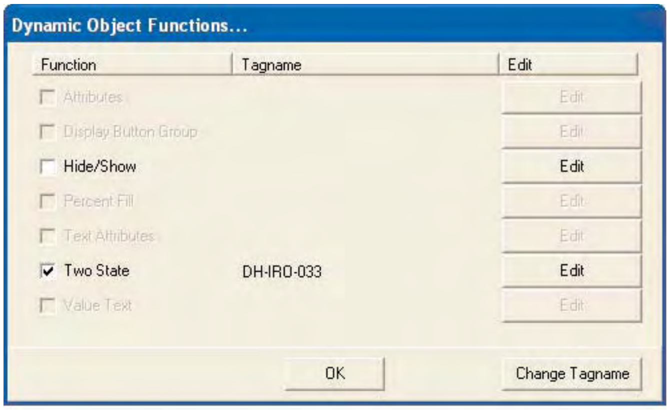
In this example the valve will be all green when the "Inhibited" input is Off (False) and will flash between the settings for the On and Off states when the "Inhibited" input is On (True).

Below these settings are two check boxes, one called "Track Size" the other "Track Position" which when selected allow these attributes to be dynamically changed based on the state of the object.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

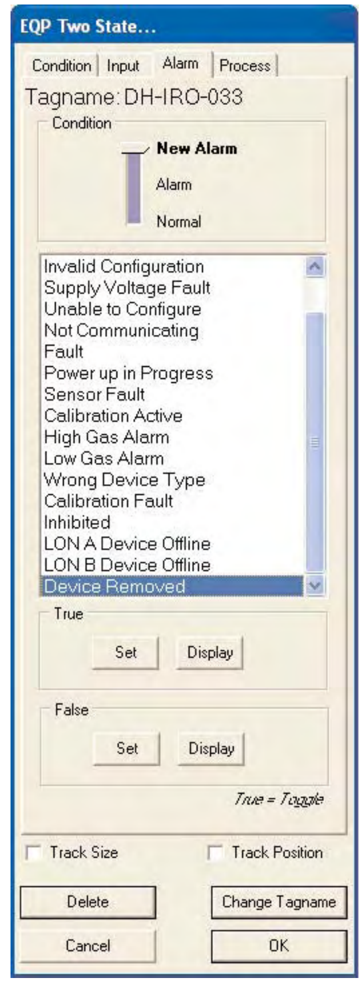
- The "Delete" button will eliminate the link between the currently selected tagname and the object being configured.
- The "Change Tagname" button allows a different link to be established between the object being configured and the tagname database.
- The "Cancel" button aborts the configuration.
- The "OK" button accepts the configuration and closes the dialog box.

This will close the “Two State” dialog box and take you back to the “Dynamic Object Functions...” dialog box. Here the checkbox for “Two State” will now be filled and the tag-name will be listed in the appropriate column.



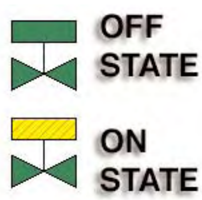
Also note that the “Hide/Show” function is still available for configuration. It can be used in conjunction with the Two State function.

Graphic Primitives: Two State - Alarm Tab: This tab allows a configuration where the “On/Off” state change in the selected status or diagnostic “input” of the tagname will cause the dynamic object to flash between its True and False attribute sets.



The list box shows the available inputs that pertain to the linked tagname. Different devices may have a different list.

Configuration involves selecting the desired input from the list, using the slider control to select the condition to compare the input against and then setting the objects visible attribute set for each of the two states.



Use the standard object editing tools to select the size, color, pattern, line weight and color of the object for each state and then use the “Set” buttons to save these settings. Test the configuration using the “Display” buttons to toggle the On/Off state.

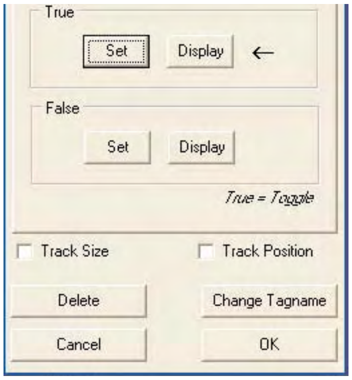
In the example to the right, the input “Device Removed” is selected. In this example, the effect is that when the input condition occurs, the valve actuator will “flash” between the solid green “Off” state and the yellow “On” state thus highliting the problem.

The flashing will stop when the operator acknowledges the event causing the inputs state to change to “Alarm” or “Normal”.

Below these settings are two check boxes, one called “Track Size” the other “Track Position” which when selected allow these attributes to be dynamically changed based on the state of the object.

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.

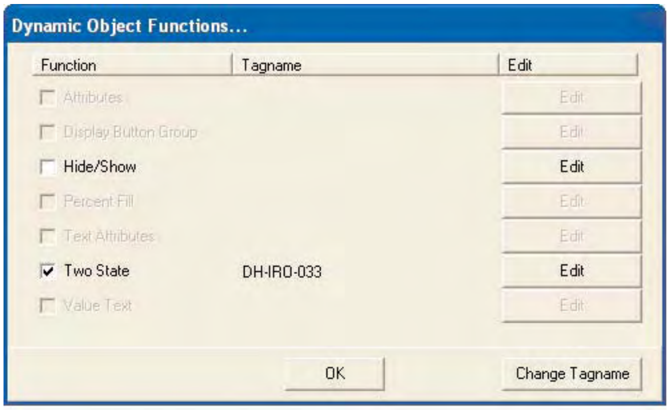


- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.
- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box.

Once attribute sets have been assigned for two states of the selected condition for the tagname, test them with the “Display” buttons.

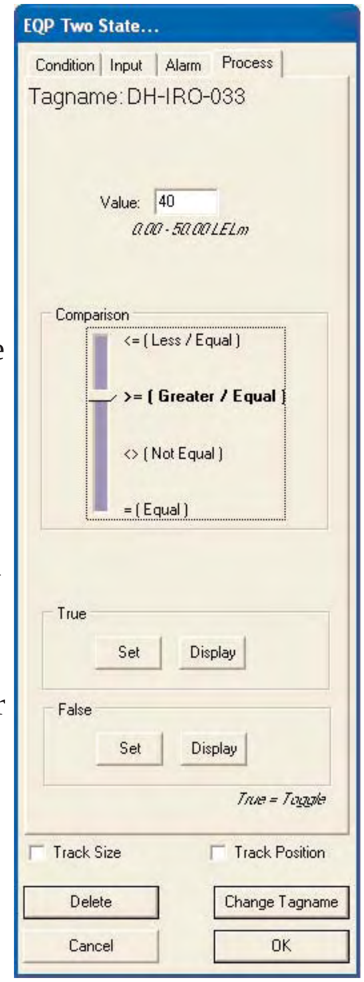
This will show the applied attribute sets for each state. If satisfied, finalize the configuration by choosing the “OK” button in the bottom right area of the dialog box.

This will close the “Two State” dialog box and take you back to the “Dynamic Object Functions...” dialog box. Here the checkbox for “Two State” will now be filled and the tagname will be listed in the appropriate column.



Also note that the “Hide/Show” function is still available for configuration. It can be used in conjunction with the Two State function.

Graphic Primitives: Two State - Process Tab: This tab allows a configuration where the value of the tagnames process variable is used to cause the selected dynamic object to flash between its True and False attribute sets.



Configuration involves a “Value” setting and a “Comparison” setting.

The “Value” is entered into a field, in engineering units and the “Comparison” is selected using a four position slider.

On the lower right side of the dialog box there is a small legend that says “True = Toggle”.

This means that when the “True/False” evaluation of the process variable value against the entered value and comparison is true, the selected object will flash between its True and False attribute sets.

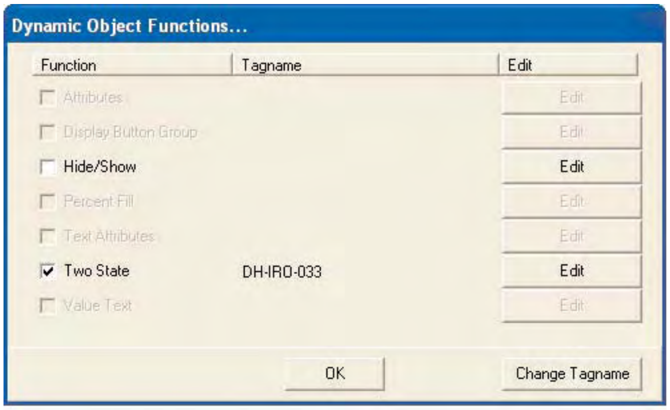
In the example to the right, the value is “40” and the comparison slider is in the “>= greater than or equal to” position.

With these selections, the dynamic object will flash when the process variable for tagname DH-IRO-033 is greater than or equal to “40” and the object will be solid, with the “False” attribute set, when the value is less than “40”

The four buttons at the bottom of the dialog box can be used accept, cancel or modify the selection and/or configuration.

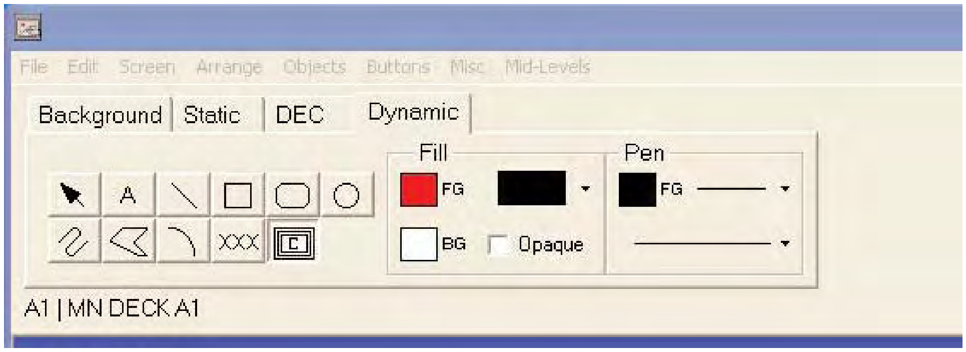
- The “Delete” button will eliminate the link between the currently selected tagname and the object being configured.
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.
- The “Cancel” button aborts the configuration.
- The “OK” button accepts the configuration and closes the dialog box.
- The “Change Tagname” button allows a different link to be established between the object being configured and the tagname database.

This will close the “Two State” dialog box and take you back to the “Dynamic Object Functions...” dialog box. Here the checkbox for “Two State” will now be filled and the tag-name will be listed in the appropriate column.



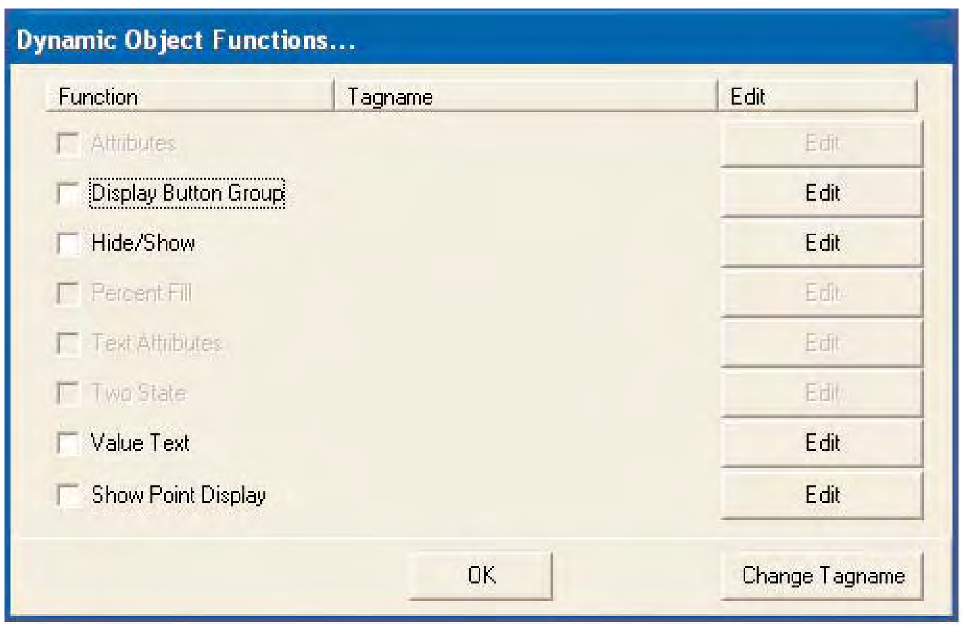
Also note that the “Hide/Show” function is still available for configuration. It can be used in conjunction with the Two State function.

Complex Object Tool: This tool provides for the selection and configuration of the many dynamic complex objects available on the dynamic layer.

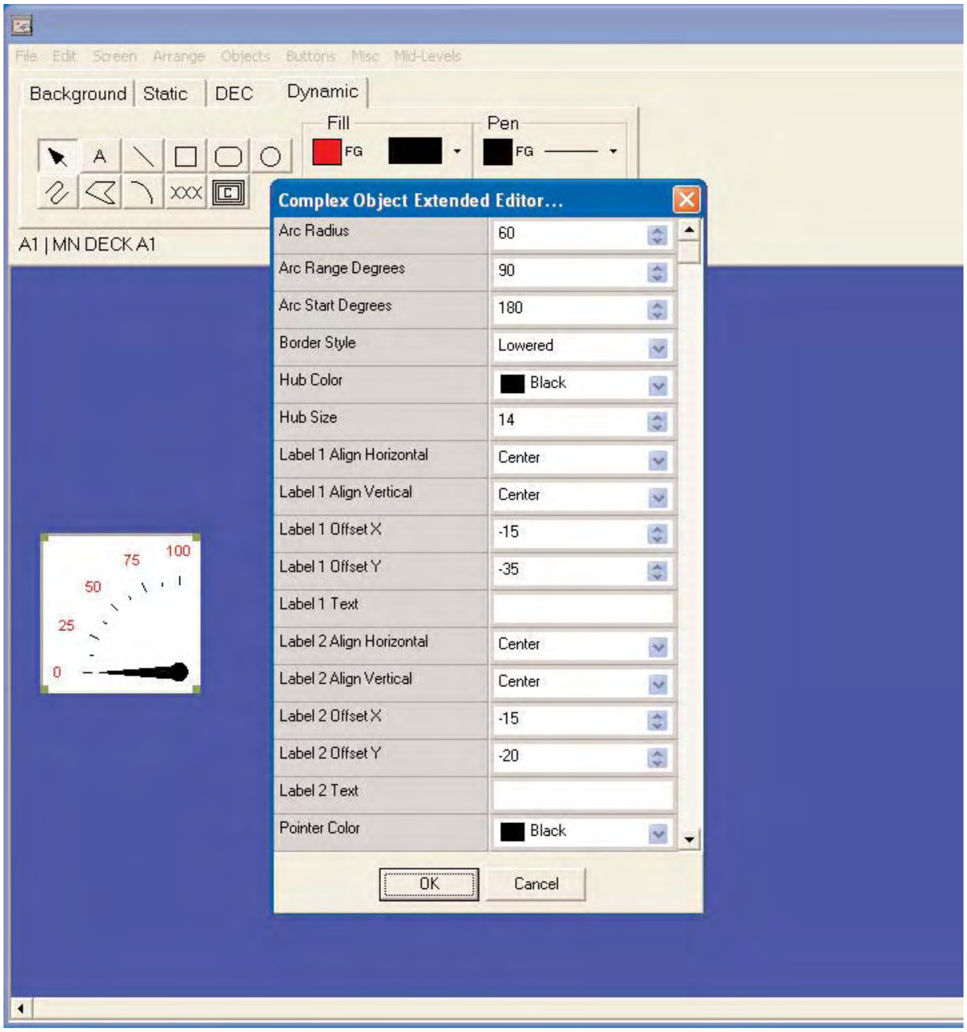


These objects are for the display of mostly analog data in the form of conventional instruments like LED's, and various forms of meters.

Once the complex object is selected and placed on the graphic it configured with attributes like the graphic primitives described earlier.



Complex Object Tool: “Right clicking” on the complex object will allow access to the “extended editor”. From this dialog box the complex objects internal parameters can be modified.



Each object has different parameters based on its function but in general the text color, axis labels, pointer and/or text colors and other items can be modified.

The size of many of these complex objects can easily be changed by simply selecting the object and clicking and dragging on one of the objects selection handles until it reaches the desired size.

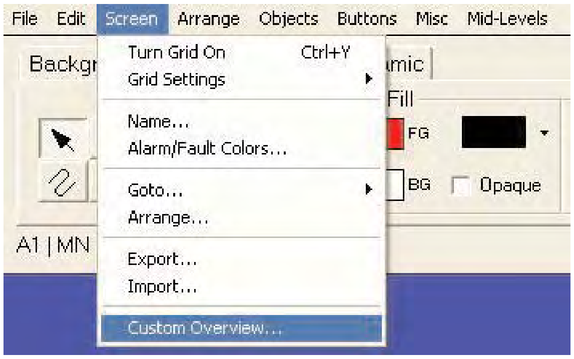
The working components of the object will scale accordingly.

Custom Overview: In certain cases, the automatically generated composite overview created by S^3 does not present the desired format and a custom overview is required.

S^3 supports the creation and use of a full screen custom overview complete with dynamic objects and links to lower level graphic screens.

In the examples on this page, a digital photo created in another program was imported into S^3 to serve as a background layer in the projects custom overview. In the example above, dynamic polygons were created to outline different areas of the platform and then linked to the appropriate “mid-level overview”. A “virtual annunciator” was also created using the same technique. Any alarms in these areas then highlite the problem area and clicking on them navigates to the appropriate linked screen, allowing the operator to quickly navigate to problem areas.

Custom Overview: A custom overview is a full screen (1024 x 768 pixel) graphic with no visible on-screen buttons or navigation tools. It is created in the "Custom Overview Editor" which is accessed from the "Screens" menu in the graphic editor.



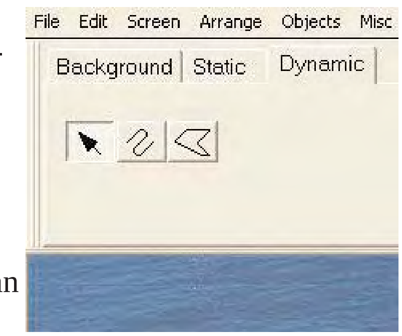
The environment of the editor is very similar to the standard screen graphic editor but with scroll bars added to the graphic window to accommodate its "full screen" size and a "View" button to display and test the custom overview in a full screen mode.

The custom overview is "multi-layered" having three independent layers; Background, Static and Dynamic. These layers function identically to their counterpart layers on the standard graphic screens (see Chapter 10).

The Background layer can contain an imported bitmap graphic, the static layer contains the tools for creating object based graphics, and the Dynamic layer allows objects to be created that are linked to "Tags" in the database.

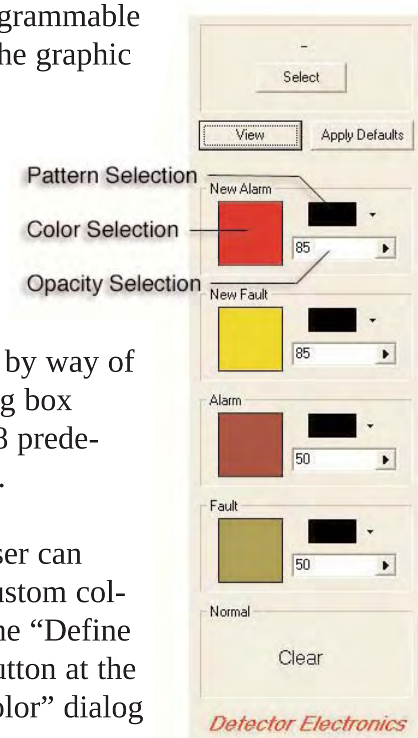
Layer Summary: The background and static layers function identically to their counterparts in the standard graphic development environment but allow you to work with the larger 1024 x 768 pixel format provided for the custom overview as opposed to the standard 800 x 600 pixel format. The purpose of these layers are to allow the creation of the desired graphic representation. Refer to Chapter 10 of this manual for instructions on background and static layer usage and tools.

Dynamic Layer: The Dynamic Layer provides tools for creating “invisible” boundaries around areas of the graphics on the layers below that can then be “linked” to the “state” of other graphic screens or mid-level overviews. When the “linked” screen changes state the dynamic object representing the screen will change according to it’s configured graphic attributes.



The “Polygon” and “Freehand” drawing tools are provided to create “linkable” graphic objects that will typically highlite an area of the custom graphic.

Dynamic Element Graphic Attributes: On the right side of the Custom Overview editor in place of the user programmable buttons are graphic controls for setting the graphic attributes of created dynamic elements.

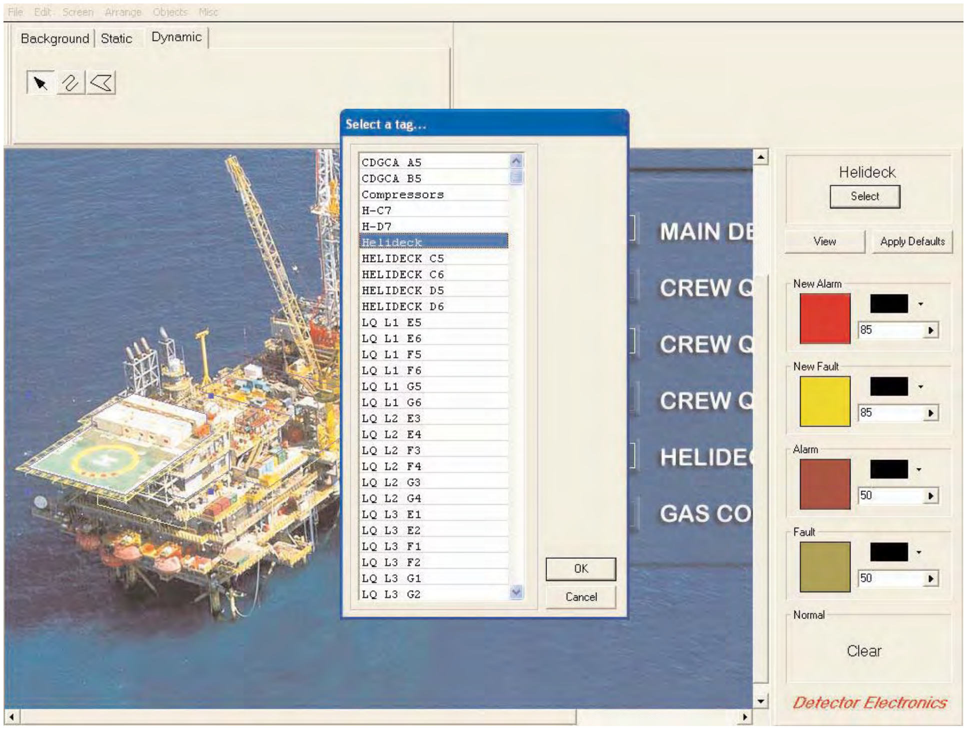


A separate color pattern and opacity can be assigned to each dynamic object for each of its five potential states; Normal, Fault, Alarm, New Fault, and New Alarm.

Color selection is by way of the standard dialog box which provides 48 predefined basic colors.

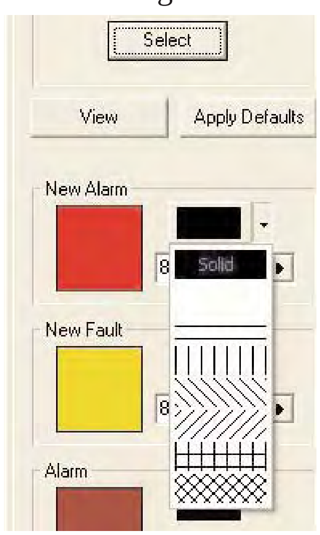
In addition, the user can define up to 16 custom colors by selecting the “Define Custom Color” button at the bottom of the “Color” dialog box.

Use either the “Freehand Tool” or “Polygon Tool” to create an outline around the area desired to indicate the status of a linked screen. Then choose the “Select” button from the top right of the editing screen to display to available screens which can be linked to the selected dynamic object.



Once linked, the link will be displayed above the “Select” button.

Setting Dynamic Object Graphic Attributes: Select a dynamic object, its link will be displayed above the “Select” button. On the right side of the screen are five “State boxes” showing the current graphic attributes for the selected dynamic object. If changes are desired, click on the appropriate “State box” and modify the attributes as necessary.

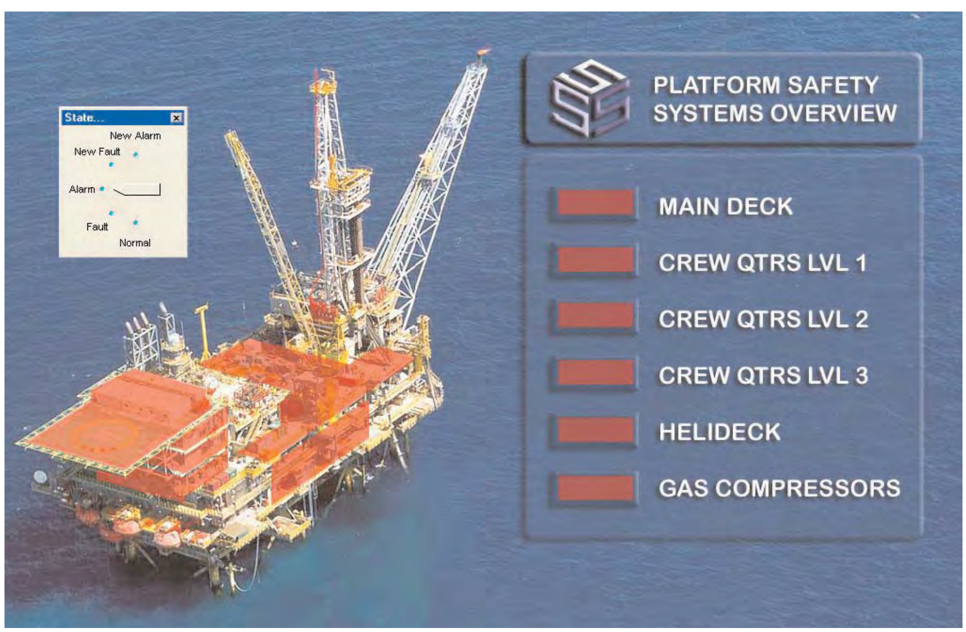


Pattern: To the right, the “New Alarm” pattern selection “pull down” menu shows the various selections available for the state. In this case the “Solid” pattern is selected which as the name implies renders a solid color. A standard mix of vertical, horizontal, diagonal and hatch patterns are available.

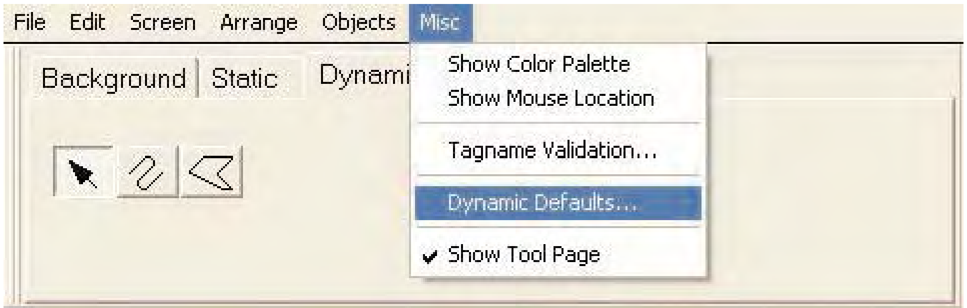
Opacity: This attribute allows the background layers to show through the object in inverse proportion to the opacity setting. At 100% opacity the selected color and pattern completely obscure the lower layers and as the opacity decreases more of the background becomes visible “through” the object. This gives the ability to “color” an area while still being able to see a selectable amount of detail.

Adjusting the opacity of a selected object is accomplished by entering a value from 0-100% in the numeric field or by using the slider. In the sample to the left, 25%, 50%, 75% and 100% opacity have been applied to yellow circles with a solid pattern.

Viewing Dynamic Object Graphic Attributes: Once the desired attributes have been modified they can be tested using the “View” button. This will show the Custom Overview graphic “full screen” and provide a selector switch to change the “virtual state” of all dynamic objects simultaneously. This will allow you to dynamically view how the objects will look in each state. Clicking the “close box” on the “View dialog box” will return to the Custom Overview editor.

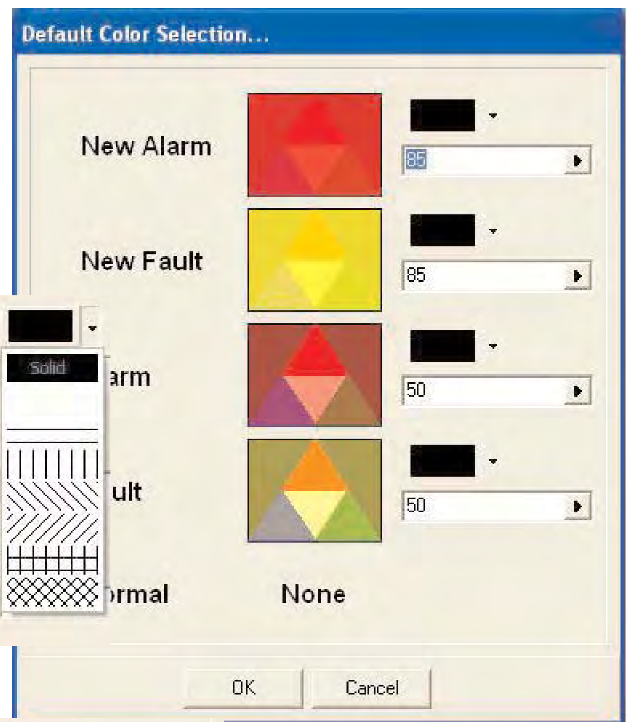


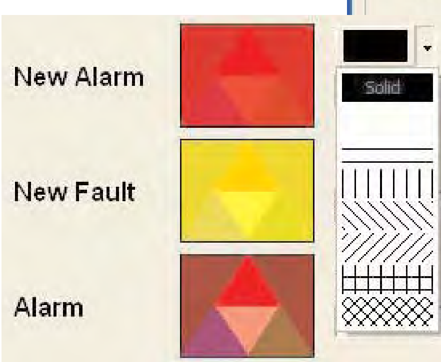
Setting Dynamic Defaults: Because of the need to set the color, pattern and opacity for <u>each</u> of the five states for <u>every</u> dynamic object, a means was provided to set defaults for these parameters that could be applied individually or globally.



Selecting “Dynamic Defaults...” from the “Misc.” menu will display the “Default Color Selection...” dialog box used to create a default setting for color, pattern and opacity that can be easily applied to objects on the dynamic layer of the Custom Graphic Editor.

The five object states are shown with a Det-Tronics logo in the center to provide a reference point as the different attributes are adjusted.



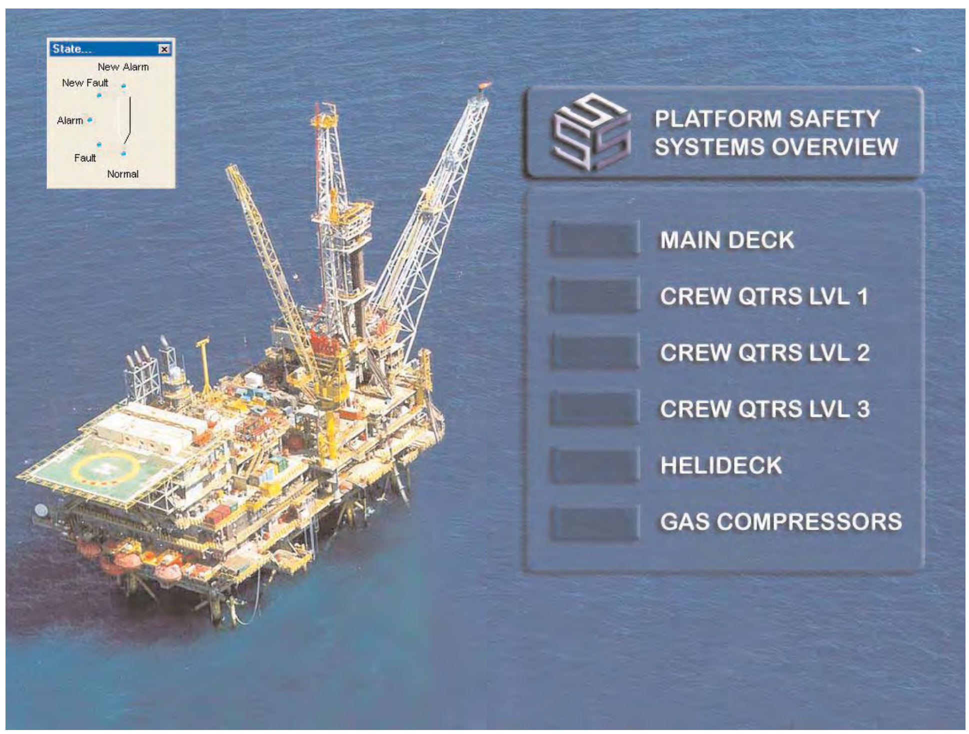


Pattern selection and

opacity adjustments are accomplished using the same menu and slider techniques used in the custom overview editor and described earlier.

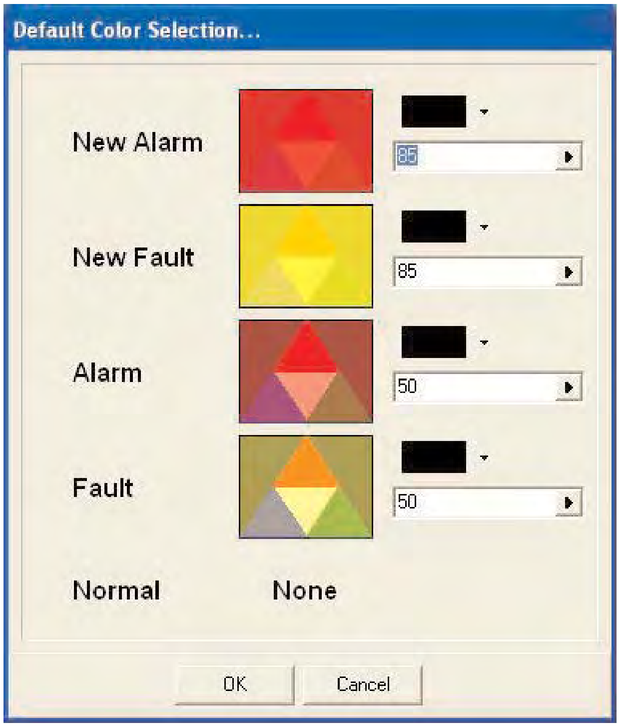
Apply Defaults: Once the color, pattern and opacity levels have been set for each of the five states the "OK" button saves the default settings and closes the "Default Color Selection..." dialog box. To utilize these default values, simply select a dynamic object and click on the "Apply Defaults" button on the upper right area of the screen. In the above example, a polygon linked to the Helideck is selected.

View Custom Overview: Once the background, static and dynamic layers have been configured and the links and colors have been selected the "View" button will display the Custom Overview in a full screen mode. In this preview mode, a rotary selector switch is provided to allow each of the five states to be viewed with their selected attributes.



Above is the custom overview with the state selector in the "Normal" position and shows how the overview will look with no alarms present in the system.

Above is the custom overview with the state selector in the "Fault" position and shows how the overview will look with a fault in each programmed area present in the system.



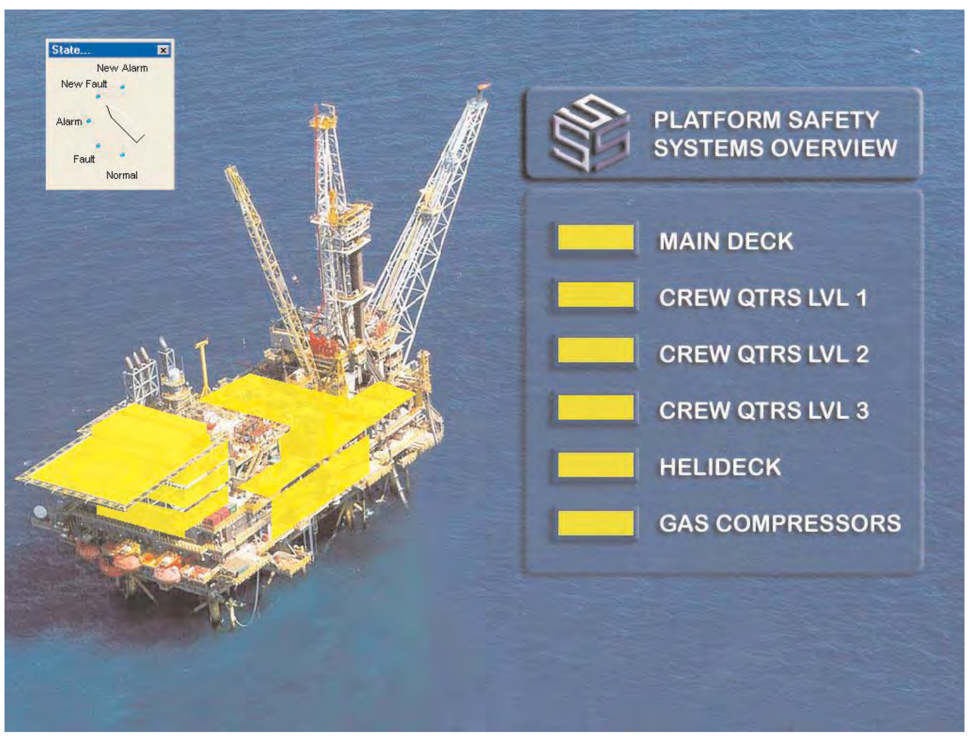
The polygons outlining the various areas of the platform along with the rectangles on the "virtual annunciator" have taken on the values entered in the color selections. In this case, a solid yellow with a 50% opacity.

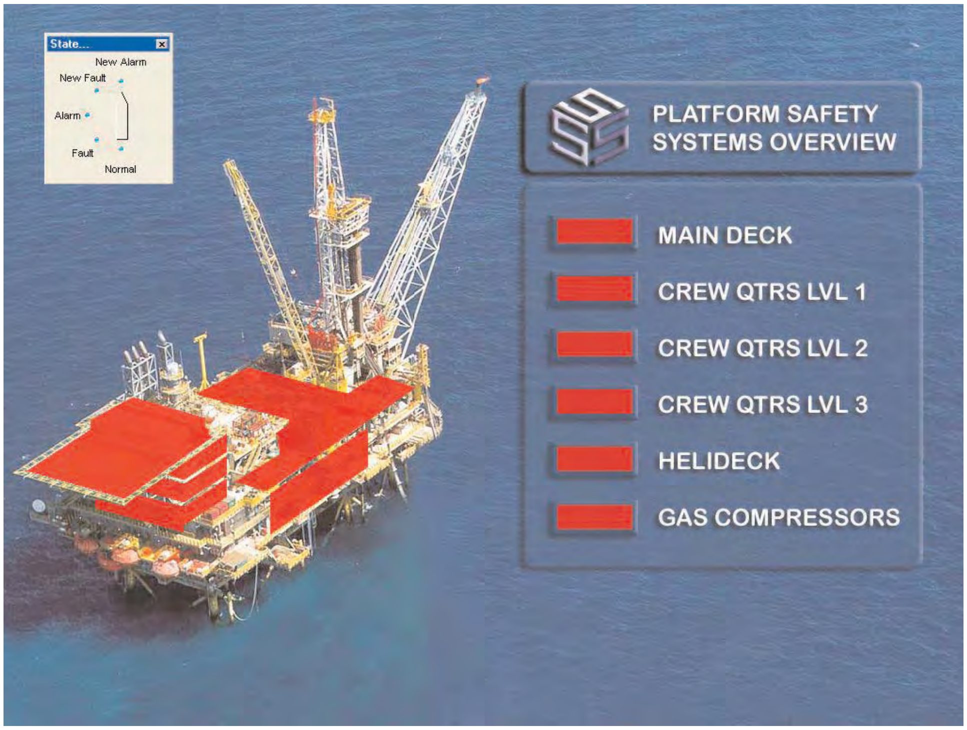
In this case providing a yellow highlite along with the ability to see some detail of the platform below the outlined area.

Changing the position of

the rotary selector to each of the other positions then displays the overview with its dynamic objects showing their color, pattern and opaci-

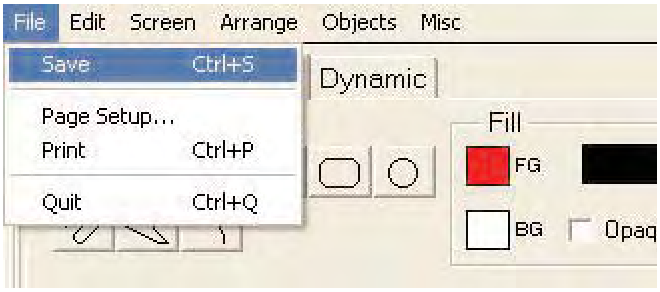
ty settings.



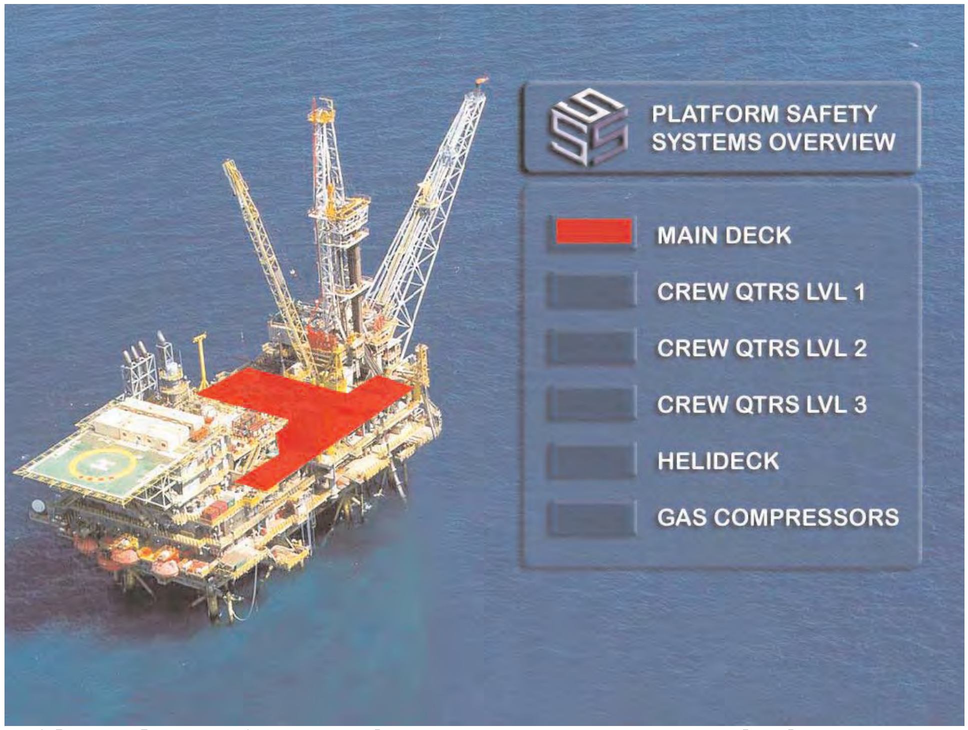


Above shows the "Alarm" state, below shows the "New Fault" state. Above, the state selector is in the "New Alarm" position and the dynamic objects reflect that state.

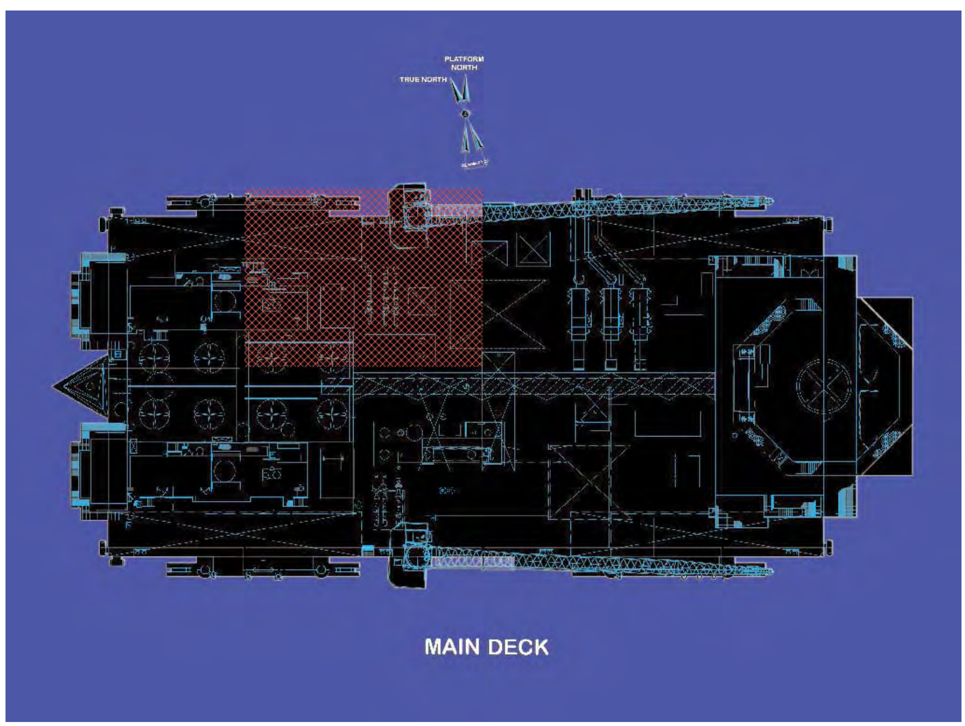
After previewing the Custom Overview, clicking on the "Close Box" of the "State..." selector switch dialog box will close the preview and return to the Custom Overview editor.



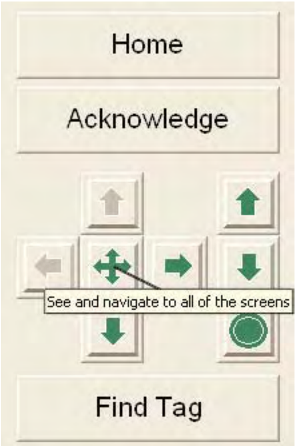
To return to the main graphic editor, select "Save" or "Quit" from the "File" menu. If "Quit" is selected and changes have been made in the Custom Overview a "confirmation" dialog box will appear to ensure changes are not inadvertently lost.



Mid-Level Overviews: In the Custom Overview example above, an area of the platform called “Main Deck” is in alarm. Clicking on either the polygon outlining the main deck, or the rectangle on the “virtual annunciator” will take the user to the Main Deck “Mid-Level Overview” where the trouble is shown and used to further navigate to the source screen.



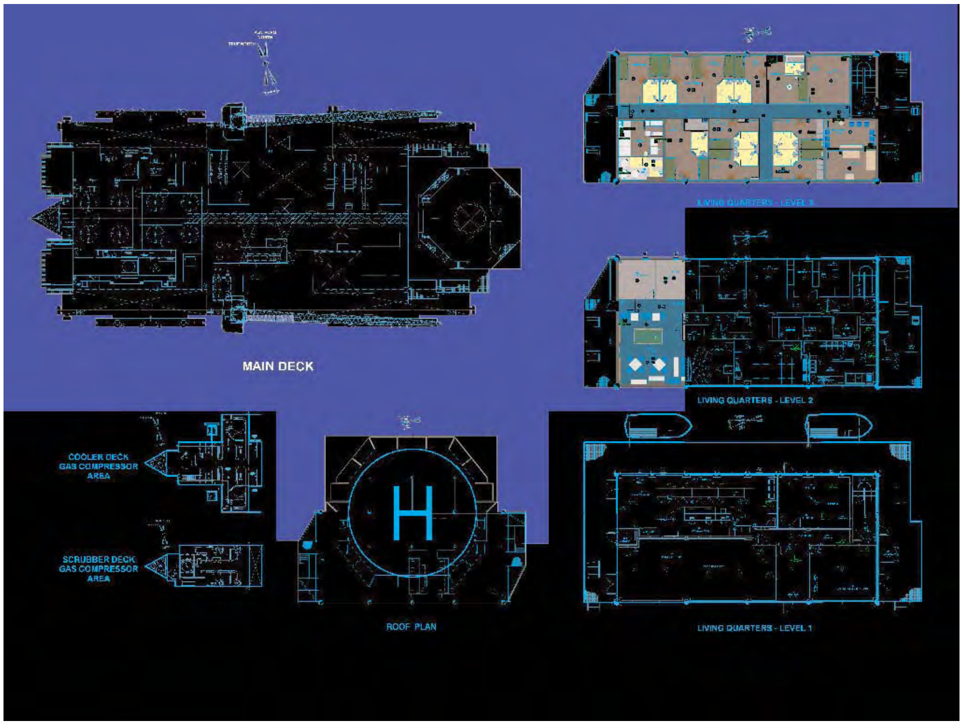
Mid-Level Overviews: S³ automatically creates a total overview that is a composite of all of the low level graphic screens in the project. This overview is accessible from the “cross” navigation button in both the graphic editor and online graphics environments.



This composite, scales all of the low level screens and any blank screens between them into a single 1024 x 768 pixel graphic representing the system.

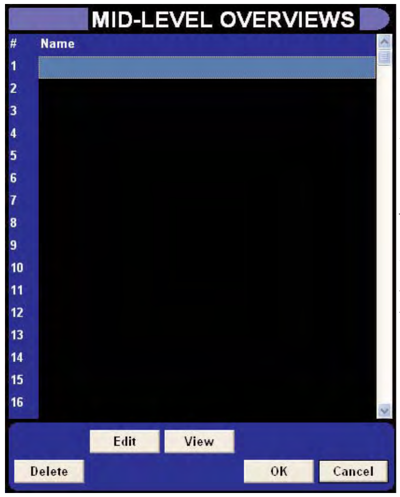
From this “Total Overview” any low level screens with alarm or fault conditions will highlite in accordance with their settings.

In many cases, the size, geography or construction of the facility my make this type of overview less than ideal. In the offshore platform example project below, multiple areas and levels are represented by 45 low level screens. A composite of this many screens causes a very large loss of detail making it difficult to determine where the problem is.



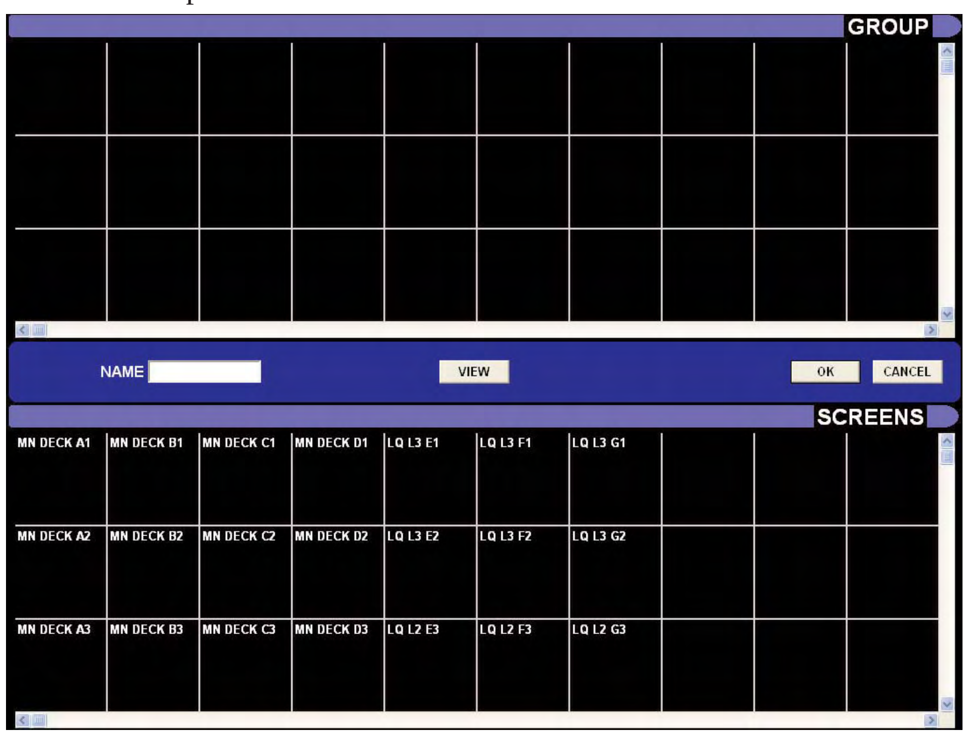
To overcome this issue, S³ supports the creation of “Mid-Level Overviews” which are a group of low level screens, typically arranged to form a good “pictorial image” of an area..

Mid-Level Overview Creation: In the graphic editor, from the “Mid-Levels” menu select “Edit...” to access the Mid-Level Overview management dialog box.



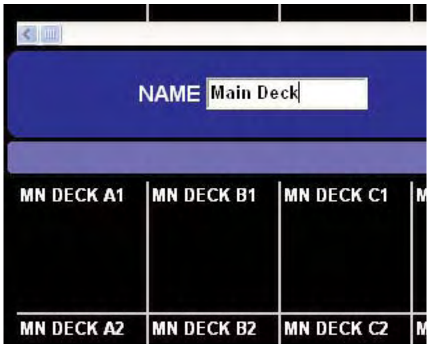
From there levels can be edited, viewed or deleted. If no Mid-Level Overviews have been created, the dialog box will show the first 16 empty slots with the first one highlighted.

Selecting the “Edit” button will open the Mid-Level Overview Group Creation screen. This screen is divided horizontally with the top section, labeled “Group” and the bottom “Screen.



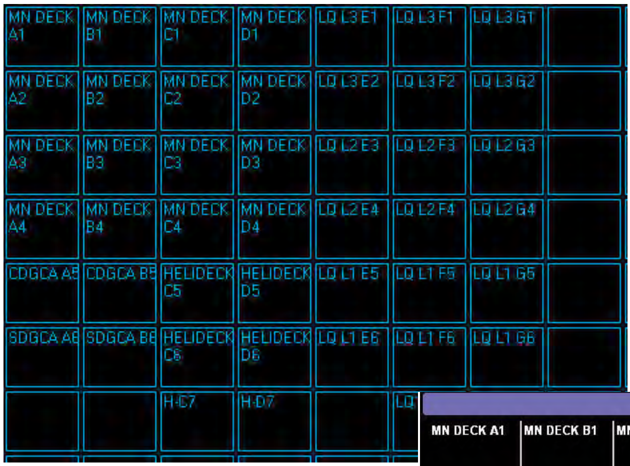
First, enter a “Name” for the Mid-Level Overview being created. This becomes a “Tag Name” in the database and will be used for linking.

In the example below, the name “Main Deck” has been entered to be the tagname for this Mid-Level Overview screen.



Creating the Mid-Level Overview (MLO) is accomplished by clicking and dragging all of the screens from the lower area that will make up the MLO into the top section and arranging them in the proper order to create the desired effect.

In the sample project used for this example there are 45 screens to choose from. Each screen has both a name and graphic grid coordinate. When the names were created for the low level screens care was taken to make the name descriptive of the area of the facility. This makes it easier to pick which screens will be included in the Mid-Level Overview.

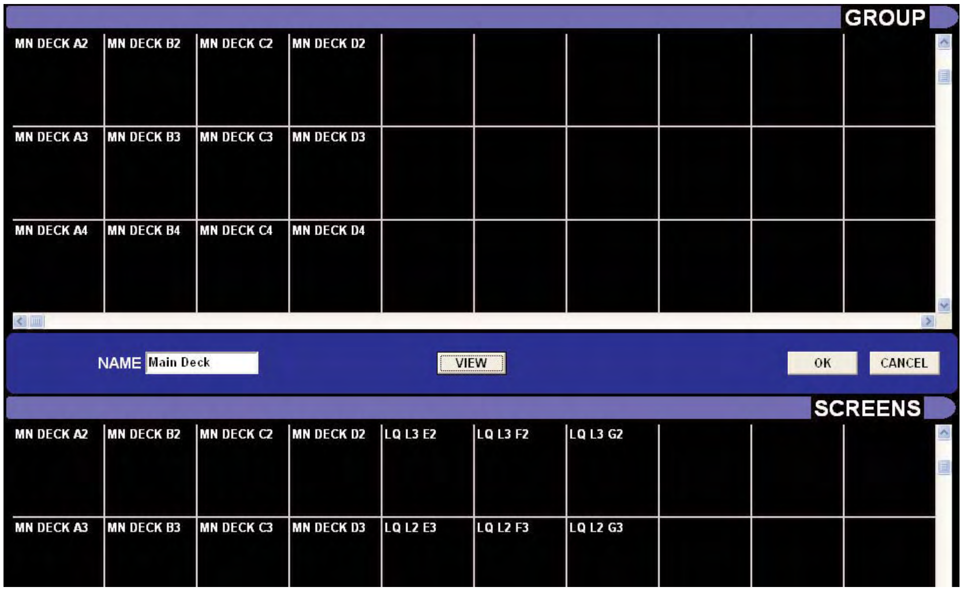


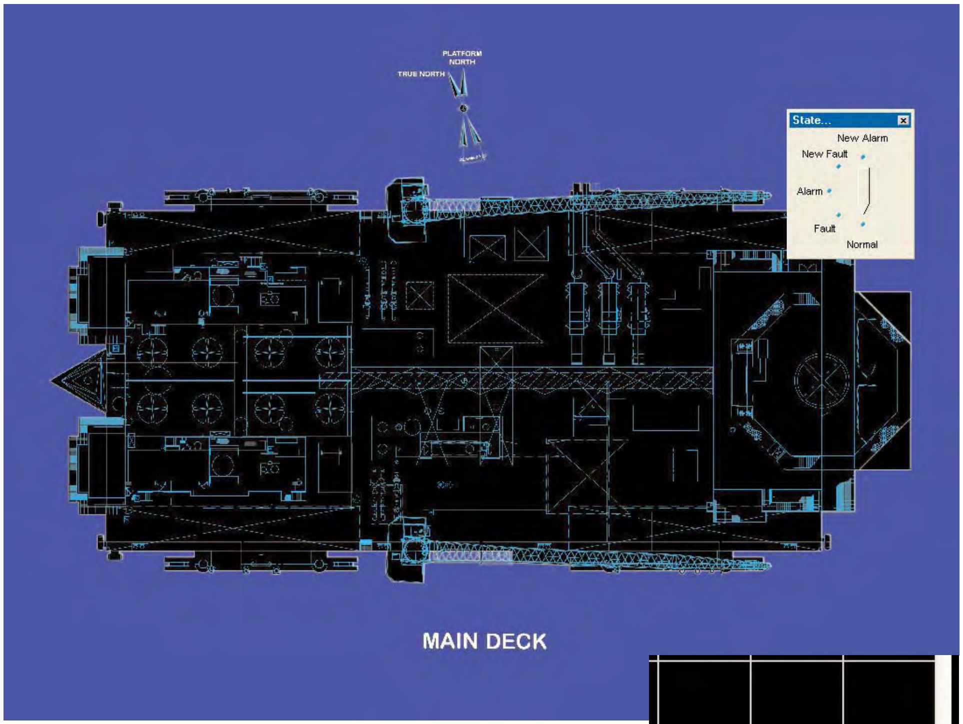
For the MLO being created for this example, all of the screens with the “MN DECK” designation will be used to create a group. This includes screens A1, A2, A3, A4, B1 thru B4, C1 thru C4 and D1 thru D4.

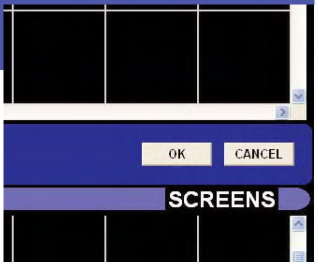
As these screens are copied from the screens section to the group section the MLO is taking shape.

The “construction” of the MLO can be viewed at any time by selecting the “View” button. This will create an image of the MLO based on the screens that have been grouped. Below is an example of the partially completed MLO. The program will automatically “pad” the image with “black space” to ensure that the MLO has the proper aspect ratio when displayed at its full resolution of 1024 pixels wide by 768 pixels tall.

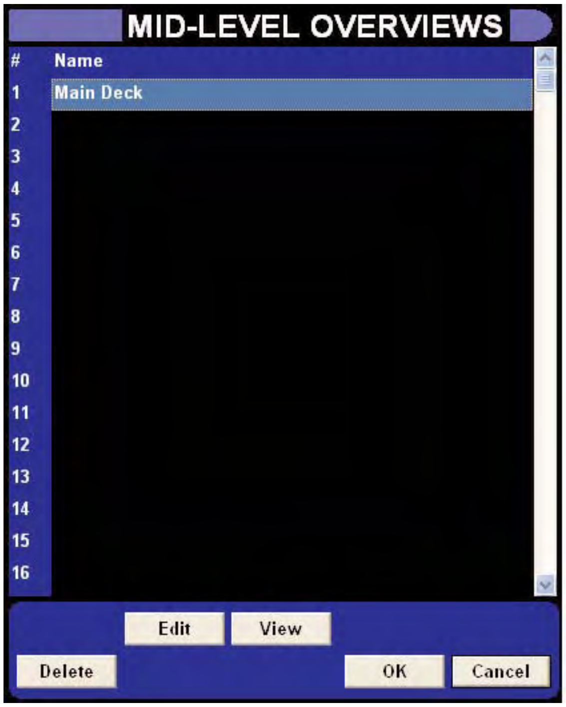
When all 16 screens for the main deck have been arranged, select the view button to see the completed MLO.







Note that in the "View mode" a rotary state selector is provided to preview the graphics in each of their five potential states; closing this window will close the preview window and return to the editor.



In the editor, select the "Exit" button to return to the Mid-Level Overview management dialog box.

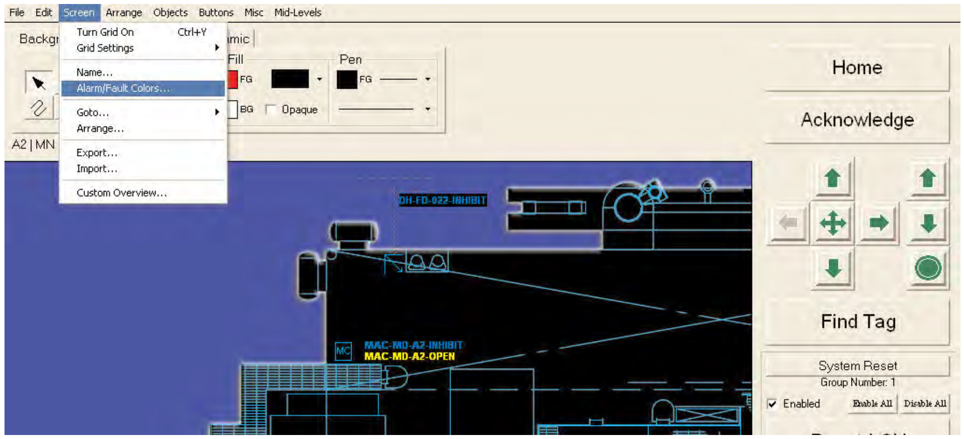
Notice that the first position is now filled with the "Main Deck" MLO.

The "Edit" button can be used to re-enter the editor and make changes to the MLO.

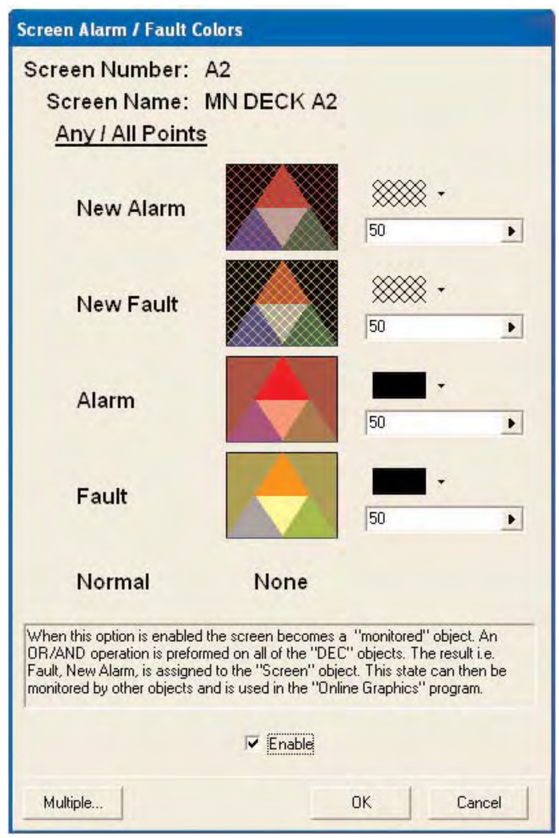
The "View" button goes directly to the full screen preview of the MLO, as in the graphic at the top of the page.

The color, pattern and opacity of the screens making up the Mid-Level Overview are set “per screen” from within the main graphic editor.

Select “Alarm/Fault Colors...” from the “Screens” menu to access the



“Screen Alarm / Fault Colors” dialog box. At the top, the “Screen Number” and “Screen Name” identify the screen that the selections will apply to.

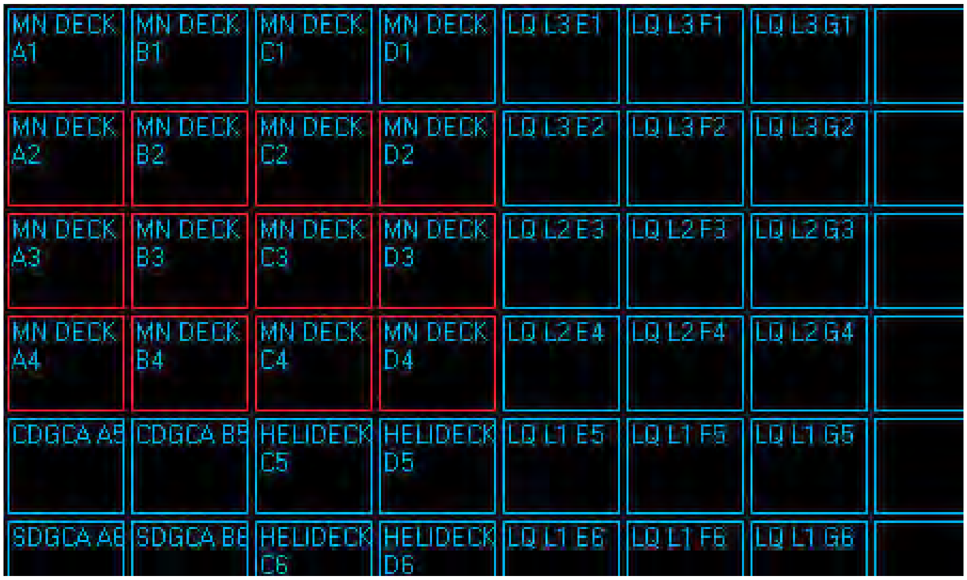


Note: Once set the selections will only work if the “Enable” checkbox is selected at the bottom center of the dialog box.

Once you have one screen working the way you want, this set of attributes can easily be quickly and easily be applied to any number of screens. To do so, select the “Multiple” button at the bottom left of the dialog box.

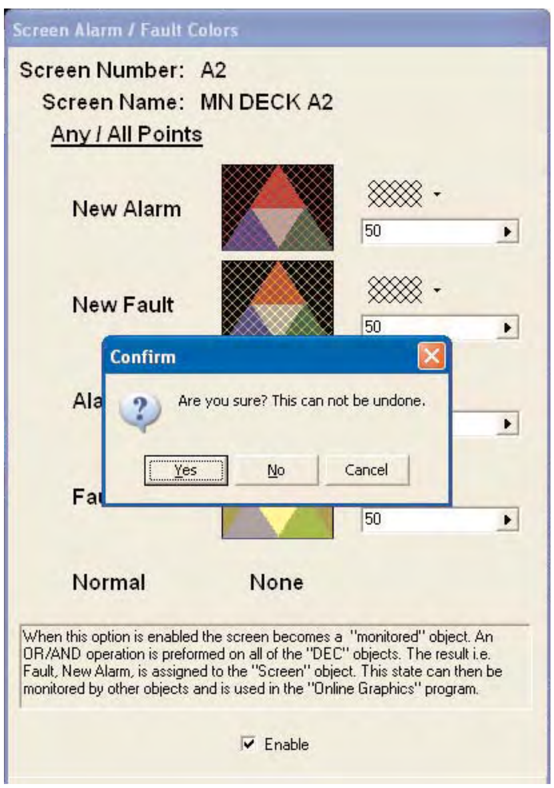
This will open a screen listing all of the graphic screens and allowing individual or global selections to apply the parameters to.

Copying Screen Color Attributes: Selecting the “Multiple” button on the “Screen Alarm / Fault Colors” dialog box will open a display which graphically shows all of the 250 graphic screens, both configured and blank.



Clicking on a screen name will highlite its rectangle in red showing that it has been selected to receive the attributes configured on the “Screen Alarm / Fault Colors” dialog box.

Once the selections are made and the “OK” button is clicked a “Confirmation” dialog box appears to allow cancellation or final acceptance of the color attribute assignments.



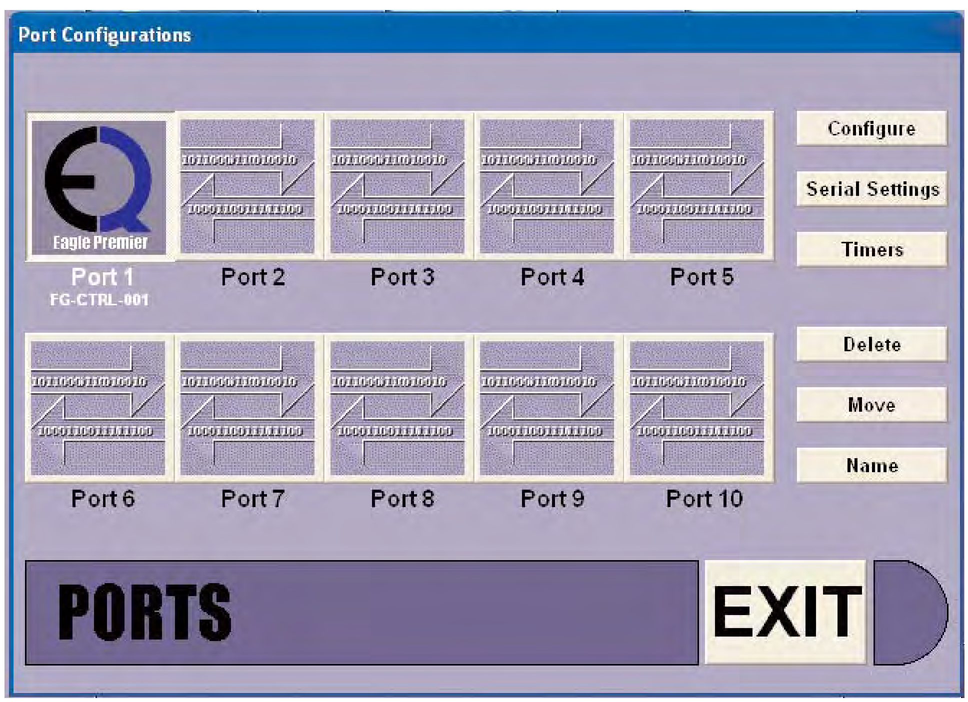
EAGLE QUANTUM PREMIER CONFIGURATION

One of the supported communication port types is for the Detector Electronics Corporation “Eagle Quantum Premier” fire & gas system.

System configuration consists of three major phases.

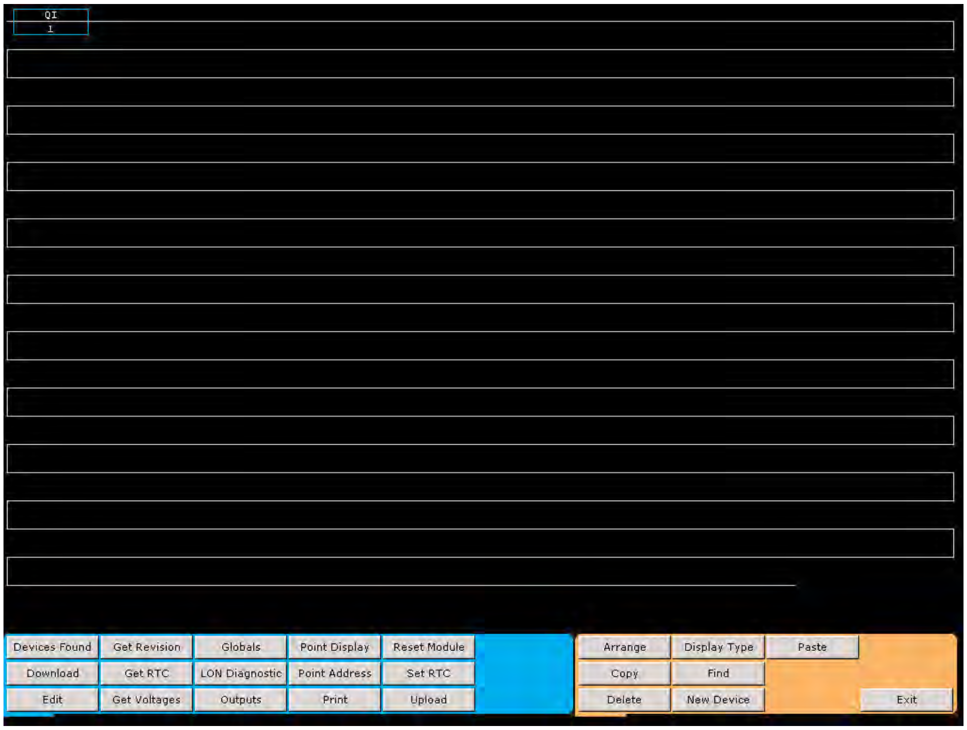
• Identifying all of the devices on the network.
• Configuring the operating parameters of each of these devices.
• Downloading the configuration data over the network to the devices.

Prior to configuration, ensure communication with the Eagle Quantum Premier controller is established. Reference the “Ports” (Section 2) area of this users guide on establishing serial communications.



Enter the Eagle Quantum Premier configuration screen by either double-clicking on the port button or by selecting the port and then choosing “Configure” from the buttons on the right of the Ports screen.

Eagle Quantum Premier Configuration Screen: The main configuration screen is divided into two functional areas. The top area, which has a schematic representation of the Local Operating Network (LON™) on which all of the field devices reside and the lower area which contains context sensitive buttons for accessing features and performing functions.



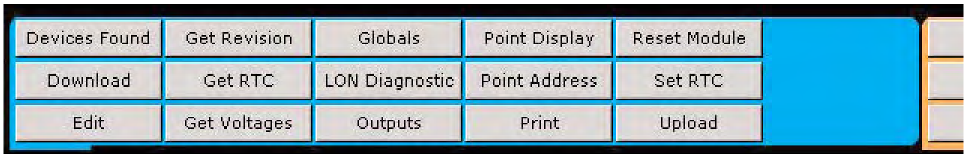
On a new loop, as represented in the sample above, the LON schematic has a single device, the controller, shown at the upper left corner and addressed as "Node 1". This node is automatically placed on the LON because without it no further configuration or monitoring can take place.

Button Bar Overview: There are two button bars located at the bottom of the screen, the "Command Bar" and the "Configuration Bar". The Command Bar is used to create, query or directly manipulate LON devices.

The Configuration Bar is used to create, duplicate or delete devices and to reconcile their physical and logical LON addresses.

The functionality of each button is described on the following pages.

Command Bar: The command bar has fifteen buttons, most of which initiate a command to a field device to perform a certain function, return a value, or feed “real-time” information to S^3 to be displayed.

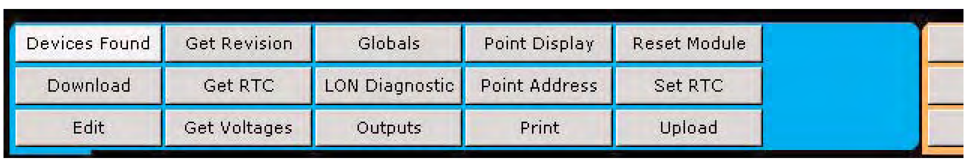


The command issued is specific to the node selected in the upper section. In some cases, multiple nodes may be selected using either the shift-click or drag methods and the command can be sent to all applicable nodes in the selected set.

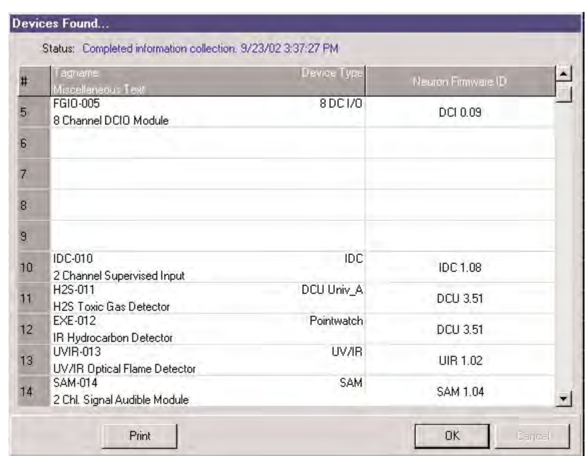
To initiate a command using the command bar, select either a single node or a group of nodes, then click on the desired command button. In most cases a progress monitor will appear and display text messages tracking the execution of the command.

Command Definitions

Devices Found: This command actively queries the controller for information on any devices it is in communication with.

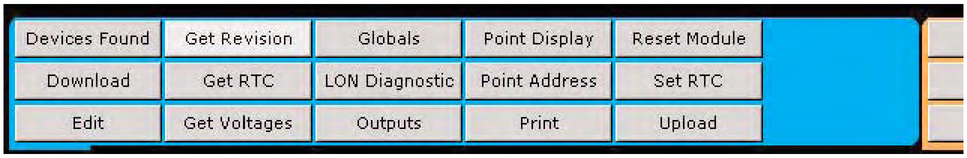


The controller returns this information to S^3 which displays a table listing the devices, by node number (address on the LON) along with the device type and the firmware revision number of each device.

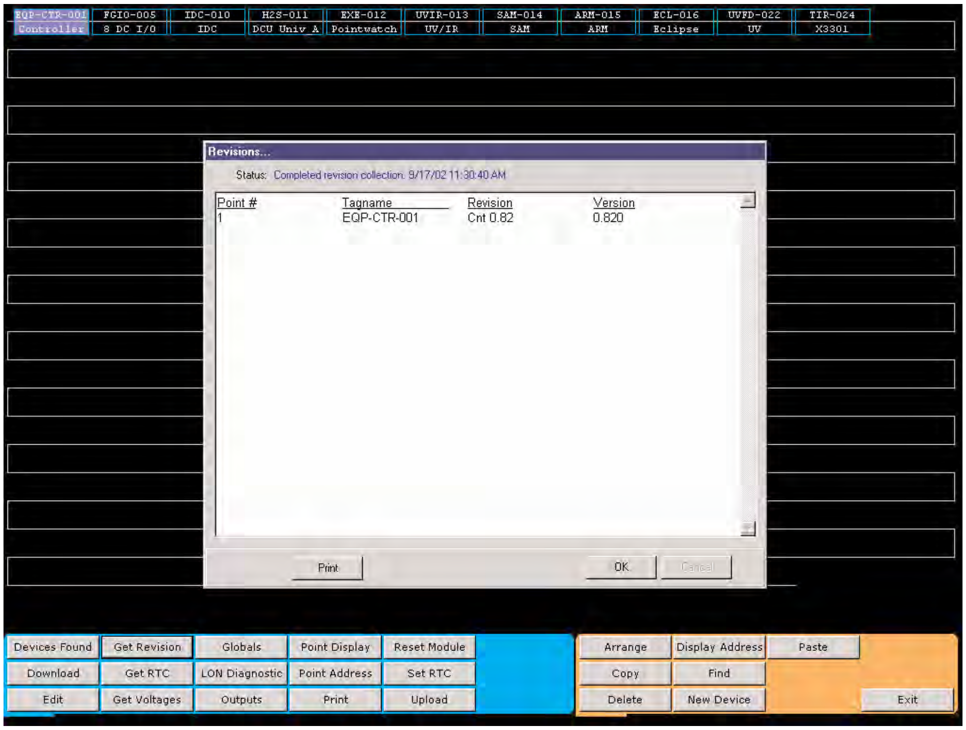


The “Devices Found” dialog box also provides a “Print” button which can be used to output a hardcopy of the current LON configuration, both hardware and firmware.

Get Revision: Returns the selected devices revision and firmware version information.

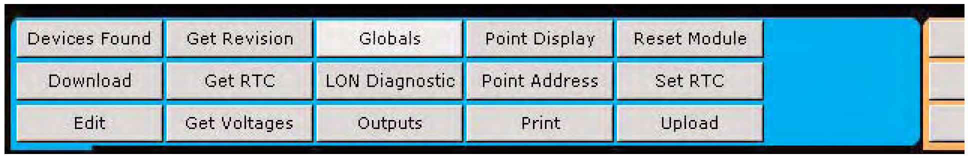


Over time features and fixes are added to various products. The "Get Revision" feature provides a convenient way of determining if the devices in the system have these features and/or fixes or if they need to be updated.



In the example above, the controller was selected prior to initiating the "Get Revision" command and the "Revisions..." dialog box displays the controllers information.

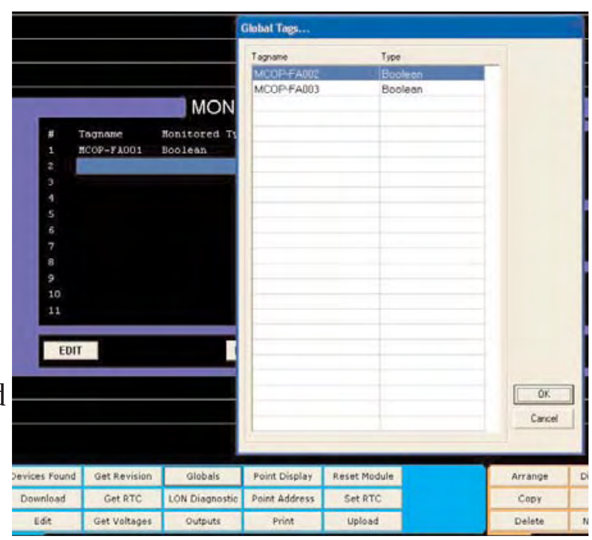
Globals: Provides access to configuration services allowing defined global memory values to be set up for tracking by the DCD.



Once configured these globals can be logged and/or printed by the event monitor and can also be used to control dynamic graphics and TAG objects in the "online graphics" environment.

Note: Global memory points cannot be configured from this location. Global memory point creation and configuration is done within the controllers logic editor.

To configure a global memory point for monitoring, select a "slot" from the "Monitored Globals" pane on the left side of the dialog box and then select the "Edit" button.

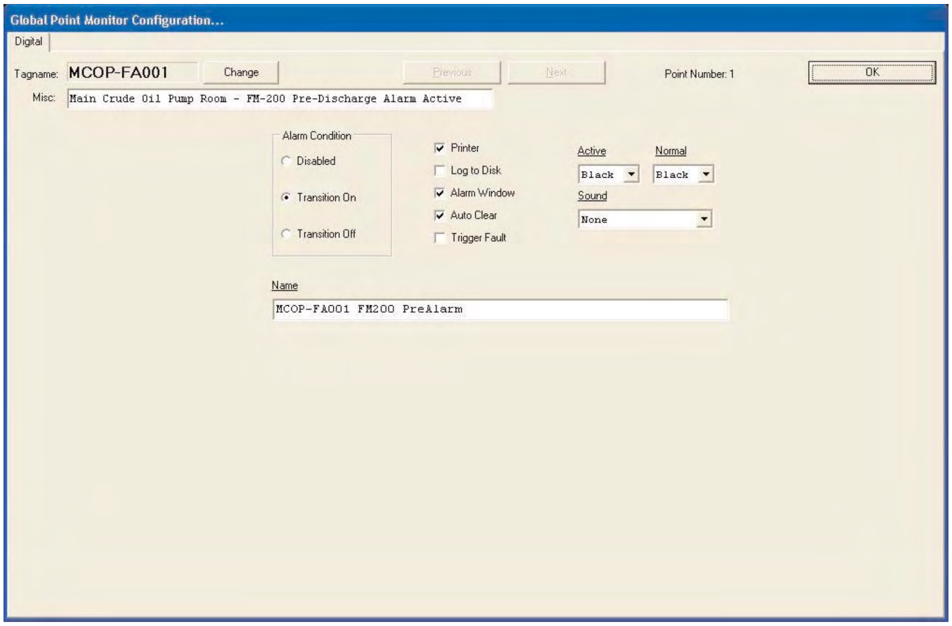


This will open a dialog box displaying all configured global memory points that are available for monitoring.

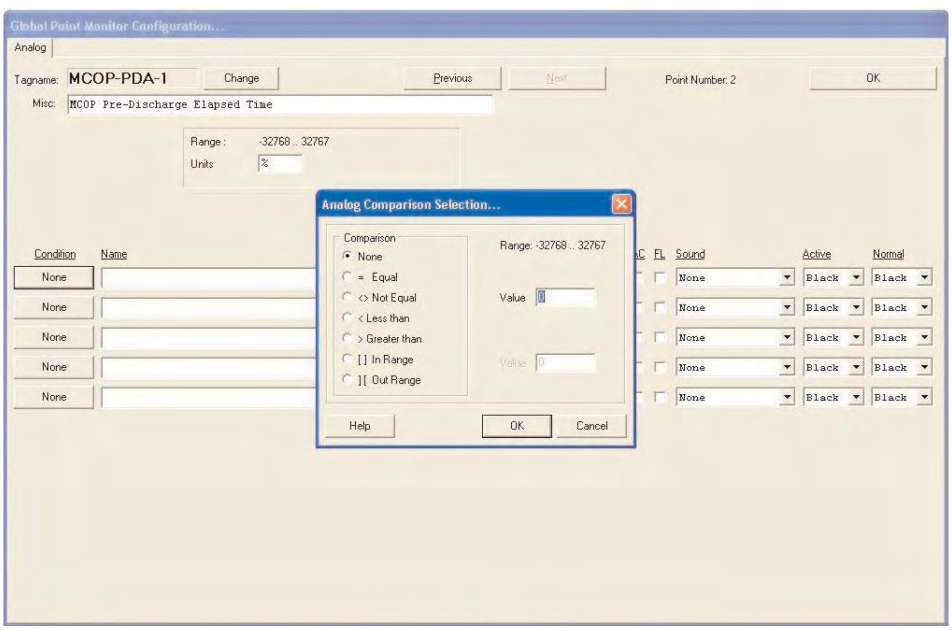
In the example to the right, two points are available.

Choose the desired point and select "OK" to access the configuration dialog box for the point.

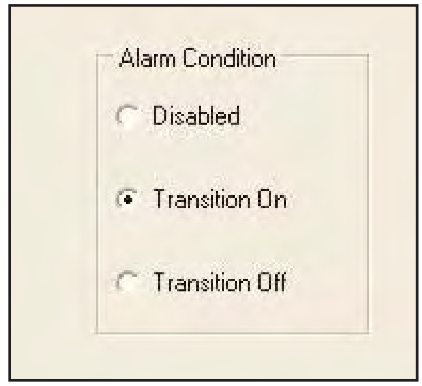
A dialog box labeled "Global Point Monitor Configuration..." that is specific to the type (digital, analog, etc.) will be displayed allowing the monitoring of the point to be configured.



The selected example point above is a "Digital" ON/OFF point type that can be configured to log to the printer, disk, alarm window. In the example below, an "Analog" point type is selected and can be configured for multiple conditional events to be tracked.



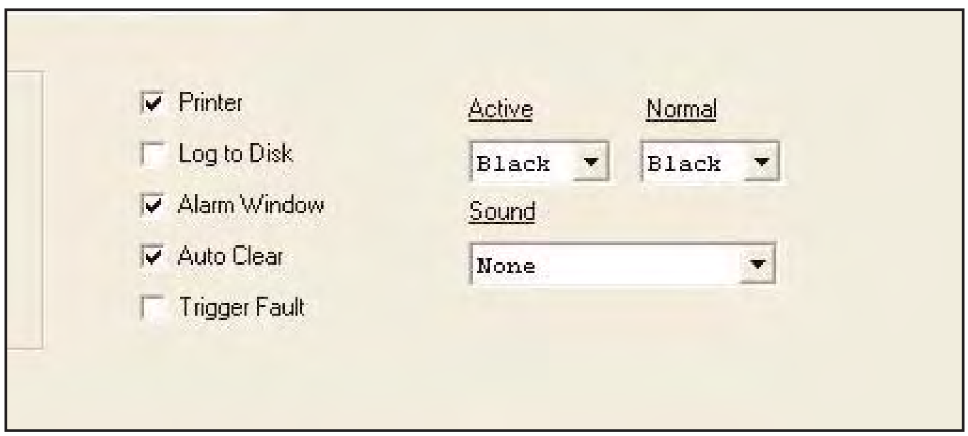
Discrete Points: Globals tied to "discrete" ON/OFF type events can be set to alarm when the event transitions either High (ON) or Low (OFF) with the "Alarm Condition" radio button. They can also be disabled which removes them from tracking but leaves the event configured in case it is desired to activate it later without the need for knowing the configuration details.



Transition On: When the tracked event transitions from the off state to the on state the alarm will be activated as configured.

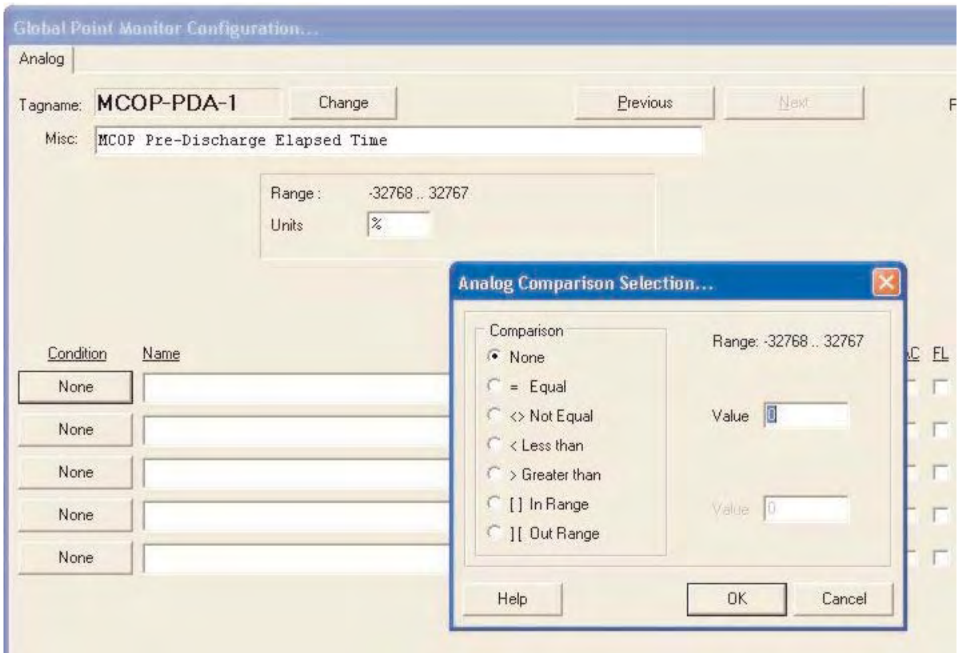
Transition Off: When the tracked event transitions from the on state to the off state the alarm will be activated as configured.

The event configuration consists of selecting where the event is to be tracked (Printer, Disk, Alarm Window), whether it will automatically



clear when the event returns to its normal condition, what colors will be used for the events normal and active states, and whether a recorded sound will be triggered when the event occurs. There is also an option to allow the event to "trigger a fault" instead of an alarm for display purposes in the online graphics environment.

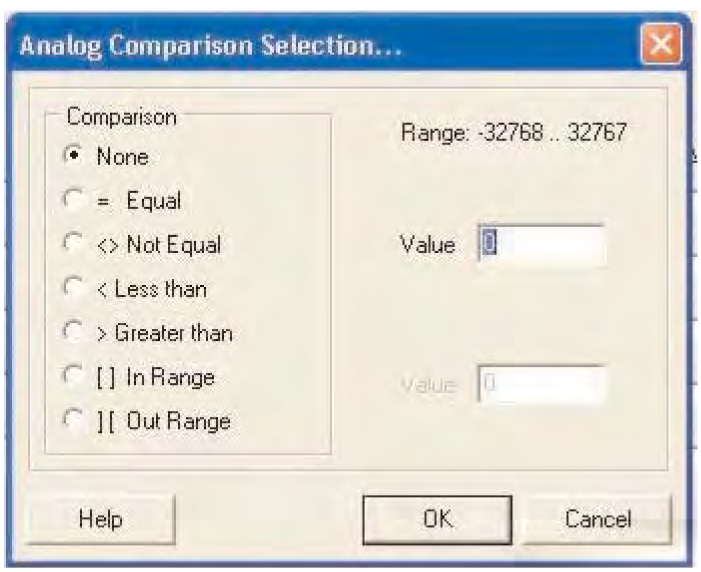
Analog Points: Globals tied to “analog” type events can be set to alarm in accordance with “conditional arguments” chosen from the “Analog Comparison Selection...” dialog box.



Up to five conditions can be named and configured with each one using one of the available comparisons. The analog signal is compared using the selected logical operator against the values entered. When the condition is true the event will be activated and tracked as configured.

The logical operators for comparison are self explanatory and selected by radio button. Most have a single value entry field.

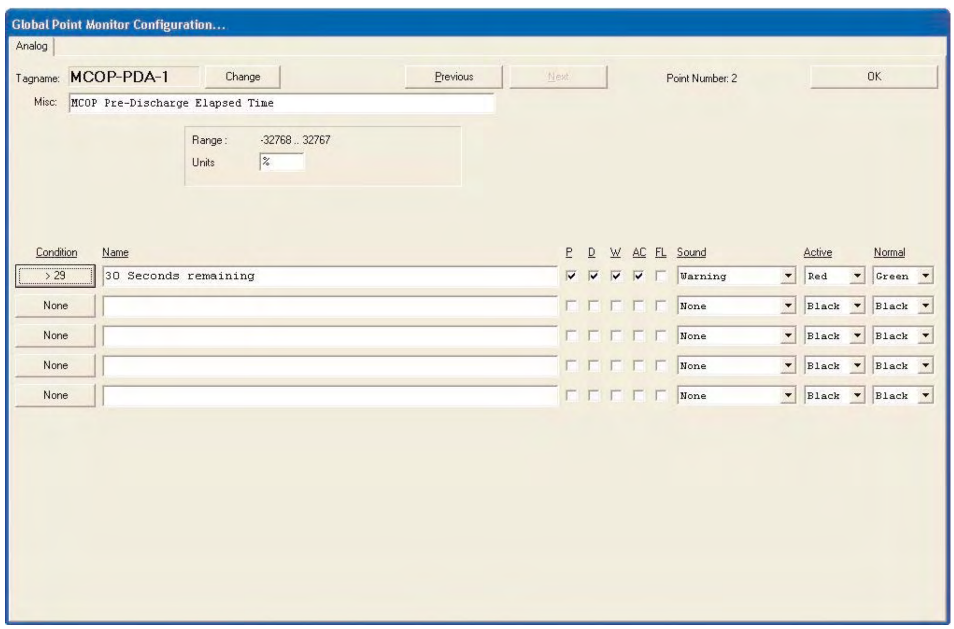
The “In Range” and “Out Range” operators have two value entry fields to define the desired range.



Once the event name is entered and the comparison configured, the event tracking configuration is set up using the check boxes and pull-down menus to the right of the event name.

The five checkbox selections are defined below:

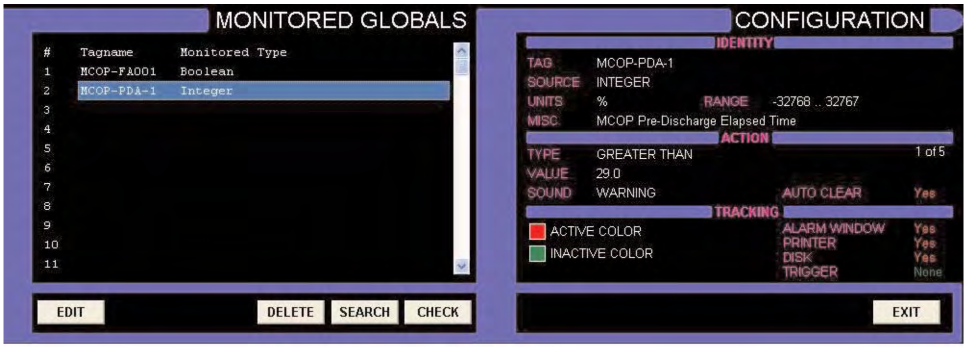
P: Printer (Tractor feed event printer), D: Disk (Daily log file),
W: Window (One line FIFO display at the bottom of the online graphics screen), AC: Auto Clear (Event directly tracks the "raw" data state and doesn't require operator acknowledgement), FL: Fault (Designates the event to be considered a fault instead of an alarm for online graphics purposes.



In the completed sample above, when the analog value exceeds 29 the event "30 Seconds Remaining" will be logged to the printer (in red), daily log file, event window and the OIS will play the "Warning" sound.

When the value drops below 29 the even will automatically clear.

Selecting a “Monitored Global” display its associated configuration data in the “Configuration” pane to the right of the globals list.



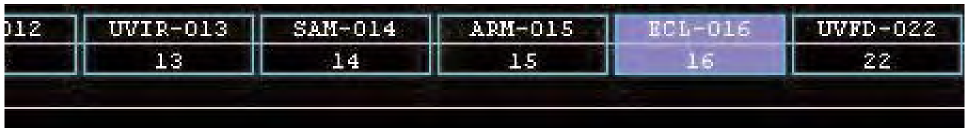
This provides “at a glance” a complete configuration overview of the selected global.

Since hundreds of monitored global points can be created, a “Search” button is provided to quickly locate a specific point entering all or part of the text from the points tagname.

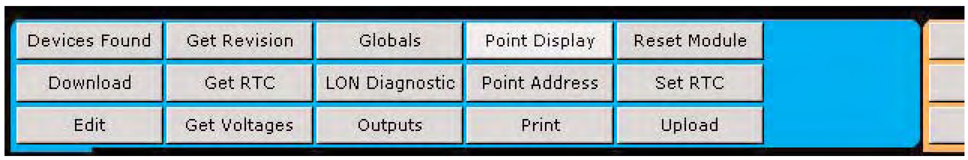
A “Check” button ensures that the monitored global is indexed to a valid tag in the controller. If the tag has been deleted after the creation of the monitored global, an error will be generated.

A “Delete” button is used to remove one or more monitored globals from the database.

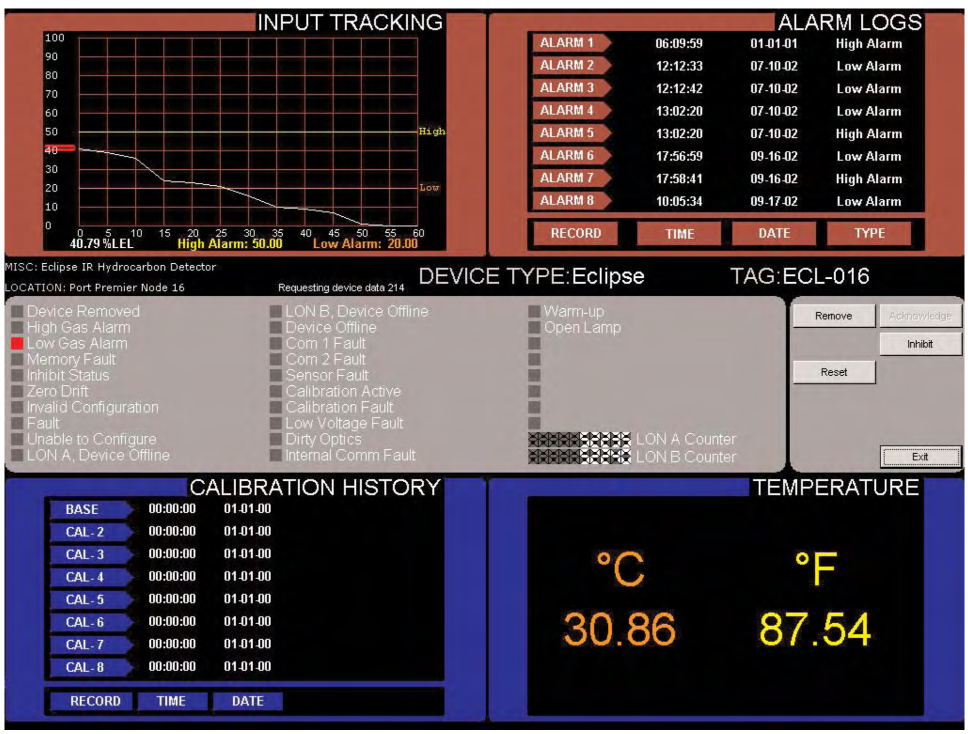
Point Display: Shows detailed information about a selected node including status and diagnostics, alarm history, calibration history and trend, and if applicable the current analog value. To access a devices point display, select the device from the LON schematic by single clicking on it. It will hilight as shown below.



Select the “Point Display” button and the appropriate display will open.

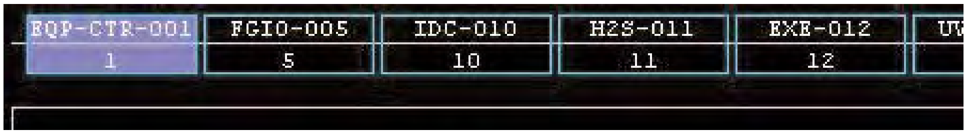


Each device type has a point display that is specific to the information available for its type of field device. In this example, an “Eclipse” infrared hydrocarbon gas detector is selected.

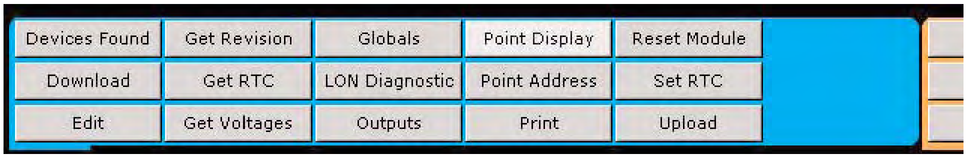


Both configuration and dynamic information for the device is arranged in a logical manner and presented on a full screen template. If the controller is not currently connected and communicating with the S3 station then simulated data will be displayed for the selected point.

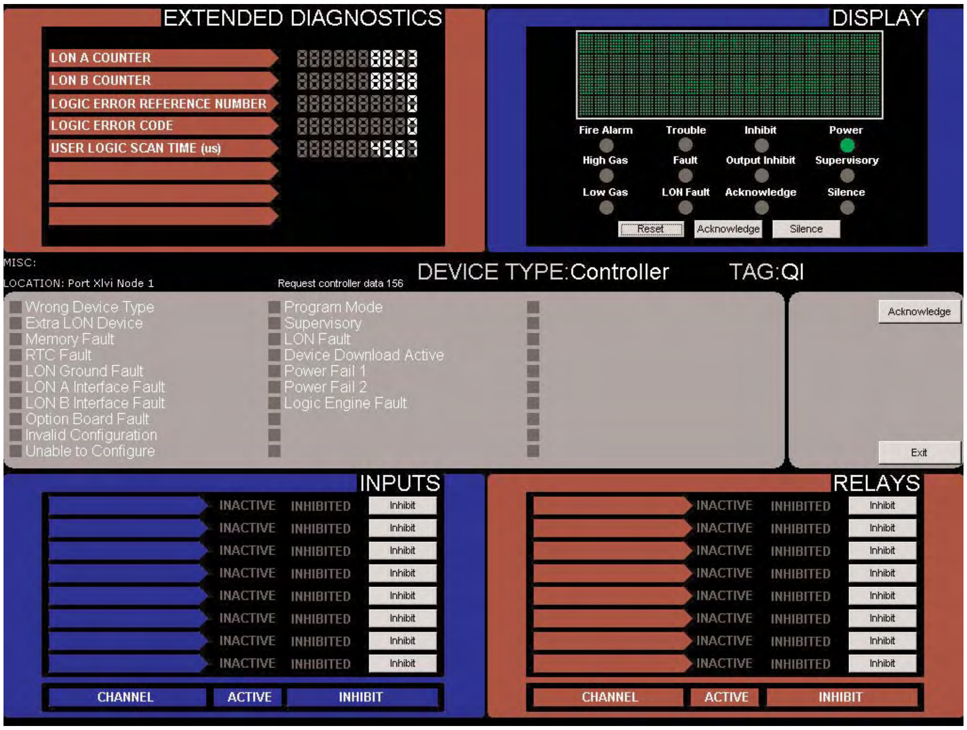
In the example below Node 1, the Controller is selected.



When the “Point Display” button in the command bar is selected a point display template specific to the controller is brought up.



Point displays are very useful in determining the status of the device, for resetting faults, inhibiting functions, checking calibration and alarm his-



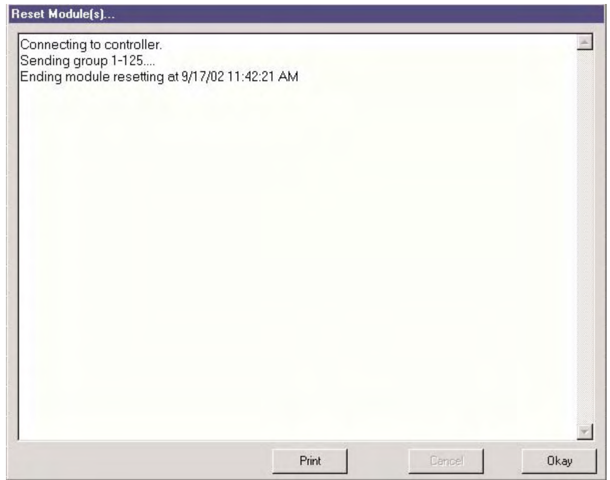
tories and in the case of the controller, you can see a mimic of the face-plates scrolling text display.

Point displays are also accessible from the online graphics mode but certain maintenance and diagnostic features are excluded.

Reset Module: This command forces a selected field device to perform a "soft restart" effectively "rebooting" the field device. This will also reset any latched alarms, faults, outputs, etc.

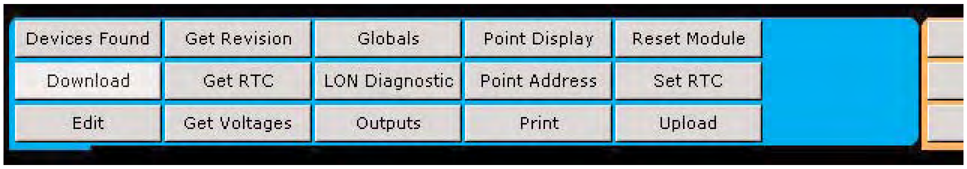
The reset command can be sent to a single selected device or a group of devices.

In the example to the right a group of nodes 1-125 was selected from the LON schematic and the reset command issued.



The controller then sent the reset command to the appropriate devices and logged the activity to the "Reset Module(s)" dialog box to provide feedback to the user.

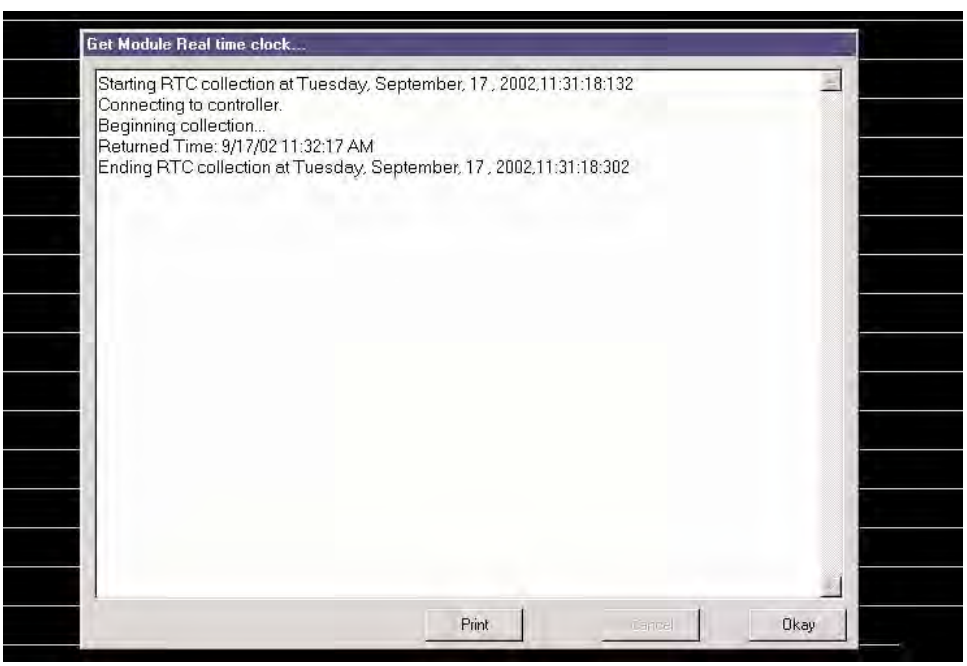
Download: Sends all configuration data from S3's LON configuration database to the controller. This command must be used after changing the configuration of a node, group of nodes, or controller logic.



To send configuration data to the devices on the LON, choose "Download". This will cause S^3 to sequentially download the configuration of all nodes, starting with LON address 1 and ending with the last configured node.

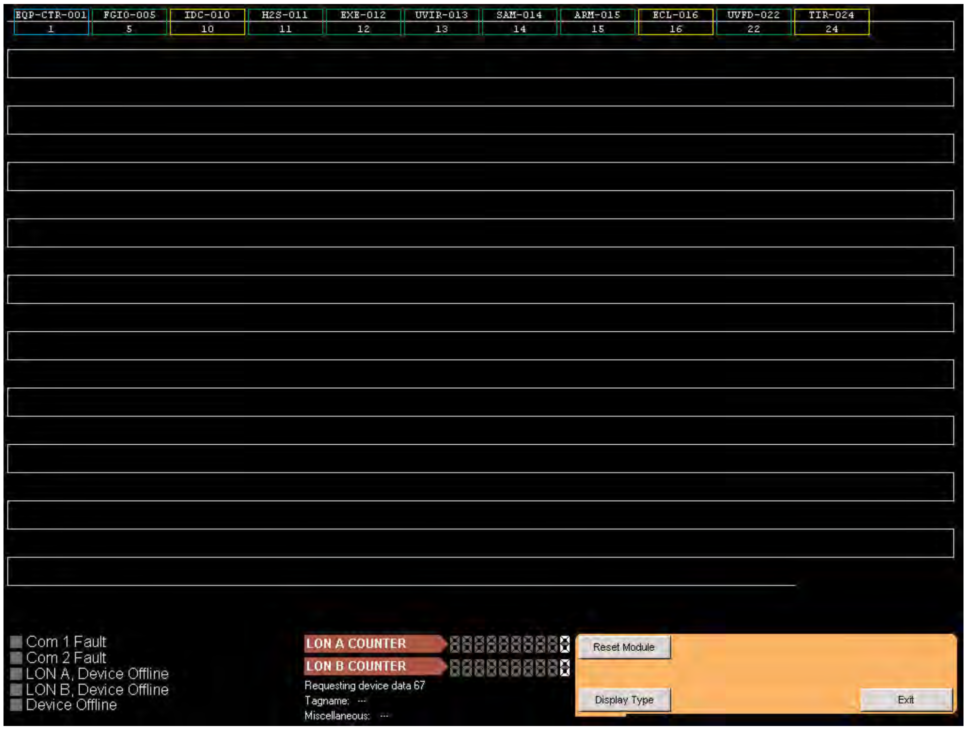
Get RTC: Requests the "Real Time Clock" data from the controller.

The gateway will return the current date and time, according to its internal clock. Verify this date and time against that of the S^3 station for



accuracy. If it is not the same as the S3 station, use the Set RTC command described later to correct the discrepancy.

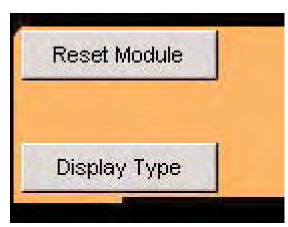
LON Diagnostic: Displays a graphic "LON Schematic" displaying dynamic information about the LON and the devices residing on it. The schematic begins with Node 1, the controller, in the upper left corner and a line representing the communication network (LON) running back and forth across and down the screen.



The LON is typically wired as a loop starting and ending at the controller although the schematic does not show this for aesthetic reasons. The end of the LON at the lower right is assumed to connect back to the controller at the top left of the screen.

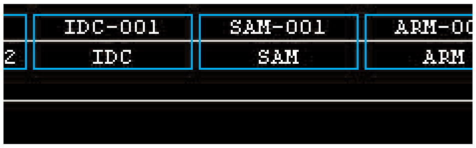
Each configured device is represented by a rectangle bisected longitudinally with the tag name displayed in the upper section and the node num-

ber (LON address) displayed in the lower section.

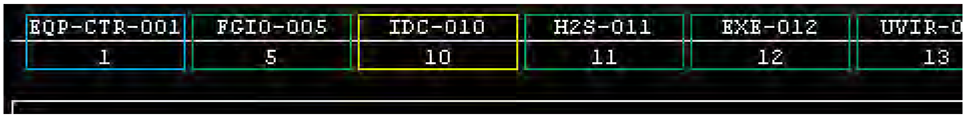


Using the "Display Type" button the node number in the lower section can be replaced with the device type.

This button is a "toggle" and will change name following activation to indicate what its function will be on its next activation.



Diagnostic data is displayed to two ways on the display, through the color of the rectangle defining each node,



and through indicators and counters at the bottom of the screen.

The LON is typically wired as a loop starting and ending at the controller which has two physical interfaces (transceivers) labeled "A" and "B".

On an intact LON each of these transceivers receives information from all of the field devices at roughly the same time. A nodes proximity to one or the other transceiver along with the propagation delay of long wiring distances and/or network extenders will induce a small time differential. This differential will cause an individual nodes message to be read by either the A or B transceiver first and processed by the controller.

If the last message processed by the controller for a node comes through the "A" transceiver the rectangle representing that node will have a green outline on the diagnostic LON schematic. If it comes through the "B" transceiver its rectangle will be outlined in yellow.

Normal LON: On a healthy LON with good network integrity, message traffic will appear random and each nodes outline color will constantly change without any pattern.

Faulted LON: On a faulty LON with a break in the wiring or other abnormal condition, message traffic may have only one path to the controller. This would be indicated graphically by all of the nodes before the problem changing to one color (green or yellow) and the nodes after the problem changing to the other color. The area where the color transition occurs is most likely the problem area.

In this way the LON diagnostic display can be used to localize LON wiring problems.

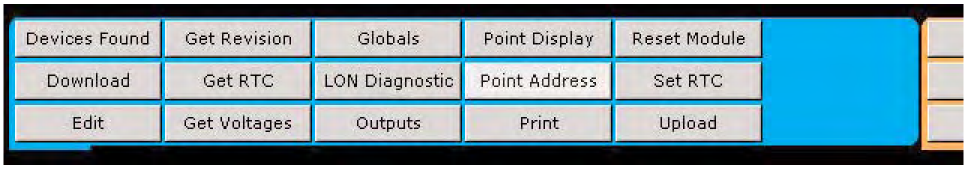
In addition to the graphic representation of message traffic on the display, quantitative data is available for diagnostics through indicators and counters.

If a node on the schematic is selected (by single-clicking on its rectangle) the five indicators in the lower left of the screen will show the diagnostic data from the selected node.

To the right of these indicators are LON counters that show message processing by the controller. On a healthy system the counters should be close to equal. On a system with a degraded network, there may be a significant offset showing either the “A” or “B” transceiver getting the majority of traffic.

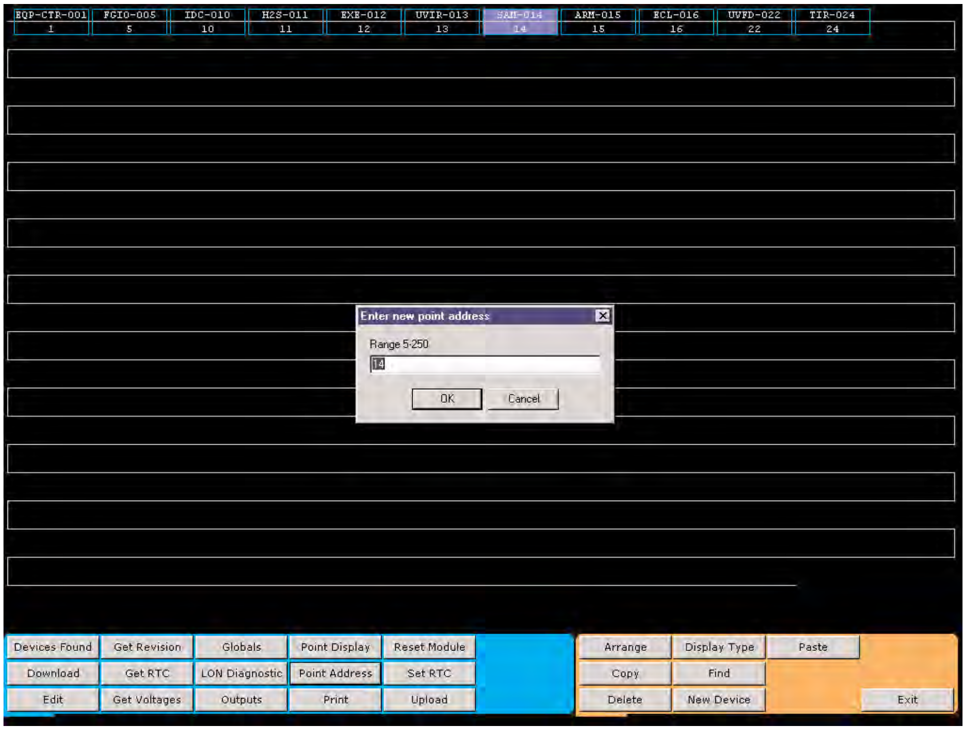
Reset Module: To the right of the LON counters is the “Reset Module” button. This command forces a selected field device to perform a “soft restart” effectively “rebooting” the field device. This will also reset any latched alarms, faults, outputs, etc.

Point Address: Allows a node on the LON schematic to be given a different address.



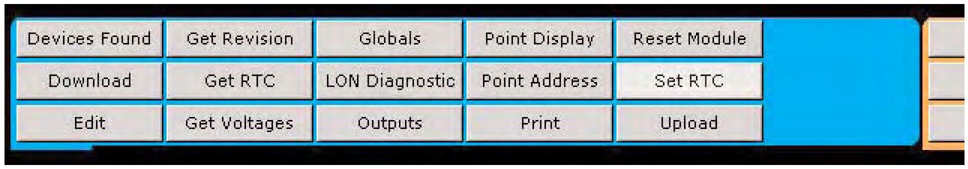
This is typically used when similar nodes are copied & pasted to preserve a particular set of configuration parameters. After the paste function, the “new” node may have an incorrect address and it must then be changed.

To use this function, select a node by single-clicking on its rectangle. Once the node is hilighted, click on the “Point Address” button and the “Enter new point address” dialog box will appear.



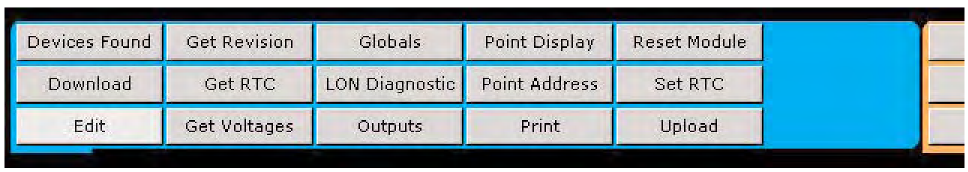
Enter the desired new node number and the click on the “OK” button.

Set RTC: Sends the current date and time of the S^3 station to the controller synchronizing them. Since the field devices all use the controllers date and time pulse when storing their own alarm and calibration data, it

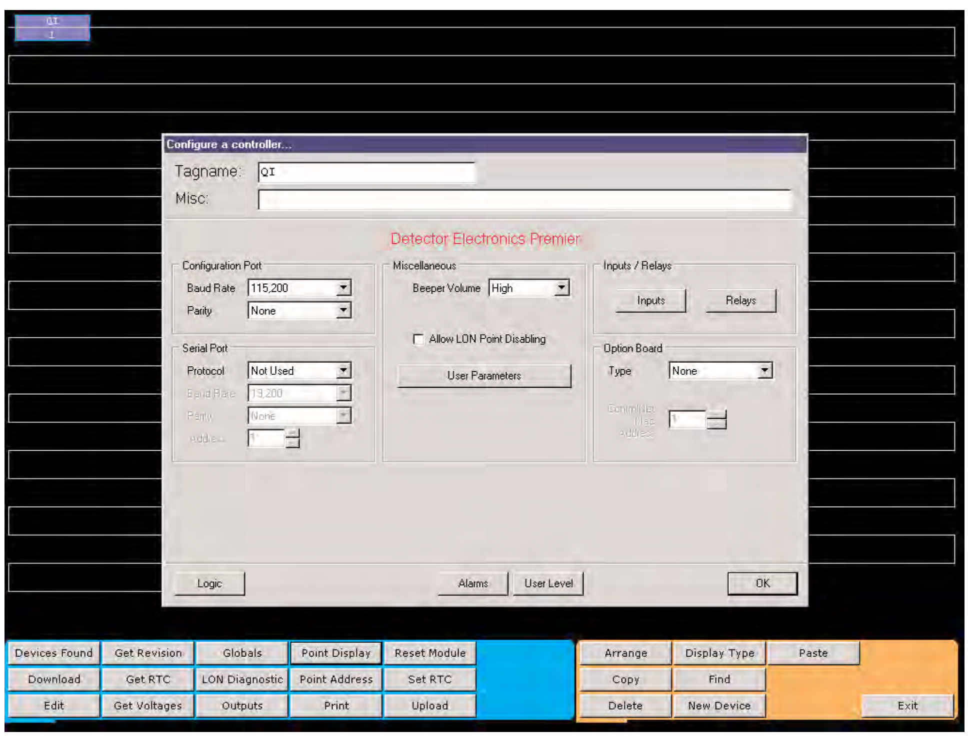


is important that it match the clock used by S3 station for event monitoring and tracking.

Edit: Selecting the "Edit" button displays the detailed configuration data for a single selected node. You can also enter the edit mode for a particular node by double-clicking on the rectangle representing the node on the

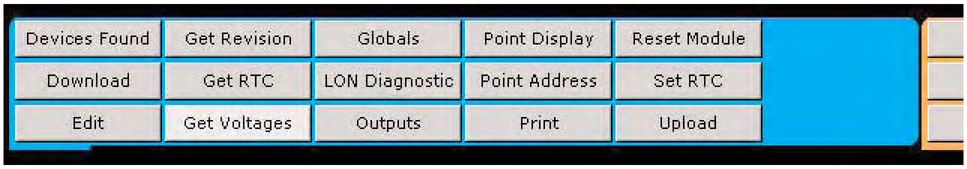


LON schematic. Below is an example of the controller configuration screen. Detailed examples of node editing, for each device, will be



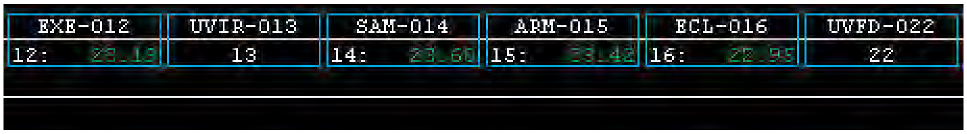
shown in the Premier Device Configuration section of this document.

Get Voltages: Displays 24 vdc supply voltage information for uses such as troubleshooting power distribution problems.



Selecting the “Get Voltages” button will display a graphic LON Schematic upon which S3 will overlay dynamic 24 vdc power supply data from each compatible field device.

Certain previous generation Eagle Quantum field devices may not be compatible with this command.



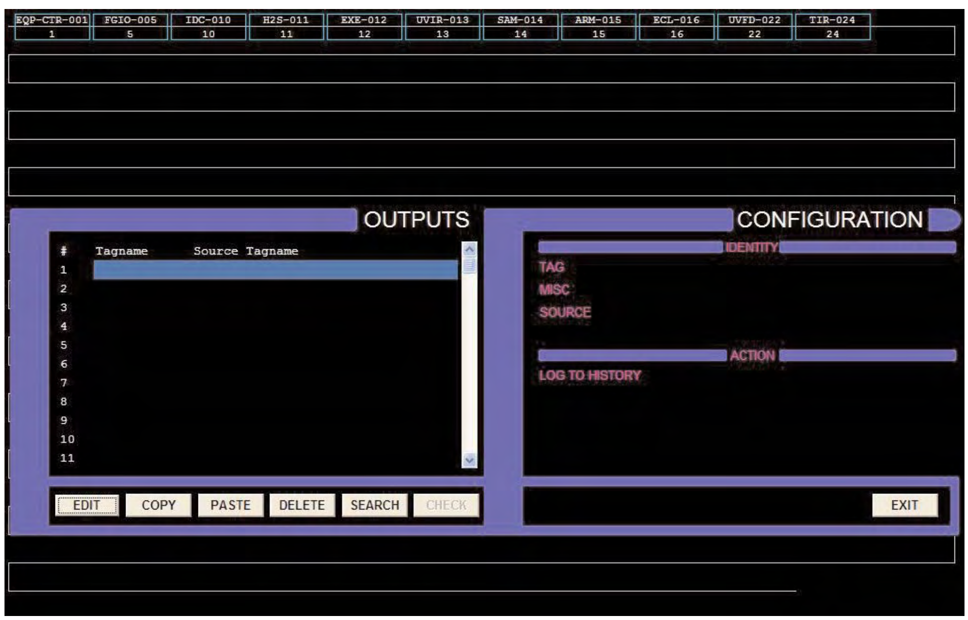
In the example above nodes 12, 14, 15 and 16 are compatible and display the node address in the lower left with the supply voltage in the lower right. Nodes 13 and 22, a UV/IR and UV optical flame detector do not support this feature and only display their node number.

Outputs: Tags linked to commands to be sent to the controller or field devices on the LON via the online graphics system are configured here.

If your system does not include online graphics you may skip this section.

The “user configured buttons” available when in the “online graphics” mode can be used to control certain features of Eagle Quantum Premier hardware. Before the buttons can be configured from the Graphics Editor the “Outputs” must first be configured here. Each “output” is a tag in the DCD database that references a command or controls a memory location within the Premier controller.

Select the “Outputs” button from the command bar to access the configuration screen.

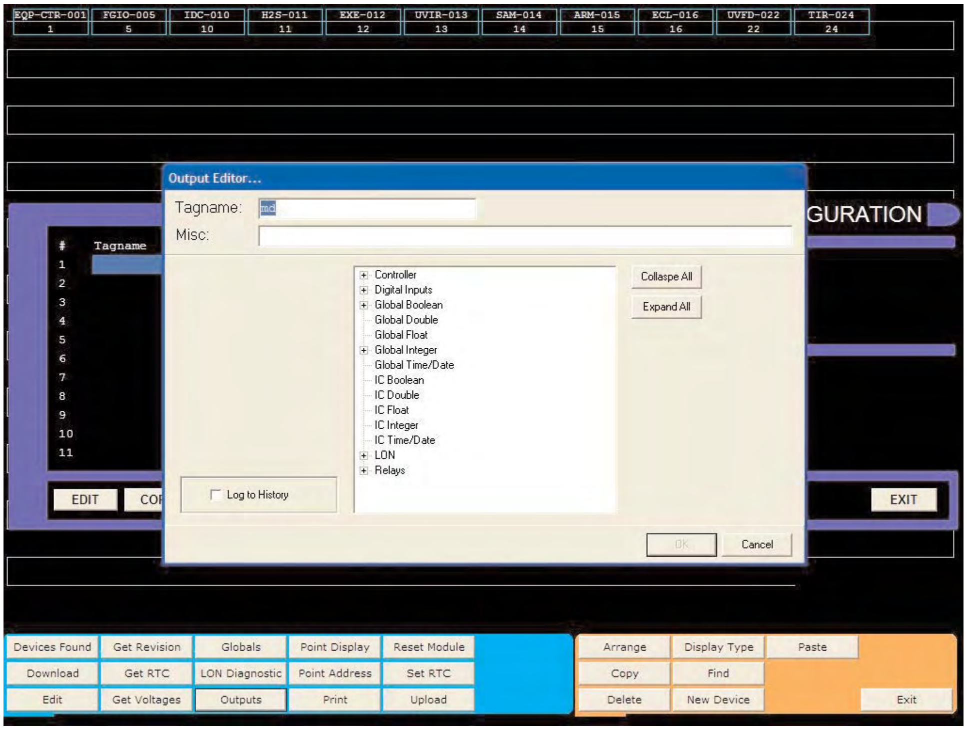


The screen is divided into two sections, Outputs & Configuration. On the left side the outputs pane consists of a scrolling list showing all configured output tags in the database. Below the list are buttons for creating and maintaining the tag list.

On the right side is the configuration pane which will show the details of any selected output from the list.

To create an output, double click on one of the “slots” in the scrolling list or select a slot and click on the “Edit” button below the list.

This will display the “Output Editor” dialog box.



The Output Editor provides two data entry fields, the first for entering the Tagname desired for the configured output, the second provides for a “long description” of the tagname function.

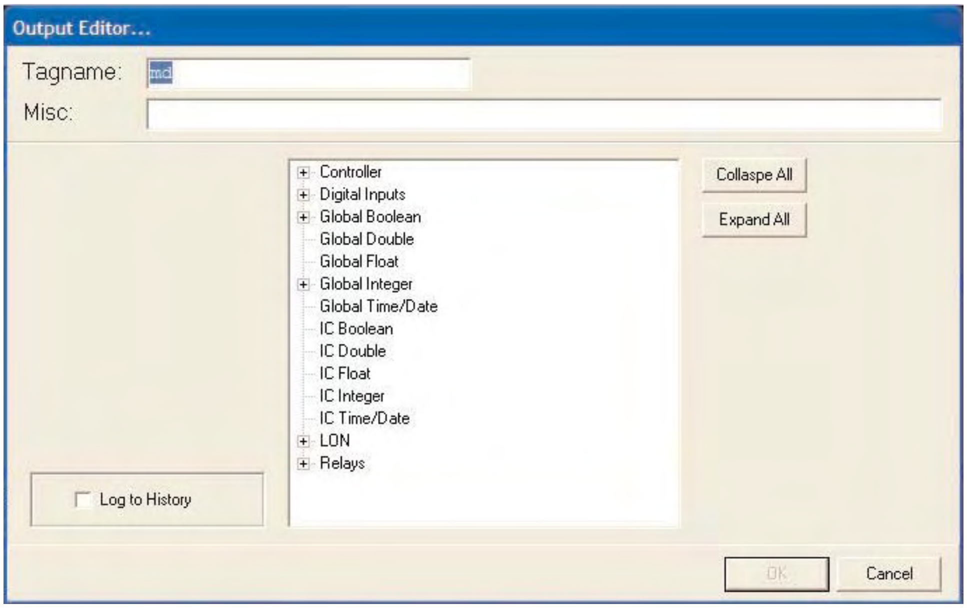
Below these two fields is a hierarchal list of “destinations” to tie the output to in the database.

Any item on the list that has a “+” before it has subordinate items and clicking on the “+” will expand the list showing all items that make up that category.

To the right of the list are two buttons that can “Expand” or “Collapse” all subordinate items in the list for easy viewing.

A checkbox in the lower left of the Output Editor dialog box determines whether the configured output will be logged to the history file upon execution.

Below is the Output Editor dialog box just after opening. A random, unique tagname is generated by default by S^3.



The firsts twelve items on the list provide access to controller commands and the global database. The "LON" item will allow access to all field device command functions, the "Relays" item is for accessing the controllers onboard relays.

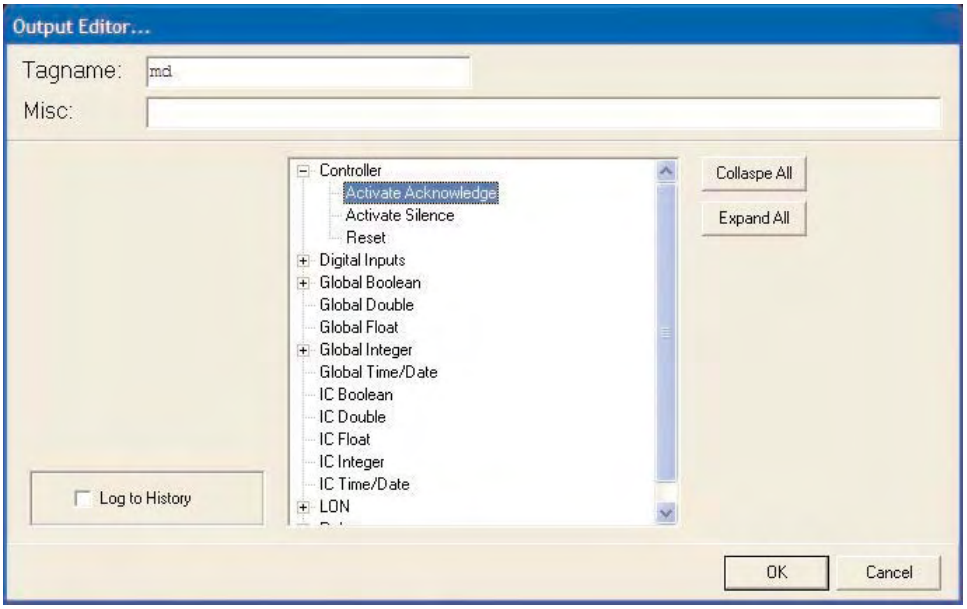
In the example below, the "Controller" item has been expanded by clicking on the "+" sign and now shows three subordinate items, Activate Acknowledge, Activate Silence and Reset.

As these additional items are revealed, the list extends beyond the bottom and becomes scrolling.

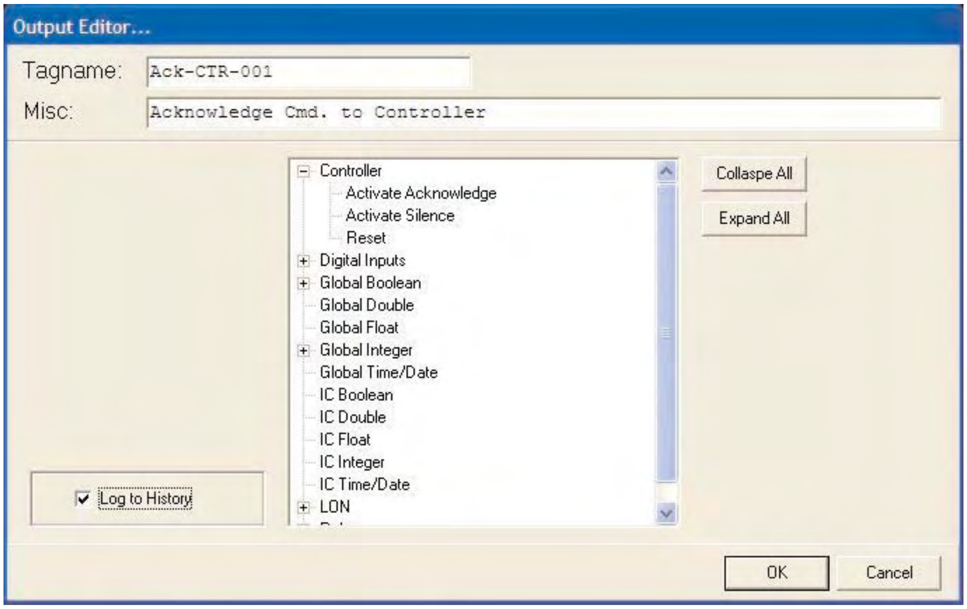
The hierarchal arrangement of items provides an easy and logical method of accessing the thousands of potential items that could be configured as outputs on a large premier system.

Sample output configurations:

Example 1 involves an output to acknowledge an alarm on the controller. With the controller selected and its item list expanded select the "Activate Acknowledge"item.



Next, create the Tagname and Miscellaneous comments and select "Log to History" to complete the configuration.

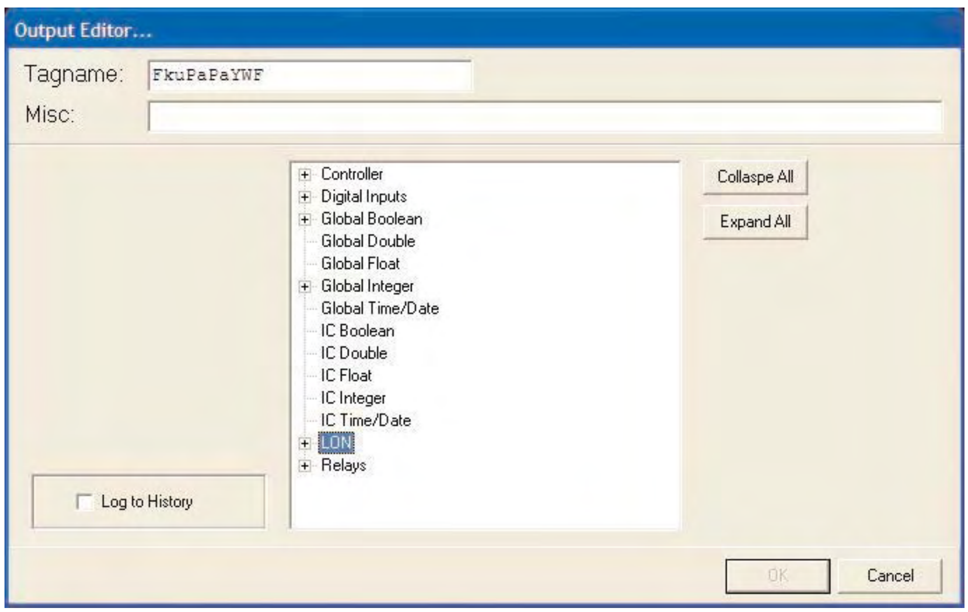


When the configuration is complete, select the "OK" button in the lower right of the dialog box.

The configured output #1 is now displayed both in the output list on the left along with its details displayed in the configuration pane on the right.

Example 2 involves creating an output to reset an Agent Release Module (ARM) on the LON. This output will be configured in output slot #2.

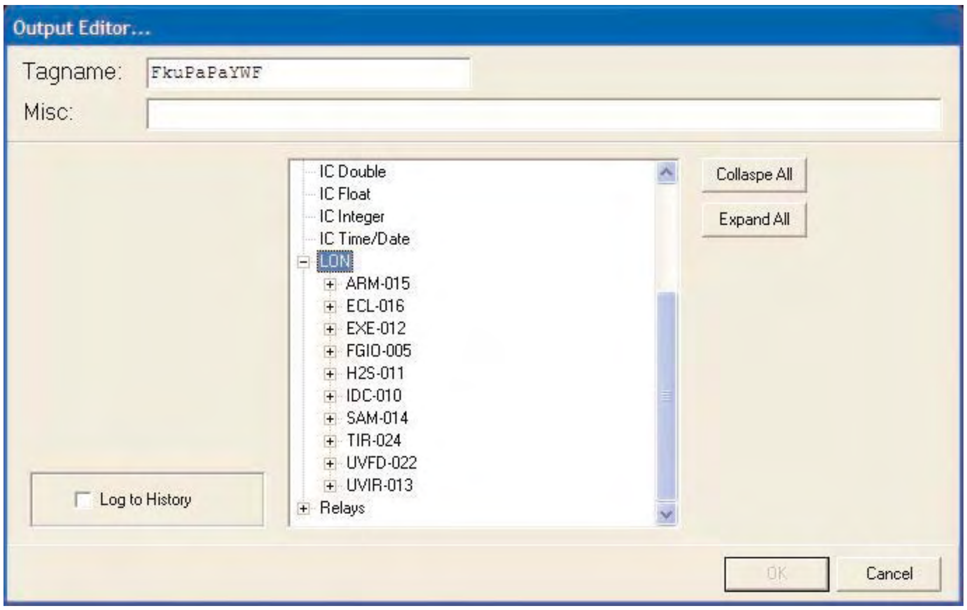
Double click on the second slot, or single click the slot and select the "Edit" button in the bottom left of the output pane to open the "Output Editor" dialog box.



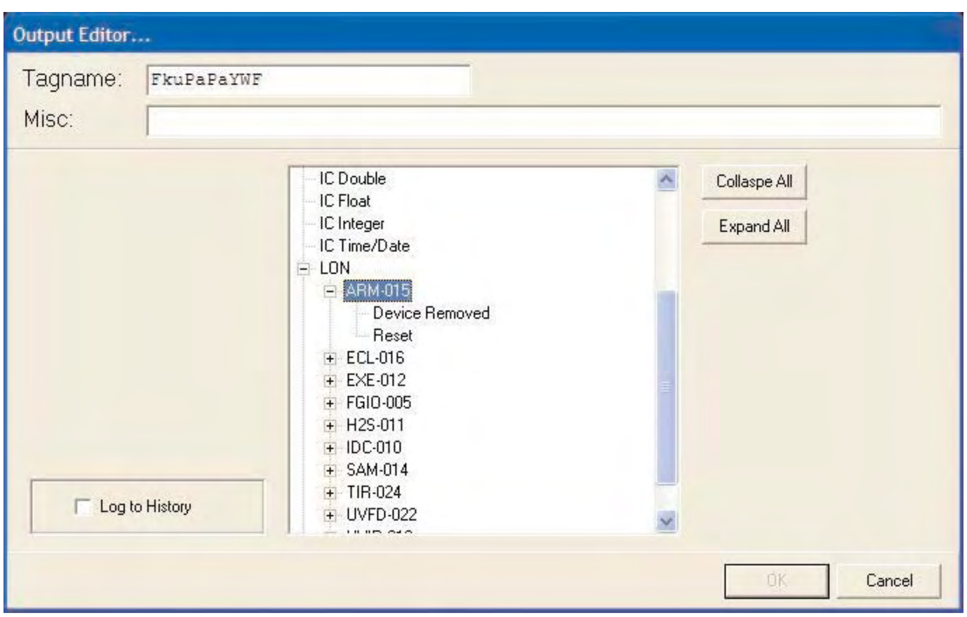
Notice that a random tagname has been entered automatically, next select the "LON" item. All field devices will be listed under this item.

Clicking on the “+” sign left of the “LON” item will expand it revealing the devices on the LON. In this sample program there are only 10 field devices but in typical systems their could be dozens.

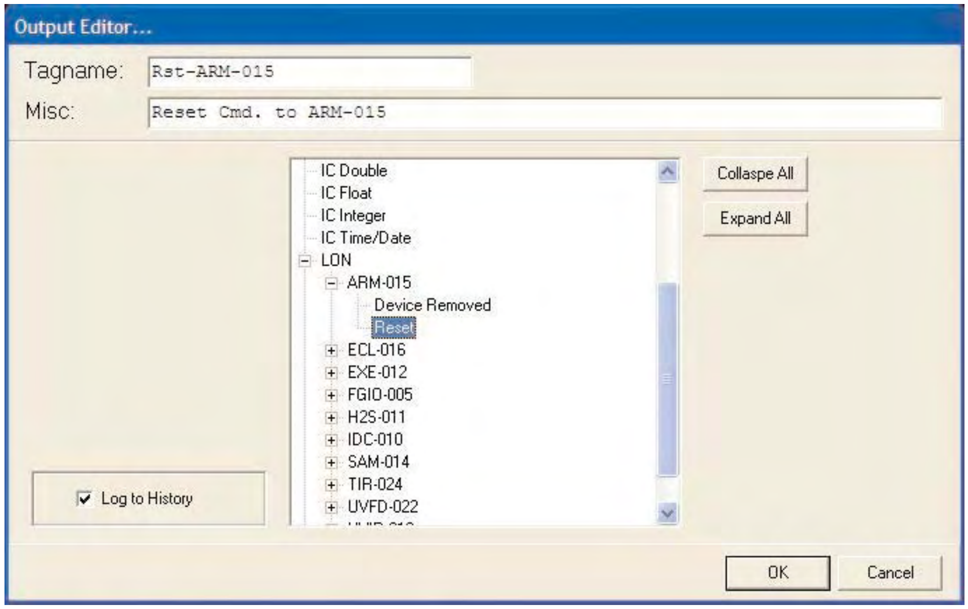
Notice that each LON field device has the “+” sign to its left signifying that there are subordinate items associated with them. The number of subordinate items will vary by device type.



Expand the “ARM-015” item to display its subordinate items. An ARM has only two selections; “Device Removed” and “Reset”.



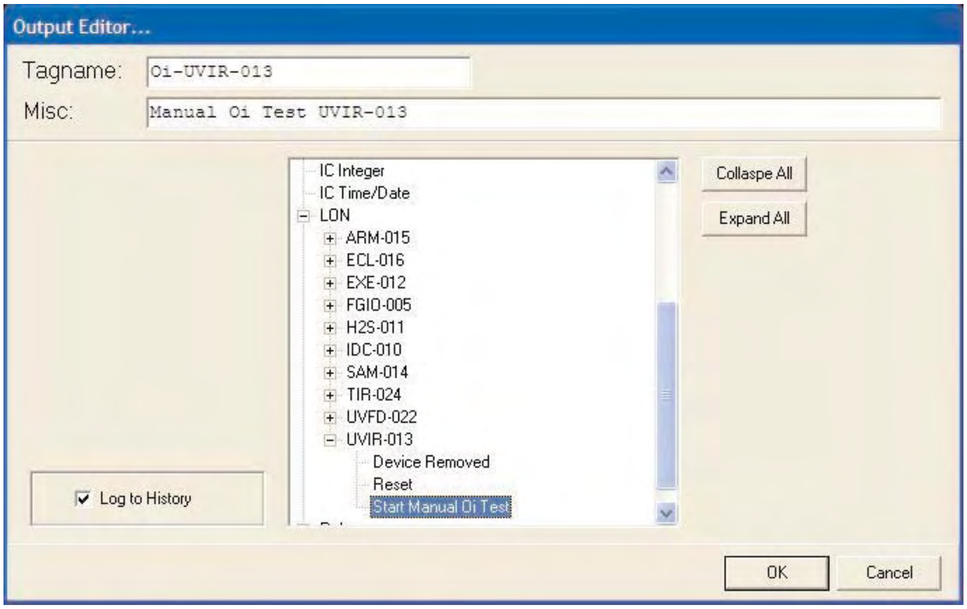
Select the “Reset” item from the ARM-015 list, fill in the Tagname and Miscellaneous fields and then select “Log to History” to complete the configuration.



Then select the “OK” button in the lower right of the dialog box to complete the configurations entry into the database.

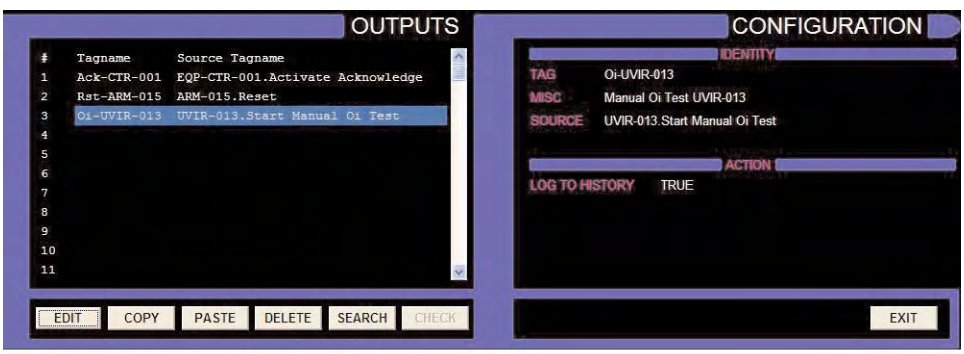
This completes the configuration of the first two output “slots”.

Example 3 involves creating an output to initiate a manual Optical Integrity (Oi) test on a UV/IR optical fire detector. This output will be configured in output slot #3.



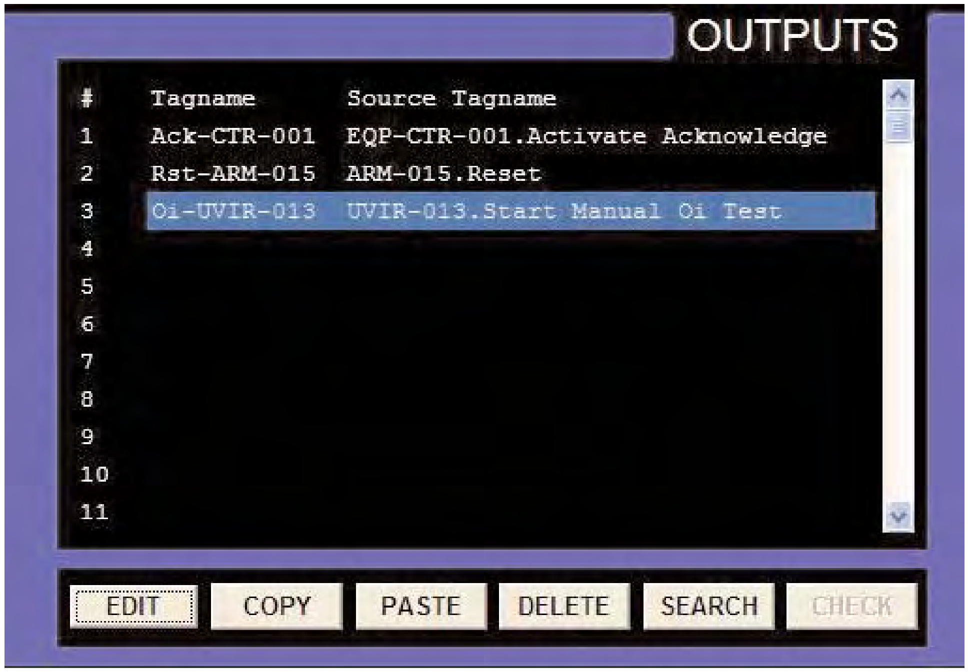
Above is the output editor dialog box with “UVIR-013” expanded, “Start Manual Oi Test” selected, and the Tagname and miscellaneous fields filled out.

Notice that the UVIR detector has three subordinate items instead of two as in example 2 with the ARM module.



The three examples for output tags are now complete and the configuration information is displayed on the “Outputs Configuration” screen.

Output Configuration Screen Details: The left had pane uses a scrolling list with three columns to display the configured outputs and allow for their editing.



The first column "#" contains the slot number for the outputs in the database. In the example above, the first three slots are configured.

The second column contains the "Tagname" that is used within the database to identify the item. This tagname will be used throughout the S^3 environment, and specifically within the graphic editor when assigning these outputs to user configured buttons.

The third column "Source Tagname" displays the tagname of the device that the output is associated with followed by the command function. In the hilighted example of slot 3 above, the source is UVIR-013 and the command function is "Start Manual Oi Test". This is then represented in the output list as;

UVIR-013.Start Manual Oi Test

The six buttons at the bottom of the Outputs pane perform the following functions:

Edit: Opens the “Output Editor” dialog box to allow an output to be configured for slot selected.

Copy: Allows a selected slots configuration to be copied for pasting into another slot to speed up the configuration of similar outputs.

Paste: Used with “Copy” above, allows a copied slots configuration to be pasted into the selected slot to speed up the configuration of similar outputs.

Delete: Immediately and permanently deletes a slots configuration. This function is not “reversible” so use with caution.

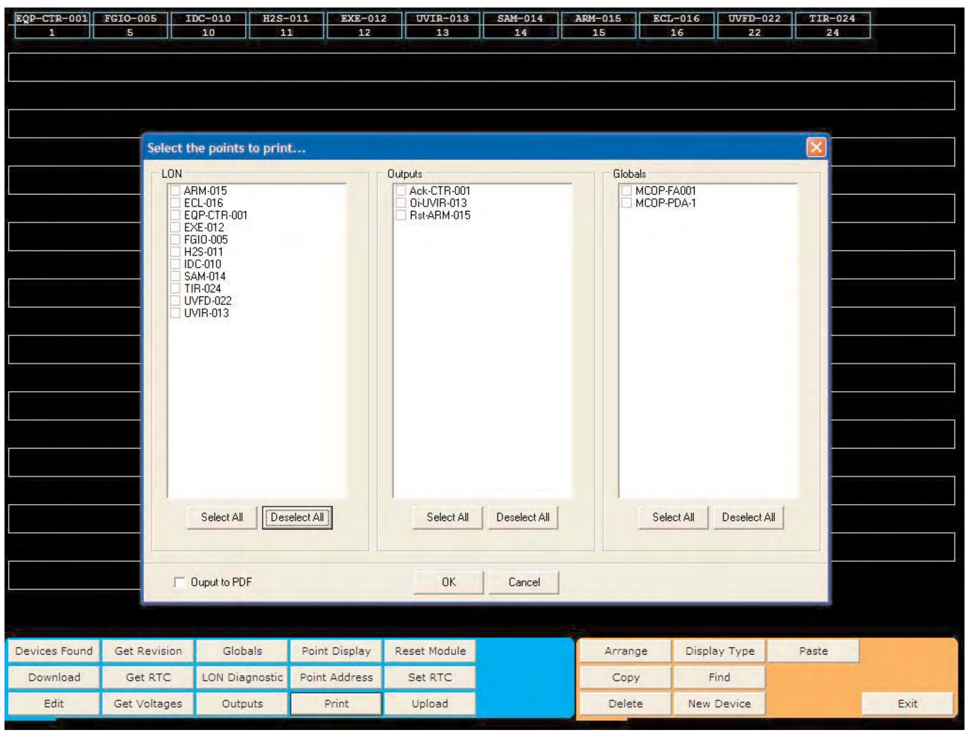
Search: Since thousands of outputs can be configured, the search function allows for locating matching text strings to quickly find a desired slot for viewing or editing.

Check: Primarily used following editing of the LON configuration to verify that all configured outputs are still linked to a valid items in the database.

Print: Allows for the select printing of configuration information for the controller, field devices and database for documentation purposes.

Note: This command will send the selected configuration data to the default Windows printer, not the alarm & event printer.

Once the “Print” button on the command bar is selected the print selection dialog box will open.

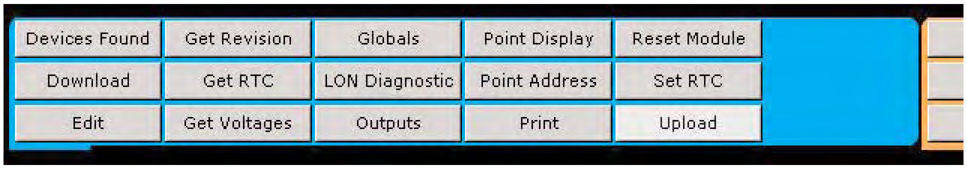


The dialog box is divided into three main selection areas, LON, Outputs, and Globals. All configured items for each category are displayed along with a checkbox to select the items data for printing.

At the bottom of each column are “Select All” and “Deselect All” buttons to aid in the rapid selection of data to print.

Optionally, the data can be output to a “PDF” format by using the checkbox in the lower left of the dialog box.

Upload: Queries the controller for its configuration and if a complete configuration was properly stored, it will be uploaded and saved to a user selected project name. The current project will not be changed.



CAUTION: USING THE UPLOAD COMMAND WILL COMPLETELY REPLACE ANY EXISTING CONFIGURATION FOR THE ACTIVE PORT.

The “Upload” command is typically used when attaching an S^3 station to an existing system for which there is no existing database on the S^3 station.

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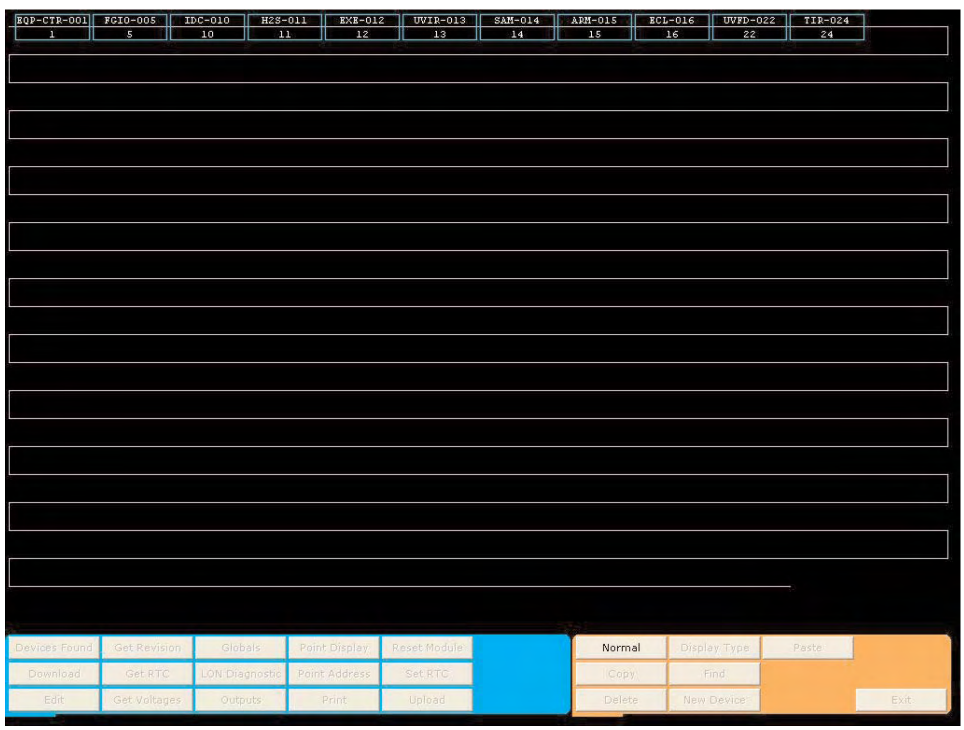
Configuration Bar: The configuration bar has eight buttons, each of which is used in the configuration of the LON and creation of LON devices.

__**Configuration Bar Feature Definitions**__

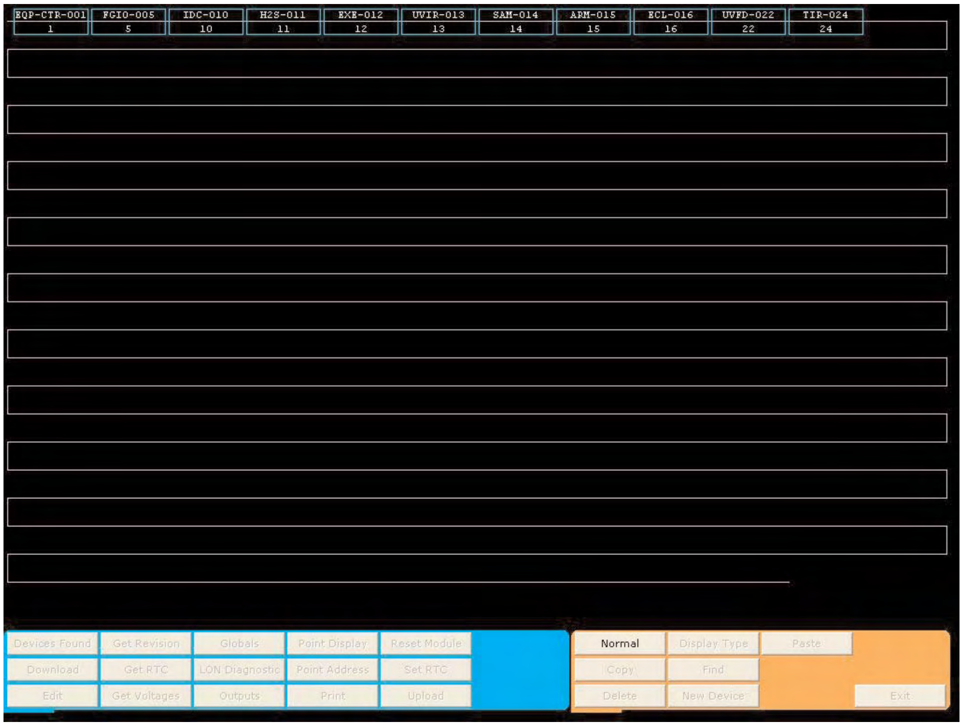
Arrange: This button allows the re-arrangement of the nodes on the LON schematic for the purpose of matching the physical and logical order of the network.

This must be done to optimize the functionality of the LON diagnostic screen.



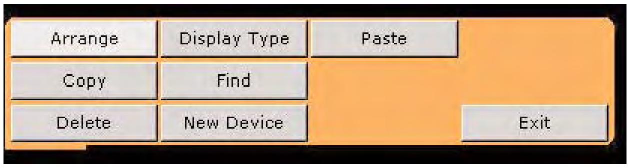
On the example network schematic shown above the node order is shown numerically. Node 1 being the controller, followed sequentially by nodes

5, 10, 11, 12 ....etc. In the plant, it's entirely possible that "Node 5" may wire to "Node 20" and the overall order could be 1, 5, 20, 21, 23 ... etc.

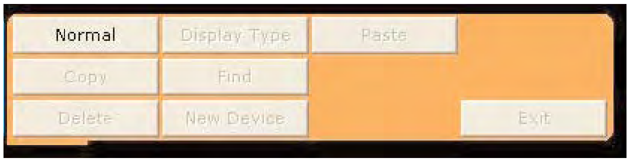


The "Arrange" button allows you to move the location of the nodes on the schematic representing the LON to match the actual way the LON is wired in the field. This is an important step for ease of future LON troubleshooting.

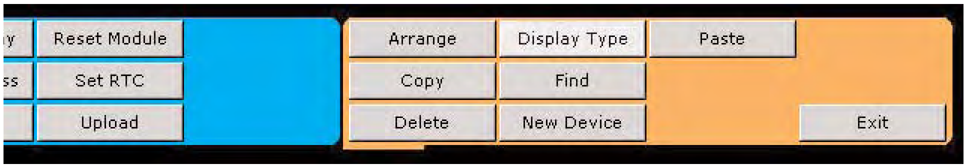
To use the "Arrange" function, click on the button and drag the nodes into their desired locations. To move a node, click and drag it over the area between the two nodes where you would like it to be, then release the mouse button. The node will then be moved to this location but retain its original address.



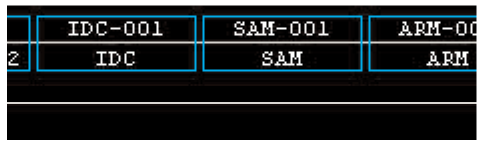
When the physical and logical addresses have been reconciled, select the "Normal" button to return to the standard LON configuration screen.



Display Type: A “toggle button” that allows either the default Node Number to be displayed on the LON schematic, as shown in the example below, or the device type.

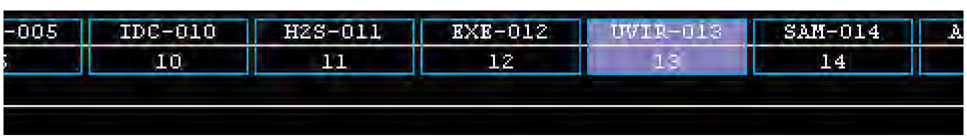


When the “Display Type” button is selected, the LON schematic will substitute the device type for the node number, as shown below. When the device type is being displayed, the button on the configuration bar will toggle to say “Display Number”, and when selected shifts the LON schematic display back to the default Node Number view.



Copy: Used in conjunction with the “Paste” command, “Copy” allows a nodes configuration to be duplicated elsewhere on the LON while retaining the configuration data.

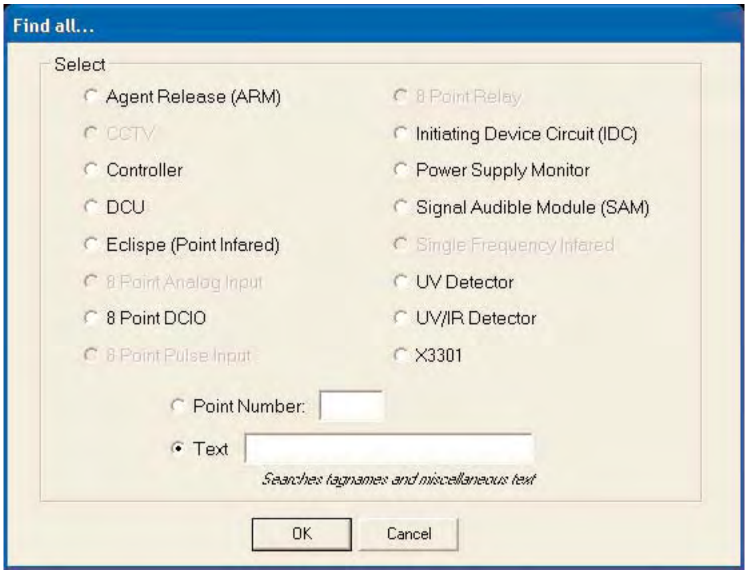
This is very useful when there are to be many nodes of the same type and configuration on a LON. The detailed configuration only needs to be done once, then copy and paste as many as needed with only the new nodes tag name and address needing to be manually entered.



To copy a node select it by single clicking on the device then choose the “Copy” button. The “Paste” button will produce a new device with all of the configuration from the copied node, just enter the new tag name and miscellaneous text.

Find: Displays a dialog box that allows the configuration database to be searched for specific types of field devices, a specific node address, or specific text.

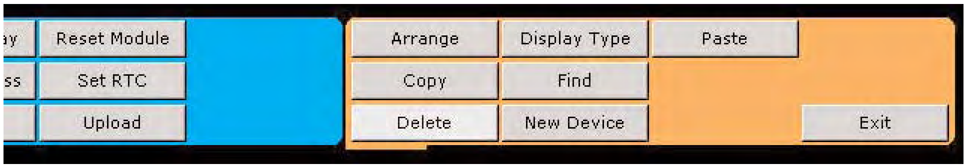
The “Find” button will open the “Find all...” dialog box which provides radio buttons to select a device type, and fields for either a LON address or text from either the tagname or miscellaneous text.



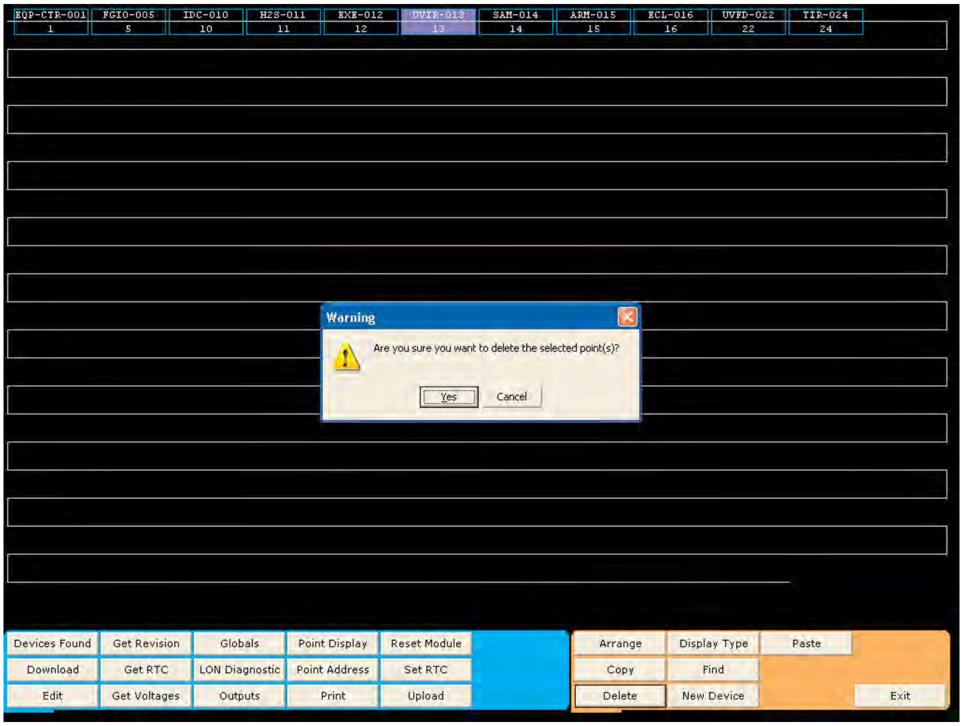
Items found matching the search criteria are highlighted in blue on the LON schematic.

This is particularly useful when trying to find a specific tag name on very large systems with hundreds of points.

Delete: Removes a selected node from the LON configuration.

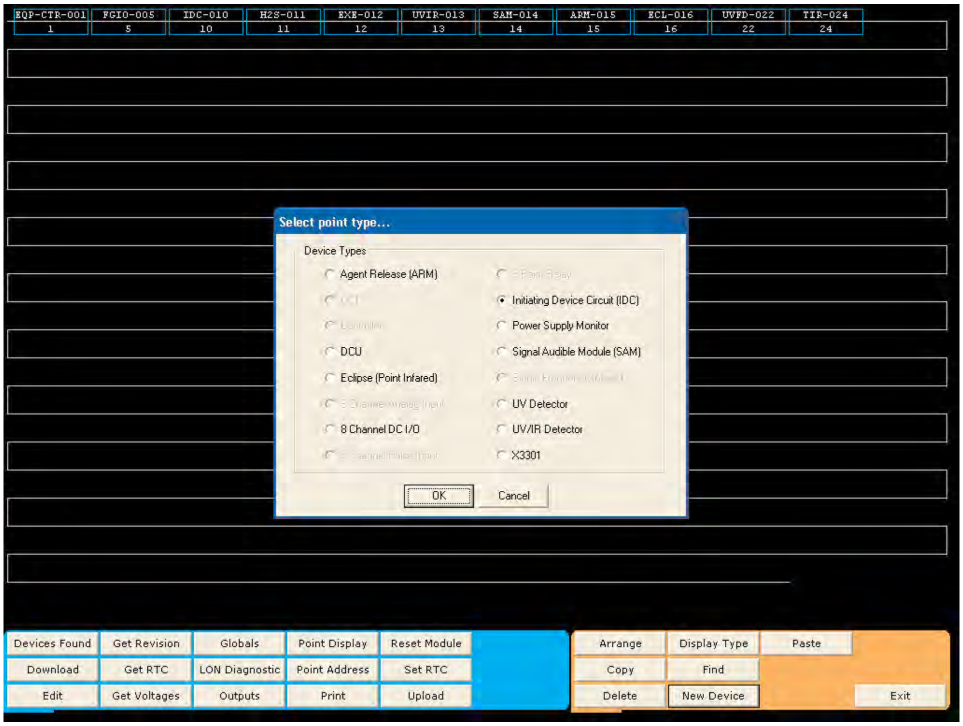


Select a node or multiple nodes on the LON Schematic and then select the "Delete" button to remove them from the database.



Use this function with caution as it does not have an "undo"!

New Device: Opens the "Select Point Type" dialog box from which you can choose the type of new device to add to the LON.



In the example above, "Initiating Device Circuit (IDC)" has been select-ed.

At this point, selecting the "OK" button would add an IDC to the LON, just after the last configured device.

At this point, the configuration dialog box for the selected point type is displayed. This dialog box provides access to all of the programmable parameters for the selected device type. The detailed configuration instructions for each device type is covered in a later chapter.

Controller: The “Controller” is the first device on any Eagle Quantum Premier Local Operating Network (LON). This device is used performs the user logic, provides the NFPA-72 required operator interface elements and provides a communication interface to the S^3 Operator Interface Station (OIS) and/or other intelligent systems for monitoring purposes.

Both the user logic and the configuration for all of the LON devices is first created and stored in the S^3 configuration database, then downloaded to the Controller, which in turn downloads this information to the field devices where it is stored in their non-volatile memory.

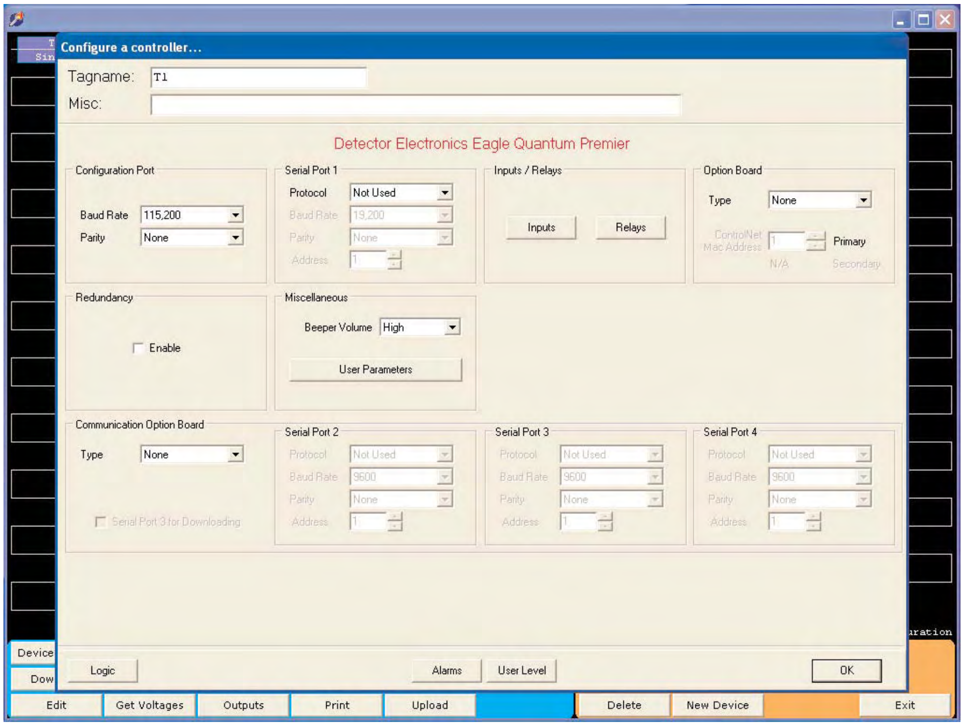
A copy of the configuration data is also stored in the Controllers own non-volatile memory.

When an Eagle Quantum Premier port is first created, the LON schematic is empty except for a “node rectangle” representing the Controller, as shown in the example to the right.

The node rectangle is divided in half horizontally with the tag name in the top and controller configuration in the bottom. S^3 has assigned `“T1”` as a temporary tag name. This tagname is randomly generated.

This is replaced by the user assigned tag name as described in the "Point Configuration • Common Settings" section of this users guide. The bottom half will contain the controller configuration default of "Single" signifying a single "non-redundant" arrangement.

Configure a Controller: To begin controller configuration, double-click on its selection rectangle or single-click on the selection rectangle and choose the "Edit" button in the lower left position of the command bar. This opens the "Configure a controller..." dialog box which provides access to all of the user configurable features of the controller, including access to the logic editor.

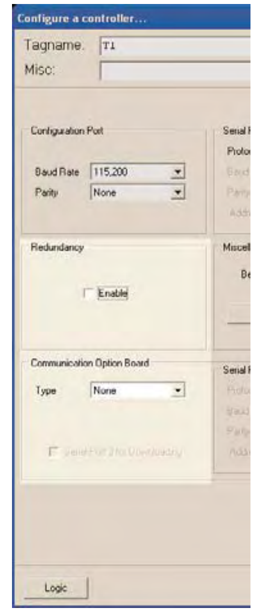


Note:
This chapter of the user guide deals with the hardware configuration of the controller only. Logic creation is covered in chapter 18.

Tagname: This field provides room for a 24 character tagname which will be used to reference the controller throughout the S^3 global database. This tagname is used in the graphic editor, online graphics, logic editor, OPC server, and all printed documentation. Upon device creation in the database S^3 assigns a randomly generated tagname.

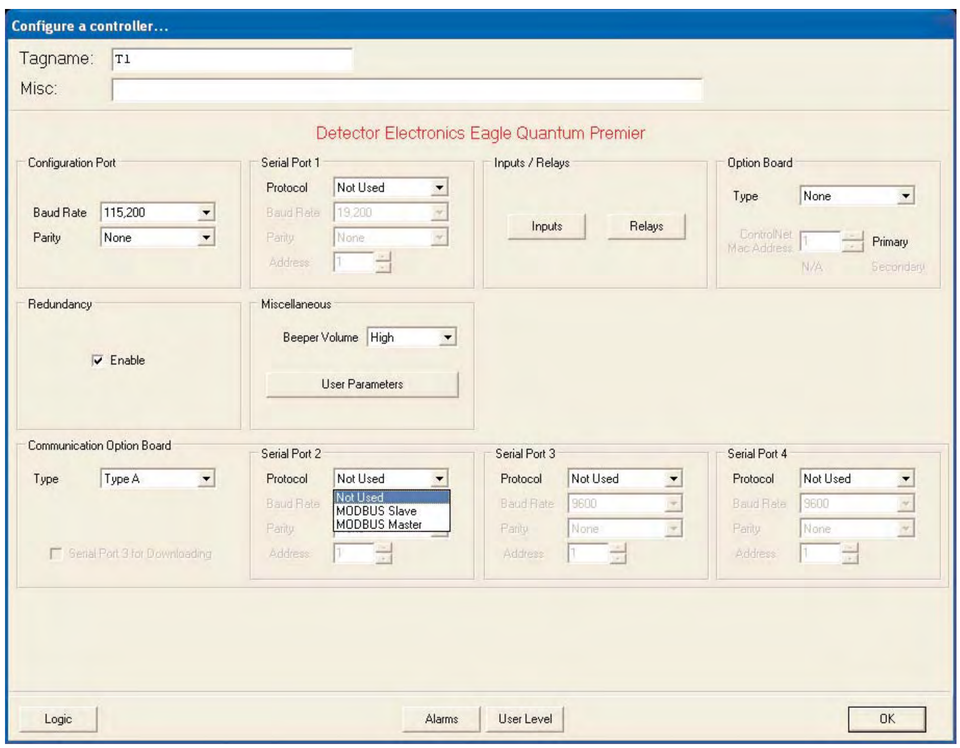
Misc: The "Miscellaneous" field provides room for an optional 32 character description to be used as desired.

Redundancy: The EQP system supports either a simplex (Single) or redundant (Dual) configuration. This selection is displayed in the lower half of the rectangle representing the controller.



If a redundant arrangment is to be used, two identical controllers are hooked up in parallel. On a failure of the primary the "Hot-Standby" unit would take over without interruption.

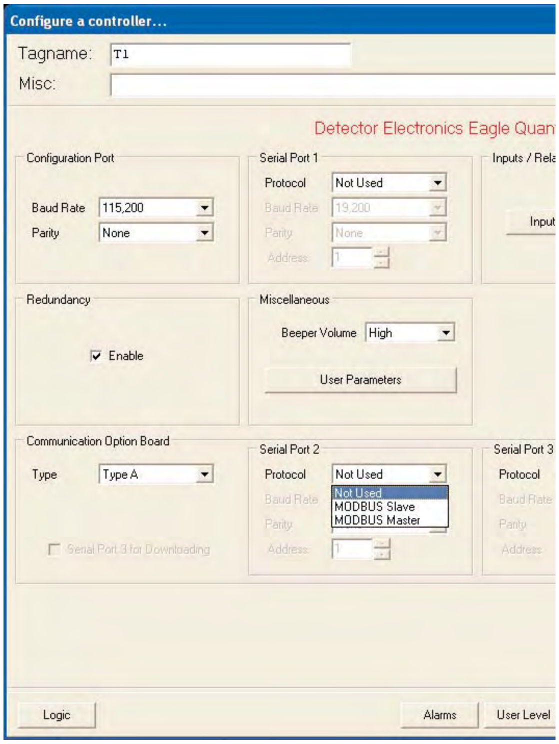
Redundancy configuration: If redundancy is to be used, "Enable" this feature with the redundancy checkbox, and then select "Type-A" from the pull down menu for "Communication Option Board". The "Type-A" option board is required to support redundancy and also provides an additional three serial ports for user configuration.



Serial Ports: The Eagle Quantum Premier Controller supports up to six serial ports. Two on the motherboard; one for configuration and a second for Modbus communications. Four on the option board; one for redundancy and three for Modbus.

(Note: one of the option ports can be used for configuration.)

Configuration Port: This motherboard port is used to connect to an S^3 workstation to perform configuration, diagnostics and troubleshooting. It utilizes a proprietary protocol unique to the EQP controller and S^3 software package and cannot be used by other devices. The configuration port uses the RS-232 standard and it has two configurable parameters; baud rate and parity.



Baud Rate: The port speed can be adjusted in standard intervals between a high speed of 115,200 baud which is both the default setting and the recommended setting, and, a low speed of 2,400 baud. Lower speeds are not recommended but sometimes required if the controllers location is too far from the S^3 workstation to support the recommended speed.

Parity: The parity setting for the controllers configuration port defaults to "None" but it can also be adjusted to either "Even" or "Odd".

There are no other adjustable parameters for the configuration port.

Serial Ports 1-4: These ports can be used for communication with a host device such as a users Distributed Control System (DCS), Programmable Logic Controller (PLC) or Human Machine Interface (HMI).

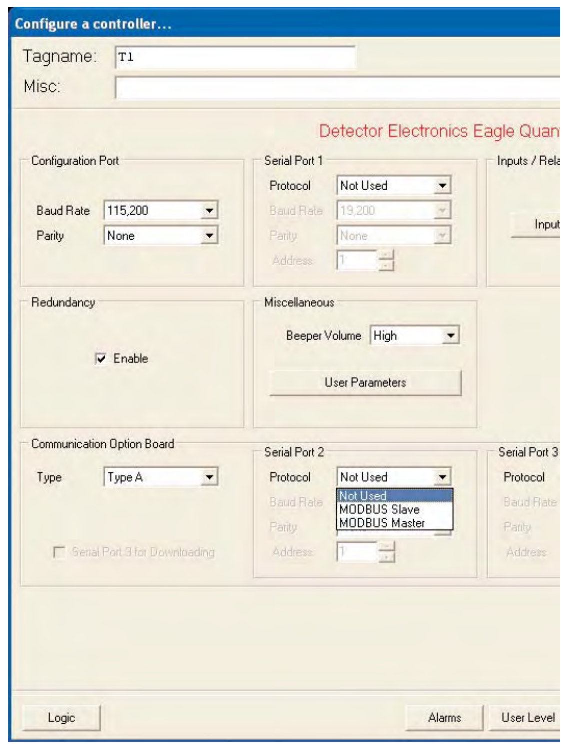
Ports 1 and 4 uses the RS-485 standard, 2 and 3 use the RS-232 standard. Each have four configurable parameters; protocol, baud rate, parity and address.

Protocol: This serial port currently supports the Modbus RTU slave protocol and the pop-up menu allows the selection of either "MODBUS Slave" or "Disabled". Port 3 can also be set as a configuration port.

Baud Rate: The motherboard ports speed can be adjusted in standard intervals between a high speed of 115,200 baud and a low speed of 2,400 baud. 19,200 baud is both the default setting and the most commonly used setting for connection to Modbus compliant devices. Ports 2-4 on the Type-A expansion board have a speed range of 9,600 to 230,400 bps.

Parity: The parity setting for the controller's configuration port defaults to "None" but it can also be adjusted to either "Even" or "Odd".

Address: The address field is for entering the desired Modbus station address. The default value is "1" and it can be changed by using the "up/down" arrows or direct entry of a value.



The Modbus station address must be in a range from 1 to 247.

Miscellaneous: This section of the "Configure a controller..." dialog box has three adjustable parameters; setting of the controller's built in "beeper" volume, LON point disabling and access to the user parameter editor.

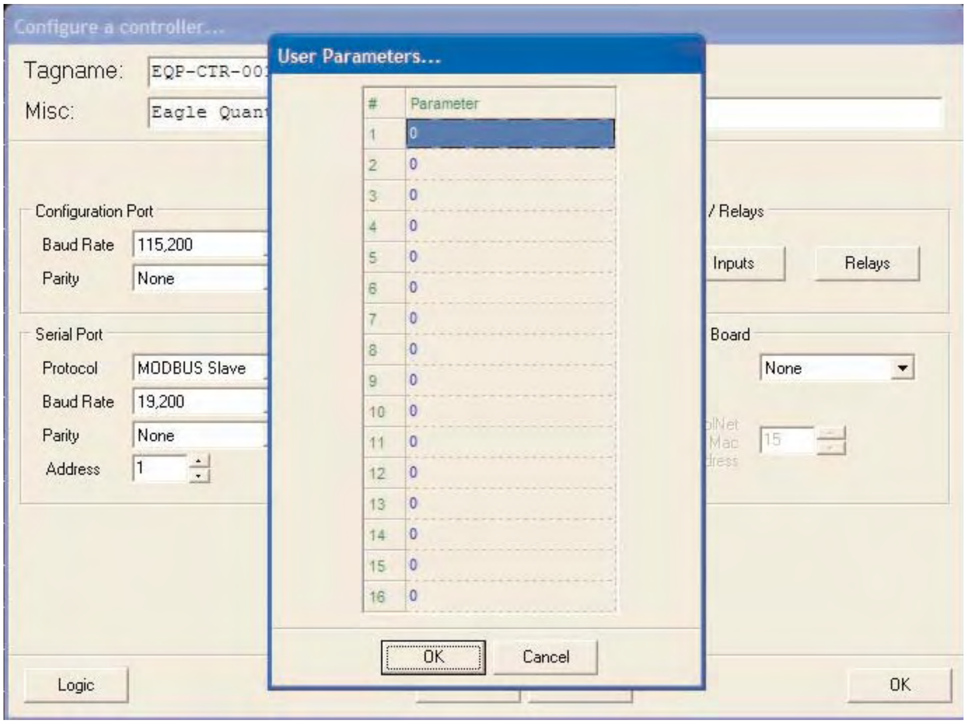
Beeper Volume: The Eagle Quantum Premier controller has an integral "Beeper" to annunciate a variety of conditions and to meet regulatory requirements.

To accommodate the controller being mounted in areas with different amounts of ambient noise the beeper can be adjusted to any of three settings; Low, Medium and High, via a pop-up menu. The default value is "Low" which is suitable for installations where the controller is not in a separate enclosure and is in a control room / office type environment.

Allow LON Point Disabling: This checkbox selection determines whether or not field devices can be "Disabled" via software command for maintenance or diagnostic purposes.

This feature is enabled by default.

User Parameters: This button opens the "User Parameters..." dialog box allowing for their values to be set.



These parameters are intended for use in special applications utilizing the Allen-Bradley ControlNet interface option.

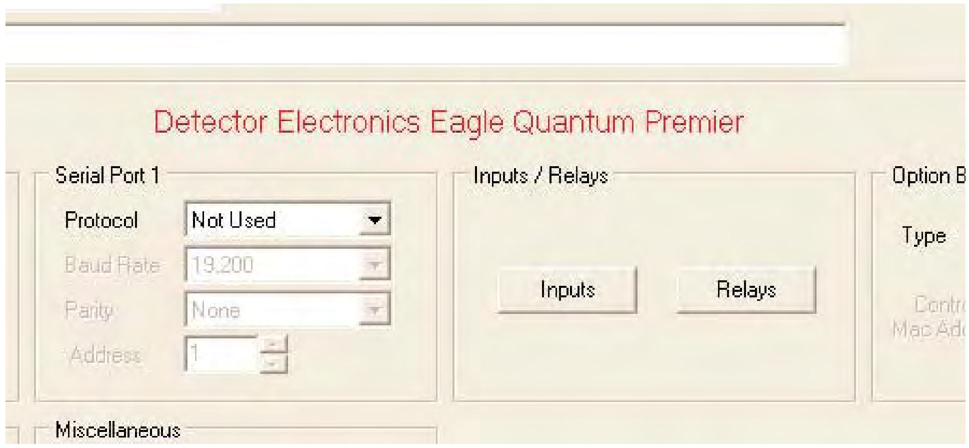
The use of these parameters is described in the users guide for the ControlNet option module.

In general applications, these parameters should be "0".

CAUTION
Do not make adjustments to the settings of these parameters unless you have detailed knowledge of their operation.

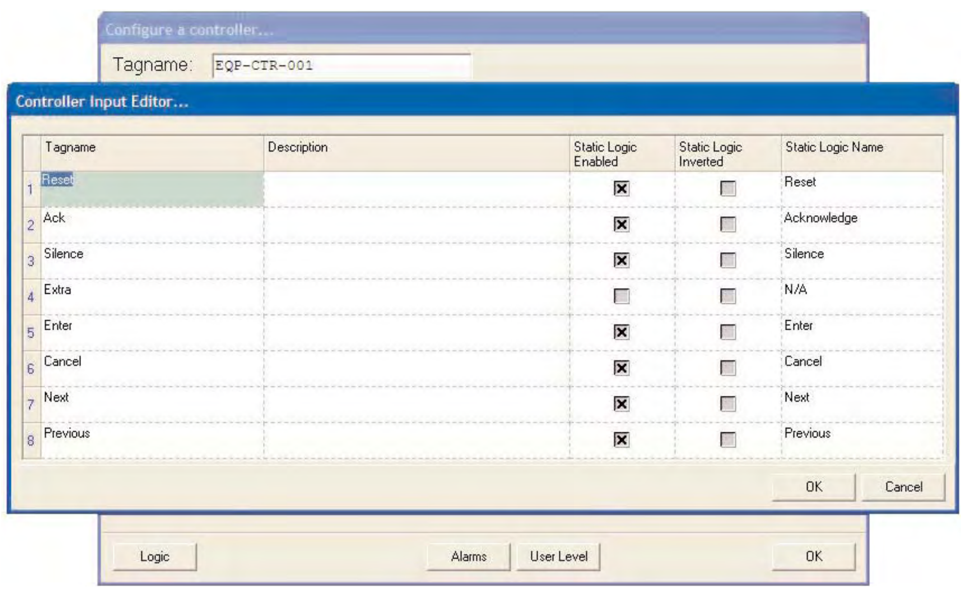
WARNING
Inappropriate use of these parameters could cause unintended results in controller operation.

Inputs / Relays: The Eagle Quantum Premier controller provides eight unsupervised digital inputs and eight unsupervised relay outputs. This I/O can be configured to perform pre-assigned "Static Logic" functions or they can be configured at the users discretion for any desired purpose.



All sixteen of these I/O points are accessible by the controller's user programmable logic.

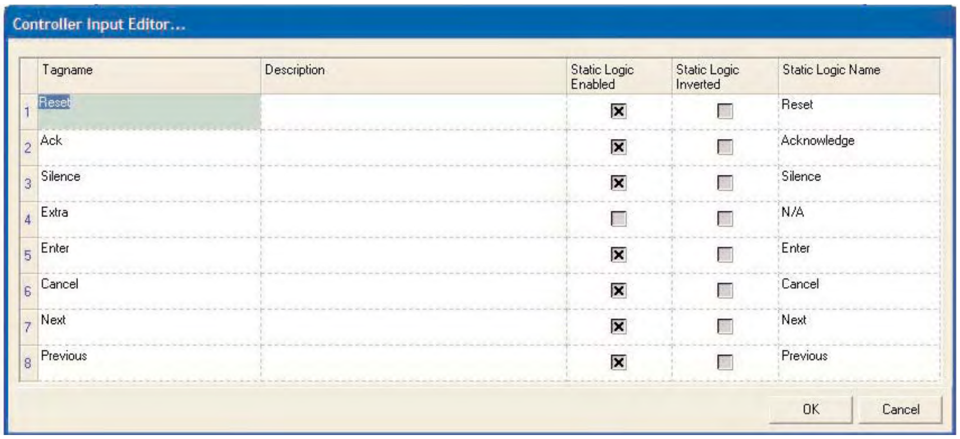
Inputs: Selecting the "Inputs" button will open the "Controller Input Editor..." dialog box. By default the "Static Logic" functions for each point is disabled and each point is unnamed.



The functions of the static logic functions are self explanatory and mirror the functionality of the controller's faceplate buttons.

Inputs continued...

The primary reason for this feature is to accommodate instances where the controller must be mounted inside another enclosure and the faceplate buttons are brought through the door to allow operation while inside. Typically a window allows viewing of the controller's faceplate.



Controller Input Editor...

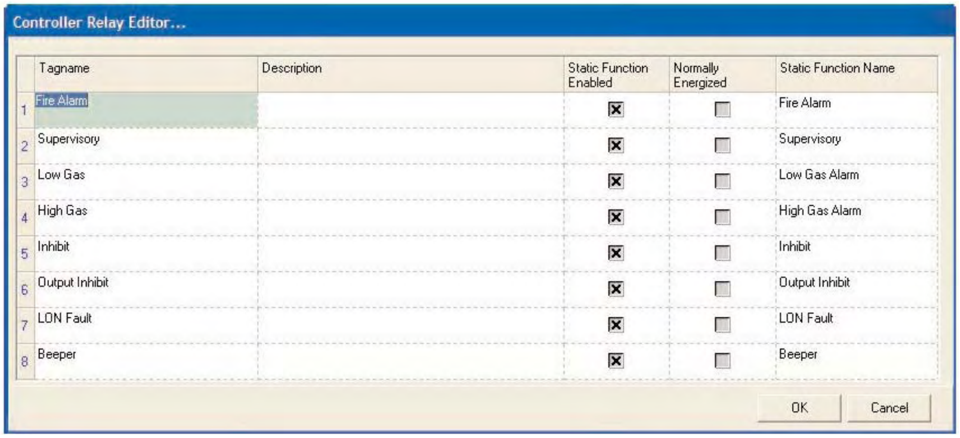
	Tagname	Description	Static Logic Enabled	Static Logic Inverted	Static Logic Name
1	Reset		☒	☐	Reset
2	Ack		☒	☐	Acknowledge
3	Silence		☒	☐	Silence
4	Extra		☐	☐	N/A
5	Enter		☒	☐	Enter
6	Cancel		☒	☐	Cancel
7	Next		☒	☐	Next
8	Previous		☒	☐	Previous

OK Cancel

Each point can be logically "inverted" by using the checkbox in the "Static Logic Inverted" column.

If the use of "Static Logic" is required, use the appropriate checkbox to enable this feature on a point-by-point basis and enter a tagname and description appropriate to the desired function(s).

Relays: Selecting the "Relays" button will open the "Controller Relay Editor..." dialog box. By default the "Static Logic" functions for each point is disabled and each point is unnamed.



Controller Relay Editor...

	Tagname	Description	Static Function Enabled	Normally Energized	Static Function Name
1	Fire Alarm		☒	☐	Fire Alarm
2	Supervisory		☒	☐	Supervisory
3	Low Gas		☒	☐	Low Gas Alarm
4	High Gas		☒	☐	High Gas Alarm
5	Inhibit		☒	☐	Inhibit
6	Output Inhibit		☒	☐	Output Inhibit
7	LON Fault		☒	☐	LON Fault
8	Beeper		☒	☐	Beeper

OK Cancel

The functions of the static logic functions are self explanatory and mirror the functionality of the controller's faceplate LEDs and beeper.

If the use of "Static Logic" is not required, use the appropriate checkbox to enable this feature on a point-by-point basis and rename the function(s).

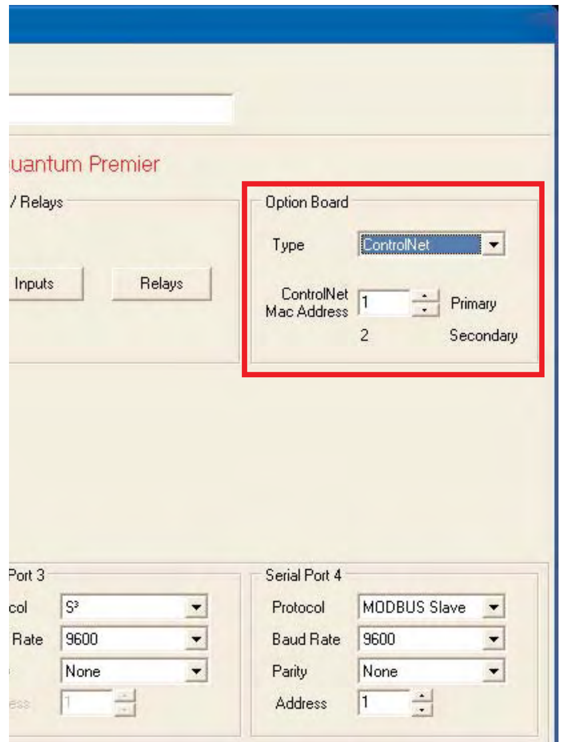
Options Board: The Eagle Quantum Premier controller is designed to be expandable and is provided with a slot for an add on circuit board.

Selecting the "Type" pop-up menu will display the available options.

If no expansion board is installed select "None"

If the "ControlNet" expansion board is selected the "ControlNet Mac Address" field will activate allowing data entry.

The ControlNet option provides redundant communications with Allen-Bradley (or compatible) products that support this ControlNet.



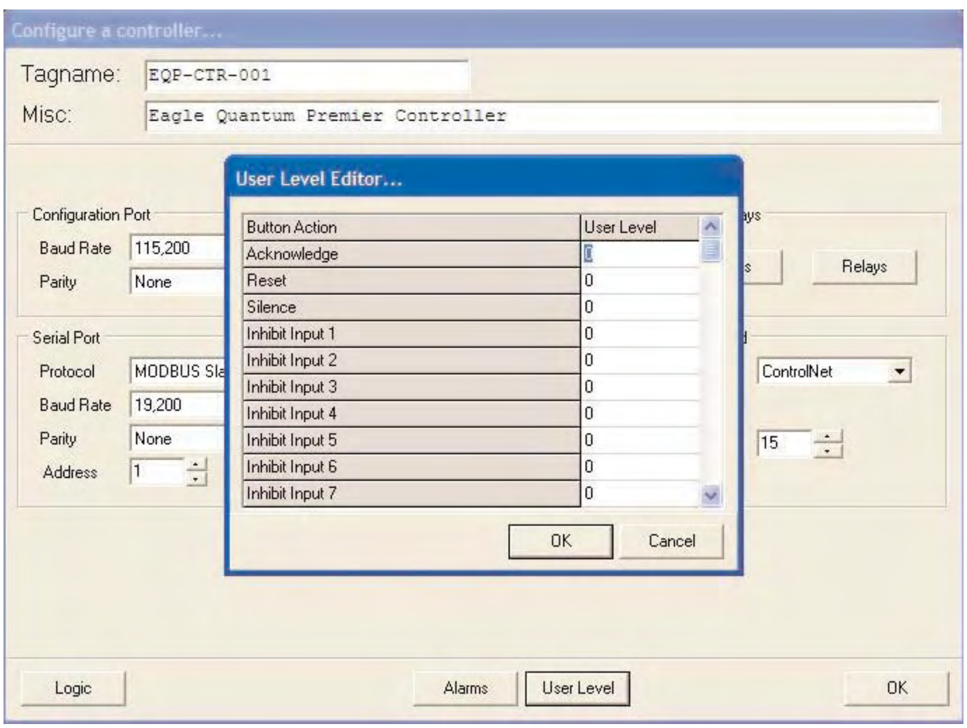
The ControlNet Mac address can be set in a range from 1 to 99.

Configure a controller continued...
Across the bottom of the "Configure a controller..." dialog box there are four buttons; Logic, Alarms, User Level and OK.

Logic: This button launches the S^3 Logic Editor for the Eagle Quantum Premier controller. This feature is covered in detail in Chapter 18.

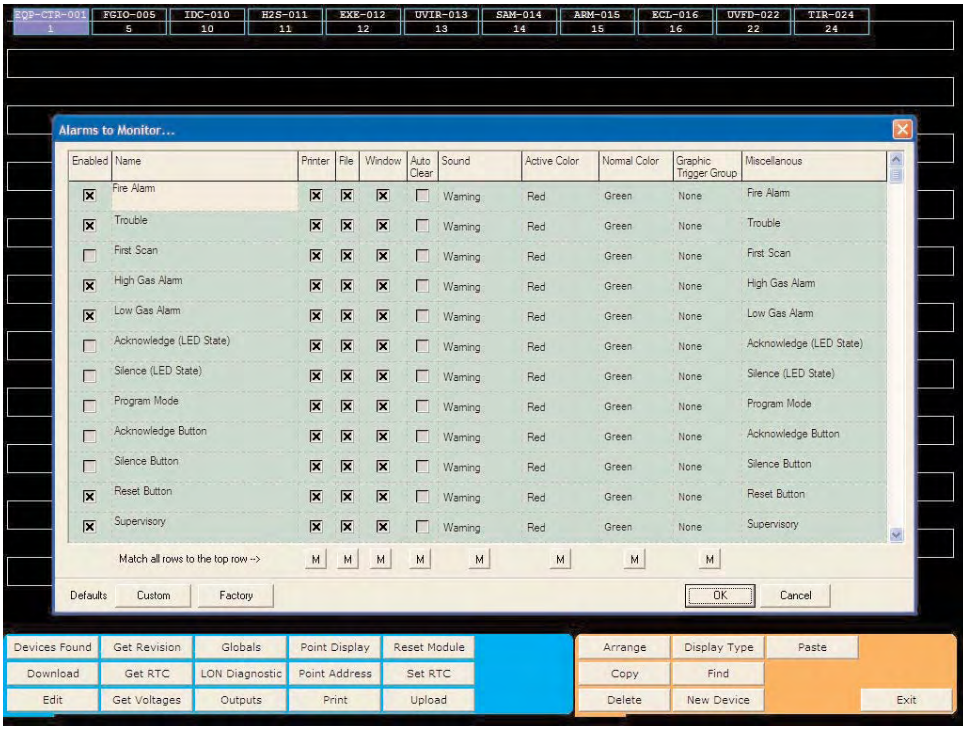
Alarms: Selecting this button opens the "Alarms to Monitor..." dialog box. This scrolling list displays the alarms and events related to the controller that can be configured to be monitored by S^3. The controller has 75 alarms and events that can be monitored, some of which are disabled by default. Alarm and event monitoring is covered on the next page.

User Level: Allows user levels to be set on a variety of controller features for security. Assign an appropriate user level to each item in the list. For details in user level settings refer to Chapter 9.



OK: Closes the "Configure a controller..." dialog box when finished.

ALARMS & EVENTS



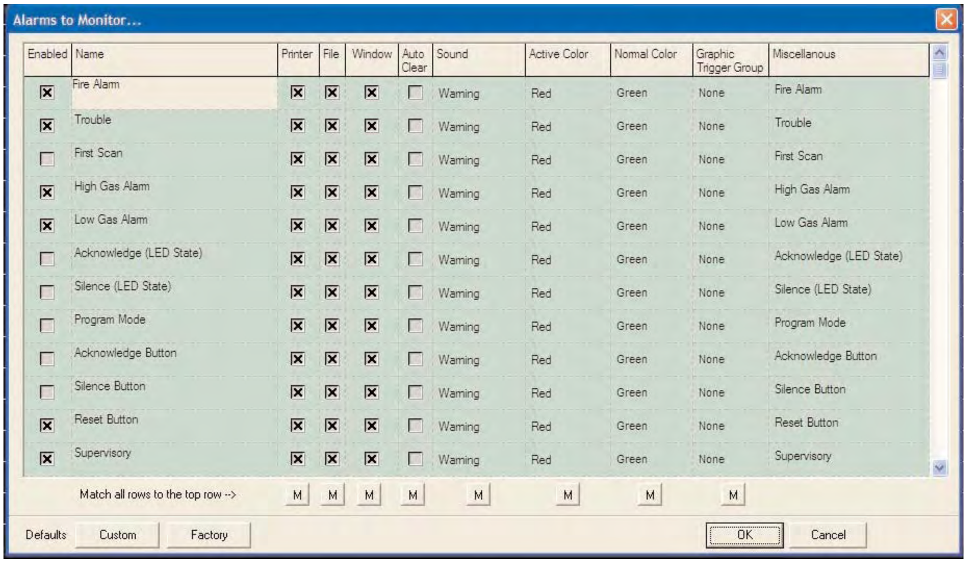
Every field device on the LON as well as the controller have a device specific set of alarms and events that can be configured for the S[3] DCD to track. This data is made available by the DCD to the S[3] Online Graphics program and OPC Server.

Although the number and type of events vary from device to device, the methodology for the configuration of these items is the same and will be covered in detail only once.

In the descriptions for configuring each type of field device any unique attributes pertaining to that devices event tracking will be presented.

Alarms: Allows for the configuration of the alarm and event monitoring for the device. These alarms and events are used by the S³ Online Graphics program and OPC Server.

Clicking on the “Alarms” button will open the “Alarms to Monitor...” dialog box. Below is an example of the controller’s event configuration.



The dialog box is a scrolling list with eleven attribute columns. There are four buttons running horizontally across the bottom of the window; Custom, Factory, OK and Cancel.

Custom: Selecting this button will replace all of the names with those in the second language database. Refer to “Strings” in the preferences section of this users guide. Chapter 6.

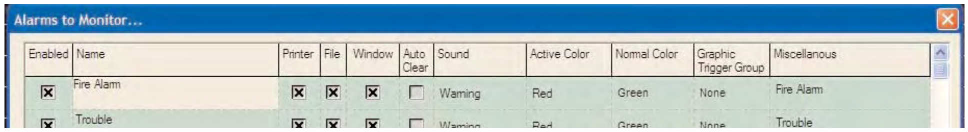
Factory: Restores the factory default values to ALL fields and settings.

OK: Closes the dialog box and stores changes in the configuration to the database.

Cancel: Closes the dialog box without storing changes.

In addition to these buttons, eight columns have a “M” button at the bottom of the column. This will “Match” every row in that column to the value or setting in the top row.

The eleven columns in the “Alarms to Monitor...” dialog box are defined below.



Enabled: Turns an event on or off. If disabled, no other settings do anything.

Name: This 48 character field is used to describe the event or alarm. This is the text that will be used and recorded throughout the S^3 applications suite when the event occurs.

Printer: When selected, sends the event to the S^3 event printer.

File: When selected, sends the event to the “Alarm History” module of S^3 for storage in the daily log.

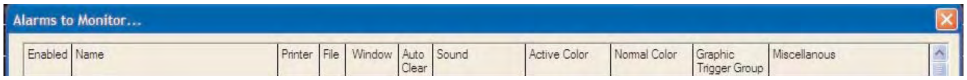
Window: When selected, sends the event to the “Active Alarms” module of S^3. This module is accessed via the F6 key when online. It will also be displayed in the single line FIFO display at the bottom of the screen when in the Online mode. Refer to Chapter 3.

Auto Clear: This selection determines whether the logged event will track the real time occurrence of the event or when the operator acknowledgement is factored in.

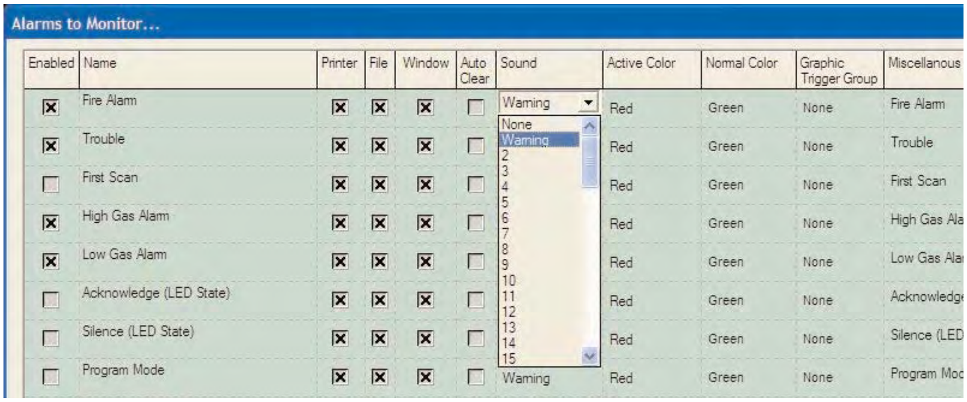
If the AC checkbox is <u>not</u> selected, which is the default, when an event occurs it will be logged to the appropriate locations, as configured by the Printer, File, Window selections, with the date and time of occurrence. When the event returns to its normal state, nothing will happen until the operator activates the “Acknowledge” button. The system will then log the date and time of the event returning to “Normal”. In reality it’s logging the first time the operator activates the Acknowledge button <u>after</u> the event has returned to normal.

If the AC checkbox <u>is</u> selected, when an event occurs it will be logged to the appropriate locations, as configured by the Printer, File, Window selections, with the date and time of occurrence. When the event returns to its normal state, the system will then log the date and time of the event returning to “Normal”.

Alarms to Monitor continued...

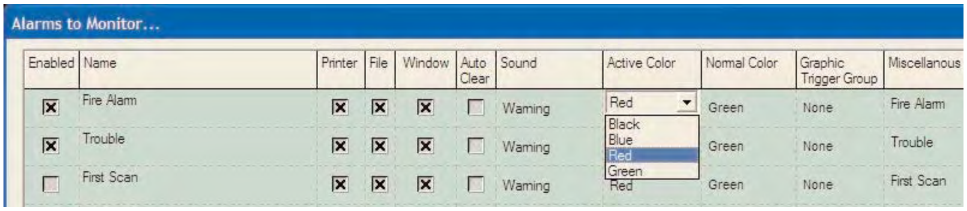


Sound: Each event may have a sound attached to it which plays when the event occurs, until the Acknowledge button is actuated. The sound



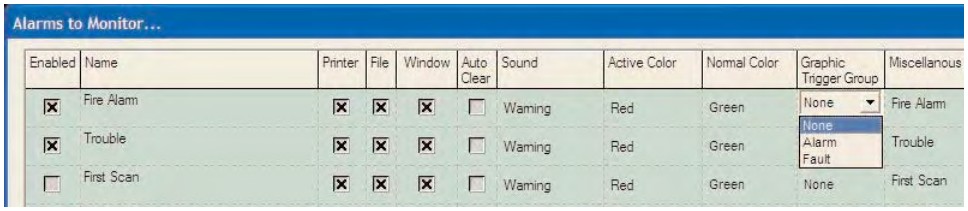
can be the default "Warning" or any of sixty three custom sounds. Use the pull down menu to select the desired sound.

Active Color / Normal Color: You can select one of four different colors for recording when events become "Active" or return to "Normal".



These color selections are made from the pull down menu located to the right of the event name. The color selections apply to both printed and screen presentations of the event. In the example above, the event will be shown in Red when active and Green when it returns to normal.

Graphic Trigger Group: Determines how the event will be classified to the S[3] Online Graphics application.



When a system is being configured that utilizes "Online Graphics" the graphic trigger configuration for each event determines how the symbol representing the device will respond when ever it changes state.

Each Eagle Quantum device has four potential states. Listed in order of increasing precedence they are; Normal, New Fault, Fault, New Alarm, Alarm.

Each of these states can have a color combination assigned to the symbol representing a field device in the online graphics. This is done within the graphic editor, described in Chapter 11.

The key to this capability resides in the configuration of the event into the appropriate trigger group of None, Alarm or Fault.

Use the pop-up menu to select the appropriate trigger group for each device.

Miscellaneous: This field always shows the factory default description for the event. This is helpful in checking custom settings to ensure translation or assignment accuracy.

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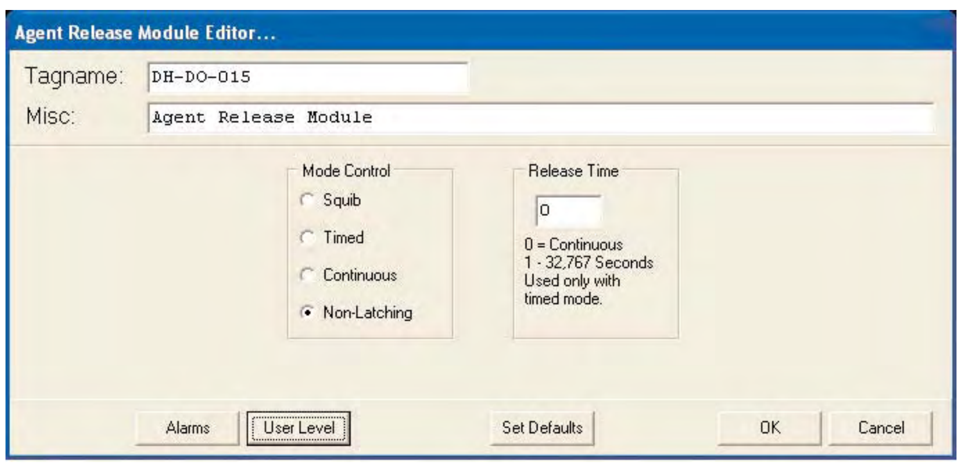
The EQ2500ARM Series Agent Release Module (ARM) is located on the LON/SLC and provides agent release capability for the Eagle Quantum Premier system.

The device is controlled by programmable logic in the Controller and can be used for “Single,” “Cross” or “Counting” Zone Style initiation.

Optional time delay, abort and manual release sequences allow the output to be programmed for use in unique applications.

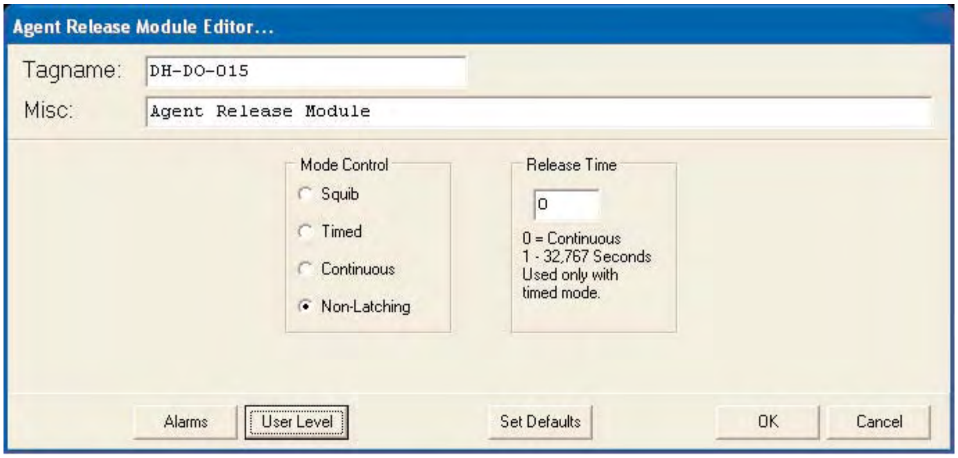


The Agent Release Module can monitor and control two output devices (rated for 24 vdc), which are energized together.

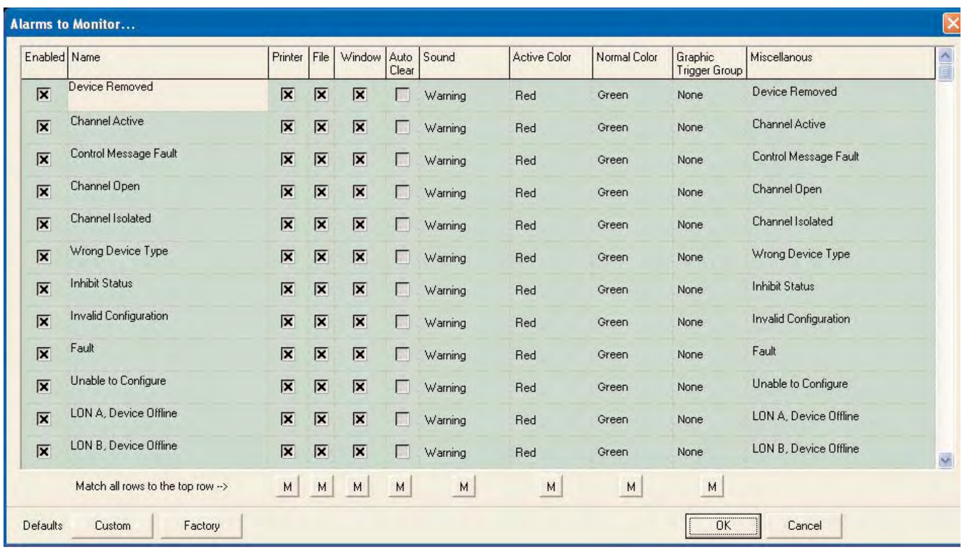
The release circuits are compatible with a variety of solenoid or initiator (squib) based suppression systems.

The release circuit is supervised for open circuit conditions. If a trouble condition occurs (open circuit or solenoid supply voltage less than 19 volts), it will be indicated at the controller.

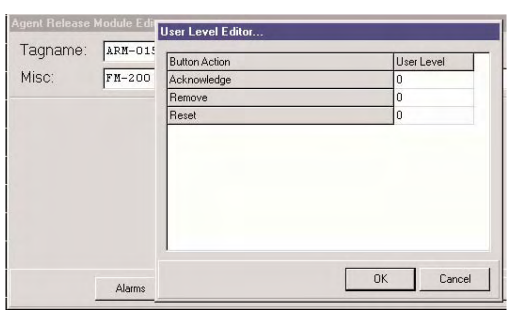
Mode Control: ARM outputs can be latching or non-latching. Non-latching follows the condition of the user programmed logic. Latching requires a reset of the controller.



Alarms: Selecting this button opens the “Alarms to Monitor...” dialog box. This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S3.



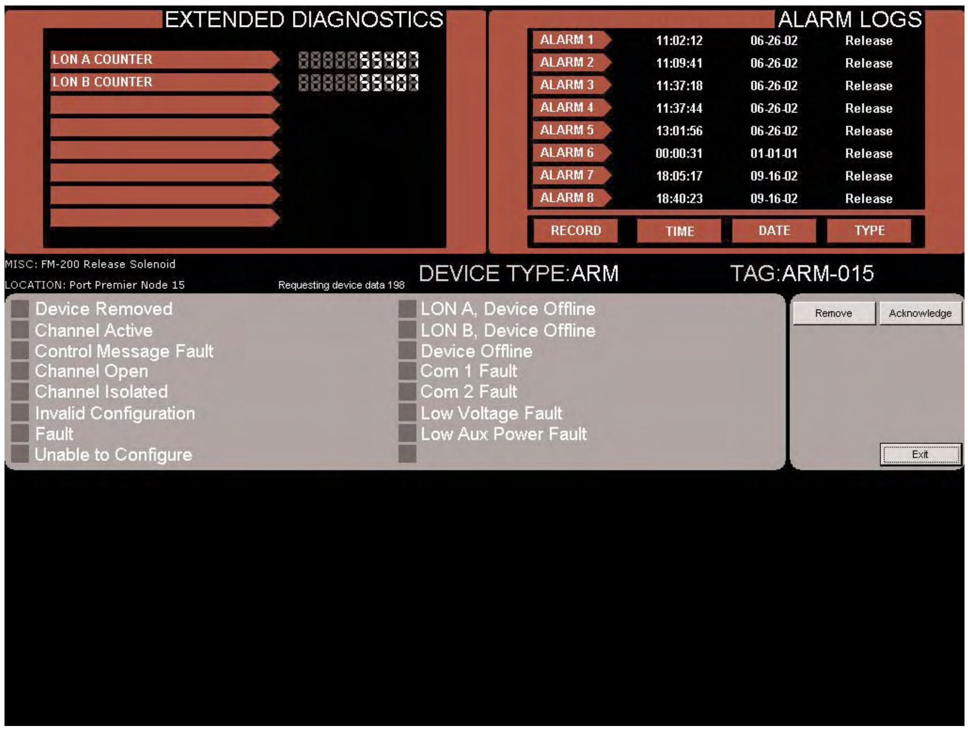
User Level: Allows user levels to be set on a variety of device features for security. Assign an appropriate user level to each item in the list. For details in user level settings refer to Chapter 9.



OK: Closes the “Agent Release Module Editor...” dialog box when finished.

Point Display: The ARM has a custom "Point Display" that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.

The point display provides a single window view of all available real-time data for the device.



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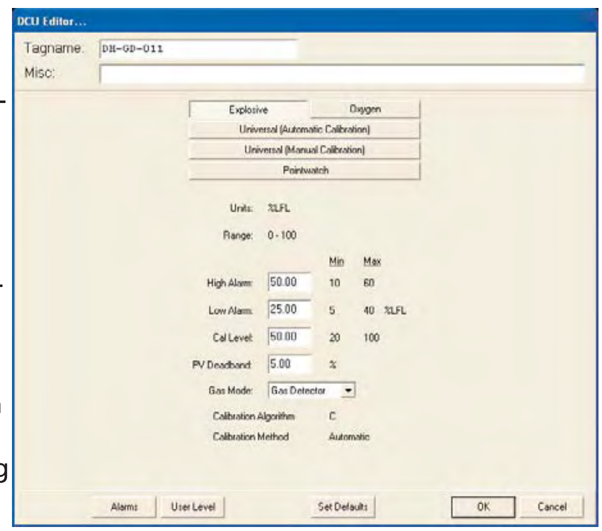
Digital Communication Unit (DCU)

For gas detectors and other analog inputs

DCU's are single channel analog input modules for the Eagle Quantum Premier LON. S^3 provides four variations of software support for DCU's, as follows:

- **Explosive:** For use with Det-Tronics catalytic bead combustible gas detectors.

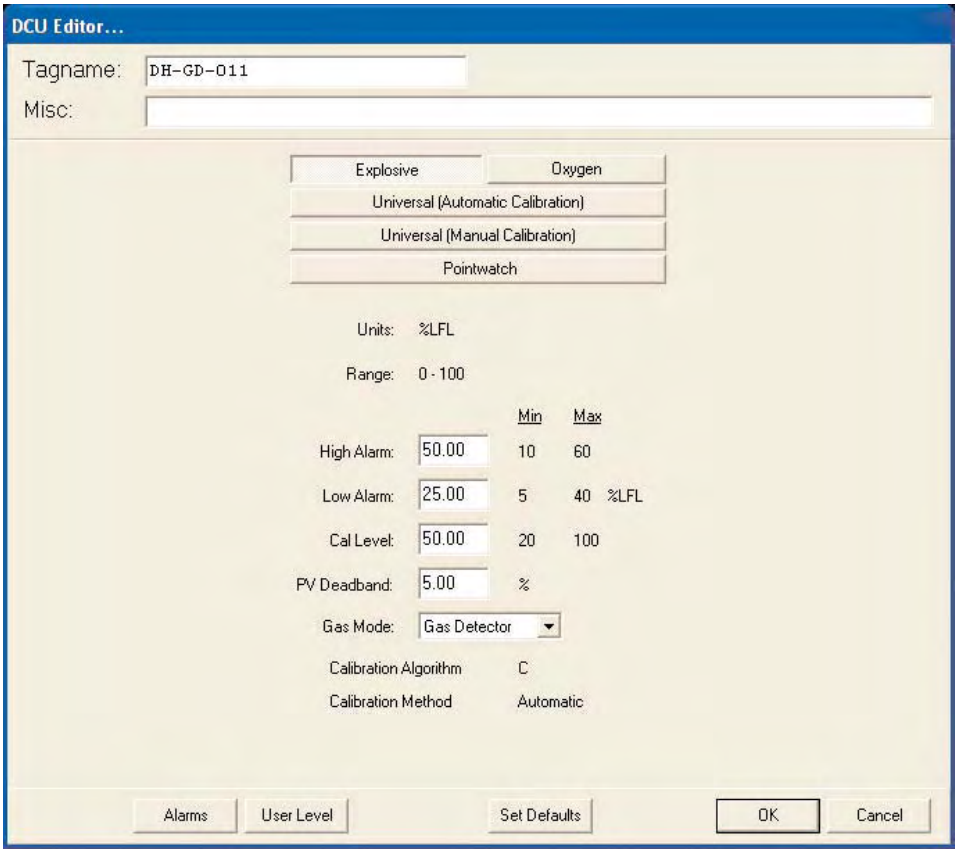


- **Oxygen:** For use with Det-Tronics electrochemical oxygen depletion cells.
- **Universal:** Used with Det-Tronics line of electrochemical cells measuring a variety of toxic gasses.

  The "Universal" DCU can also be used with any standard 4-20ma* analog input and it for allows for the entry of user assigned units and ranges.
- **DCU Pointwatch:** Used with Detector Electronics "PointWatch" U9400 series infrared point hydrocarbon detectors.

**The actual range digitized by the DCU is between 0 and 24 ma because some field devices utilize the over-range & under-range areas for diagnostic or other data.*

From a configuration standpoint, all DCU's have the same basic adjustable parameters; Alarm 1, Alarm 2, and Calibration gas concentration (Cal Level).



The DCU Universal also has a fields for entering the engineering units and unit range for the attached sensor.

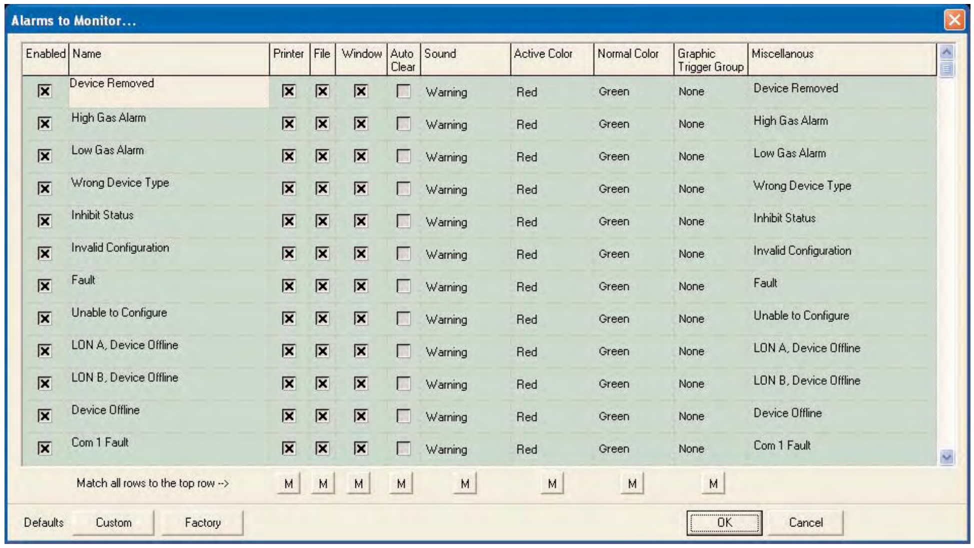
The "PV Deadband" field determines what percentage change in the Process Variable (PV) will prompt the DCU to send an immediate update to the controller instead of waiting for its regularly scheduled message time. The default is 5%.

The "Gas Mode" selection has two choices; "Gas Detector" or "Other". The default is "Gas Detector" which limits the adjustable range of the low and high alarm setpoints to be consistent with regulatory requirements.

Common Settings: The bottom of the "DCU Editor..." dialog box contains buttons for setting all of the common settings on the device.

Alarms: Selecting this button opens the "Alarms to Monitor..." dialog box. This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S³.

Completing Configuration: When all parameters have been set, select the



OK button to return to the LON configuration screen.

From the Command Bar Download the new configuration to the controller, or configure other devices.

Note:

The Download command will send all configurations. Individual nodes cannot be downloaded as is the case with earlier generations of Eagle products (i.e. EAGLE2000 & Eagle Quantum)

Point Display: The DCU has a custom "Point Display" that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.

The point display provides a single window view of all available real-time data for the device.

Note:

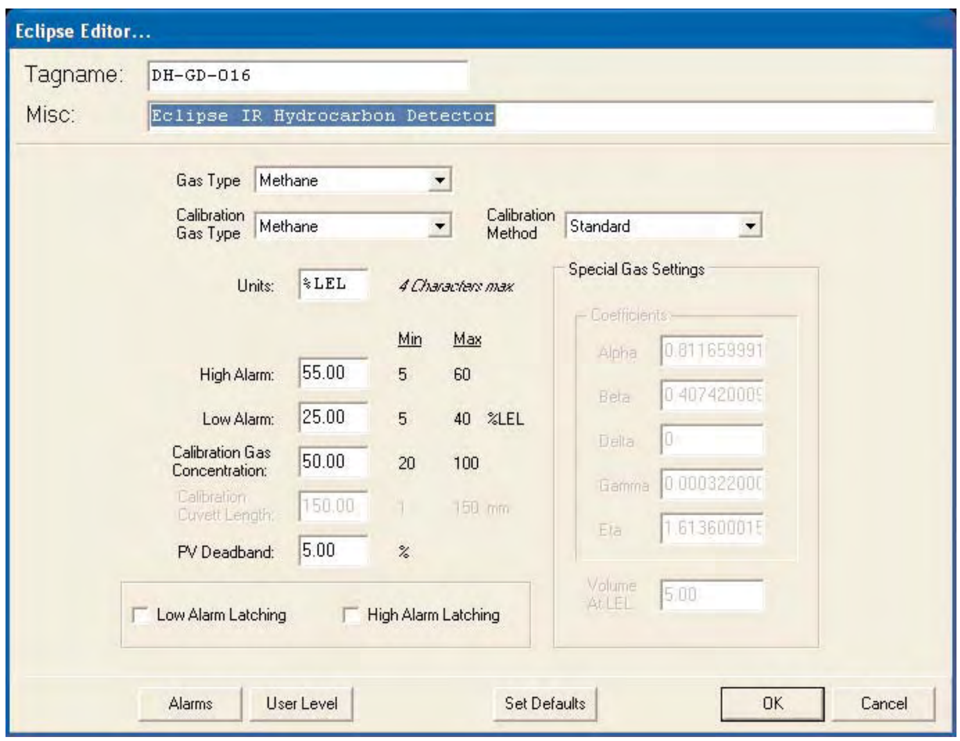
The above point display is as accessed from the configuration area. The point display in the online monitoring mode does not include the LON A & B Counters.

PIRECL

“Eclipse” Point IR Hydrocarbon Detector

The Pointwatch Eclipse Model PIRECL is a diffusion based, point-type infrared gas detector that provides continuous monitoring of combustible hydrocarbon gas concentrations in the range of 0 to 100% LEL.

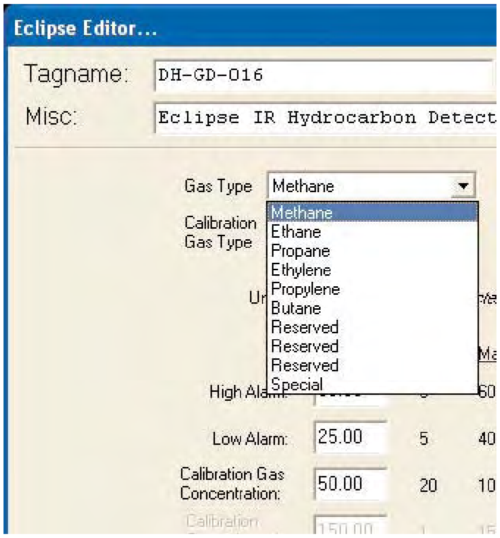
The PIRECL has integral communication hardware and resides on the EQP communication network without the need for external interface modules.



The first step in configuring the Eclipse detector is to enter the tagname and any miscellaneous text in the appropriate fields at the top of the dialog box.

Gas Type:

After entering the desired tagname and miscellaneous information, select the gas type the detector is being installed to primarily monitor from a pull-down list.

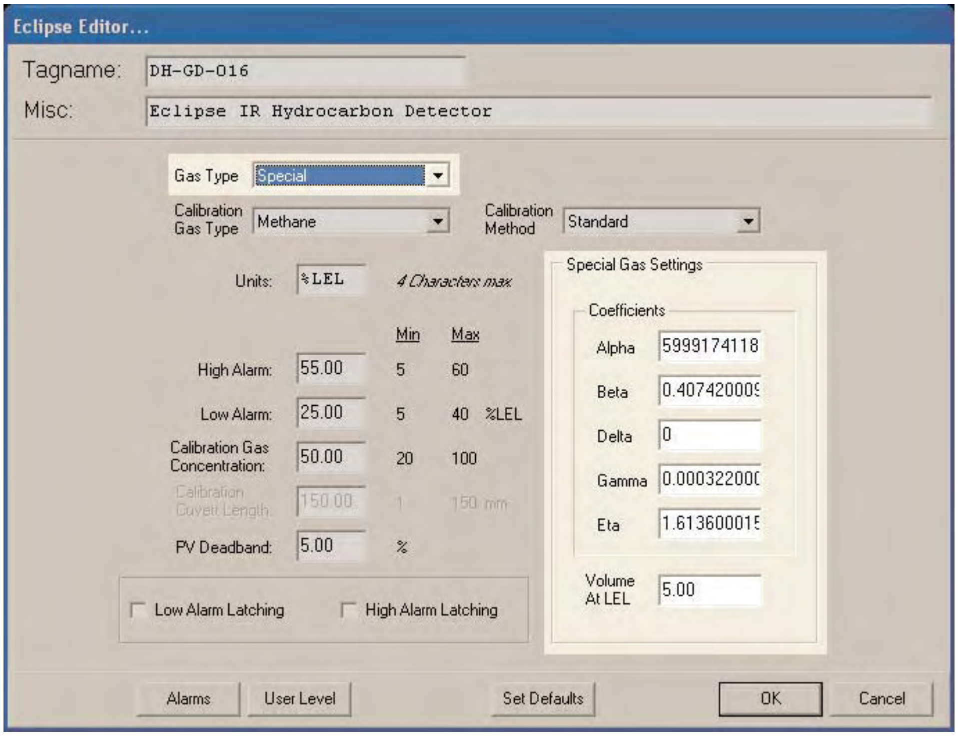


There are six common hydrocarbon gasses that have be characterized and put into the detectors memory.

There are three "Reserved" fields for future standard characterizations and one selection called "Special" which if selected allows a unique hydrocarbon gas to be defined and downloaded to the detector.

Special Gases

If "Special" is selected as the gas type, the "Special Gas Settings" area of the editor becomes active and allows for the entry of the gas coefficients necessary to define the gas.



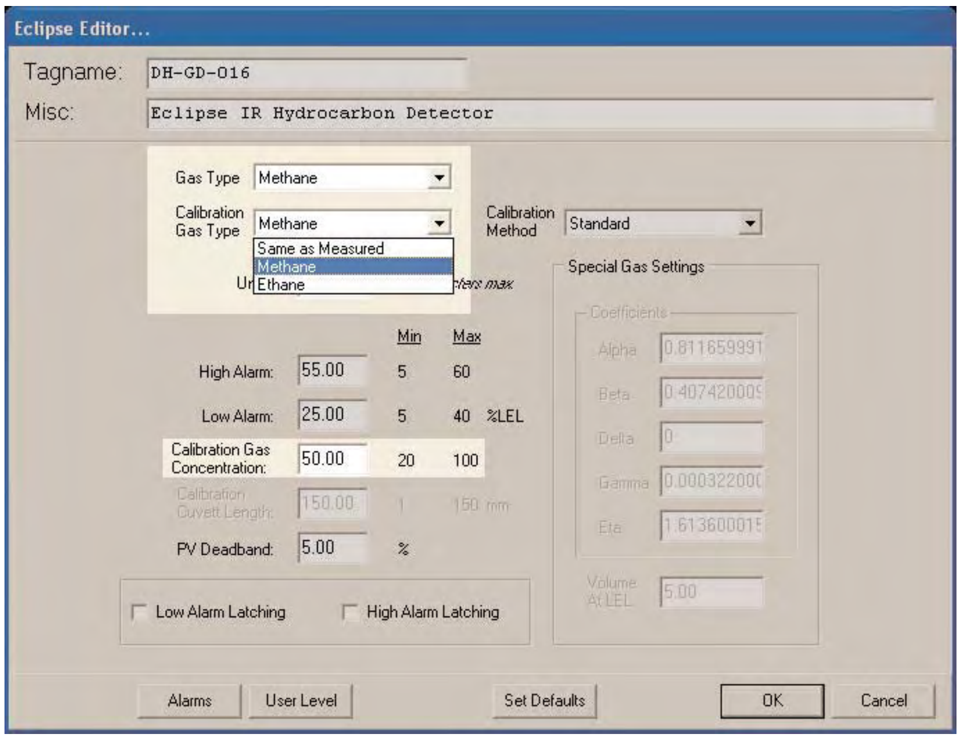
Once the gas type has been selected, a calibration gas type and method must be chosen.

Calibration Gas: Type and Concentration

Eclipse supports three selections for calibration gas type; Ethane, Methane and “same as measured”.

Typically the calibration gas type is the same as the measured gas, however, in some installations it may be preferred to use a single type of calibration gas to calibrate a number of hydrocarbon detectors even though they are not all characterized to monitor the same gas in normal operation.

Eclipse supports the use of either Methane or Ethane as a calibration gas regardless of the “Gas Type” selected for the detector. Of course, the “measured gas” can also be selected as the calibration gas type.

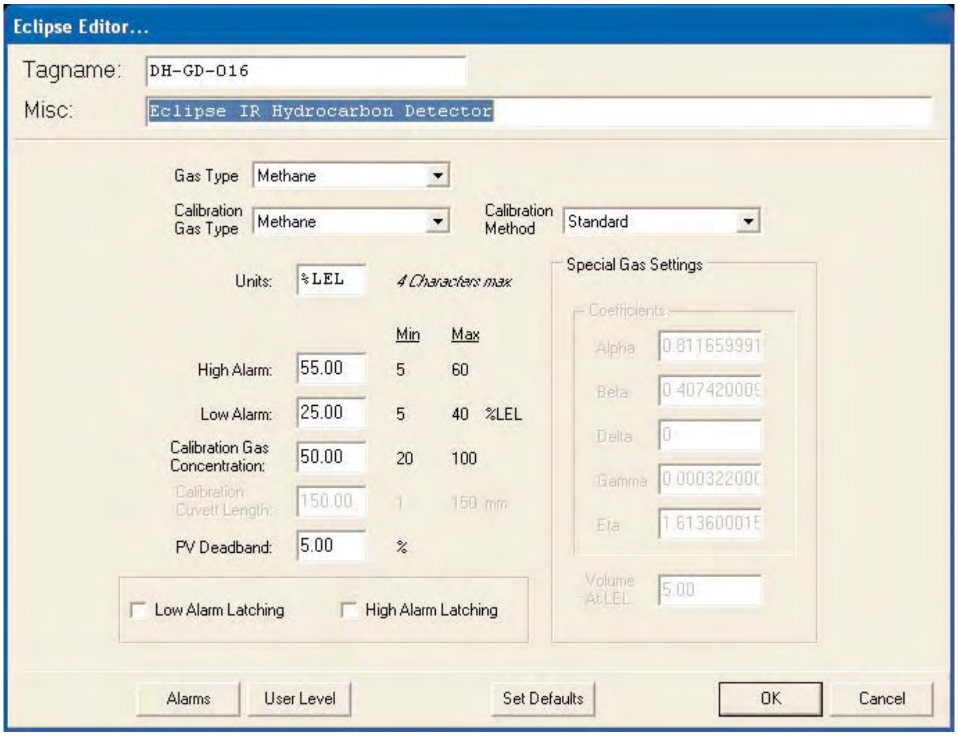


Once the calibration gas type is set, the concentration must be set.

The default value of 50%LEL can be changed between 20%LEL and 100%LEL to match the gas being used.

Alarm Setpoints:

The High and Low gas alarm setpoints can be changed by entering new values in the fields provided on the dialog box.



The default values are 50%LEL for the High Alarm and 20%LEL for the Low Alarm.

The High alarm can be adjusted within a range of 5%LEL and 60%LEL.

The Low alarm can be adjusted within a range of 5%LEL and 40%LEL.

Note:

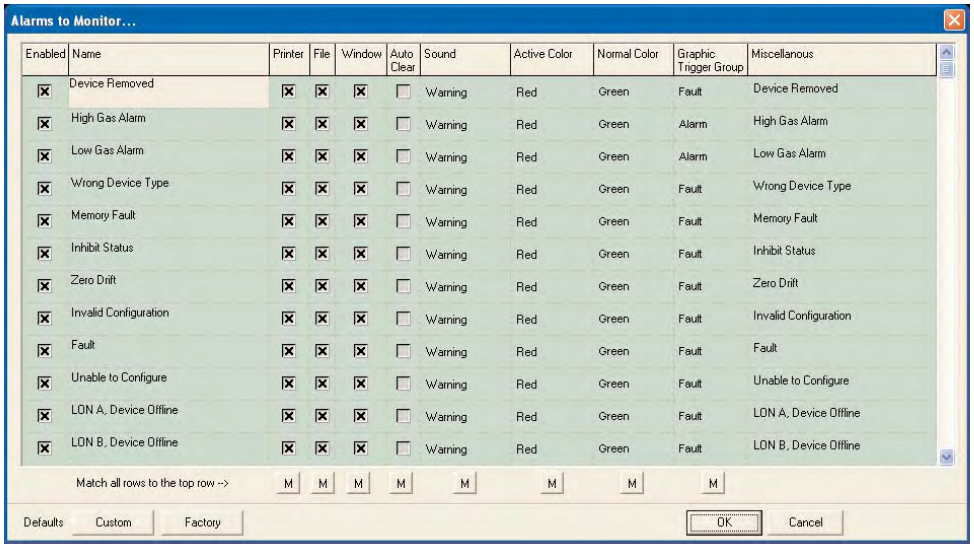
The Low Alarm setpoint cannot be set to a higher value than the High Alarm setpoint.

PV Deadband:

The “PV Deadband” field determines what percentage change in the Process Variable (PV) will prompt the unit to send an immediate update to the controller instead of waiting for its regularly scheduled message time. The default is 5%.

Common Settings: The bottom of the “Eclipse Editor...” dialog box contains buttons for setting all of the common settings on the device.

Alarms: Selecting this button opens the “Alarms to Monitor...” dialog box. This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S^3.



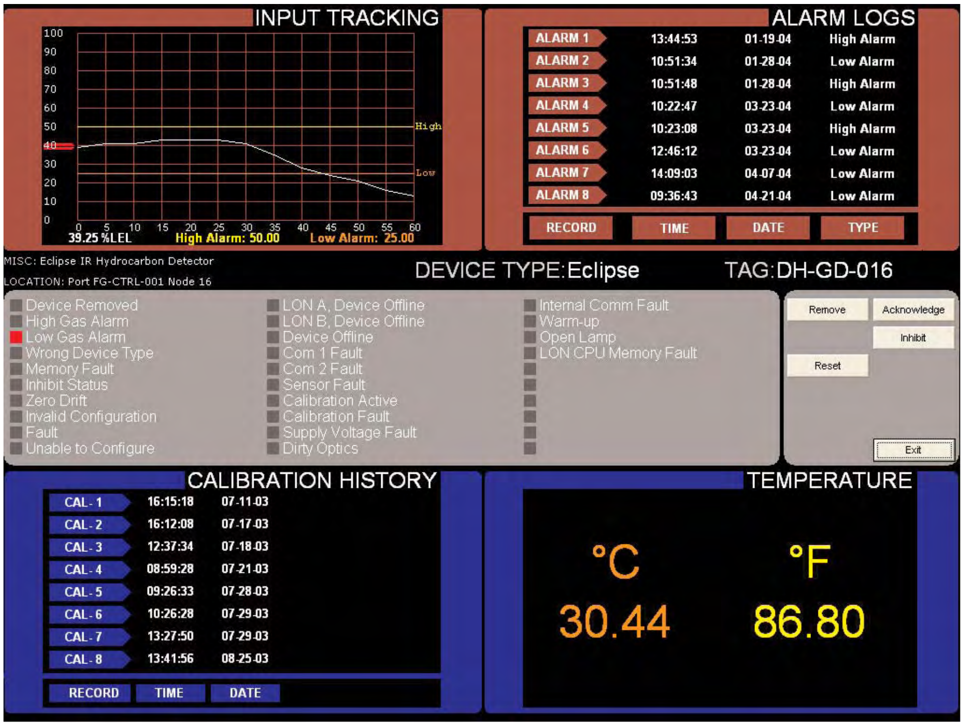
Completing Configuration: When all parameters have been set, select the OK button to return to the LON configuration screen.

From the Command Bar Download the new configuration to the controller, or configure other devices.

Note:

The Download command will send *all* *configurations. Individual nodes cannot be downloaded as is the case with earlier generations of Eagle products (i.e. EAGLE2000 & Eagle Quantum)*

Point Display: The DCU has a custom "Point Display" that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.



The point display provides a single window view of all available real-time data for the device.

Input Tracking: The upper left quadrant contains a 60 second analog track running from left to right, the newest data on the left margin. This area graphically displays the low and high alarm setpoints as horizontal lines crossing the graph area, Yellow for High and Orange for Low. Digital read-outs at the lower margin also display the PV and alarm setpoints.

Alarm History: The upper right quadrant displays the alarm history for the device. The last eight alarms with date and time are shown. This data is stored in the field device and retrieved over the LON for display.

Calibration History: The lower left quadrant displays the calibration history for the device. The last eight calibrations with date and time are shown. This data is stored in the field device and retrieved over the LON for display.

Temperature: The lower right quadrant displays the sensor package temperature.

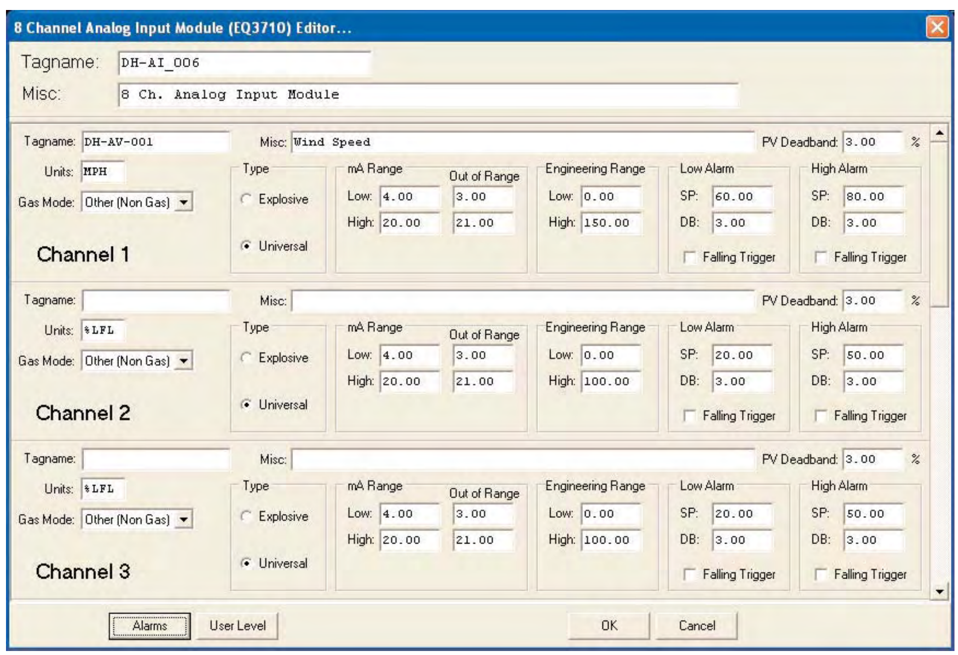
Status & Diagnostics: Crossing the whole point display in the center is an area displaying 24 discrete pieces of status and diagnostic information on the detector.

Analog Input Module (AIM)
8 channel input module for 0-24 ma signals.

AIM's are multi-channel analog modules for the Eagle Quantum Premier LON. From a configuration standpoint, each channel can be configured to be either a gas detector or a generic analog input.

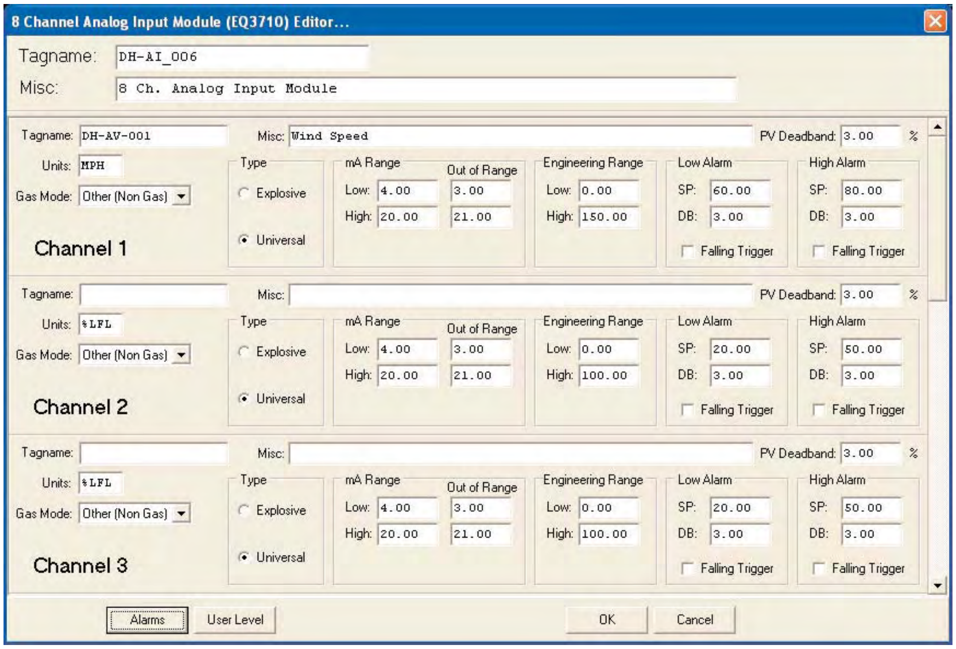
The AIM is configured by double-clicking on its selection rectangle on the LON schematic. This opens the "8 Channel AIM Editor..." which provides fields for the entry of any user changeable parameters.

Each of the eight inputs have their configuration information grouped by channel and a scroll bar is used to see them all.



Channel Configuration:

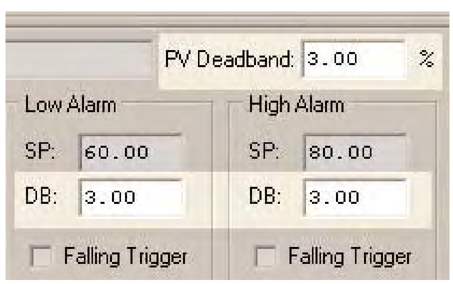
Adjustable parameters include the engineering units and range, the analog signal (ma) range, alarm setpoints, deadband adjustments for both the module and the eight individual channels, and an alarm trigger direction selection per channel.



Being a multi-channel device there are multiple tagnames. At the top of the dialog box there is a device tagname that refers to the module as a whole and is used with its global status and diagnostic events.

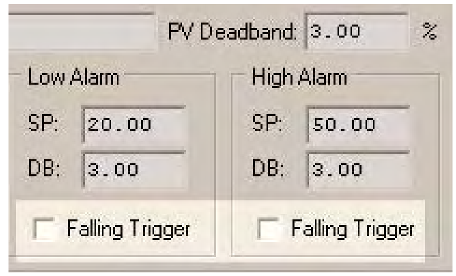
Ranges: Below this are channel tagnames and configuration fields relating to the eight individual channels. Fields are provided to enter the engineering units and ranges for both the milliamp input and engineering range.

Deadband: A field is provided to enter the desired PV (Process Variable) Deadband. Normally all values are transmitted to the controller every five seconds; If the PV changes more than the entered percentage before the five second report time arrives, an immediate message is sent with the current values.



The Alarm Setpoint areas also provide a deadband (DB) field allowing the individual alarm hysteresis to be configured.

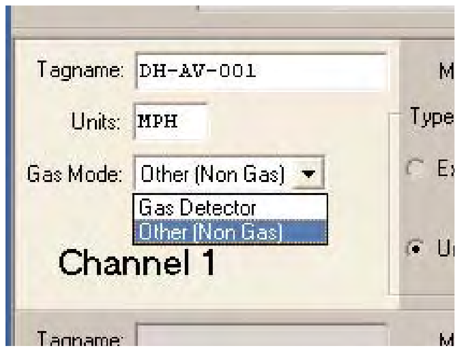
Alarm Trigger Direction: In addition, each alarm has a checkbox to choose a "Falling Trigger" alarm type.



When selected, the alarm will activate when the analog value drops below the setpoint as its value is falling.

In the default configuration, a rising value activates the alarm as it passes through the setpoint.

Gas Mode: Each channel can be configured to be used with a "Gas Detector" or "Other (Non Gas)" instrument.

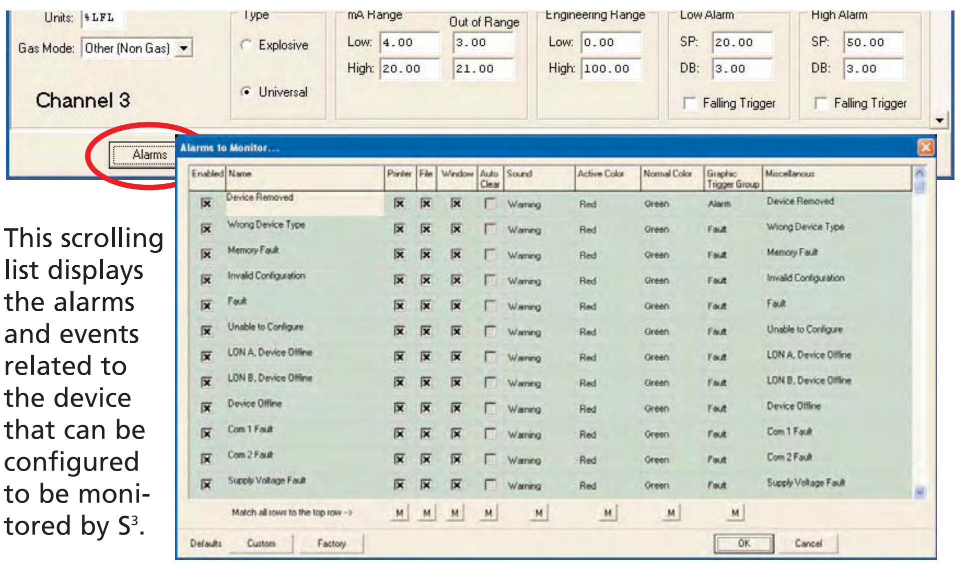


When a channel is configured as "Other" it can be used to monitor virtually any linear analog value from a wide range of temperature, pressure, level and other transmitter types.

When configured as a gas detector, regulatory requirements will preset alarm setpoint ranges and certain alarm characteristics.

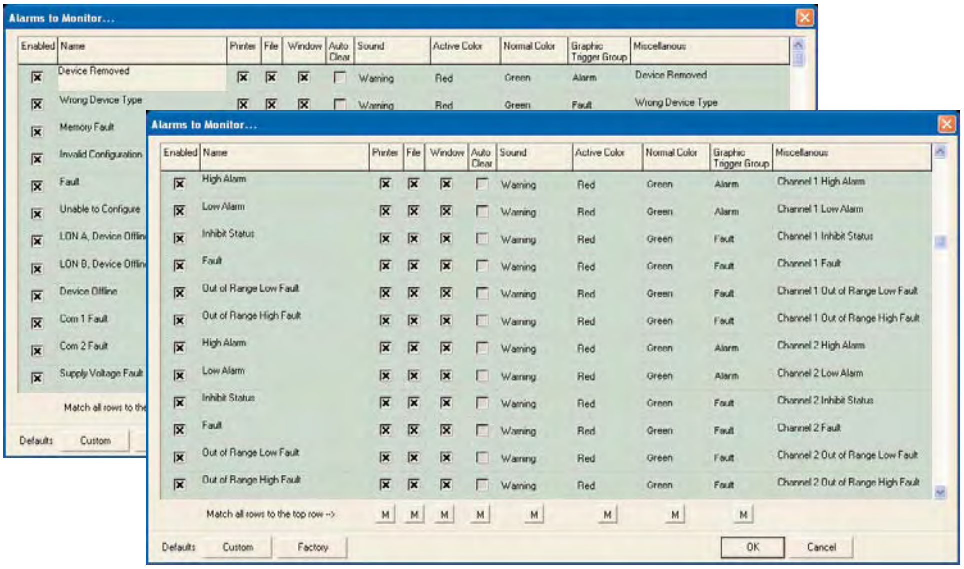
Common Settings: The bottom of the "AIM Editor..." dialog box contains buttons for setting all of the common settings on the device.

Alarms: Selecting this button opens the "Alarms to Monitor..." dialog box.



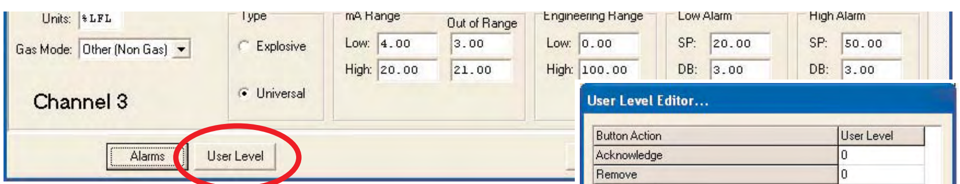
This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S³.

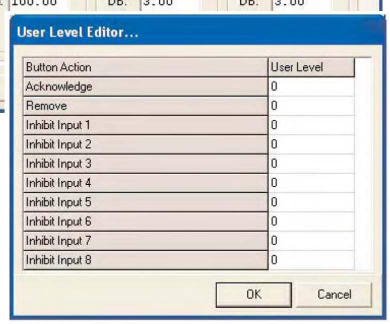
The first 12 alarms pertain to the status and diagnostic for the overall module.



After this come 6 alarms for each of the eight channels. This gives a total of 60 alarms and events that can be enabled and monitored by S^3 for this module type.

User Levels: The “User Level Editor...” provides a means for limiting access to the “Acknowledge”, “Remove”, and “Inhibit” buttons for the module which are accessible from the devices point display.



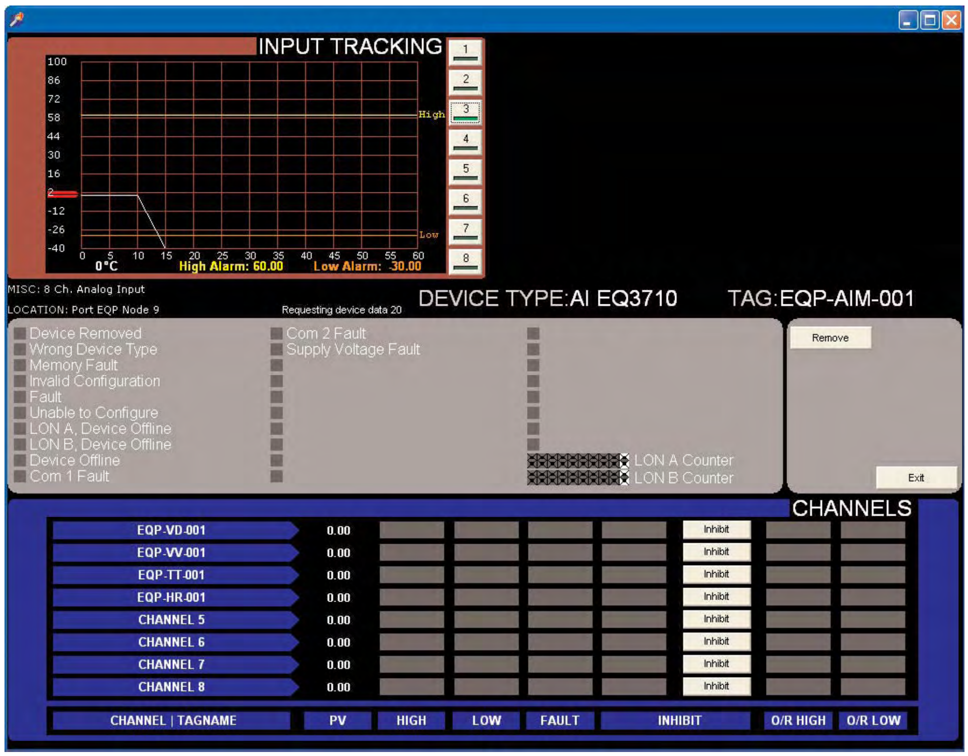


The default value is “0” and provides access to all users. Change these values to match your user account configuration and security needs.

Completing Configuration: When all parameters have been set, select the OK button to return to the LON configuration screen.

From the Command Bar Download the new configuration to the controller, or configure other devices.

Point Display: The AIM has a custom "Point Display" that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.



The point display provides a single window view of all available real-time data for the device.

Being a multichannel device, the AIM point display allows any of the 8 inputs to be connected to the analog input track in the top left quadrant by clicking on the desired channel button on the right of the graph.

The bottom half of the point display provides a data display area and annunciator for all 8 inputs. It also provides for "Inhibiting" the channels.

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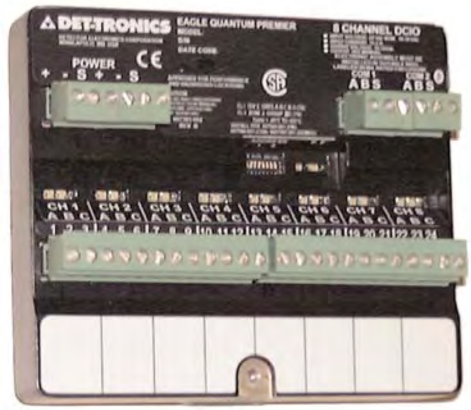


Direct Current Input Output (DCIO) Module

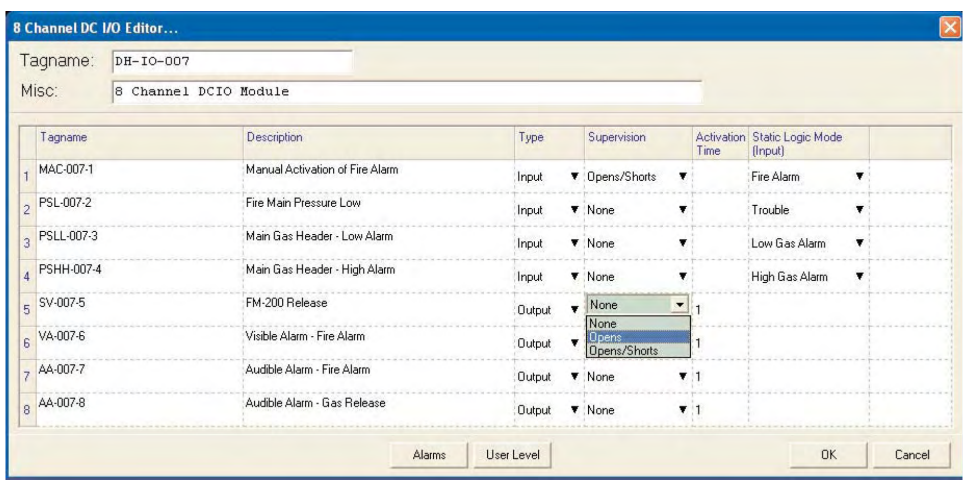
Flexible 8 channel input/output module for 24 vdc discrete field devices.

DCIO's are flexible 8 channel discrete (ON/OFF) input/output modules for the Eagle Quantum Premier LON.

From a configuration standpoint, each channel can be configured to be either an input or an output, supervised or unsupervised.

The DCIO is configured by double-clicking on its selection rectangle on the LON schematic.

This opens the "8 Channel DC I/O Editor..." which provides fields for the entry of any user changeable parameters.


8 Channel DC I/O Editor...

Tagname: DH-IO-007

Misc: 8 Channel DCIO Module

	Tagname	Description	Type	Supervision	Activation Time	Static Logic Mode (Input)
1	MAC-007-1	Manual Activation of Fire Alarm	Input	Opens/Shorts		Fire Alarm
2	PSL-007-2	Fire Main Pressure Low	Input	None		Trouble
3	PSLL-007-3	Main Gas Header - Low Alarm	Input	None		Low Gas Alarm
4	PSHH-007-4	Main Gas Header - High Alarm	Input	None		High Gas Alarm
5	SV-007-5	FM-200 Release	Output	None	1	
6	VA-007-6	Visible Alarm - Fire Alarm	Output	None / Opens / Opens/Shorts	1	
7	AA-007-7	Audible Alarm - Fire Alarm	Output	None	1	
8	AA-007-8	Audible Alarm - Gas Release	Output	None	1	

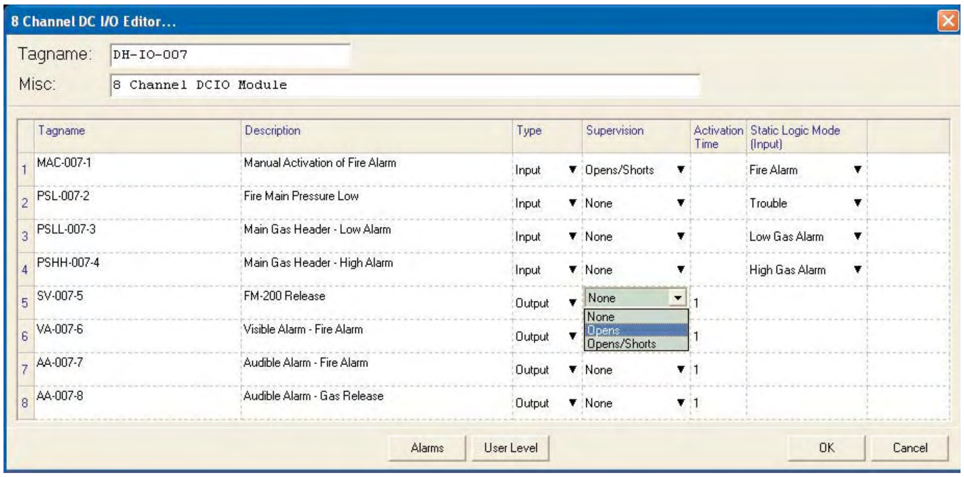
Alarms User Level OK Cancel

Being a multi-channel device there are multiple tagnames. At the top of the dialog box there is a device tagname that refers to the DCIO and is used with its global status and diagnostic events. Below this are channel tagnames for the status and diagnostics relating to the eight individual channels.

It also provides buttons for accessing other configurable items such as alarm and event tracking for the unit and user levels settings.

Tagname: The tagname at the top of the dialog box refers to the entire module.

Each of the eight channels also require a tagname and until one is entered, that channel is not available in the S³ database for programming, monitoring or dynamic graphic purposes.



Type: Using a pull down menu each channel can be configured to be either an input or an output.

When configured as an input the channels will work with "dry" contact closure type devices.

When configured as an output the channels will power a 24 vdc load.

Supervision: Via a pull down menu, the inputs and outputs may be software configured to supervise their attached device.

Available supervision options include "None", "Open Circuit" detection, "Open and Short" circuit detection.

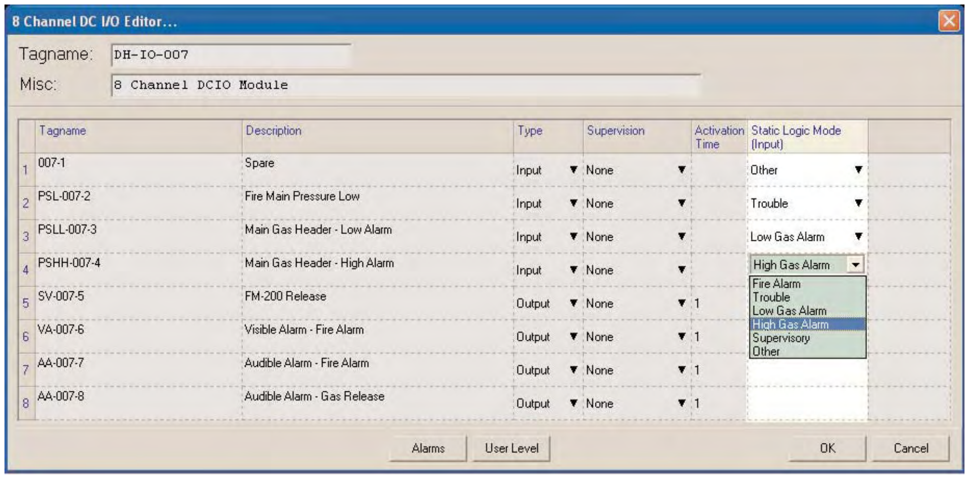
Activation Time: If a channel is configured as an output, an "Activation Time" (in seconds) can be entered.

The value is in seconds.

This feature works in conjunction with the user program to simplify the logic and protect the field device.

When being programmed in the controller, if this channel is selected as a "Timed" output then the value entered in the "Activation Time" field determines how long the output remains energized, even if the user logic keeps the output energized.

Static Logic Mode (Input): If the channel is configured as an input, a pull down menu will allow any of five different "static logic" functions to be assigned, or, to select "Other" which is the default and has no automatic function.



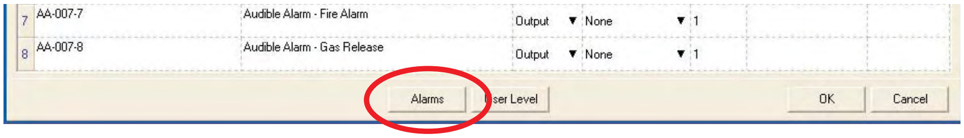
The five static logic functions are:

- **Fire Alarm:** Sets off the "Fire Alarm" LED and relay* on the EQP controller.
- **Trouble:** Sets off the "Trouble" LED and relay* on the EQP controller.
- **Low Gas Alarm:** Sets off the "Low Gas" LED and relay* on the EQP controller.
- **High Gas Alarm:** Sets off the "High Gas" LED and relay* on the EQP controller.
- **Supervisory:** Sets off the "Supr" LED and relay* on the EQP controller.

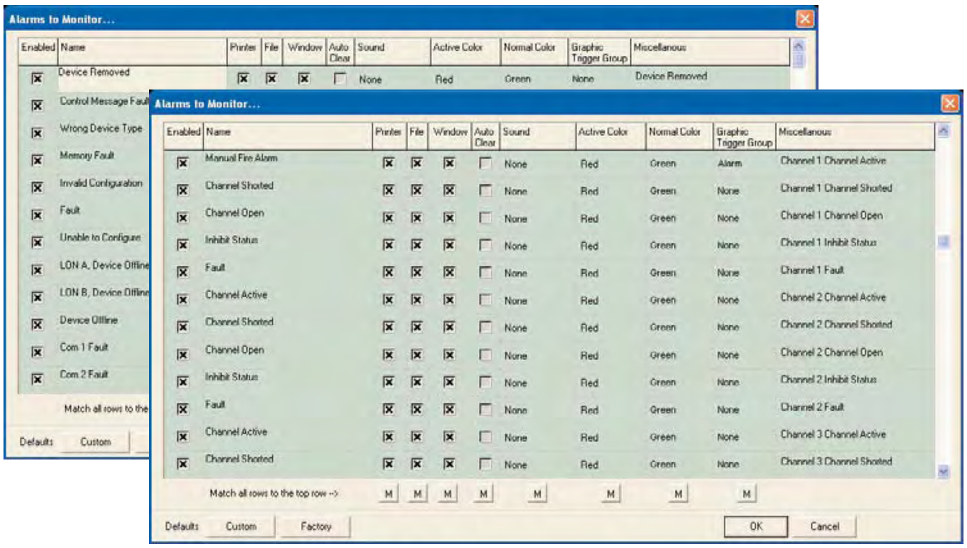
If a static logic function has been selected for an input, when the input is active that action will occur automatically without the need for any user programmed logic.

If the input is to be used with user programmed logic only, select "Other".

Alarms: Selecting this button opens the "Alarms to Monitor..." dialog box. This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S[3].

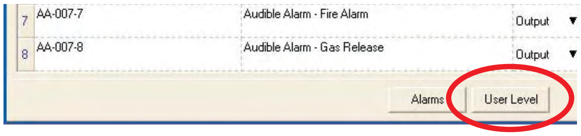


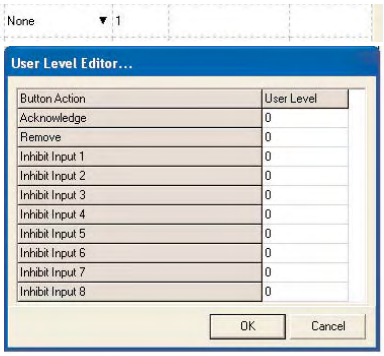
The first 13 alarms pertain to the status and diagnostic for the overall module.



After this come 5 alarms for each of the eight channels. This gives a total of 53 alarms and events that can be enabled and monitored by S[3] for this module type.

User Levels: The "User Level Editor..." provides a means for limiting access to the "Acknowledge", "Remove", and "Inhibit" buttons for the module which are accessible from the devices point display.



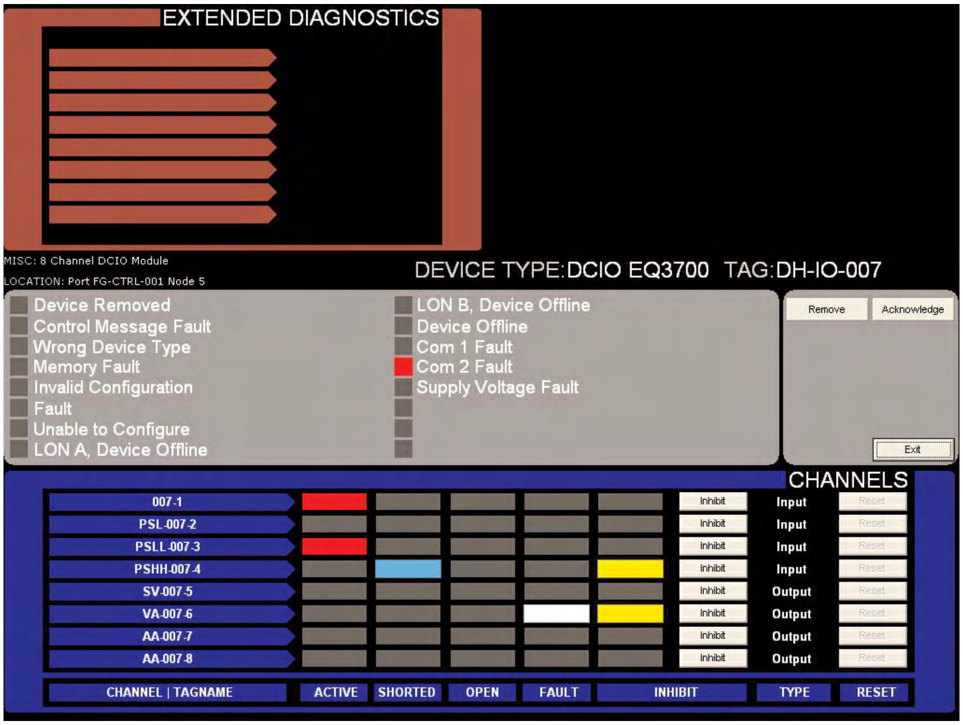


The default value is "0" and provides access to all users. Change these values to match your user account configuration and security needs.

Completing Configuration: When all parameters have been set, select the OK button to return to the LON configuration screen.

From the Command Bar Download the new configuration to the controller, or configure other devices.

Point Display: The DCIO has a custom "Point Display" that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.



The point display provides a single window view of all available real-time data for the device.

The bottom half of the point display provides a data display area and annunciator for all 8 inputs. It also provides for "Inhibiting" the channels.

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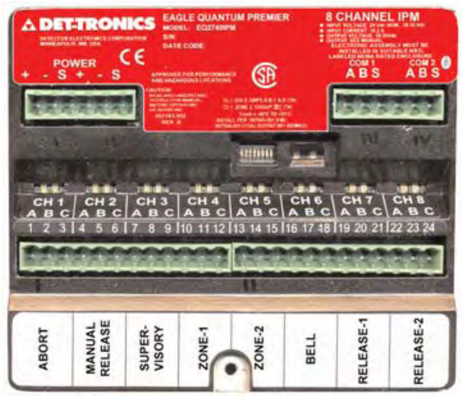


Intelligent Protection Module (IPM)

8 channel input/output module for 24 vdc discrete field devices.

Description: The Intelligent Protection Module (IPM) is a part of the Det-Tronics Eagle Quantum Premier (EQP) System that is specially designed to monitor, supervise and control one fire suppression hazard.

The IPM is designed to provide continuous and automated local area fire protection, while monitoring system operation through continuous supervision of its Inputs/Outputs and Local Operating Network/Signalling Line Circuit (LON/SLC) connection to the EQP controller.

In addition the module contains a unique “embedded logic program” that if enabled during configuration allows the IPM to perform local area protection in a “back-up mode” without controller interaction. The IPM utilizes eight pre-configured Input/Output (I/O) channels to perform its monitoring, supervision and mitigation functions.

Inputs: On the input side, three supervised channels provide the following connections:

- Channel 1 for an Abort station
- Channel 2 for a Manual Release station
- Channel 3 for a Supervisory device.

Two additional input channels (zones) provide connections for “two-wire” conventional (non-relay based) smoke and heat detectors.

- Channel 4: Zone 1 detection circuit
- Channel 5: Zone 2 detection circuit

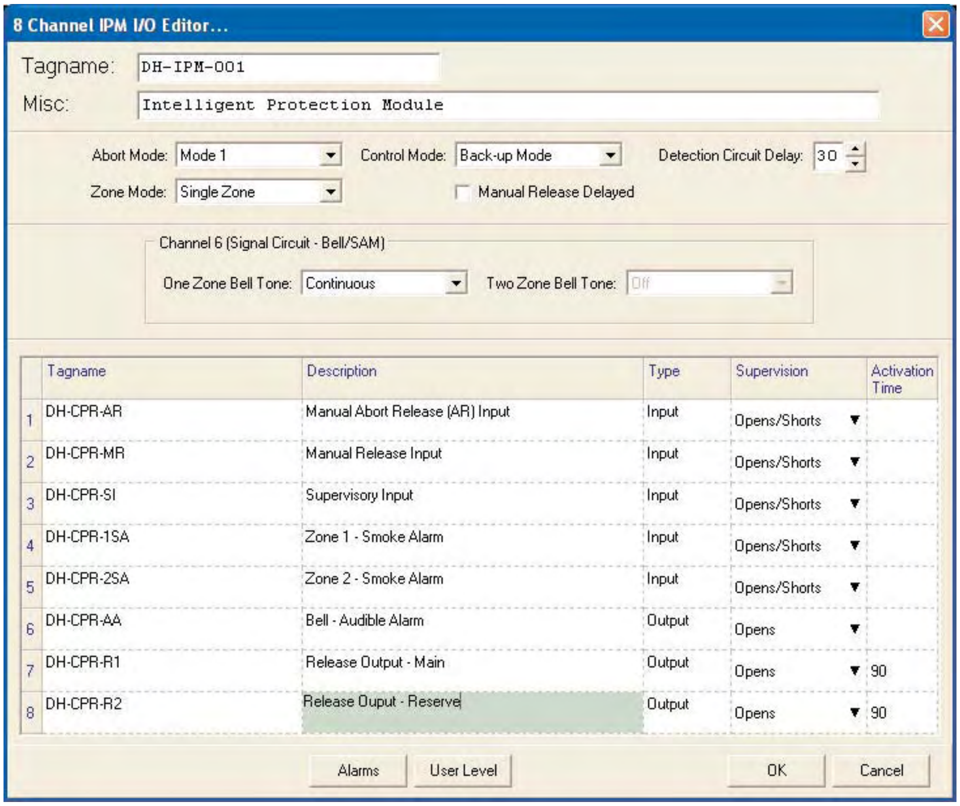
Outputs: On the output side, three supervised outputs (1 signaling, 2 releasing) provide the following connections:

- Channel 6 for a notification appliance such as a bell,horn or lamp.
- Channels 7 & 8 for a main and reserve or secondary agent release.

CONFIGURATION

Tagname: The tagname at the top of the dialog box refers to the entire module.

Each of the eight channels also require a tagname and until one is entered, that channel is not available in the S[3] database for programming, monitoring or dynamic graphic purposes.



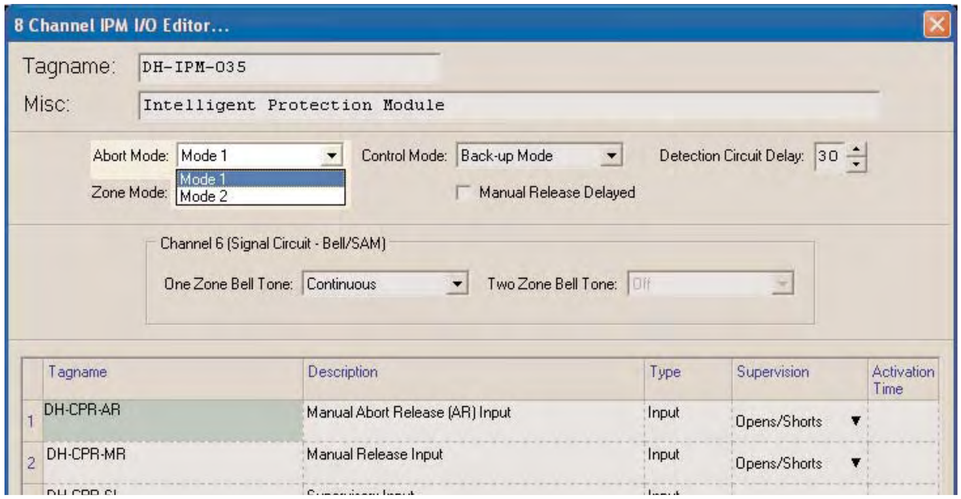
Type: On the IPM the channel type is preset and not user changeable.

Supervision: Via a pull down menu, the inputs and outputs may be software configured to supervise their attached device. Available supervision options include “None”, “Open Circuit” detection, “Open and Short” circuit detection.

Activation Time: If a channel is configured as an output, an “Activation Time” (in seconds) can be entered. The value is in seconds. This feature works in conjunction with the user program to simplify the logic and protect the field device.

When being programmed in the controller, if this channel is selected as a “Timed” output then the value entered in the “Activation Time” field determines how long the output remains energized, even if the user logic keeps the output energized.

Abort Mode: The IPM abort input, Channel 1, is software configurable to use any one of three modes of operation. These three modes operate as follows:



Mode 1: Upon activation, the delay timer will count down to and hold at 10 seconds; upon release, timer will continue to count down to zero.

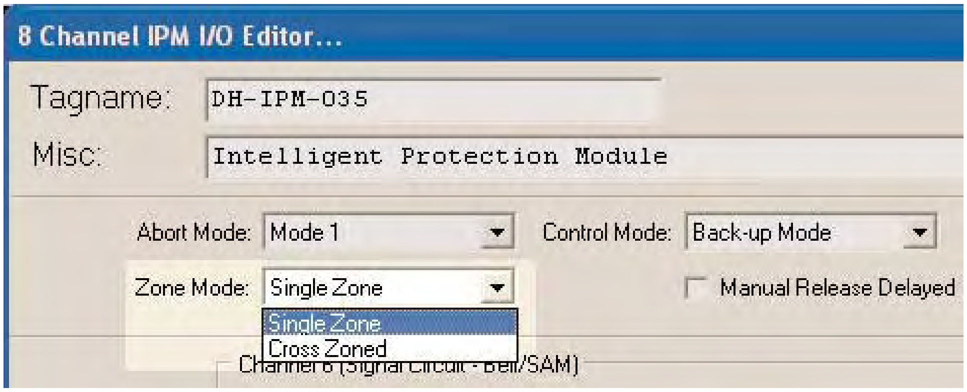
Only this mode complies with UL 864.

Mode 2: Upon activation the delay timer will reset to its initial value and on release will continue counting down to zero.

IRI Mode: Functions similar to "Mode 1" except the abort will only function if activated prior to a second alarm.

Zone Modes:

The IPM has two “zone modes”; Single or Cross Zoned. The backup logic will execute differently depending on the zone mode selected.



- **Alarm Condition**

  Single Zone Mode: Upon receipt of an alarm from an activated detector on IPM channel 4 or 5 OR activation of the manual station, channel 2:

  Signal circuit devices are activated per the software selected signaling circuit configuration described earlier – Bell Circuit (SAM) Channel 6

  Programmed release time delay activated.

  Release output(s) activated.

  Operation of Abort: Discharge is aborted ONLY when alarm is from a detector, and abort is activated during programmed release time delay. Abort sequence is dependent on the abort mode selection as described earlier.

  Cross Zoned Mode: Upon receipt of an alarm from one activated detector in one zone.

  Signal circuit devices are activated per the software selected signaling circuit configuration, two zone mode, one zone in alarm, as described earlier – Bell Circuit (SAM) Channel 6.

  Second Alarm Condition: Upon receipt of an alarm from a second activated detector in the other zone.

  Signal circuit devices are activated per the software selected signaling circuit configuration, two zone mode, two zones in alarm.

  Programmed release time delay activated.

  Release output(s) activated.

- **Manual Alarm Condition – Cross Zoned Mode:**

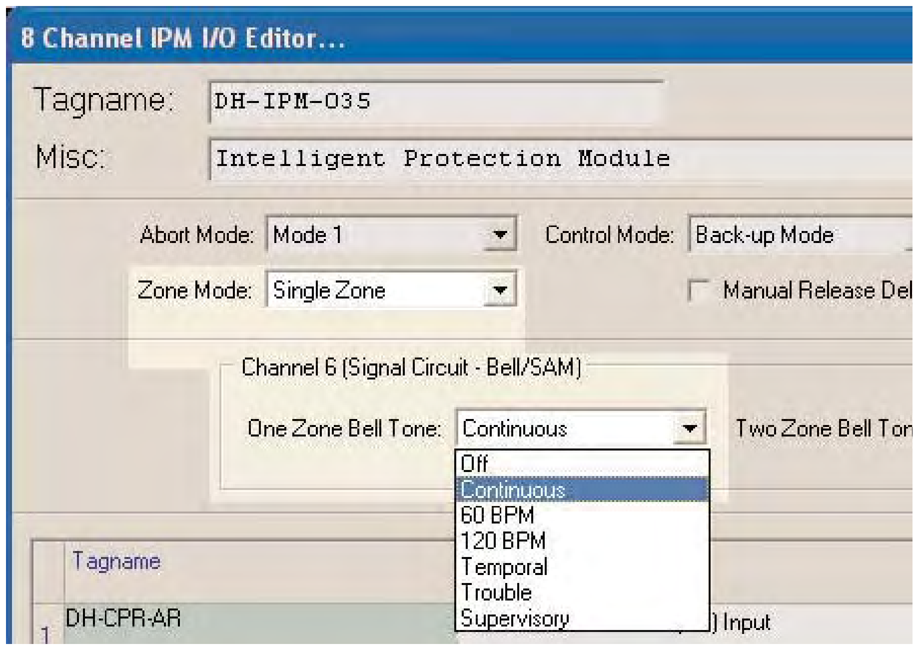
  Upon receipt of a manual alarm from Channel 2 the signal circuit devices are activated per the software selected signaling circuit configuration, two zone mode, two zones in alarm

  Programmed release time delay activated.

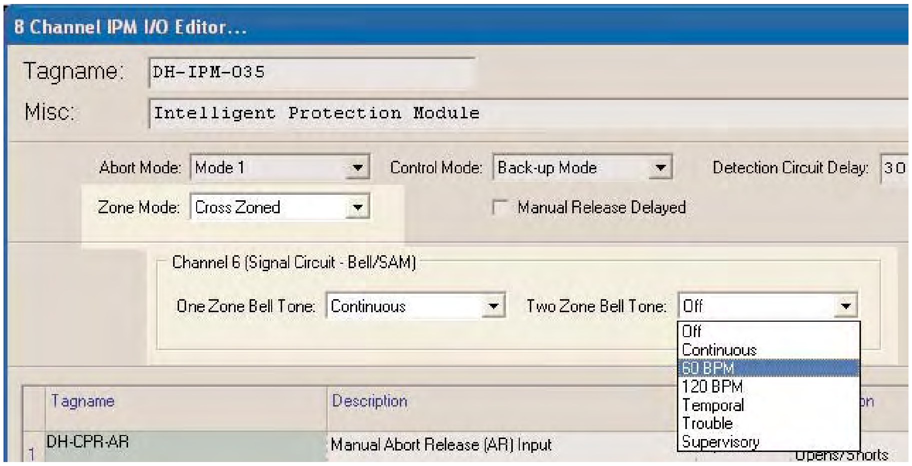
  Release output(s) activated.

- **Signaling Circuit Operation** – Bell Circuit (SAM), Channel 6: This output channel can be software selected to any standard EQP Signal Audible Module (SAM) configuration. In a cross-zoned mode, selections are limited as follows:

  Single Zone Mode: The signaling circuit can be configured to any standard SAM selection.



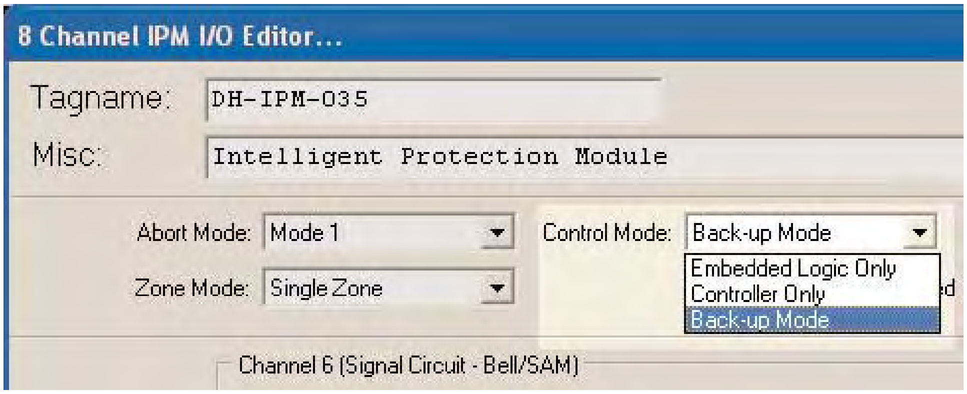
Signal Circuit in Cross Zoned Mode: In this mode the user must make two selections.



A standard SAM selection for when a single detection circuit is in alarm and another selection for when both detection circuits are in alarm.

control Mode

The IPM has 3 operation modes, Controller Only, Back-up Mode, Embedded Only.

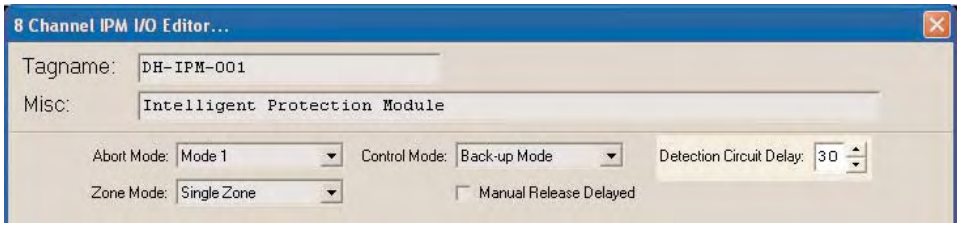


- **Controller Only:** In this mode the I/O of the IPM will be controlled from the EQP Controller only and embedded logic is inactive.
- **Back-up Mode:** (The default selection) the IPM I/O is normally controlled by the EQP Controller but utilizes embedded logic in accordance with the “Control Transfer Sequence Description” to control its I/O under certain circumstances.
- **Embedded Only:** In this mode the IPM continuously operates from its embedded logic. The status of all IPM I/O is available to the EQP Controller but control of the outputs are not; however, controller and S³ reset commands are accepted.

Detection Circuit Delay Selection:

This selection provides a time delay that will apply to the two detector circuits, (Channels 4 and 5) as well as to the manual release signal (Channel 2).

There are seven time delay selections running between 0 and 60 seconds in ten second increments as shown below:



0 Second

10Seconds

20Seconds

30Seconds

40Seconds

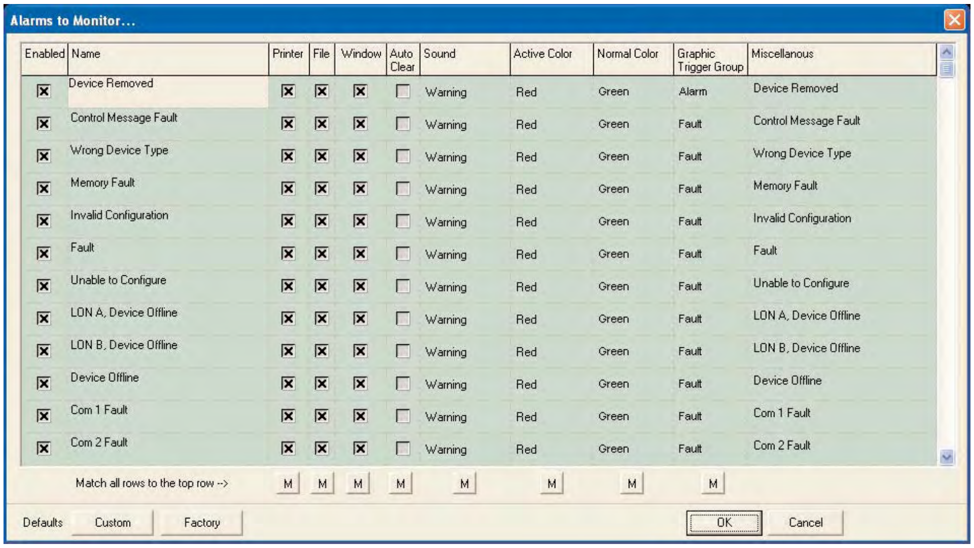
50Seconds

60Seconds

If the time delay selected is greater than 30 seconds, this time will apply only to the two detection circuits. The manual release time delay will be clamped at 30 seconds.

Alarms: Selecting this button opens the “Alarms to Monitor...” dialog box. This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S³.

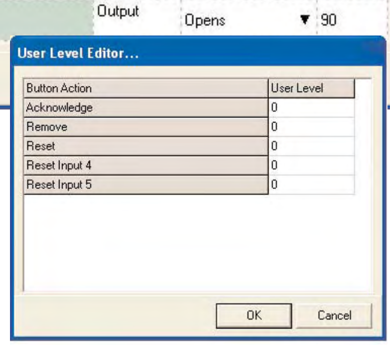
The first 14 alarms pertain to the status and diagnostic for the overall module.



After this come 4 alarms for each of the eight channels.

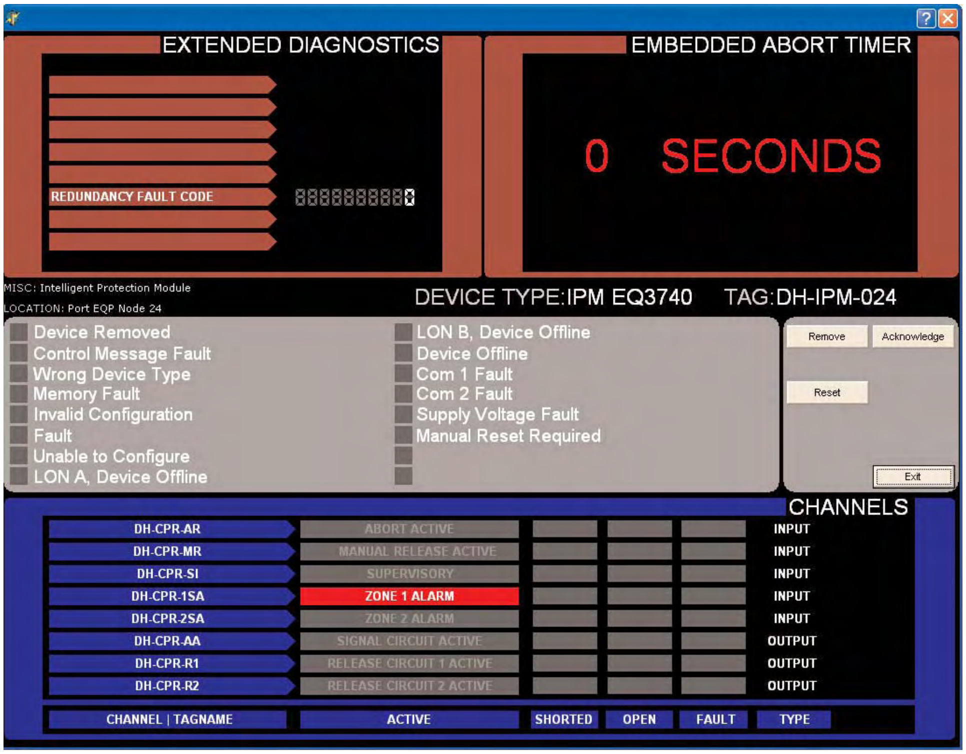
This gives a total of 46 alarms and events that can be enabled and monitored by S³ for this module type.

User Levels: The “User Level Editor...” provides a means for limiting access to the “Acknowledge”, “Remove”, Module and Channel “Reset” buttons for the module which are accessible from the devices point display.



The default value is “0” and provides access to all users. Change these values to match your user account configuration and security needs.

Point Display: The IPM has a custom "Point Display" that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.



The point display provides a single window view of all available real-time data for the device.

The bottom half of the point display provides a data display area and annunciator for all 8 inputs and outputs.

Reset Button: The reset button on the IPM point display will reset the module. Part of this reset includes automatically cycling power to the two smoke detector zones (channels 4 & 5) to reset these latching devices.

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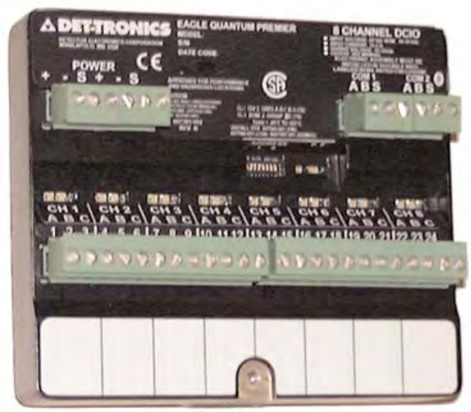


Relay Module

8 channel relay module

Description: The 8 Channel Relay Module consists of eight individually configured output channels. Each output channel drives a Form-C relay.

NOTE

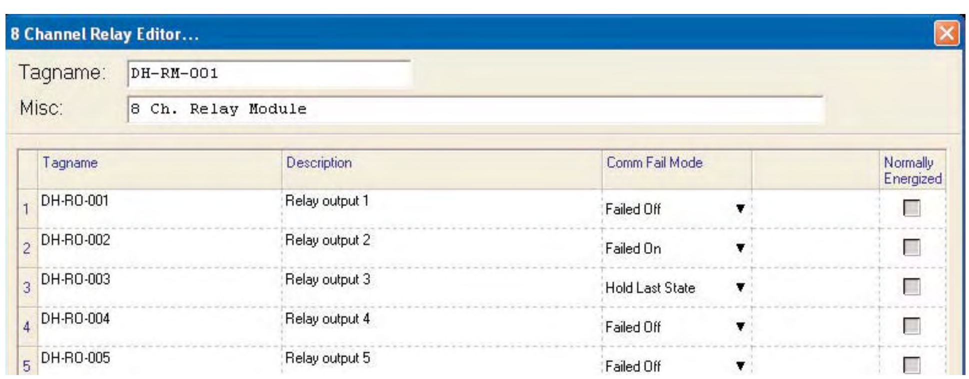
The relay module only supports equipment that operates on 24 vdc/vac (not to exceed 2amperes) at each output channel.

The relay module has two LEDs for the device and two LEDs for each channel.

On the device level, one green LED indicates power, while the other amber LED indicates a LON communication fault.

For each channel, one red LED indicates channel activation and the other amber LED indicates a fault condition.

Tagname: The tagname at the top of the dialog box refers to the entire module.


8 Channel Relay Editor...

Tagname: DH-RM-001

Misc: 8 Ch. Relay Module

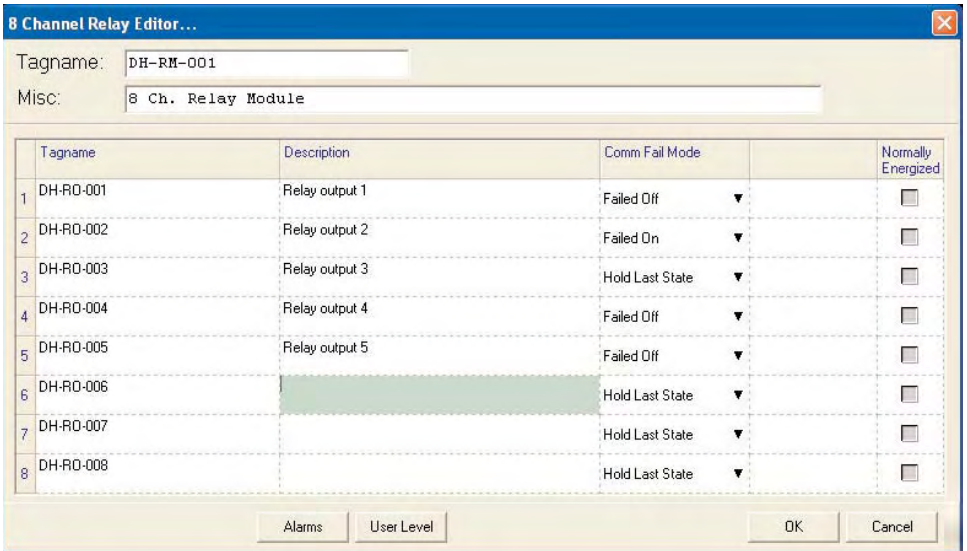
	Tagname	Description	Comm Fail Mode	Normally Energized
1	DH-RO-001	Relay output 1	Failed Off	☐
2	DH-RO-002	Relay output 2	Failed On	☐
3	DH-RO-003	Relay output 3	Hold Last State	☐
4	DH-RO-004	Relay output 4	Failed Off	☐
5	DH-RO-005	Relay output 5	Failed Off	☐

Each of the eight channels also require a tagname and until one is entered, that channel is not available in the S^3 database for programming, monitoring or dynamic graphic purposes.

Description: This field provides an area to describe the function of each relay.

Adding this optional information can make troubleshooting and startup easier.

Com Fail Mode: Each of the 8 relays can be individually configured to respond in one of three ways in the unlikely event of a complete loss of communications with the EQP controller.



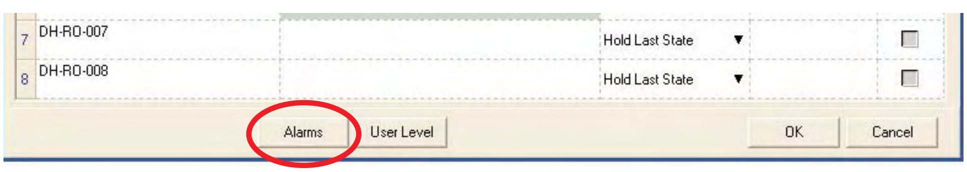
The three selections are as follows:

Failed Off: Relay coil de-energizes

Failed On: Relay coil energizes

Hold Last State: Relay coil stays energized or de-energized as per its last valid command from the EQP controller.

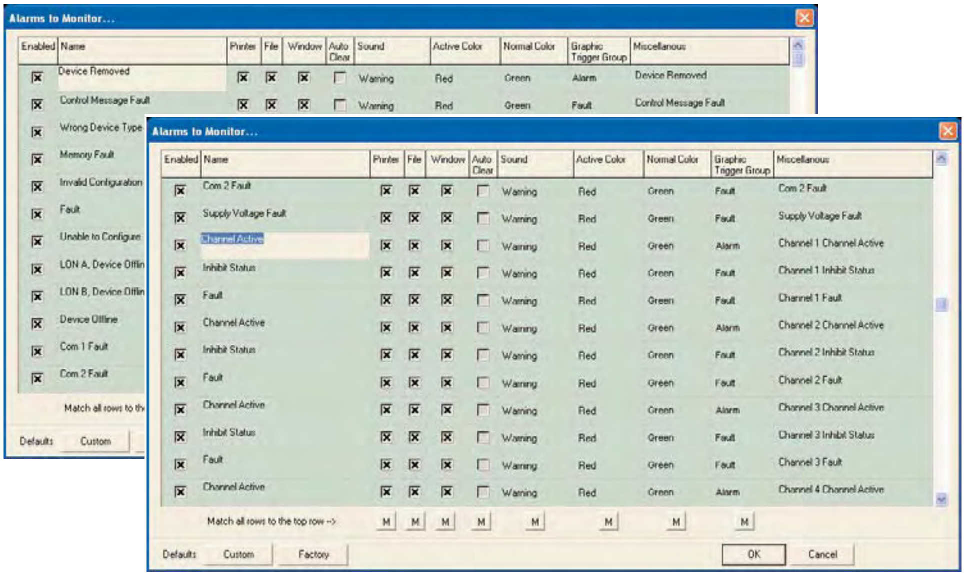
Alarms: Selecting this button opens the “Alarms to Monitor...” dialog box.



This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S^3.

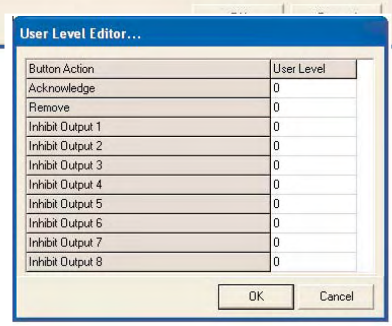
The first 13 alarms pertain to the status and diagnostic for the overall module.

After this come 3 alarms for each of the eight channels. This gives a total of 37 alarms and events that can be enabled and monitored by S³ for this module type.

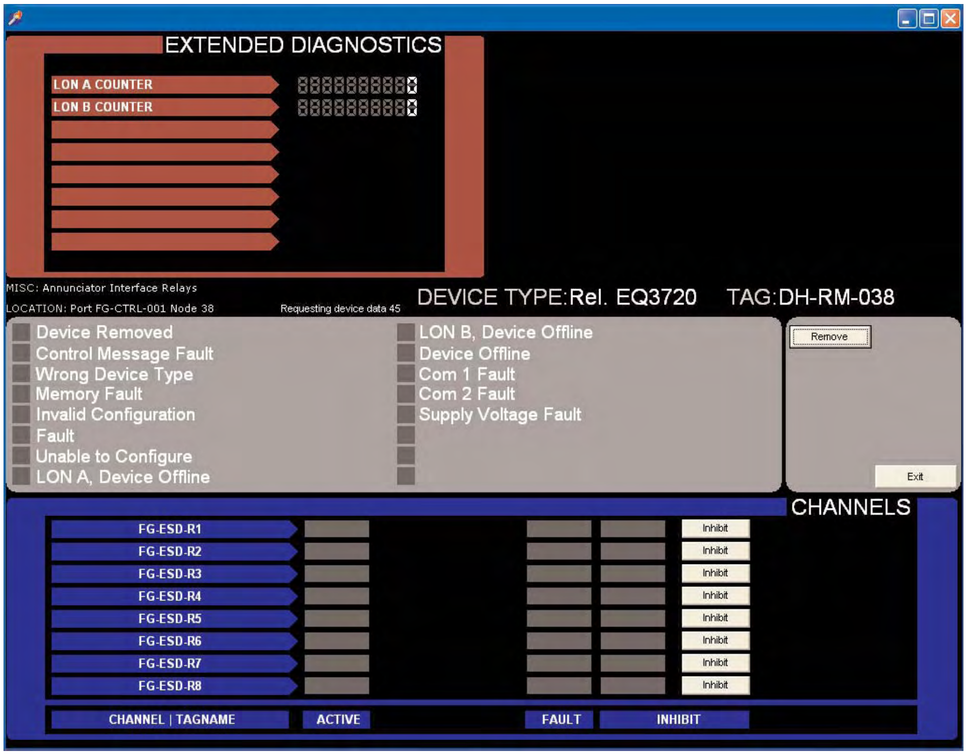


User Levels: The "User Level Editor..." provides a means for limiting access to the "Acknowledge", "Remove", and "Inhibit" buttons for the module which are accessible from the devices point display.

The default value is "0" and provides access to all users. Change these values to match your user account configuration and security needs.



Point Display: The IPM has a custom "Point Display" that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.



The point display provides a single window view of all available real-time data for the device.

The bottom half of the point display provides a data display area and annunciator for all 8 relay outputs.

Inhibit Buttons: Each relay output has an inhibit button that can be used to disable that channel from responding to commands from the user logic program in the EQP controller.

IDC

2 channel Initiating Device Circuit (IDC) module

Description: The EQ22xxIDC Series Initiating Device Circuit (IDC) module is located on the LON/SLC and provides supervised input capability for the Eagle Quantum Premier system.

There are three 2 Channel EQ22xxIDC Series Initiating Device Circuit (IDC) modules available:

The EQ22xxIDC allows discrete inputs from smoke/heat detectors, manual call stations or other contact devices.

It accepts two dry contact inputs for use with devices such as relays, push-buttons, key switches, etc.

The IDC supports ANSI/NFPA 72 Class B, Style B supervised input circuits.

Each circuit requires its own end of line (EOL) resistor for monitoring circuit continuity.

The EQ22xxIDCGF Initiating Device Circuit Ground Fault Monitor (IDCGF) responds to the presence of a ground fault within the power circuitry of the system.

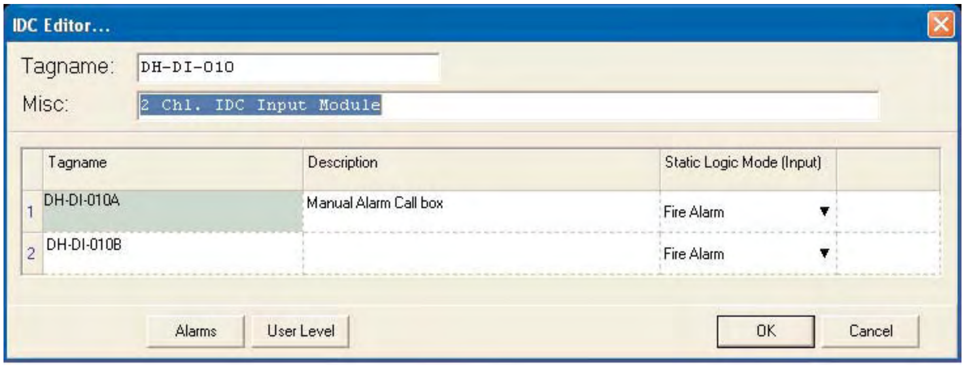
It provides an unsupervised dry contact input and ground fault monitoring circuitry for indicating a power supply trouble condition.

It is intended for use with a third party power supply.

The EQ22xxIDCSC Initiating Device Circuit Short Circuit (IDCSC) is similar to the IDC, but supports ANSI/NFPA 72 Class B Style C supervised input circuits. (Not FM Approved.)

Tagname: The tagname at the top of the dialog box refers to the entire module.

Each of the two input¨t channels also require a tagname and until one is entered, that channel is not available in the S^3 database for programming, monitoring or dynamic graphic purposes.



Configuration: Enter the Tagname for the module, a miscellaneous description and then the tagnames and descriptions for the two input channels.

Until tagnames are assigned to the two input channels they are not available in the S3 database for programming in the user logic.

Static Logic Mode (Input): Each of the two inputs has a pull down menu that allows one of five different "static logic" functions to be assigned, or, to select "Other" which is the default and has no automatic function.

The five static logic functions are:

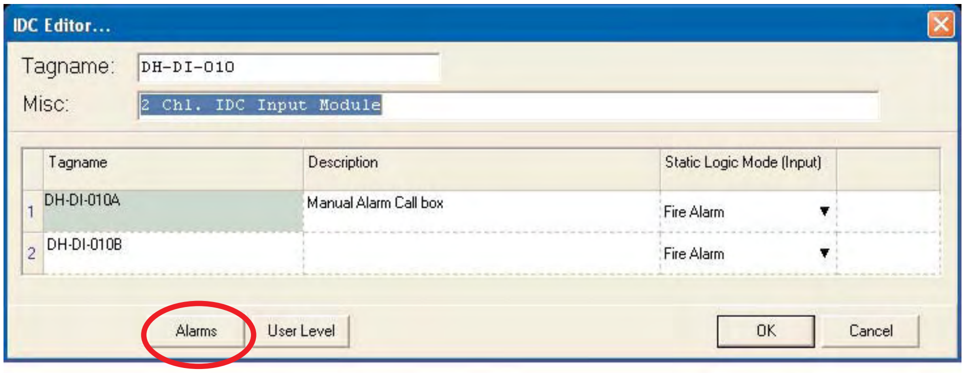
- **Fire Alarm:** Sets off the "Fire Alarm" LED and relay* on the EQP controller.
- **Trouble:** Sets off the "Trouble" LED and relay* on the EQP controller.
- **Low Gas Alarm:** Sets off the "Low Gas" LED and relay* on the EQP controller.
- **High Gas Alarm:** Sets off the "High Gas" LED and relay* on the EQP controller.
- **Supervisory:** Sets off the "Supr" LED and relay* on the EQP controller.

If a static logic function has been selected for an input, when the input is active that action will occur automatically without the need for any user programmed logic.

If the input is to be used with user programmed logic only, select “Other”.

Alarms: Selecting this button opens the “Alarms to Monitor...” dialog box.

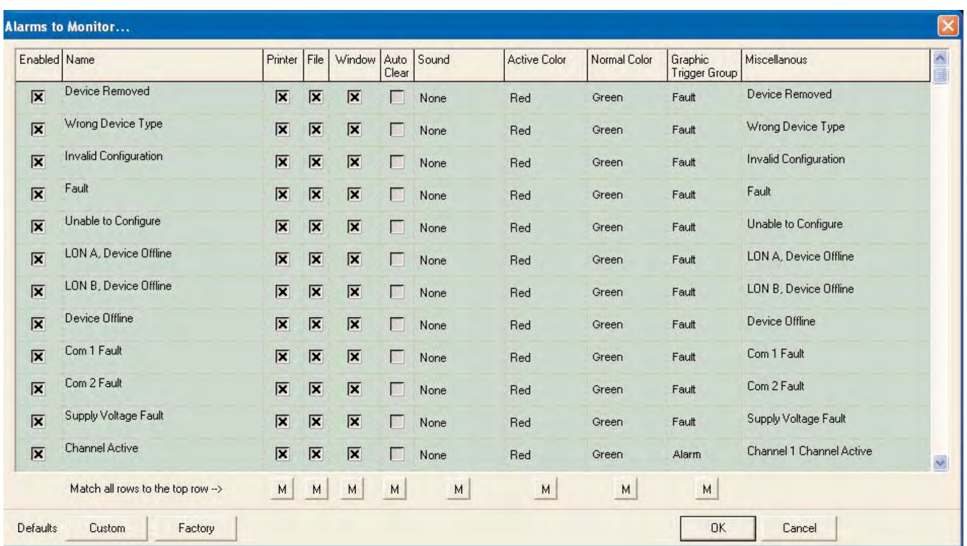
This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S³.



The first 11 alarms pertain to the status and diagnostic for the overall module.

After this come 3 alarms for each of the eight channels.

This gives a total of 17 alarms and events that can be enabled and monitored by S³ for this module type.

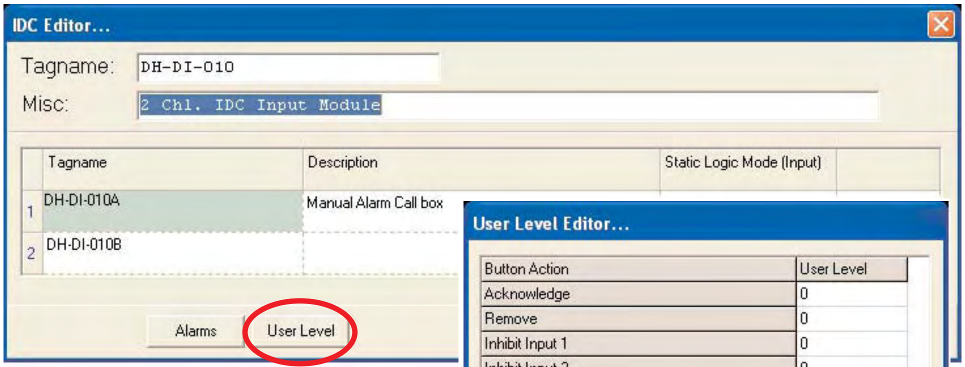

Alarms to Monitor...

Enabled	Name	Printer	File	Window	Auto Clear	Sound	Active Color	Normal Color	Graphic Trigger Group	Miscellanous
X	Device Removed	X	X	X		None	Red	Green	Fault	Device Removed
X	Wrong Device Type	X	X	X		None	Red	Green	Fault	Wrong Device Type
X	Invalid Configuration	X	X	X		None	Red	Green	Fault	Invalid Configuration
X	Fault	X	X	X		None	Red	Green	Fault	Fault
X	Unable to Configure	X	X	X		None	Red	Green	Fault	Unable to Configure
X	LON A, Device Offline	X	X	X		None	Red	Green	Fault	LON A, Device Offline
X	LON B, Device Offline	X	X	X		None	Red	Green	Fault	LON B, Device Offline
X	Device Offline	X	X	X		None	Red	Green	Fault	Device Offline
X	Com 1 Fault	X	X	X		None	Red	Green	Fault	Com 1 Fault
X	Com 2 Fault	X	X	X		None	Red	Green	Fault	Com 2 Fault
X	Supply Voltage Fault	X	X	X		None	Red	Green	Fault	Supply Voltage Fault
X	Channel Active	X	X	X		None	Red	Green	Alarm	Channel 1 Channel Active

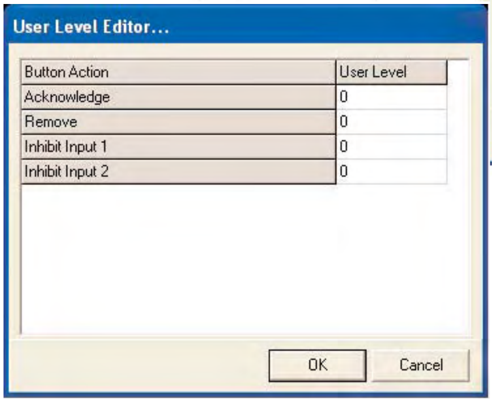
Match all rows to the top row --> M M M M M M M M

Defaults Custom Factory OK Cancel

User Levels: The “User Level Editor...” provides a means for limiting access to the “Acknowledge”, “Remove”, and “Inhibit” buttons for the module which are accessible from the devices point display.

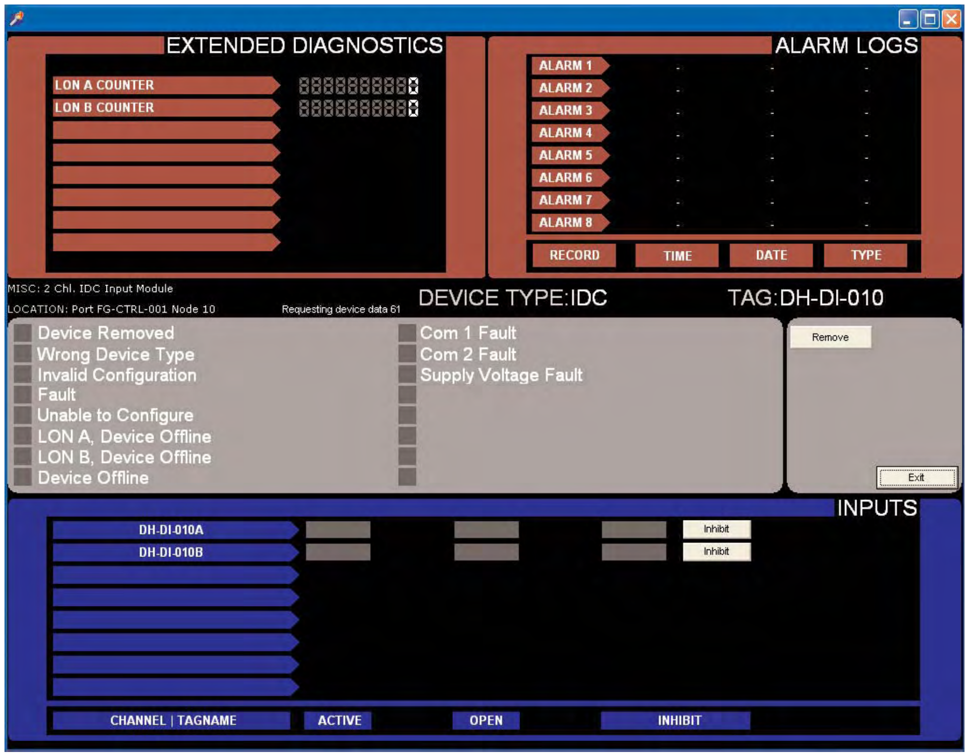


The default value is “0” and provides access to all users. Change these values to match your user account configuration and security needs.



Point Display: The IPM has a custom "Point Display" that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.

The point display provides a single window view of all available real-time data for the device.



The top right quadrant of the display shows the last eight alarms (channel activation) with their date and time data.

The bottom half of the point display provides a data display area and annunciator for the two input channels.

Inhibit Buttons: Each input has an inhibit button that can be used to disable that channels status from reaching the user logic program in the EQP controller.

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X9800

Infrared Optical Flame Detector

Description: The X9800 is located on the LON/SLC and provides Infrared Optical Flame detection capability for the Eagle Quantum Premier system.

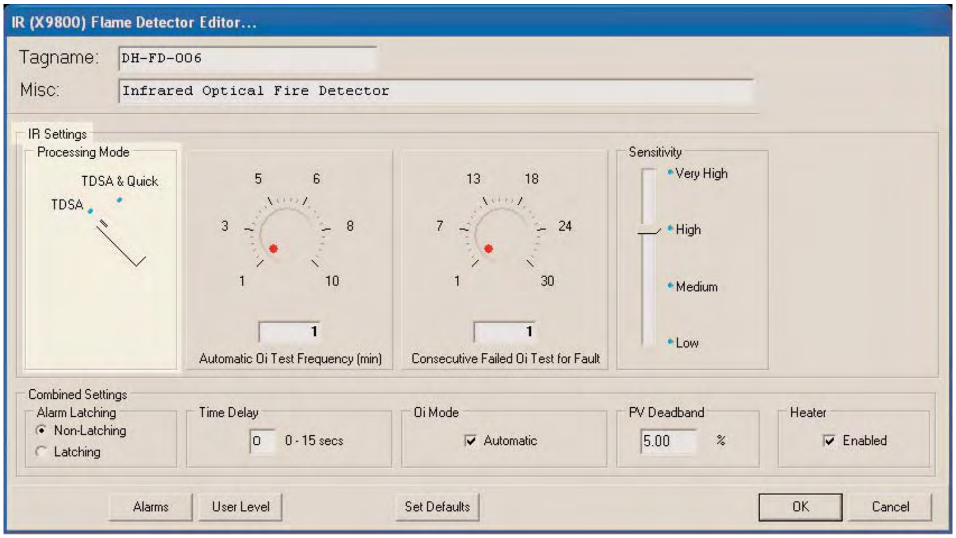
The X9800 meets the most stringent requirements worldwide with advanced detection capabilities and immunity to extraneous sources, combined with a superior mechanical design.

The detector is equipped with both automatic and manual oi test capability. The detector has Division and Zone explosion-proof ratings and is suitable for use in indoor and outdoor applications.

Tagname: The tagname at the top of the dialog box refers to the flame detector.

Until a tagname is entered the detector is not available in the S^3 database for programming, monitoring or dynamic graphic purposes.

Configuration: Enter the Tagname for the detector, a miscellaneous description and then adjust the IR Settings.



Processing Mode: The X9800 features signal processing options.

These options determine the type of logic that the detector will use for processing fire signals to customize the X9800 to the application.

Two signal processing options are available for the X9800: “TDSA” and “TDSA & Quickfire”.

- **TDSA enabled**

  The TDSA signal processing technique analyzes the input signal in real time, requiring the IR signal to flicker randomly in order to recognize it as a fire condition.

  Using TDSA signal processing, the X9800 ignores regularly chopped blackbody sources (occurring in areas where moving conveyors and hot objects in proximity to one another result in a regularly chopped IR signal), because it looks for a less uniform signal.

  However, in the presence of a regularly chopped signal, the unit is more susceptible to false alarms due to sporadic IR that functions as a trigger when occurring in conjunction with the regularly chopped signal.

- **TDSA & Quick Fire enabled** (either initiates fire alarm).

  The Quick Fire (High Speed) feature can be used in conjunction with the TDSA signal processing method.

  This method overrides TDSA requirements in the event of an intense signal. When Quick Fire is activated, the detector is capable of responding to an intense fire signal in less than 30 milliseconds (0.030 seconds).

  Using the Quick Fire feature in conjunction with TDSA signal processing allows the detector to provide a high speed response to a large, non-flickering fire (such as in high pressure gas applications) while maintaining an ability to respond to smaller fires.

Automatic oi

The X9800 includes the Automatic Optical Integrity (oi) feature — a calibrated performance test that is automatically performed once per minute to verify complete detector operation capabilities.

No testing with an external test lamp is required.

The detector automatically performs the same test that a maintenance person with a test lamp would perform — once every minute, 60 times per hour. However, a successful automatic oi test does not produce an alarm condition.

The X9800 signals a fault condition when less than half of the detection range remains. This is indicated by the amber color of the LED on the face of the detector.

Magnetic oi / Manual oi

The detector also incorporates both magnetic oi and manual oi features that provide the same calibrated test as the automatic oi, and in addition actuates the message to verify output operation for preventive maintenance requirements.

These features can be performed at any time and eliminate the need for testing with a non-calibrated external test lamp.

CAUTION

These tests require disabling of all extinguishing devices to avoid release resulting from a successful test.

The magnetic oi test is performed by placing a magnet by the marked location (mag oi) on the outside of the detector.

The manual oi test is accomplished by selecting the button on the devices Point Display.

The magnet must be held in place for a minimum of 6 seconds to complete the test.

These test methods activate the calibrated IR emitter.

If the resulting signal meets the test criteria, indicating that greater than half of the detection range remains, the Alarm message changes state, the indicating LED changes to red, and a full scale reading is displayed in the analog readout on the S^3 Point Display. .

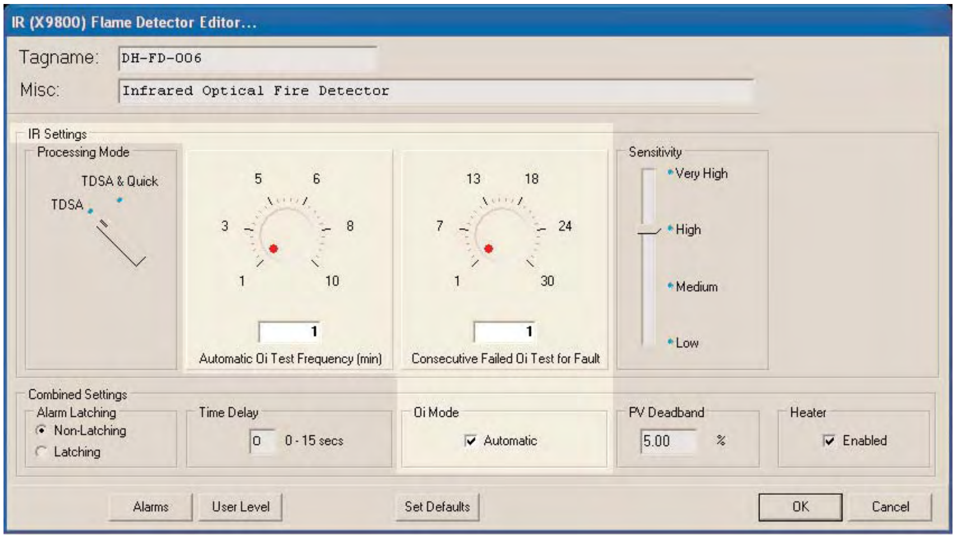
This condition remains until the magnet is removed or the S^3 software test command is released.

If less than half of the detection range remains, no alarm is produced and a fault is generated.

The fault indication can be reset by momentarily applying the magnet or the S^3 Software Point Display reset button.

Oi Configuration

The frequency of Oi testing can be adjusted between once a minute as maximum and up to once every ten minutes as a minimum.



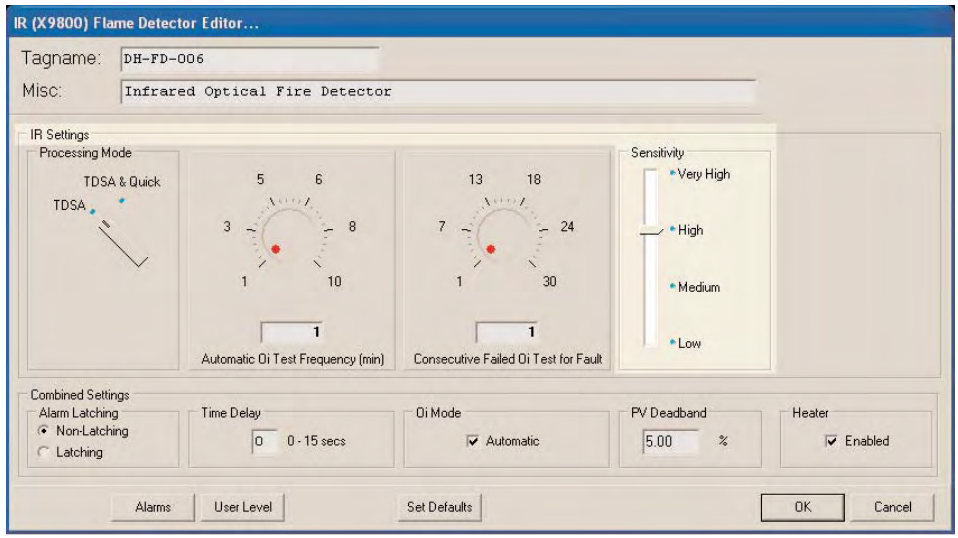
There is also a checkbox for automatic operation.

The number of failed Oi tests needed to generate a fault can also be adjusted within a range of 1 to 30.

Test failures can sometimes be generated during heavy rain or other environmental conditions thus requiring this parameter to be flexible.

Sensitivity:

Dense fog, rain as well as certain gases and vapors can absorb IR radiation and reduce the sensitivity of the detector.

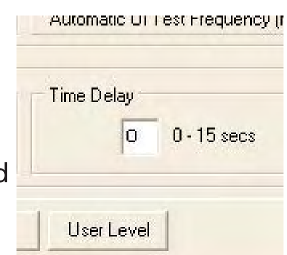


The sensitivity of the detector can be adjusted to any one of four settings using the slider control as shown above.

Alarm Latching: This refers to the fire alarm "message" being sent from the detector to the EQP controller and then used in both the embedded and user programmed logic. Non-latching is the default and most common setting.

Using the Radio Buttons select either latching or non-latching for the alarm operation. If set to latching, the user will have to reset the detector from its S^3 Point Display following an alarm.

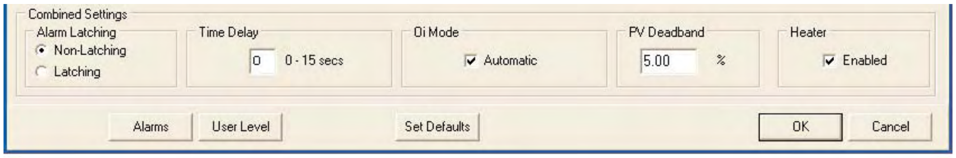
Time Delay: An input time delay can be programmed by entering a value from 1 to 15 seconds in the provided field.



This will delay sending the fire alarm message to the EQP controller until the fire alarm has been generated <u>uninterrupted</u> for the specified time. This programmable delay can be used to filter out spurious events.

PV Deadband: A field is provided to enter the desired PV (Process Variable) Deadband.

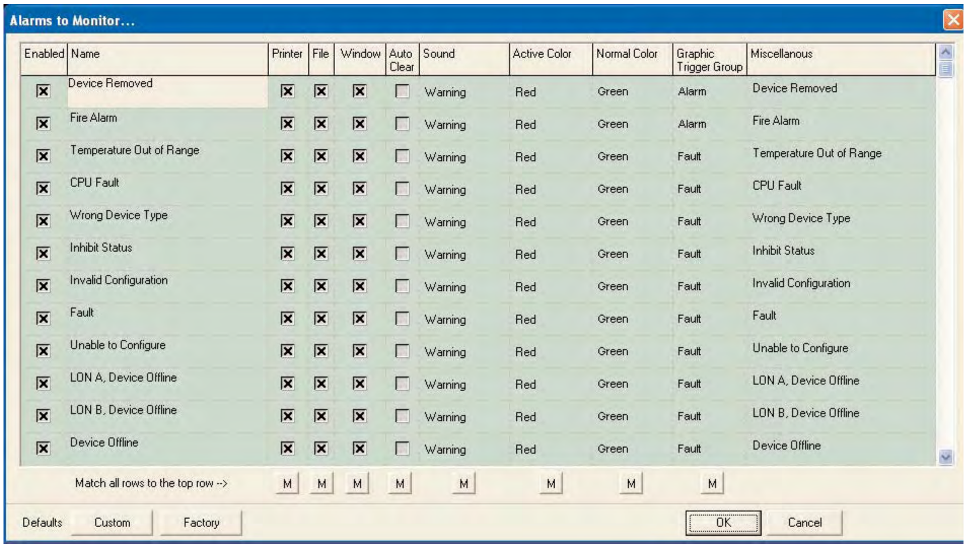
Normally all values are transmitted to the controller every five seconds; If the PV changes more than the entered percentage before the five second report time arrives, an immediate message is sent with the current values.



Heater: A checkbox is provided to enable the Microprocessor controlled heated optics for increased resistance to moisture and ice. In climates where this is not an issue, deselecting this option will save up to 8 watts per detector.

Alarms: Selecting this button opens the "Alarms to Monitor..." dialog box.

This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S[3].



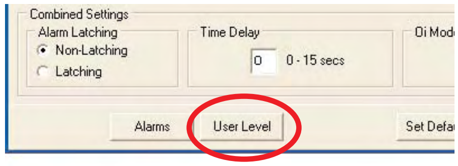
Alarms to Monitor...

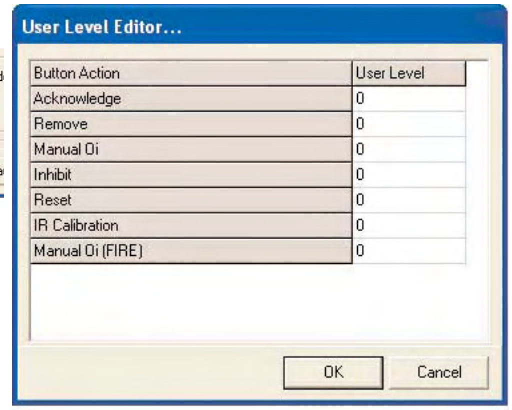
Enabled	Name	Printer	File	Window	Auto Clear	Sound	Active Color	Normal Color	Graphic Trigger Group	Miscellanous
X	Device Removed	X	X	X		Warning	Red	Green	Alarm	Device Removed
X	Fire Alarm	X	X	X		Warning	Red	Green	Alarm	Fire Alarm
X	Temperature Out of Range	X	X	X		Warning	Red	Green	Fault	Temperature Out of Range
X	CPU Fault	X	X	X		Warning	Red	Green	Fault	CPU Fault
X	Wrong Device Type	X	X	X		Warning	Red	Green	Fault	Wrong Device Type
X	Inhibit Status	X	X	X		Warning	Red	Green	Fault	Inhibit Status
X	Invalid Configuration	X	X	X		Warning	Red	Green	Fault	Invalid Configuration
X	Fault	X	X	X		Warning	Red	Green	Fault	Fault
X	Unable to Configure	X	X	X		Warning	Red	Green	Fault	Unable to Configure
X	LON A, Device Offline	X	X	X		Warning	Red	Green	Fault	LON A, Device Offline
X	LON B, Device Offline	X	X	X		Warning	Red	Green	Fault	LON B, Device Offline
X	Device Offline	X	X	X		Warning	Red	Green	Fault	Device Offline
	Match all rows to the top row -->	M	M	M	M	M	M	M	M	

Defaults Custom Factory OK Cancel

There are 27 alarms and events that pertain to the status and diagnostics for the X9800.

User Levels: The "User Level Editor..." provides a means for limiting access to the "Acknowledge", "Remove", "Manual Oi", "Inhibit", "IR Calibration", "Manual Oi (FIRE)" and "Reset" buttons for the module which are accessible from the devices point display.





The default value is "0" and provides access to all users.

Change these values to match your user account configuration and security needs.

Point Display: The X9800 has a custom "Point Display" that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.

The point display provides a single window view of all available real-time data for the device.

Alarm Logs: The top right quadrant of the display shows the last eight alarms with their date and time data.

Analog Input Track: The top left quadrant shows a dynamic 60 second history of the measured variable (IR counts) for the detector. The input track scrolls from left to right with the most current data at the "pen" on the left margin. The display updates once every five seconds.

Oi Log: The bottom left quadrant of the point display shows the detectors manual Optical Integrity (Oi) log. The last eight manual tests are shown with the date, time and a PASS/FAIL indicator.

Status & Diagnostics: The middle portion of the point display shows the discrete status and health indicators for the detector.

Buttons: There are six buttons that can send commands to the detector including; remove, inhibit, reset, Manual Oi, Manual Oi (FIRE) and IR Calibration.

Description: The EQ2500SAM Signal Audible Module is located on the LON/SLC and provides NFPA-72 compliant Notification Appliance Circuit (NAC) control capability to the Eagle Quantum Premier system.

The Signal Audible Module provides two indicating circuits for controlling UL Listed 24 vdc polarized audible/visual indicating appliances.

The device is located on the LON and is controlled by programmable logic in the Controller.

Each output circuit is independently programmable to allow notification of separate events.

Each output can be individually activated for any one of the following pre-defined outputs:

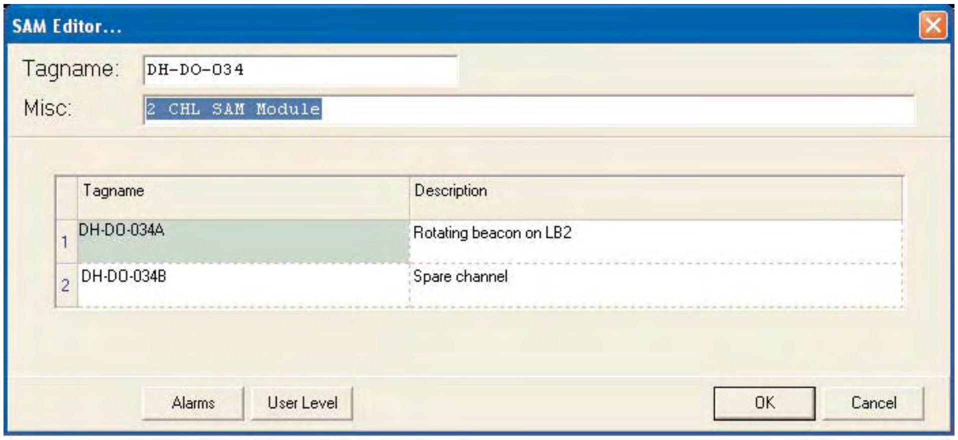
1. Continuous
2. 60 beats per minute
3. 120 beats per minute
4. Temporal pattern.

Device outputs operate in the reverse polarity manner when activated. Each output is rated at 2 amperes.

The output circuits are supervised for open and short circuit conditions.

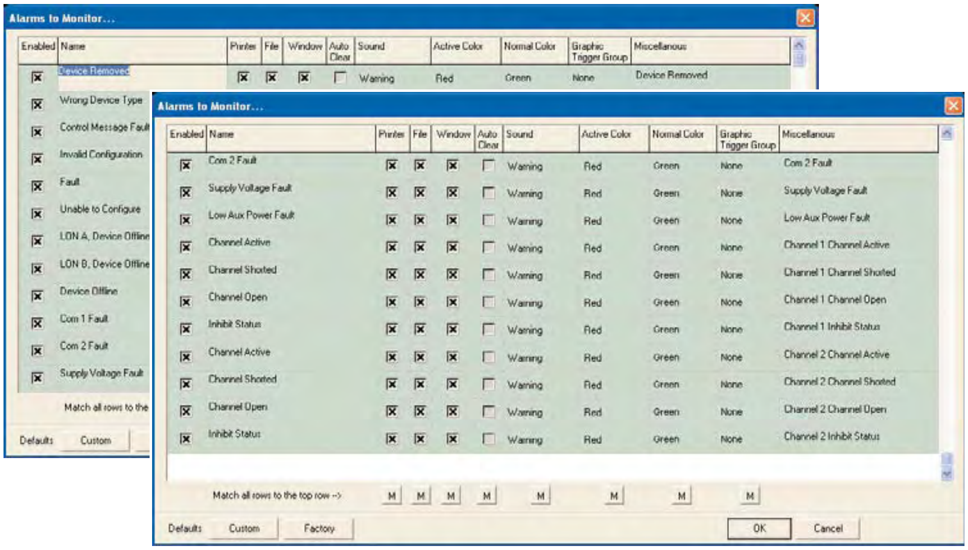
If a wiring fault occurs, a trouble condition will be indicated at the Controller and on the S^3 Point Display.

Tagname: The tagname at the top of the dialog box refers to the module. Each of the two output channels also require a tagname. Until the tagnames are entered the module is not available in the S³ database for programming, monitoring or dynamic graphic purposes.



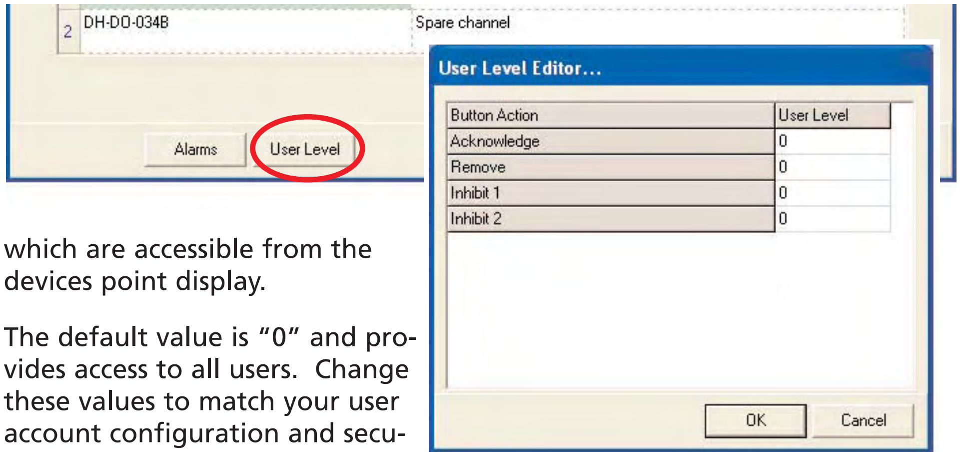
Below the tagname is a “Misc” text field to enter descriptive information to better identify the location or purpose of the module. Data in this field is optional.

Alarms: Selecting this button opens the “Alarms to Monitor...” dialog box. This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S³.



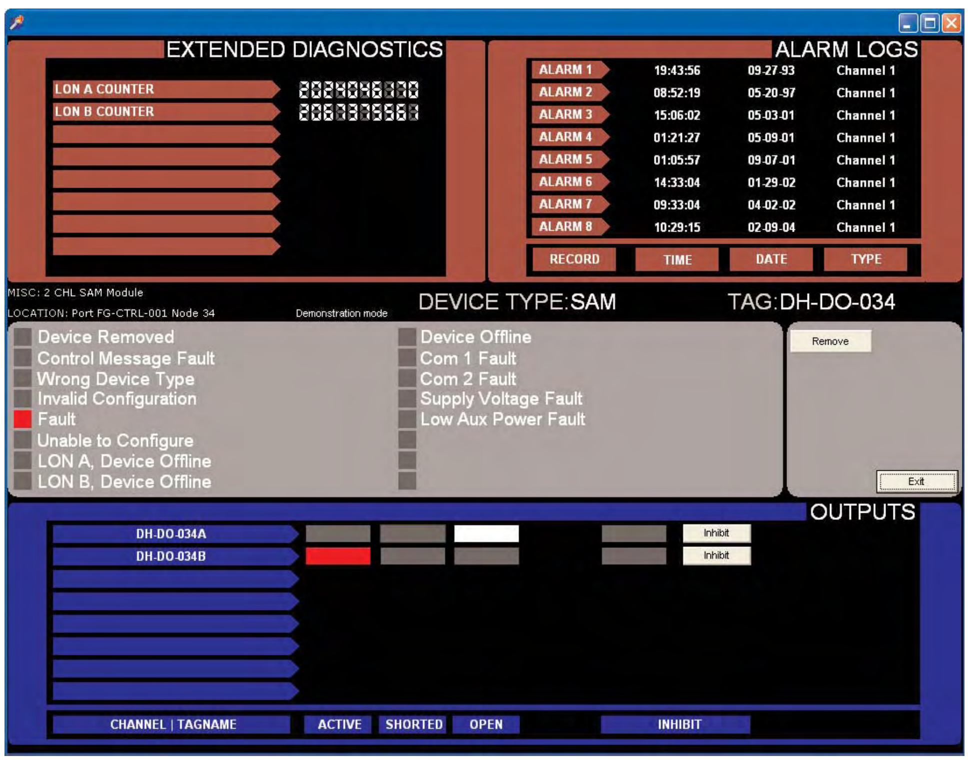
There are 13 alarms and events that pertain to the status and diagnostics for the module plus 4 per output channel.

User Levels: The “User Level Editor...” provides a means for limiting access to the “Acknowledge”, “Remove” and “Inhibit” buttons for the module which are accessible from the devices point display.



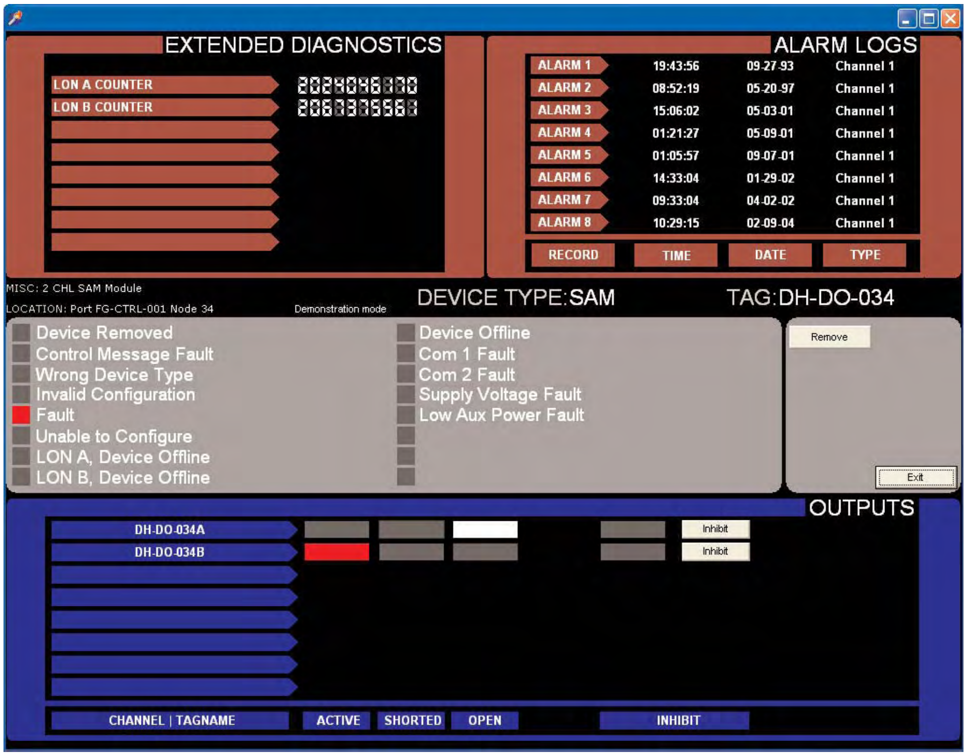
The default value is “0” and provides access to all users. Change these values to match your user account configuration and security needs.

Point Display: The SAM has a custom “Point Display” that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.



The point display provides a single window view of all available real-time data for the device.

Alarm Logs: The upper right quadrant of the point display shows the last eight alarms that have occurred along with their date & time. This information is stored in the module and is retrieved over the LON for display in this area.



Status & Diagnostics: The middle area of the point display shows the discrete status of 13 pieces of tracked status and diagnostic data.

Channel Status: The bottom half of the point display provides an annunciator style display depicting the status and health of the two output channels. Next to the channel tagname are indicators for Active, Shorted, Open and the Inhibit status. Buttons are also provided to inhibit either of the output channels. (If the user has sufficient access privileges.)

X3301

Multi-Spectrum Infrared Optical Flame Detector

Description: The X3301 is located on the LON/SLC and provides Multi-Spectrum Infrared Optical Flame detection capability for the Eagle Quantum Premier system.

It provides unsurpassed detection of fires from light to heavy hydrocarbon fuels combined with the highest degree of false alarm rejection.

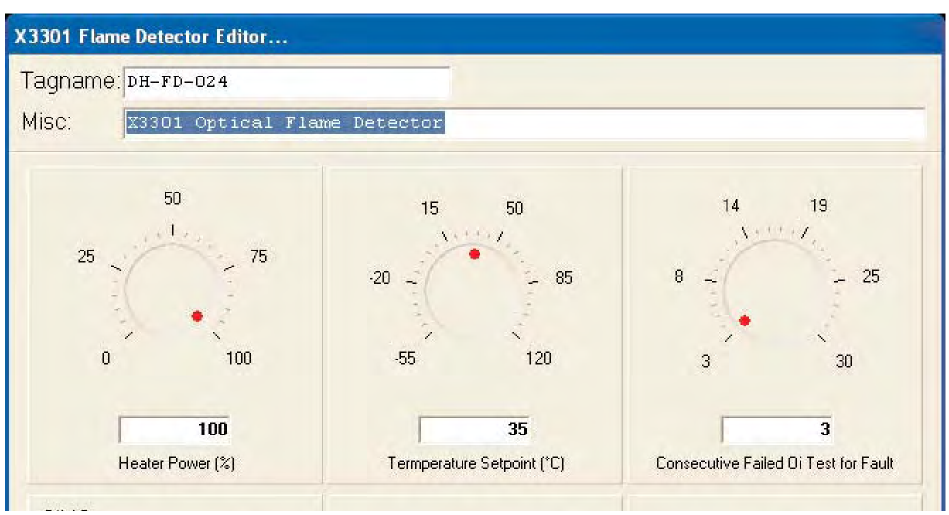
The detector has Division and Zone explosion-proof ratings and is suitable for use in indoor and outdoor applications.

The X3301 contains three IR sensors with their associated signal processing circuitry. A multi-color LED on the detector faceplate indicates detector status condition. Microprocessor controlled heated optics increase resistance to moisture and ice.

Configuration

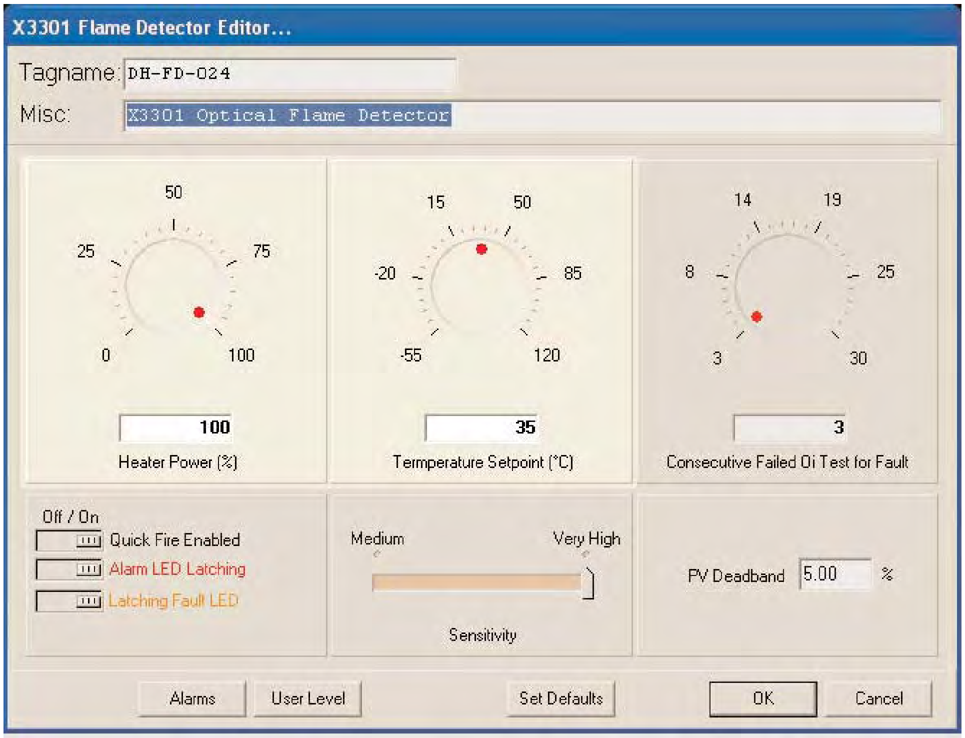
Tagname: The tagname at the top of the dialog box refers to the flame detector.

Until a tagname is entered the detector is not available in the S³ database for programming, monitoring or dynamic graphic purposes.



Heated Optics

Heater Power: Up to 8 watts of power can be utilized to provide heat to the optical sensing elements. The "Heater Power" adjustment allows the user to determine the maximum amount of power to use in trying to achieve the temperature setpoint. This can be an important adjustment in situations where the power budget is limited or in installations with large quantities of detectors.



Temperature Setpoint: The default temperature setpoint for the heated optics is 35°C but can be adjusted utilizing the rotary dial or by entering a value in the setpoint field.

OPTICAL INTEGRITY (Oi)

Automatic oi: The X3301 includes the Automatic Optical Integrity (oi) feature — a calibrated performance test that is automatically performed once per minute to verify complete detector operation capabilities.

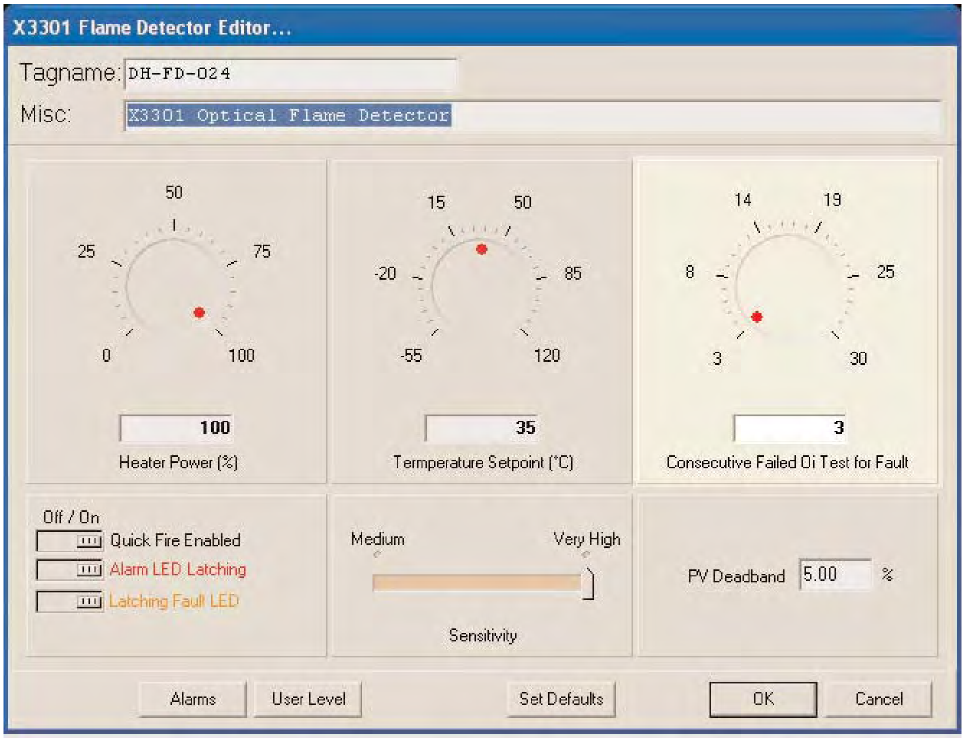
No testing with an external test lamp is required.

The detector automatically performs the same test that a maintenance person with a test lamp would perform — once every minute, 60 times per hour. However, a successful automatic oi test does not produce an alarm condition.

The Protect•IR signals a fault condition when less than half of the detection range remains. This is indicated remotely on the S^3 Point Display and is evident locally by the amber color of the LED on the face of the detector.

Oi Test Fault

The detector automatically conducts oi tests to check the integrity of the optical sensing systems. Three consecutive failed oi tests will generate a



fault condition, which will be indicated by the LED on the face of the detector turning amber. The EQP Controller and S³ software will also annunciate this fault.

In certain environmental conditions like very heavy rain, oi test failures can occur even though the hardware is not faulty. To compensate for this the number of failed oi tests required to generate the fault can be adjusted upward to a maximum of 30.

Magnetic oi / Manual oi

The detector also incorporates both magnetic oi and manual oi features that provide the same calibrated test as the automatic oi, and in addition actuates the Alarm to verify output operation for preventive maintenance requirements. These features can be performed at any time and eliminate the need for testing with a non-calibrated external test lamp.

The magnetic oi test is performed by placing a magnet by the marked location (mag oi) on the outside of the detector. The manual oi test is accomplished by selecting the oi Test button on the Point Display in the S³ software. The magnet must be held in place for a minimum of 6 seconds to complete the test. Either of these test methods activates the calibrated IR emitters. If the resulting signal meets the test criteria, indicating that greater than half of the detection range remains, the Alarm status message to the EQP controller changes state,the indicating LED changes to red, and the analog signal displayed in the tracking area of the S^3 point display goes to maximum.

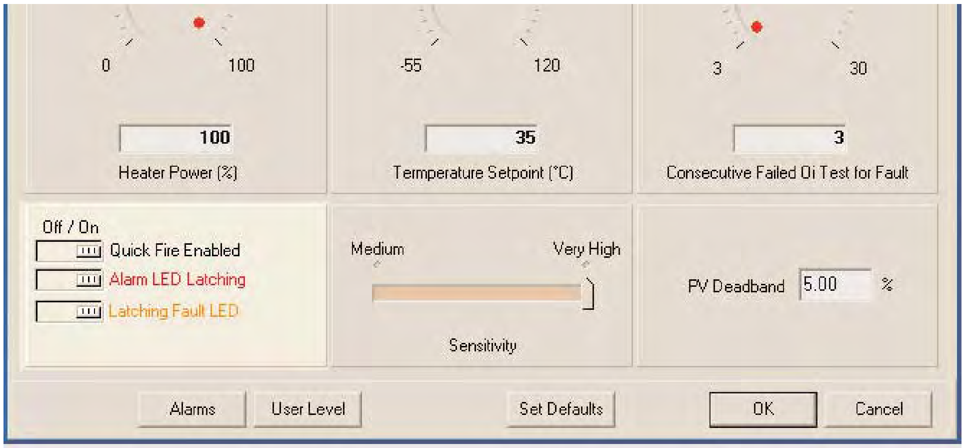
This condition remains until the magnet is removed or the software test is complete. If the alarm LED is configured for non-latching operation, it will change states and the red LED will turn to green.

If the unit has latching LED's, the detector's operating software will automatically reset the relays with no operator action required.

If less than half of the detection range remains, no alarm is produced and a fault is generated. The fault indication can be reset by momentarily applying the magnet or via S^3 software command.

Quick Fire Enabled: The "Quick Fire" feature can be enabled or disabled from a soft-switch in the bottom left area of the configuration dialog box.

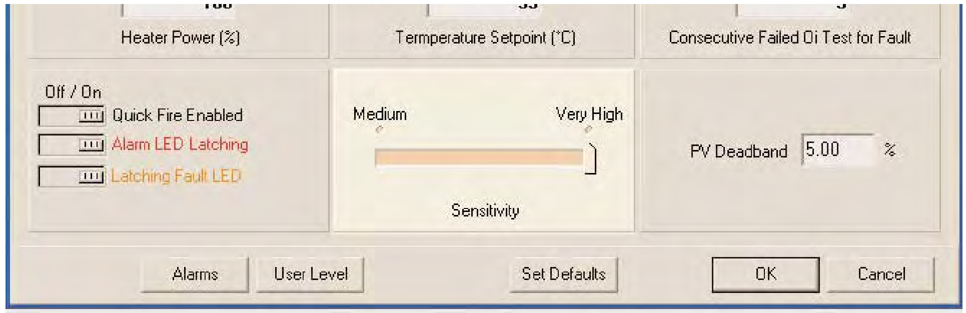
Quick Fire mode is for enhanced response to "flash" type fires. For details refer to the X3301 instruction manual; 95-8527-6.4.



Alarm LED Latch: The tri-color LED on the face of the detector turns red when in alarm and can be configured to be either latching or non-latching. If latching is selected, following a fire detection, the LED will stay on until the detector is reset from the point display for the detector in the S^3 software. The default is non-latching.

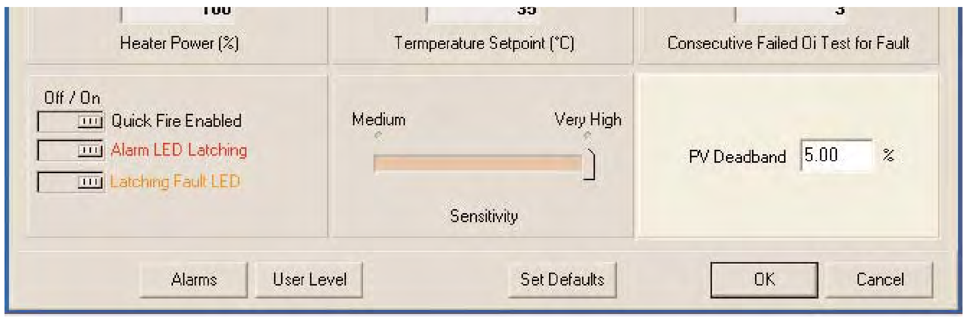
Fault LED Latch: The tri-color LED on the face of the detector turns amber when a fault is present (fire over-rides fault) and can be configured to be either latching or non-latching. If latching is selected, following a fire detection, the LED will stay on until the detector is reset from the point display for the detector in the S^3 software. The default is non-latching.

Detector Sensitivity: The sensitivity of the detector can be adjusted



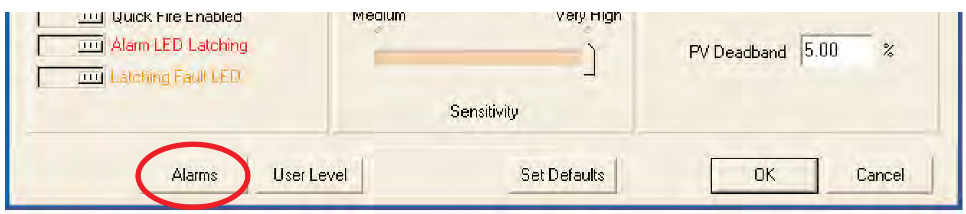
between medium and very high using the sensitivity slider control in the center bottom area of the configuration dialog box.

PV Deadband: A field is provided to enter the desired PV (Process Variable) Deadband.



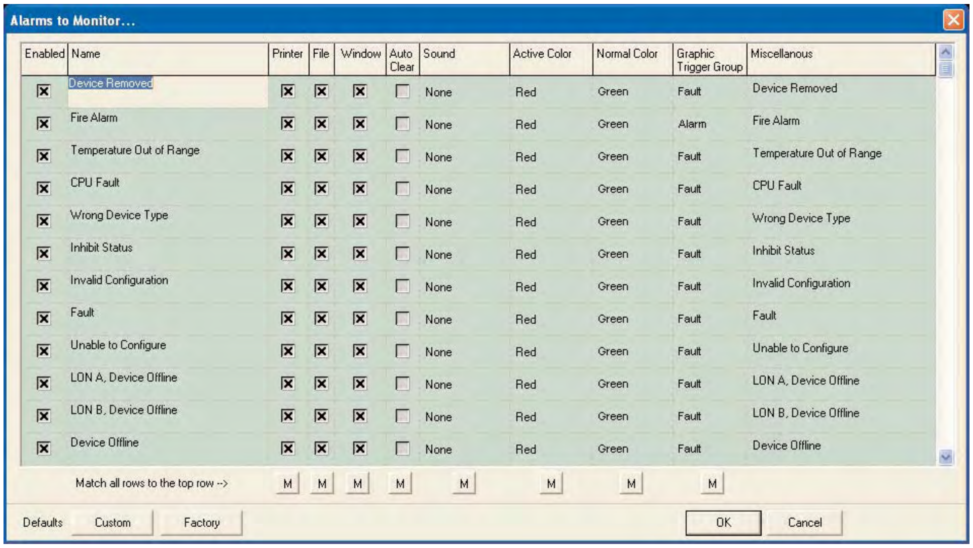
Normally all values are transmitted to the controller every five seconds; If the PV changes more than the entered percentage before the five second report time arrives, an immediate message is sent with the current values.

Alarms: Selecting this button opens the “Alarms to Monitor...” dialog box.

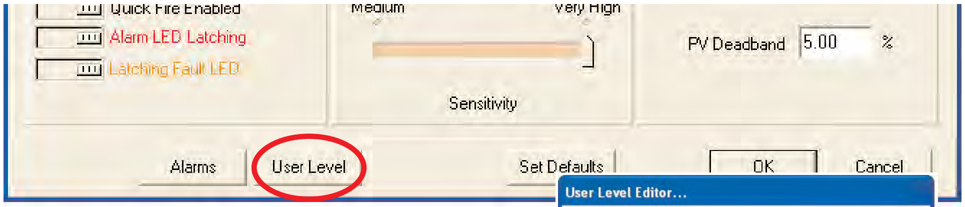


This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S^3.

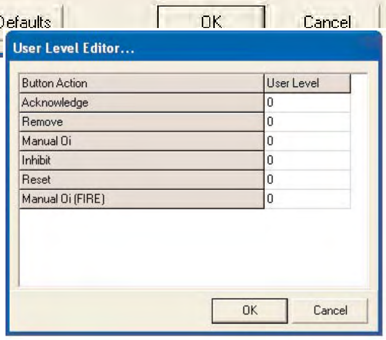
There are 30 alarms and events that pertain to the status and diagnostics for the X3301.



User Levels: The "User Level Editor..." provides a means for limiting access to the "Acknowledge", "Remove", "Manual Oi", "Inhibit", "IR Calibration",



"Manual Oi (FIRE)" and "Reset" buttons for the module which are accessible from the devices point display.

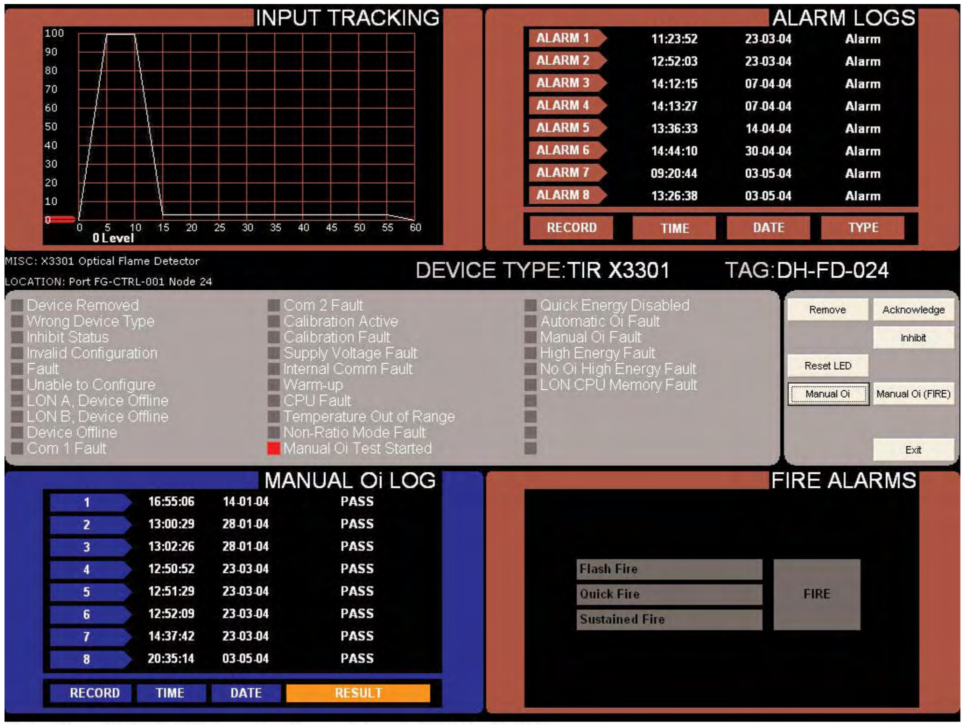


The default value is "0" and provides access to all users.

Change these values to match your user account configuration and security needs.

Point Display: The X3301 has a custom "Point Display" that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.

The point display provides a single window view of all available real-time data for the device.



Alarm Logs: The top right quadrant of the display shows the last eight alarms with their date and time data.

Analog Input Track: The top left quadrant shows a dynamic 60 second history of the measured variable (IR counts) for the detector. The input track scrolls from left to right with the most current data at the "pen" on the left margin. The display updates once every five seconds.

Oi Log: The bottom left quadrant of the point display shows the detectors manual Optical Integrity (Oi) log. The last eight manual tests are shown with the date, time and a PASS/FAIL indicator.

Status & Diagnostics: The middle portion of the point display shows the discrete status and health indicators for the detector.

Buttons: There are six buttons that can send commands to the detector including; remove, inhibit, reset, Manual Oi, Manual Oi (FIRE) and IR Calibration.

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EQ2200UV

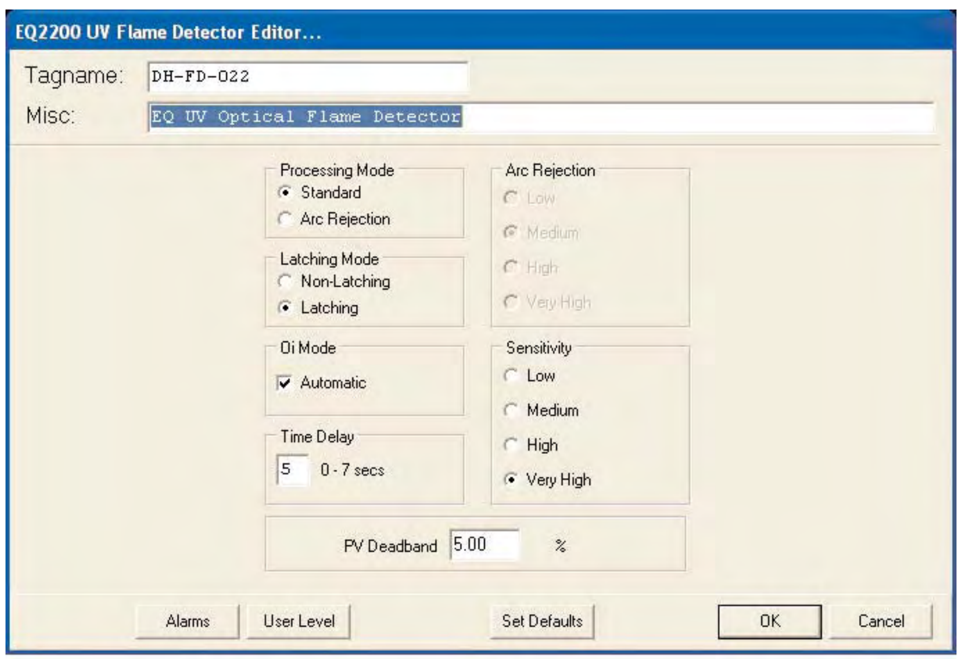
Ultraviolet (UV) Optical Flame Detector

Description: The EQ2200UV is located on the LON/SLC and provides UV Optical Flame detection capability for the Eagle Quantum Premier system.

The detector has Division and Zone explosion-proof ratings and is suitable for use in indoor and outdoor applications.

Configuration

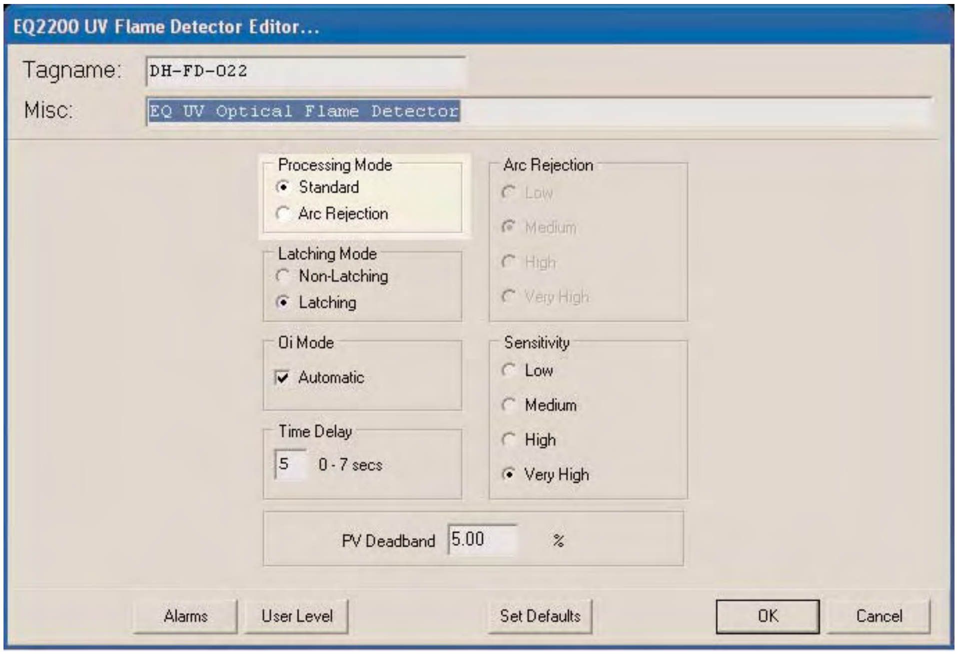
Tagname: The tagname at the top of the dialog box refers to the flame detector.



Until a tagname is entered the detector is not available in the S³ database for programming, monitoring or dynamic graphic purposes.

The UV detector output (measured in counts per second) is compared to the fire threshold (the"sensitivity" setting). If the radiant energy level from the fire exceeds the selected alarm threshold level, the fire alarm output is activated. In every application, it is crucial to ensure that the radiant ultraviolet energy level from the expected fire at the required distance from the detector will exceed the selected sensitivity level.

The UV detector can be programmed for “Arc Rejection” or “Standard Signal Processing”.



Arc Rejection (Recommended Factory Setting)

The Arc Rejection mode enables the detector to prevent nuisance fire alarms caused by UV from short-duration electrical arcs or electrostatic discharge, while maintaining the ability to reliably detect the UV given off by a flame.

Typical applications that benefit from arc rejection logic include electrostatic coating processes and uncontrolled environments where transient UV sources can be present, such as many typical outdoor applications.

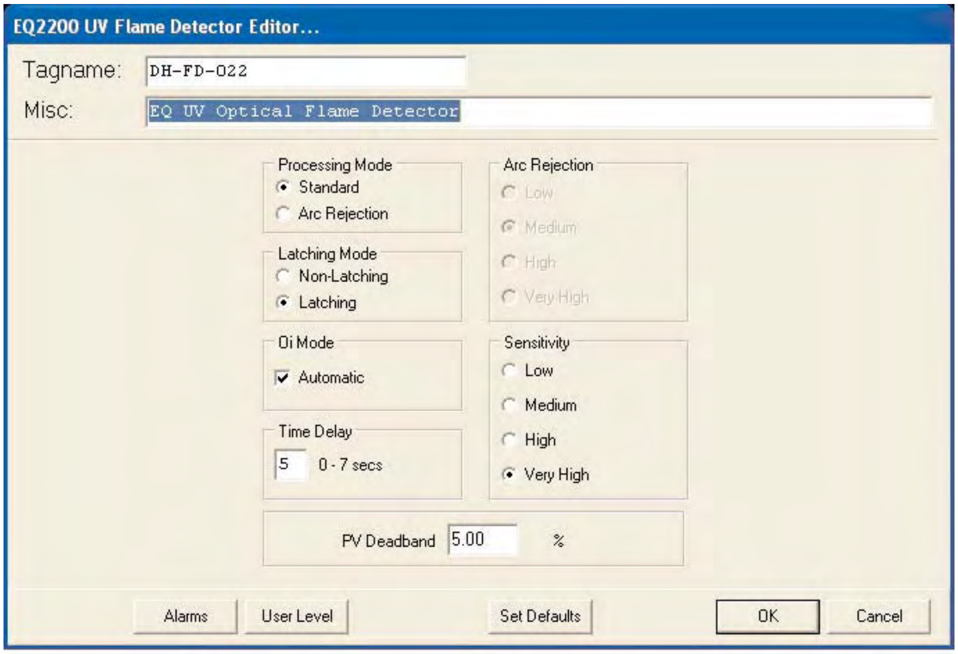
Most false alarm sources have short transient UV signatures, while fire creates a long UV signature over many seconds. Most fires are detected in a few seconds.

Standard Signal Processing

Standard signal processing is recommended for high speed suppression systems only. To allow for high speed operation, the standard processing mode does not incorporate the arc rejection programming.

This mode should only be used in a controlled, indoor environment.

Alarm Latching Mode: The red LED on the face of the detector comes on when in alarm and can be configured to be either latching or non-latching. If latching is selected, following a fire detection, the LED will stay on until the detector is reset from the point display for the detector in the S^3 software. The default is non-latching.



Oi Mode: The EQ2200UV includes the Automatic Optical Integrity (oi) feature — a performance test that is automatically performed once per minute to verify complete detector operation capabilities.

No testing with an external test lamp is required. The detector automatically performs the same test that a maintenance person with a test lamp would perform —once every minute, 60 times per hour. However, a successful automatic oi test does not produce an alarm condition.

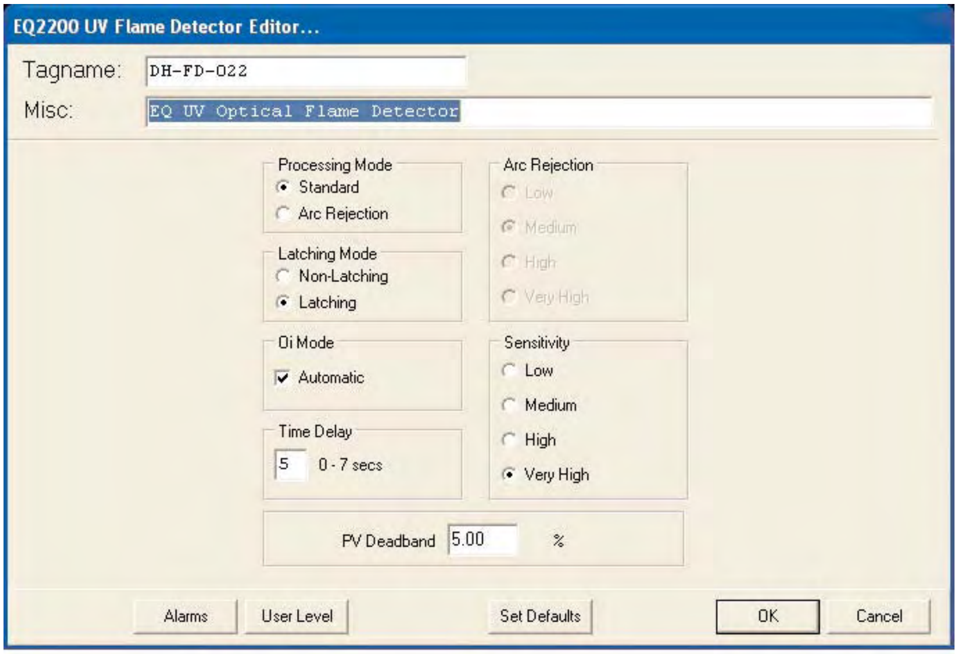
The EQ2200UV signals a fault condition when less than half of the detection range remains. This is indicated by the Oi fault message on the EQP Controller and via the S^3 software.

The default mode is Automatic. Manual Oi tests can be initiated from the point display in the S^3 software.

Time Delay: An input time delay can be programmed by entering a value from 1 to 7 seconds in the provided field.

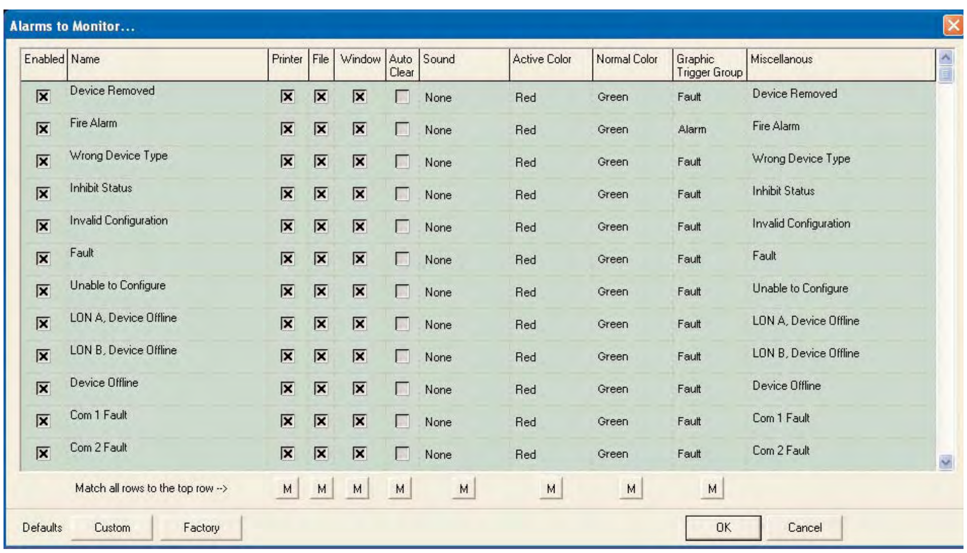
This will delay sending the fire alarm message to the EQP controller until the fire alarm has been generated uninterrupted for the specified time. This programmable delay can be used to filter out spurious events.

PV Deadband: A field is provided to enter the desired PV (Process Variable) Deadband.



Normally all values are transmitted to the controller every five seconds; If the PV changes more than the entered percentage before the five second report time arrives, an immediate message is sent with the current values.

Alarms: Selecting this button opens the "Alarms to Monitor..." dialog box.


Alarms to Monitor...

Enabled	Name	Printer	File	Window	Auto Clear	Sound	Active Color	Normal Color	Graphic Trigger Group	Miscellanous
X	Device Removed	X	X	X		None	Red	Green	Fault	Device Removed
X	Fire Alarm	X	X	X		None	Red	Green	Alarm	Fire Alarm
X	Wrong Device Type	X	X	X		None	Red	Green	Fault	Wrong Device Type
X	Inhibit Status	X	X	X		None	Red	Green	Fault	Inhibit Status
X	Invalid Configuration	X	X	X		None	Red	Green	Fault	Invalid Configuration
X	Fault	X	X	X		None	Red	Green	Fault	Fault
X	Unable to Configure	X	X	X		None	Red	Green	Fault	Unable to Configure
X	LON A, Device Offline	X	X	X		None	Red	Green	Fault	LON A, Device Offline
X	LON B, Device Offline	X	X	X		None	Red	Green	Fault	LON B, Device Offline
X	Device Offline	X	X	X		None	Red	Green	Fault	Device Offline
X	Com 1 Fault	X	X	X		None	Red	Green	Fault	Com 1 Fault
X	Com 2 Fault	X	X	X		None	Red	Green	Fault	Com 2 Fault

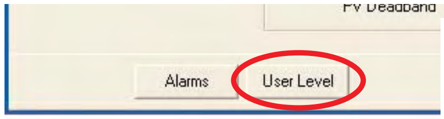
Match all rows to the top row --> M M M M M M M M

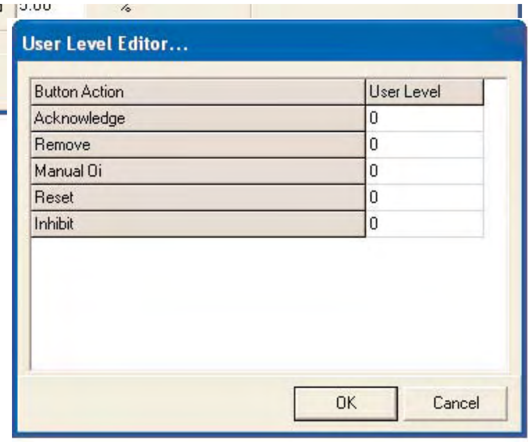
Defaults Custom Factory OK Cancel

This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S^3.

There are 20 alarms and events that pertain to the status and diagnostics for the EQ2200UV.

User Levels: The “User Level Editor...” provides a means for limiting access to the “Acknowledge”, “Remove”, “Manual Oi”, “Inhibit”, Manual Oi



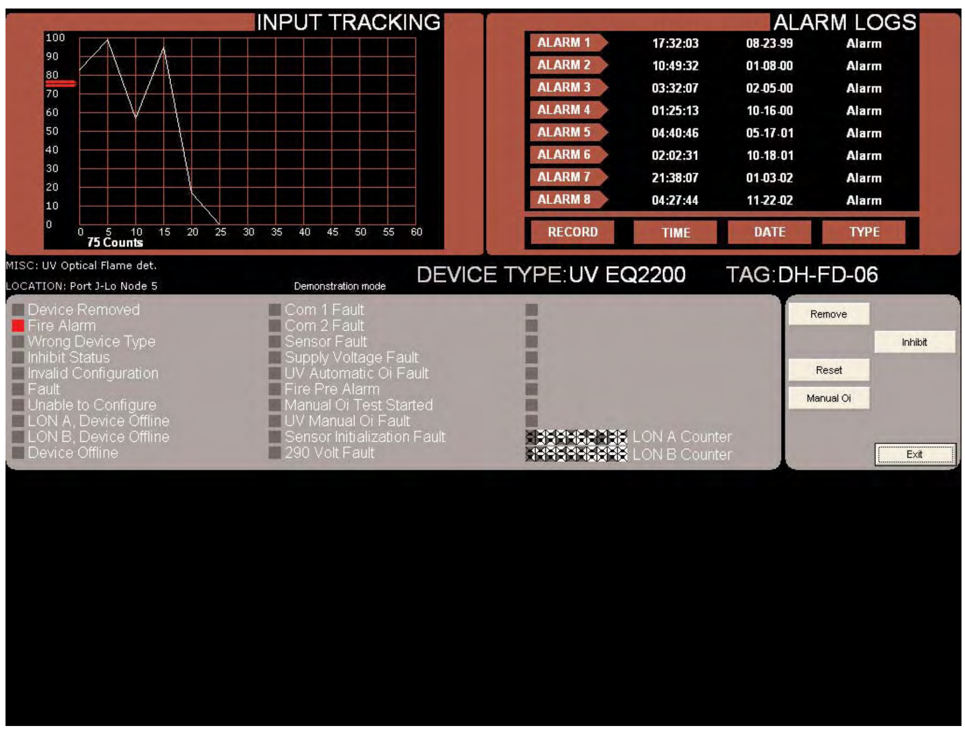


(FIRE)” and “Reset” buttons for the module which are accessible from the devices point display.

The default value is “0” and provides access to all users.

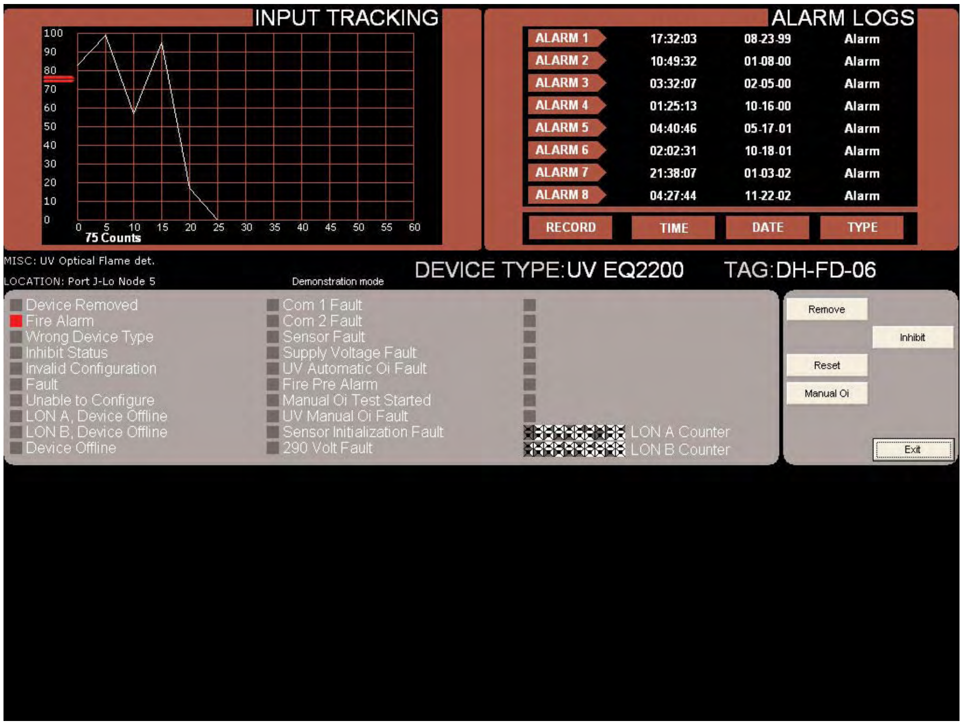
Change these values to match your user account configuration and security needs.

Point Display: The EQ2200UV has a custom “Point Display” that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.



The point display provides a single window view of all available real-time data for the device.

Alarm Logs: The top right quadrant of the display shows the last eight alarms with their date and time data.



Analog Input Track: The top left quadrant shows a dynamic 60 second history of the measured variable (UV counts) for the detector. The input track scrolls from left to right with the most current data at the "pen" on the left margin. The display updates once every five seconds.

Status & Diagnostics: The middle portion of the point display shows the discrete status and health indicators for the detector.

Buttons: There are four buttons that can send commands to the detector including; Remove, Inhibit, Reset and Manual Oi.

X2200

Ultraviolet (UV) Optical Flame Detector

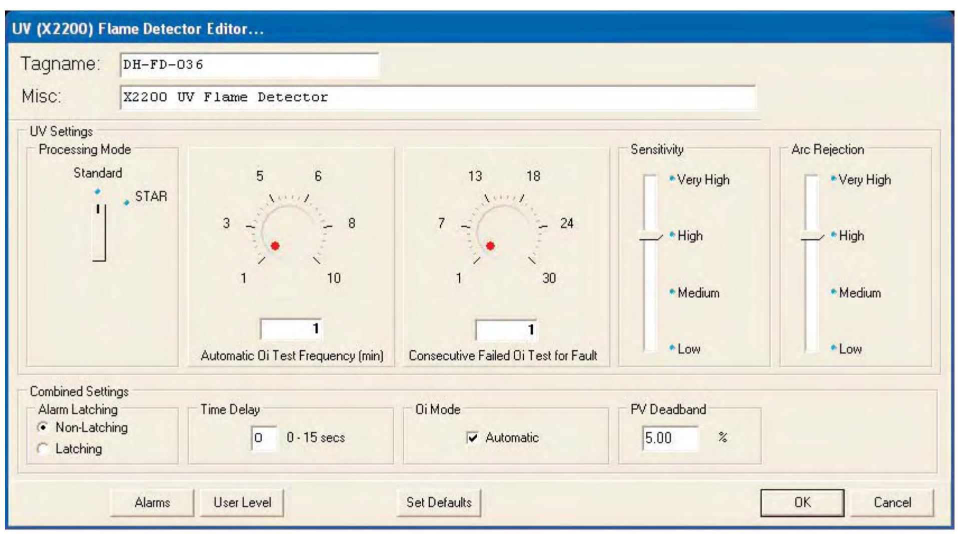
Description: The X2200 UV is located on the LON/SLC and provides Multi-Spectrum Infrared Optical Flame detection capability for the Eagle Quantum Premier system.

The X2200 meets the most stringent requirements worldwide with advanced detection capabilities and immunity to extraneous sources, combined with a superior mechanical design. The detector is equipped with both automatic and manual oi test capability.

The detector has Division and Zone explosion-proof ratings and is suitable for use in indoor and outdoor applications.

Configuration

Tagname: The tagname at the top of the dialog box refers to the flame detector.



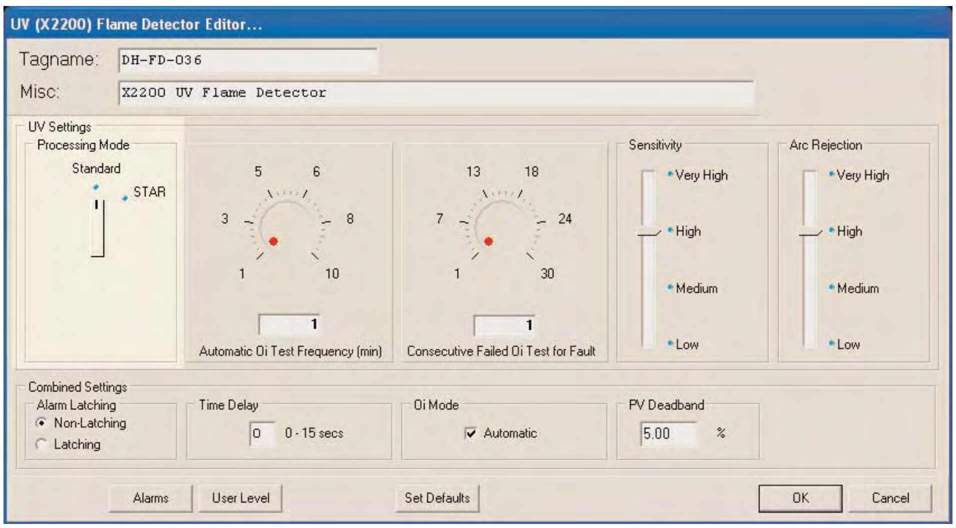
Until a tagname is entered the detector is not available in the S^3 database for programming, monitoring or dynamic graphic purposes.

SIGNAL PROCESSING OPTIONS

The UV detector output (measured in counts per second) is compared to the fire threshold (the "sensitivity" setting). If the radiant energy level from the fire exceeds the selected alarm threshold level, the fire alarm output is activated.

In every application, it is crucial to ensure that the radiant ultraviolet energy level from the expected fire at the required distance from the detector will exceed the selected sensitivity level.

The UV detector in the X2200 can be programmed for “Arc Rejection” or “Standard Signal Processing”.



STAR (Arc Rejection)

The “STAR” mode (recommended factory setting) enables the detector to prevent nuisance fire alarms caused by UV from short-duration electrical arcs or electrostatic discharge, while maintaining the ability to reliably detect the UV given off by a flame.

Typical applications that benefit from arc rejection logic include electrostatic coating processes and uncontrolled environments where transient UV sources can be present, such as many typical outdoor applications.

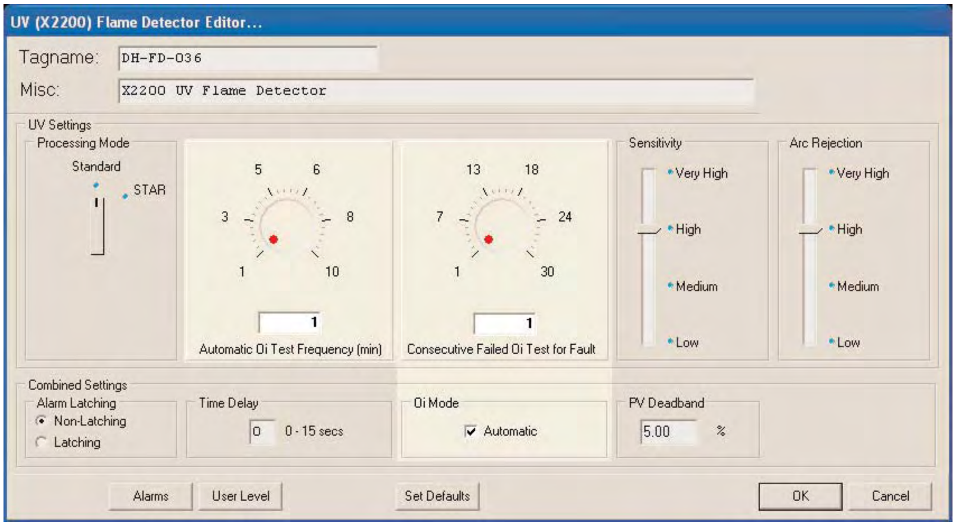
Most false alarm sources have short transient UV signatures, while fire creates a long UV signature over many seconds. Most fires are detected in a few seconds.

Standard Signal Processing

Standard signal processing is recommended for high speed suppression systems only. To allow for high speed operation, the standard processing mode does not incorporate the arc rejection programming.

This mode should only be used in a controlled, indoor environment.

Automatic oi: The X2200 includes the Automatic Optical Integrity (oi) feature — a calibrated performance test that is automatically performed once per minute to verify complete detector operation capabilities. No testing with an external test lamp is required. The detector automatically performs the same test that a maintenance person with a test lamp would perform —once every minute, 60 times per hour. However, a successful automatic oi test does not produce an alarm condition.



The X2200 signals a fault condition when less than half of the detection range remains. This is indicated by the fault message on the EQP controller and is evident by the amber color of the LED on the face of the detector.

The oi feature is set to automatic as a factory default but can be deselected for "manual only" operation. Manual oi tests can be initiated via the detectors point display in the S^3 software.

Oi Test Frequency

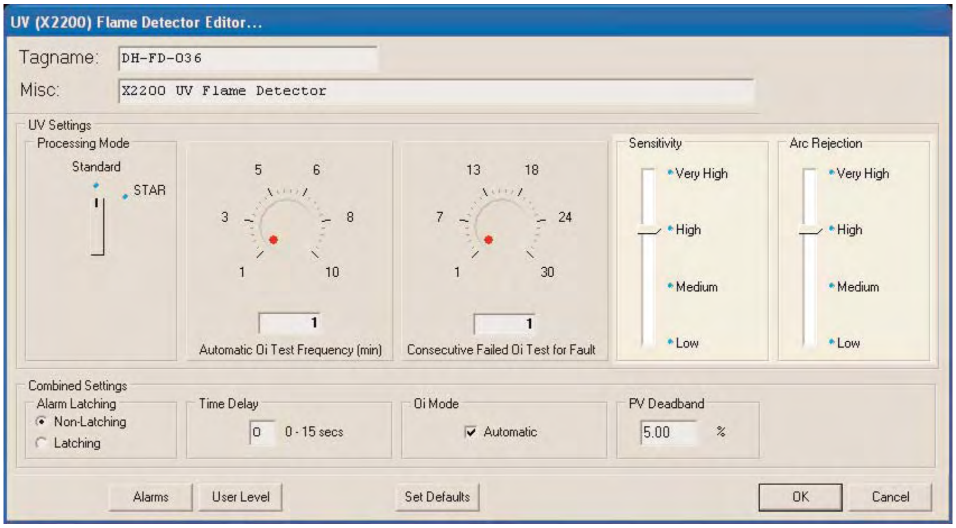
The default oi test frequency is once a minute but can be adjusted to any whole minute increment up to a maximum of ten minutes.

Oi Test Fault

The detector automatically conducts oi tests to check the integrity of the optical sensing systems. Three consecutive failed oi tests will generate a fault condition, which will be indicated by the LED on the face of the detector turning amber. The EQP Controller and S^3 software will also annunciate this fault.

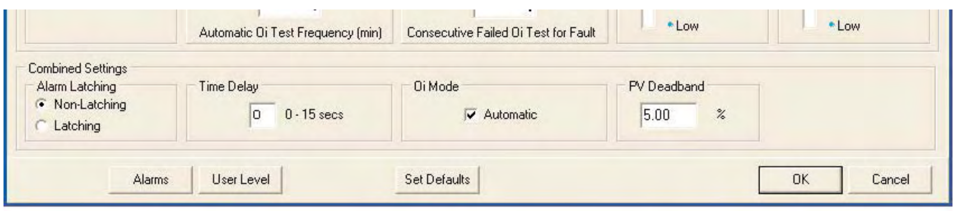
In certain environmental conditions like very heavy rain, oi test failures can occur even though the hardware is not faulty. To compensate for this the number of failed oi tests required to generate the fault can be adjusted upward to a maximum of 30.

Sensitivity and Arc Rejection: The detector sensitivity and arc rejection settings are adjusted using the four position sliders provided in the configuration dialog box.



The factory default for both is "High" which responds to a 1 x 1 foot n-Heptane fire at 60 feet in 1 second with standard processing. For other fuels, distances, etc. refer to the Appendix in the X2200 instruction manual 95-8549.

Combined settings:



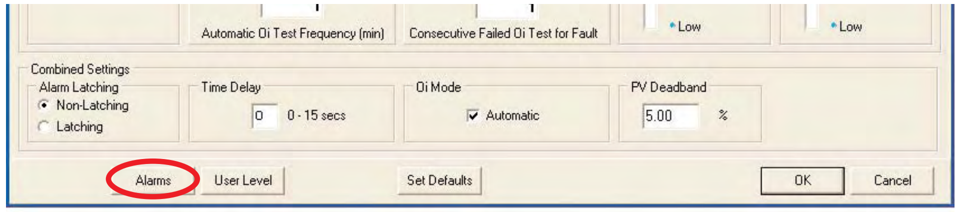
Alarm LED Latch: The tri-color LED on the face of the detector turns red when in alarm and can be configured to be either latching or non-latching. If latching is selected, following a fire detection, the LED will stay on until the detector is reset from the point display for the detector in the S^3 software. The default is non-latching.

PV Deadband: Normally all values are transmitted to the controller every five seconds; If the PV changes more than the entered percentage before the five second report time arrives, an immediate message is sent with the current values.

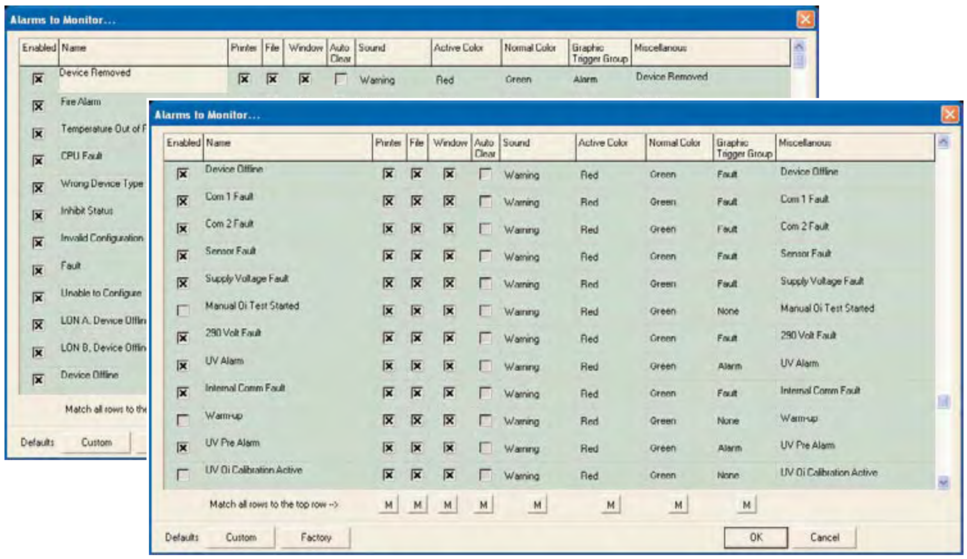
Time Delay: An input time delay can be programmed by entering a value from 1 to 15 seconds in the provided field.

This will delay sending the fire alarm message to the EQP controller until the fire alarm has been generated <u>uninterrupted</u> for the specified time. This programmable delay can be used to filter out spurious events.

Alarms: Selecting this button opens the "Alarms to Monitor..." dialog box.

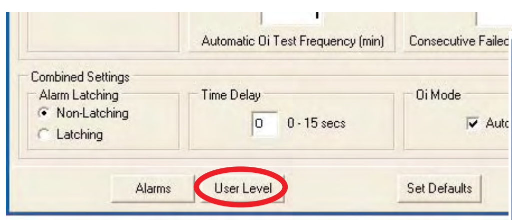


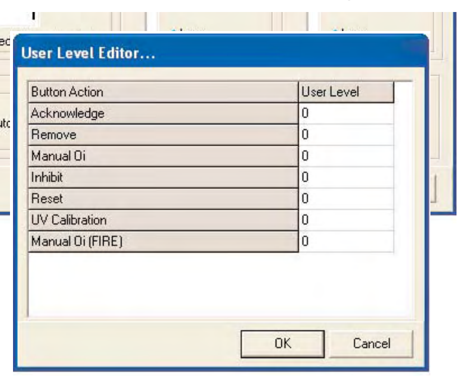
This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S³.



There are 25 alarms and events that pertain to the status and diagnostics of the X2200 detector.

User Levels: The "User Level Editor..." provides a means for limiting access



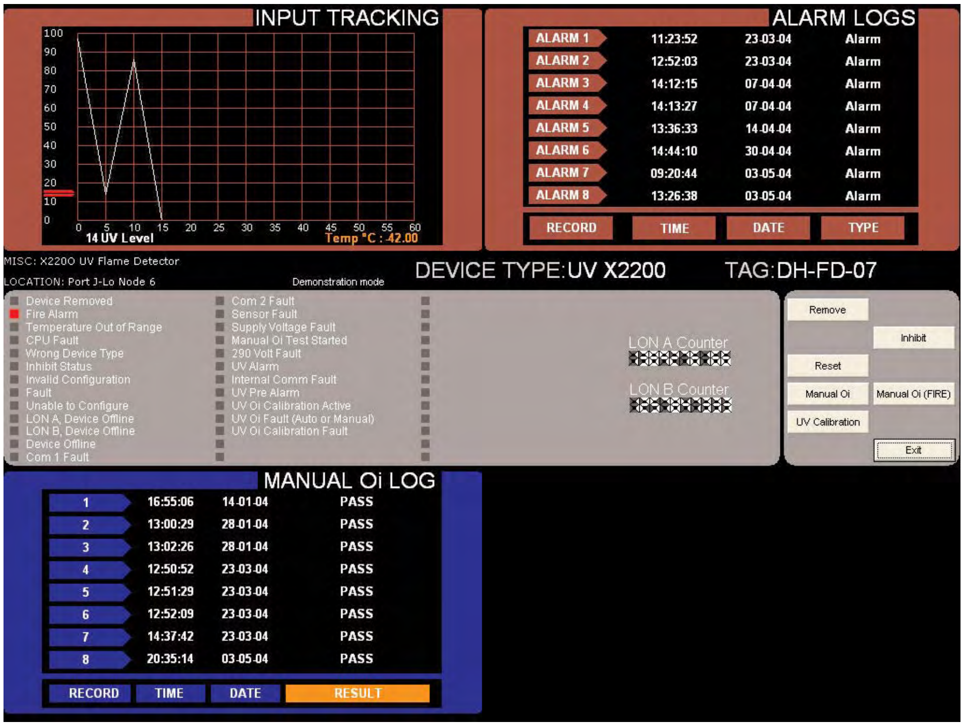


to the "Acknowledge", "Remove", "Manual Oi", "Inhibit", Manual Oi (FIRE)" and "Reset" buttons for the module which are accessible from the devices point display.

The default value is "0" and provides access to all users.

Change these values to match your user account configuration and security needs.

Point Display: The X2200 UV detector has a custom “Point Display” that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.



The point display provides a single window view of all available real-time data for the device.

Alarm Logs: The top right quadrant of the display shows the last eight alarms with their date and time data.

Analog Input Track: The top left quadrant shows a dynamic 60 second history of the measured variable (UV Level) for the detector. The input track scrolls from left to right with the most current data at the “pen” on the left margin. The display updates once every five seconds.

Oi Log: The bottom left quadrant of the point display shows the detectors manual Optical Integrity (Oi) log. The last eight manual tests are shown with the date, time and a PASS/FAIL indicator.

Status & Diagnostics: The middle portion of the point display shows the discrete status and health indicators for the detector.

Buttons: There are six buttons that can send commands to the detector including; remove, inhibit, reset, Manual Oi, Manual Oi (FIRE) and UV Calibration.

EQ2200UVIR

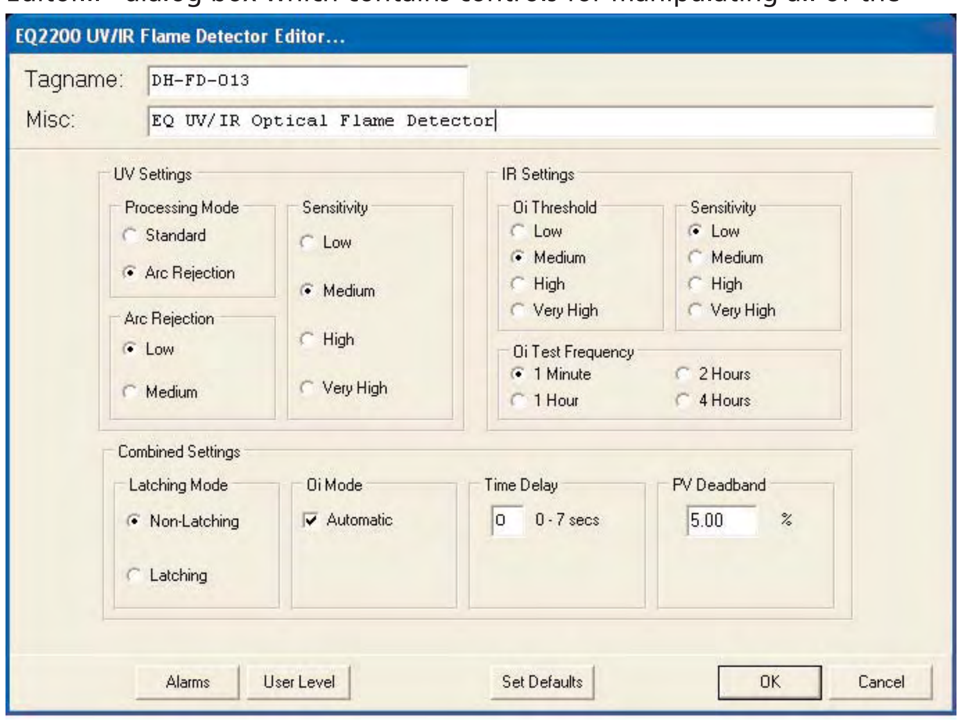
Ultraviolet (UV) / Infrared (IR) Optical Flame Detector

Description: The EQ2200UVIR is located on the LON/SLC and provides a combination UV & IR Optical Flame detection capability for the Eagle Quantum Premier system.

The detector has Division and Zone explosion-proof ratings and is suitable for use in indoor and outdoor applications.

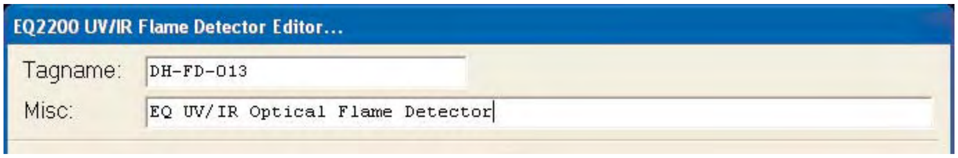
Configuration

Configuration of the detector is through the "EQ2200UVIR Flame Detector Editor..." dialog box which contains controls for manipulating all of the



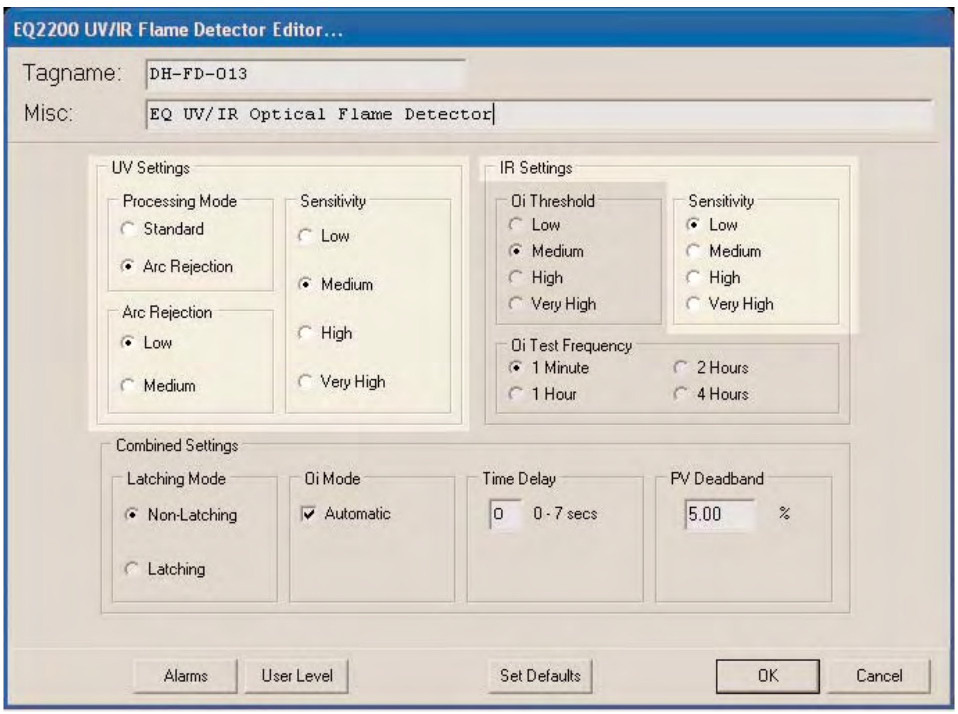
adjustable parameters of the detector. This includes processing and sensitivity adjustments for both of the sensors along with some global settings for alarm action, Oi, time delays and deadband.

Tagname: The tagname at the top of the dialog box refers to the flame detector as a whole and is the identifier used for programming.



Until a tagname is entered the detector is not available in the S³ database for programming, monitoring or dynamic graphic purposes. The optional description entered in the miscellaneous text field can be used for further describe where or how the detector is being used and can be helpful in troubleshooting.

Sensor Settings & Sensitivity: Both the UV and IR sensors have independently adjustable settings for a variety of processing and sensitivity variables that can be used to fine tune the detectors operation to fit the application.



UV Specific Settings: The UV detector can be programmed for either "Standard Signal Processing" or "Arc Rejection".

Arc Rejection (Recommended Factory Setting)

The Arc Rejection mode enables the detector to prevent nuisance fire alarms caused by UV from short-duration electrical arcs or electrostatic discharge, while maintaining the ability to reliably detect the UV given off by a flame. Most false alarm sources have short transient UV signatures, while fire creates a long UV signature over many seconds. Most fires are detected in a few seconds.

Standard Signal Processing

Standard signal processing is recommended for high speed suppression systems only. To allow for high speed operation, the standard processing mode does not incorporate the arc rejection programming.

This mode should only be used in a controlled, indoor environment.

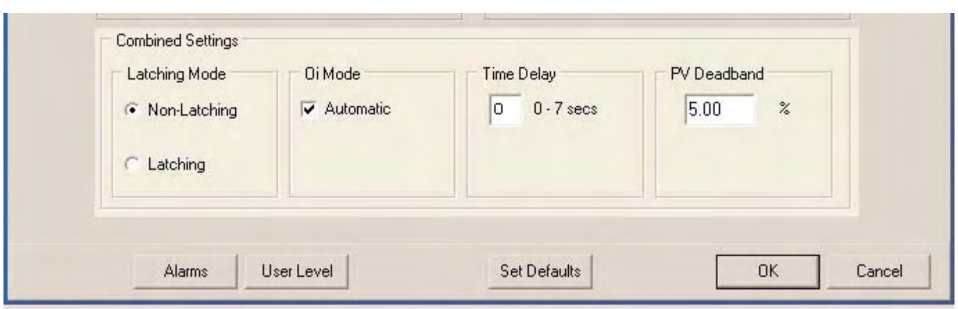
UV and IR Sensor Sensitivity Settings: Both the UV and IR detectors can be individually programmed to operate in one of four sensitivity settings; Low, Medium, High or Very High.

The sensitivity level determines the maximum response distance and the response for the UV/IR detector as a whole will be the lesser of the two.

Examples of sensitivity settings are shown in the table below:

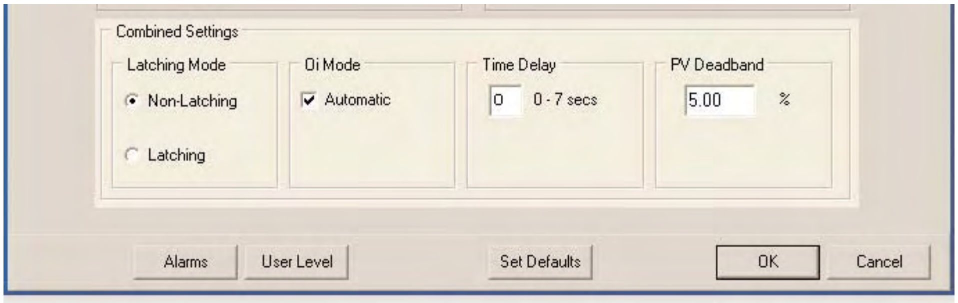
	Sensitivity	Arc Rejection	30 Inch Methane	1 Sq. Ft. Gasoline	1 Sq. Ft. Methanol
UV Standard	Low		40	30	15
	Medium		60	45	20
	High		80	65	35
	Very High		100	100	55
UV Arc Rejection	Low	Medium	35	30	10
	Low	High	35	30	10
	Medium	Medium	55	40	15
	Medium	High	55	40	15
	High	Medium	60	50	25
	High	High	65	50	25
	Very High	Medium	85	65	50
	Very High	High	85	65	50
IR	Low		40	65	40
	Medium		55	75	45
	High		65	90	55
	Very High		90	100	60

Combined Settings: The bottom portion of the dialog box contains settings for the alarm latching, Optical Integrity (Oi), input time delay and PV deadband adjustments that apply to the whole detector as opposed to a specific sensor.



Alarm Latching Mode: The red LED on the face of the detector comes on when in alarm and can be configured to be either latching or non-latching. If latching is selected, following a fire detection, the LED will stay on until the detector is reset from the point display for the detector in the S³ software. The default is non-latching.

Oi Mode: The EQ2200UVIR includes the Automatic Optical Integrity (oi) feature — a performance test that is automatically performed to verify complete detector operation capabilities.



No testing with an external test lamp is required. The detector automatically performs the same test that a maintenance person with a test lamp would perform —once every minute, 60 times per hour. However, a successful automatic oi test does not produce an alarm condition.

While the default Oi test frequency is once a minute, it can be changed to once an hour, every two hours, or once every four hours.

The default mode is Automatic. Manual Oi tests can be initiated from the point display in the S³ software.

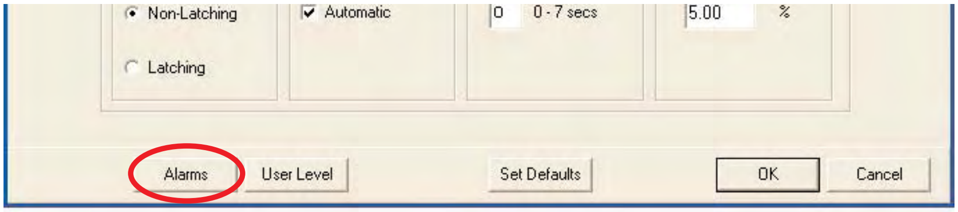
Time Delay: An input time delay can be programmed by entering a value from 1 to 7 seconds in the provided field.

This will delay sending the fire alarm message to the EQP controller until the fire alarm has been generated uninterrupted for the specified time. This programmable delay can be used to filter out spurious events.

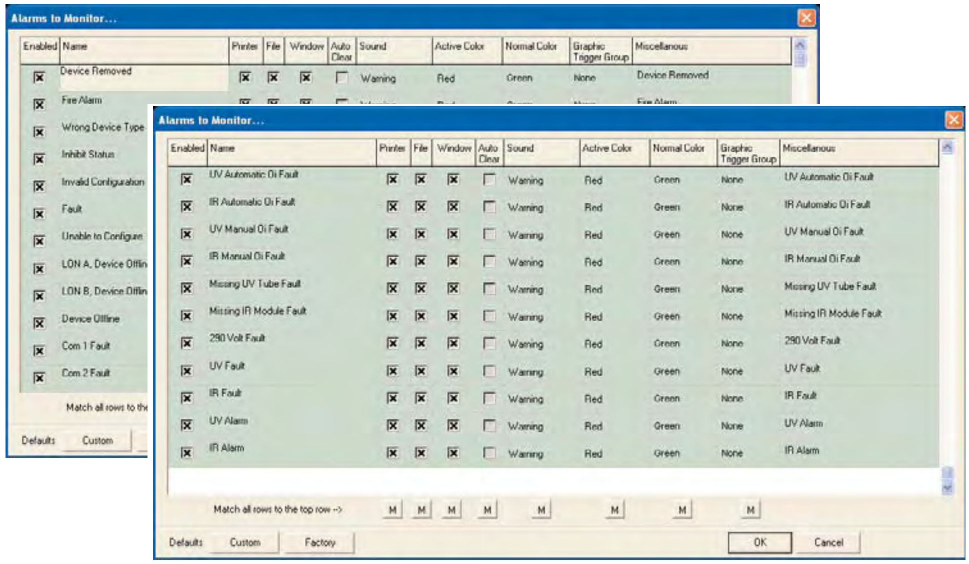
PV Deadband: A field is provided to enter the desired PV (Process Variable) Deadband.

Normally all values are transmitted to the controller every five seconds; If the PV changes more than the entered percentage before the five second report time arrives, an immediate message is sent with the current values.

Alarms: Selecting this button opens the "Alarms to Monitor..." dialog box.

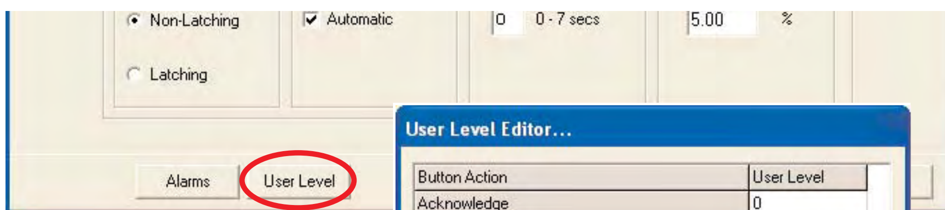


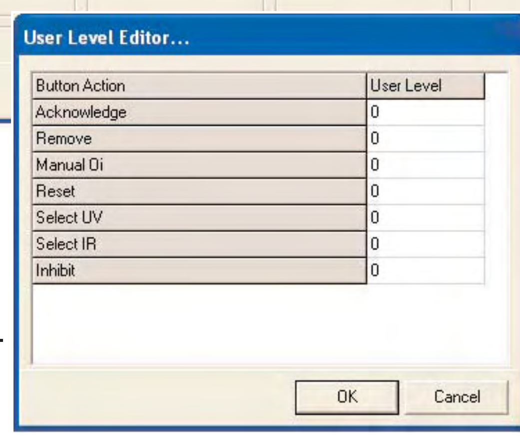
This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S³.



There are 26 alarms and events that pertain to the status and diagnostics of the EQ2200UVIR

User Levels: The "User Level Editor..." provides a means for limiting access



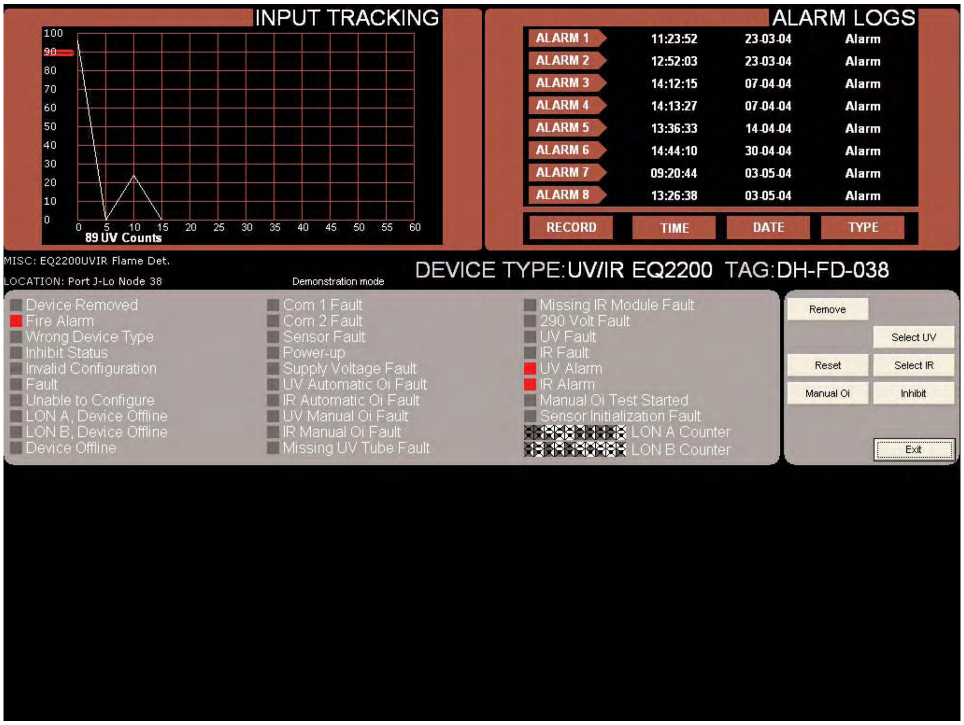


to the "Acknowledge", "Remove", "Manual Oi", "Inhibit", Manual Oi (FIRE)" and "Reset" buttons for the module which are accessible from the devices point display.

The default value is "0" and provides access to all users.

Change these values to match your user account configuration and security needs.

Point Display: The EQ2200UVIR has a custom "Point Display" that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.



The point display provides a single window view of all available real-time data for the device.

Alarm Logs: The top right quadrant of the display shows the last eight alarms with their date and time data.

Analog Input Track: The top left quadrant shows a dynamic 60 second history of the measured variable (UV counts or IR level) for the detector. The input track scrolls from left to right with the most current data at the "pen" on the left margin. The display updates once every five seconds.

Only one of the two PV's (UV or IR) can be displayed at a time, used the "Select UV/IR" buttons on the center right side of the display to toggle between displaying UV Counts as shown in the example above, or, the IR sensors level.

Status & Diagnostics: The middle portion of the point display shows the discrete status and health indicators for the detector.

Buttons: There are six buttons that can send commands to the detector including; Remove, Inhibit, Reset, Select UV, Select IR and Manual Oi.

X5200

Ultraviolet (UV) / Infrared (IR) Optical Flame Detector

Description: The X5200 is located on the LON/SLC and provides UV/IR Optical Flame detection capability for the Eagle Quantum Premier system.

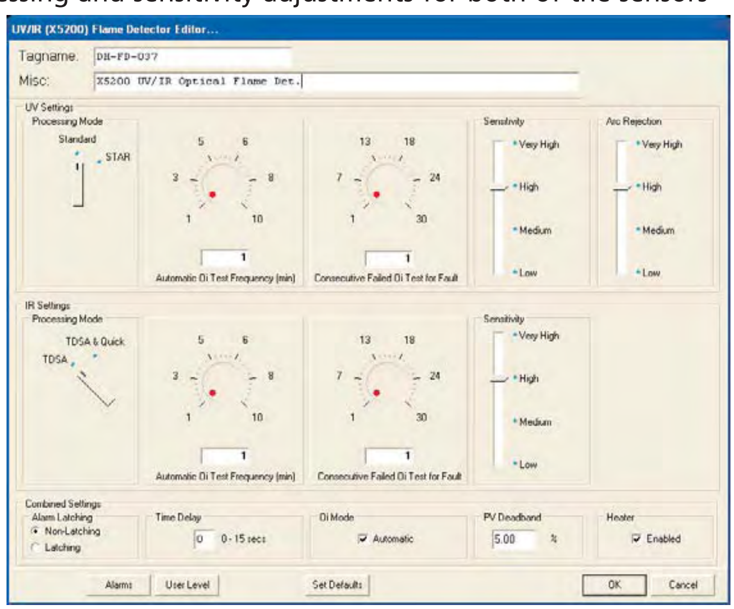
The X5200 meets the most stringent requirements worldwide with advanced detection capabilities and immunity to extraneous sources, combined with a superior mechanical design. The detector is equipped with both automatic and manual oi test capability.

The detector has Division and Zone explosion-proof ratings and is suitable for use in indoor and outdoor applications.

Configuration

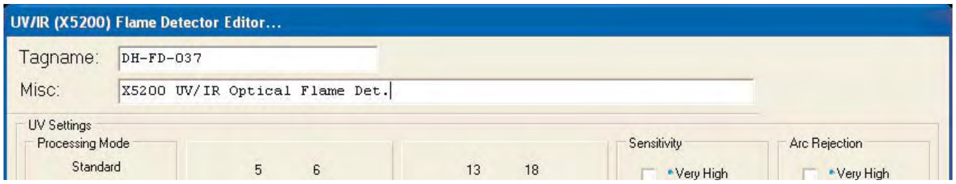
Tagname: Configuration of the detector is through the "UVIR (X5200) Flame Detector Editor..." dialog box which contains controls for manipulating all of the adjustable parameters of the detector.

This includes processing and sensitivity adjustments for both of the sensors along with some global settings for alarm action, Oi, time delays and deadband.



The tagname at the top of the dialog box refers to the flame detector as a whole and is the identifier used for programming.

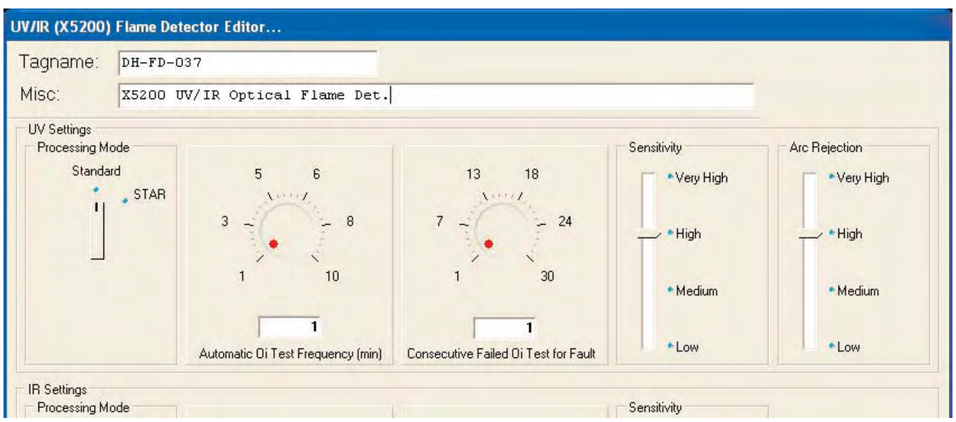
Until a tagname is entered the detector is not available in the S^3 database for programming, monitoring or dynamic graphic purposes. The optional description entered in the miscellaneous text field can be used for further



describe where or how the detector is being used and can be helpful in troubleshooting.

The X5200 features signal processing options for both the UV and IR sensors. These options determine the type of logic that the detector will use for processing fire signals to customize the X5200 to the application.

UV DETECTOR OPTIONS: The UV detector output (measured in counts per second) is compared to the fire threshold (the "sensitivity" setting). If the radiant energy level from the fire exceeds the selected alarm threshold level, the fire alarm output is activated. In every application, it is crucial to ensure that the radiant ultraviolet energy level from the expected fire at the required distance from the detector will exceed the selected sensitivity level.



The UV detector in the X5200 can be programmed for "Standard" signal processing or "Arc Rejection".

Arc Rejection: (Recommended Factory Setting)

The Arc Rejection mode enables the detector to prevent nuisance fire alarms caused by UV from short-duration electrical arcs or electrostatic discharge, while maintaining the ability to reliably detect the UV given off by a flame.

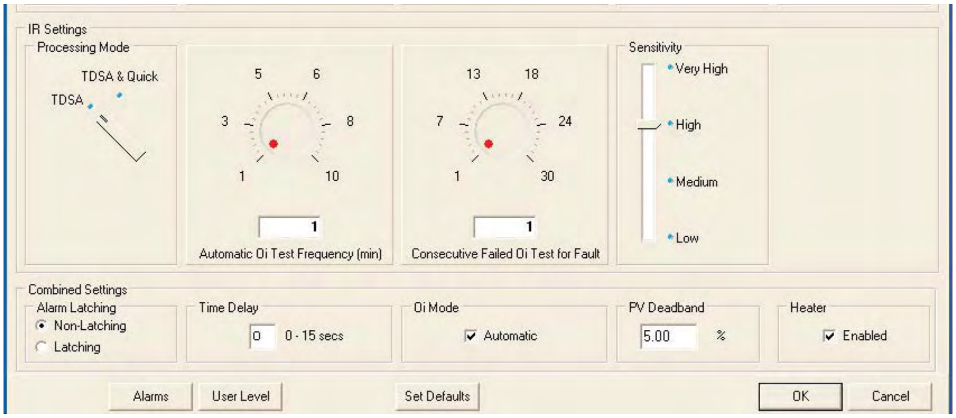
Typical applications that benefit from arc rejection logic include electrostatic coating processes and uncontrolled environments where transient UV sources can be present, such as many typical outdoor applications. Most false alarm sources have short transient UV signatures, while fire creates a long UV signature over many seconds. Most fires are detected in a few seconds.

Standard Signal Processing: Standard signal processing is recommended for high speed suppression systems only. To allow for high speed operation, the standard processing mode does not incorporate the arc rejection programming. This mode should only be used in a controlled, indoor environment.

IR DETECTOR OPTIONS

The IR detector in the X5200 can be programmed for; "TDSA enabled" or both "TDSA and Quick Fire enabled" (either initiates fire alarm).

Time Domain Signal Analysis (TDSA): The TDSA signal processing technique analyzes the input signal in real time, requiring the IR signal to flicker ran-



domly in order to recognize it as a fire condition.

Using TDSA signal processing, the X5200 ignores regularly chopped blackbody sources (occurring in areas where moving conveyors and hot objects in proximity to one another result in a regularly chopped IR signal), because it looks for a less uniform signal.

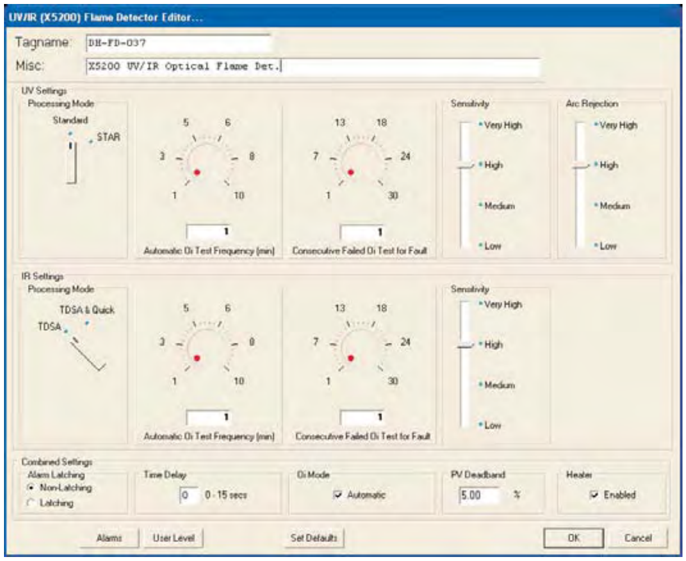
However, in the presence of a regularly chopped signal, the unit is more susceptible to false alarms due to sporadic IR that functions as a trigger when occurring in conjunction with the regularly chopped signal.

Quick Fire (High Speed): The Quick Fire (High Speed) feature can be used in conjunction with the TDSA signal processing method.

This method overrides TDSA requirements in the event of an intense signal. When Quick Fire is activated, the detector is capable of responding to an intense fire signal in less than 30 milliseconds (0.030 seconds).

Using the Quick Fire feature in conjunction with TDSA signal processing allows the detector to provide a high speed response to a large, non-flickering fire (such as in high pressure gas applications) while maintaining an ability to respond to smaller fires.

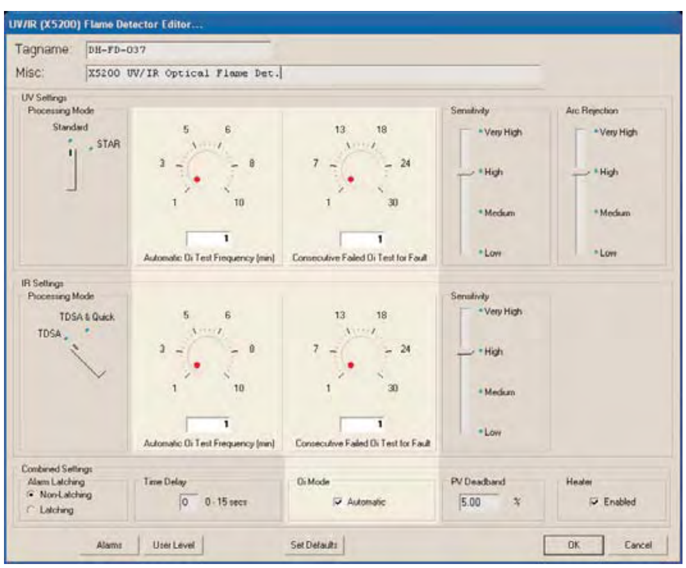
Sensor Sensitivity Adjustments:



Both the UV and IR sensors have individually adjustable sensitivity selections. These settings combined with the signal processing and arc rejection selections will effect how the detector responds to different types of fires. For details on the impact of these settings on a variety of common fuels, refer to the X5200 Instruction manual, Detronics number 95-8546.

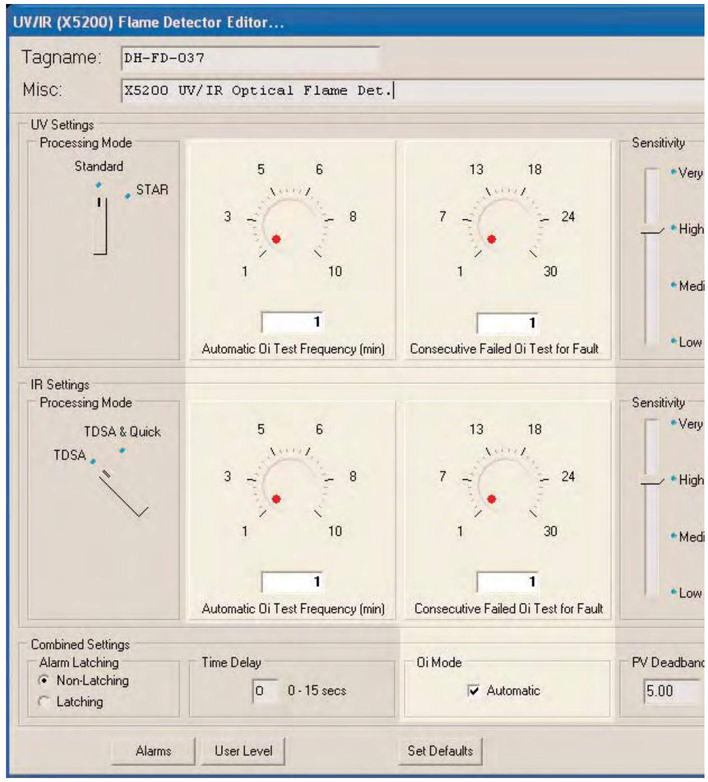
Automatic Optical Integrity (Oi)

The X5200 includes the Automatic Optical Integrity (oi) feature — a calibrated performance test that is automatically performed once per minute to verify complete detector operation capabilities. No testing with an external test lamp is required. The detector automatically performs the same test that a maintenance person with a test lamp would perform — once every minute, 60 times per hour. However, a successful automatic oi test does not produce an alarm condition.



The X5200 signals a fault condition when less than half of the detection range remains. This is indicated by the Fault relay and is evident by the amber color of the LED on the face of the detector.

The oi feature is set to automatic as a factory default but can be deselected for “manual only” operation. Manual oi tests can be initiated via the detectors point display in the S³ software.



Oi Test Frequency

The default oi test frequency is once a minute but can be adjusted to any whole minute increment up to a maximum of ten minutes.

Oi Test Fault

The detector automatically conducts oi tests to check the integrity of the optical sensing systems. Three consecutive failed oi tests will generate a fault condition, which will be indicated by the LED on the face of the detector turning amber. The EQP Controller and S³ software will also annunciate this fault.

In certain environmental conditions like very heavy rain, oi test failures can occur even though the hardware is not faulty. To compensate for this the number of failed oi tests required to generate the fault can be adjusted upward to a maximum of 30.

Oi Mode: The X5200 UVIR includes the Automatic Optical Integrity (oi) feature — a performance test that is automatically performed to verify complete detector operation capabilities.

Combined Settings: The bottom portion of the dialog box contains settings for the alarm latching, Optical Integrity (Oi), input time delay and PV deadband adjustments that apply to the whole detector as opposed to a specific sensor.

Alarm Latching Mode: The red LED on the face of the detector comes on when in alarm and can be configured to be either latching or non-latching. If latching is selected, following a fire detection, the LED will stay on until the detector is reset from the point display for the detector in the S³ software. The default is non-latching.

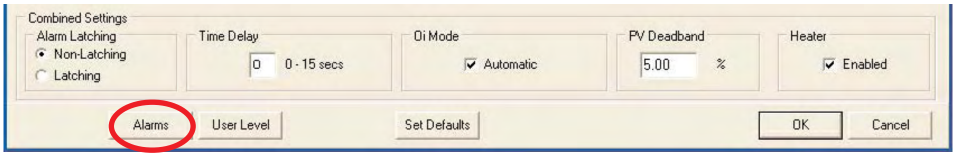
Time Delay: An input time delay can be programmed by entering a value from 1 to 15 seconds in the provided field.

This will delay sending the fire alarm message to the EQP controller until the fire alarm has been generated <u>uninterrupted</u> for the specified time. This programmable delay can be used to filter out spurious events.

PV Deadband: A field is provided to enter the desired PV (Process Variable) Deadband.

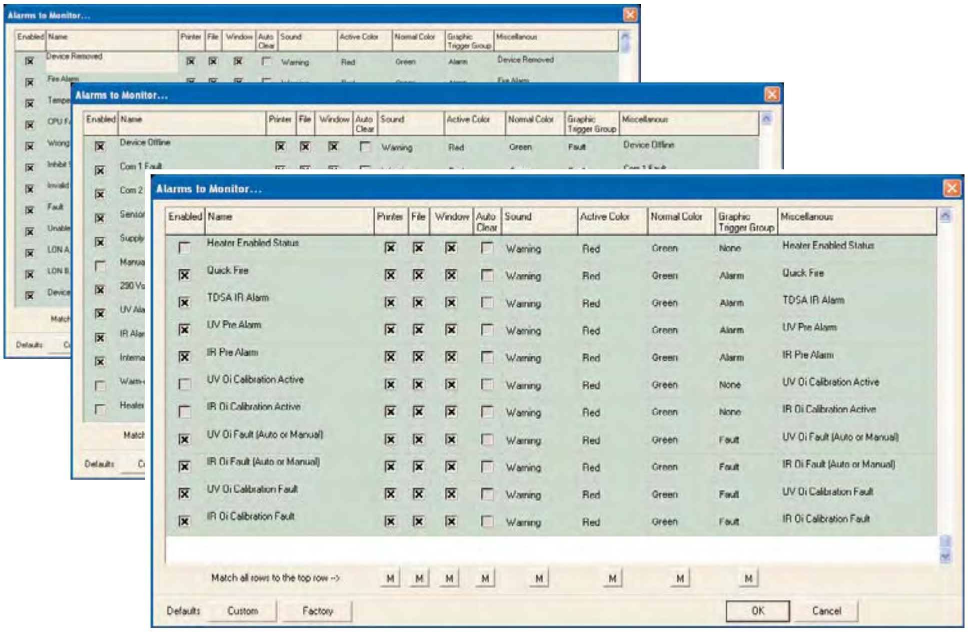
Normally all values are transmitted to the controller every five seconds; If the PV changes more than the entered percentage before the five second report time arrives, an immediate message is sent with the current values.

Alarms: Selecting this button opens the "Alarms to Monitor..." dialog box.

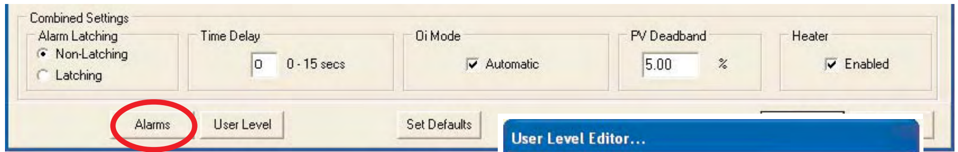


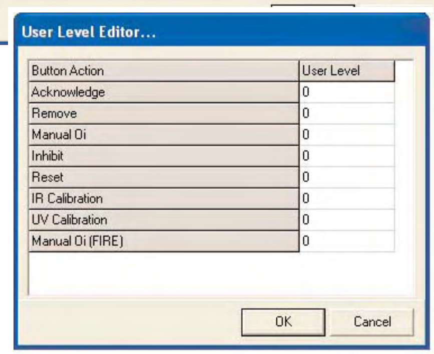
This scrolling list displays the alarms and events related to the device that can be configured to be monitored by S³.

There are 33 alarms and events that pertain to the status and diagnostics of the X5200 UVIR.



User Levels: The “User Level Editor...” provides a means for limiting access to the “Acknowledge”, “Remove”, “Manual Oi”, “Inhibit”, Manual Oi





(FIRE)”, “IR Calibration”, “UV Calibration” and “Reset” buttons for the module which are accessible from the devices point display.

The default value is “0” and provides access to all users.

Change these values to match your user account configuration and security needs.

Point Display: The X5200 UVIR detector has a custom “Point Display” that can be accessed from either the Point Display button on the Command Bar or from the Online Mode.

The point display provides a single window view of all available real-time data for the device.

Alarm Logs: The top right quadrant of the display shows the last eight alarms with their date and time data.

Analog Input Tracks: The top left and bottom right quadrants show a dynamic 60 second history of the detectors measured variables, UV and IR levels. The input track scrolls from left to right with the most current data at the "pen" on the left margin. The display updates once every five seconds.

Oi Log: The bottom left quadrant of the point display shows the detectors manual Optical Integrity (Oi) log. The last eight manual tests are shown with the date, time and a PASS/FAIL indicator.

Status & Diagnostics: The middle portion of the point display shows the discrete status and health indicators for the detector.

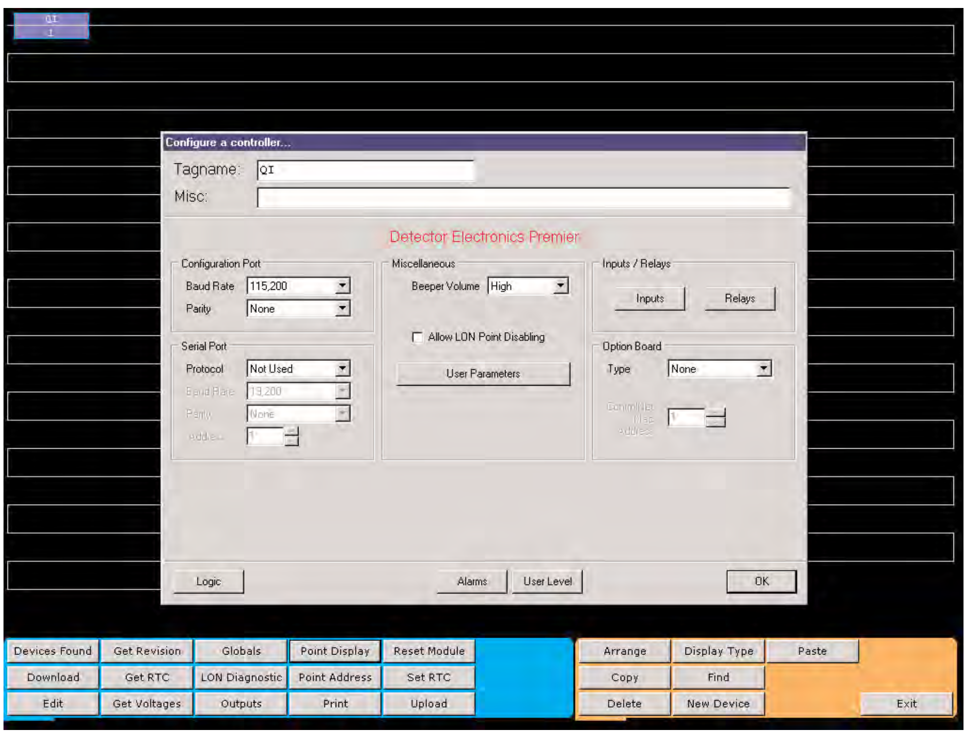
Buttons: There are eight buttons that can send commands to the detector including; remove, inhibit, reset, Manual Oi, Manual Oi (FIRE), IR Calibration and UV Calibration.

LOGIC EDITOR

The Eagle Quantum Premier controller is a programmable device that requires a "user program" to be written to customize the system for the hazard(s) being monitored.

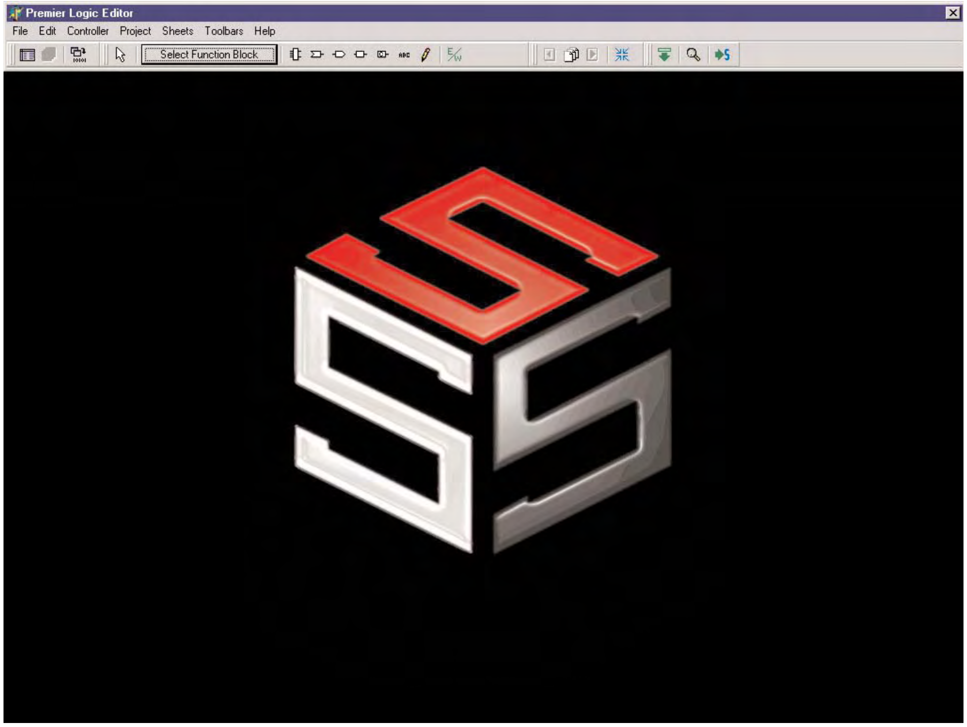
This "user program" is developed utilizing a "Logic Editor" within the S^3 software environment that provides the following facilities:

- An IEC-61131-3 style logic editor for developing logic.
- A logic simulator for testing and debugging the logic.
- The ability to download the program to the controller.
- The ability to monitor the operation of the logic "online".
- The ability to create printed documentation of the user program.



The logic editor is accessed through the controllers configuration dialog box. In the lower left of the "Configure a controller ..." dialog box there is a "Logic" button. Selecting this button will launch the "Logic Editor".

Once the “Logic” button is selected from the “Configure a controller ...” dialog box, the “Logic Editor” program is launched.

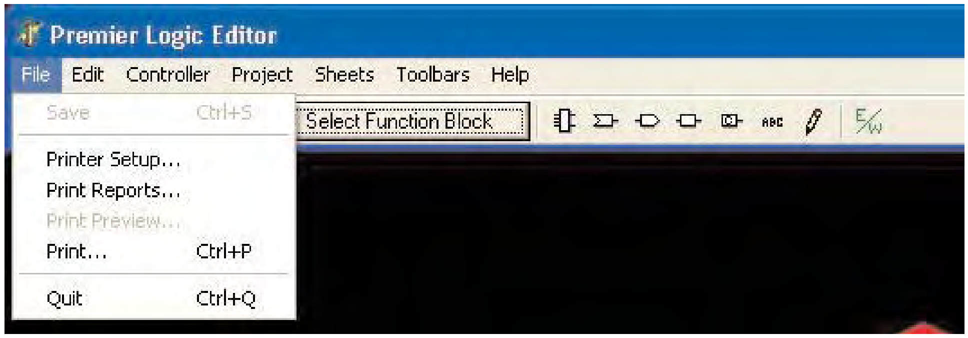


The “Premier Logic Editor” is a full screen application, and when launched looks like the example above.

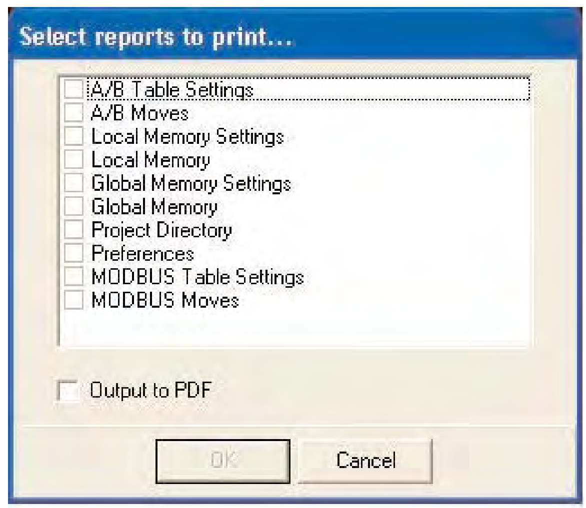
The upper area of the screen contains the applicable menus at the top and a button bar below that provides access to a variety of editing and display tools. Below the button bar, is an empty area with the S^3 logo, this is the main work area where logic pages are displayed and edited.

There are seven standard Windows pull down menus; File, Edit, Controller, Project, Sheets, Toolbars and Help. Each menu will be described in detail later. The button bar is customizable but in the examples above and below it is shown in its default configuration.

File Menu: This menu contains the standard “Windows” routines for setting up to print to a network printer and then printing selected reports.



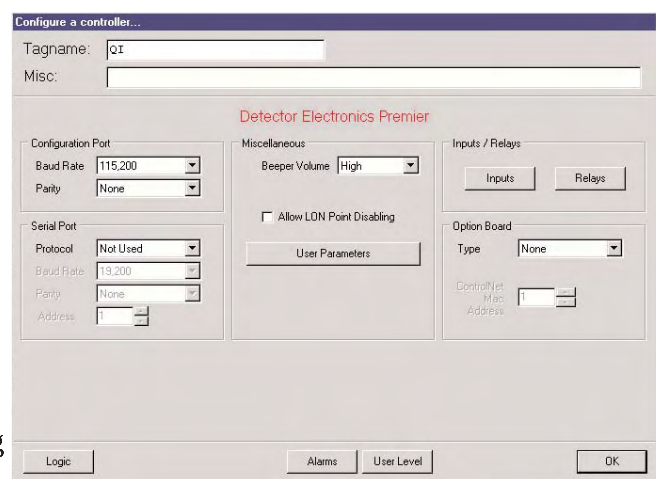
Print Reports: Calls up the “Select reports to print...” dialog box which presents ten check boxes to select what portions of the controllers configuration are to be assembled into a report for printing.



In the lower left of the dialog box, there is an “Output to PDF” checkbox that will send the reports to a PDF file instead of to the selected network printer.

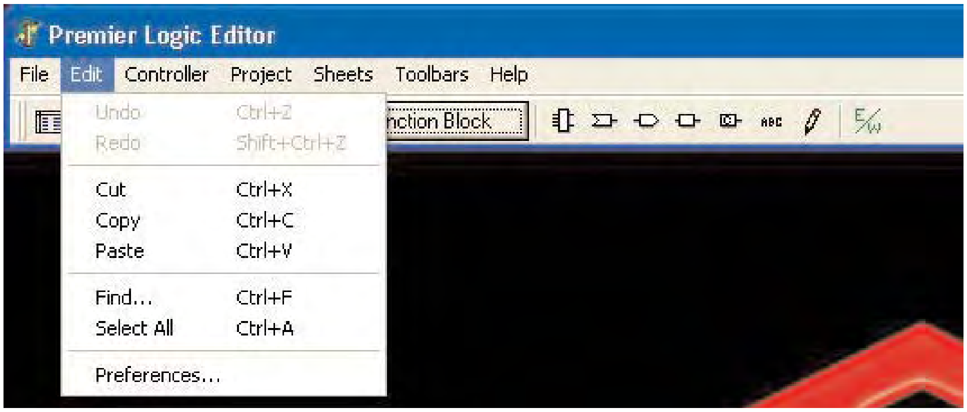
These reports can be read and printed by Adobe Acrobat™ and other PDF compliant programs.

Quit: The “Quit” selection will shut down the logic editor program and return to the controllers configuration dialog box.

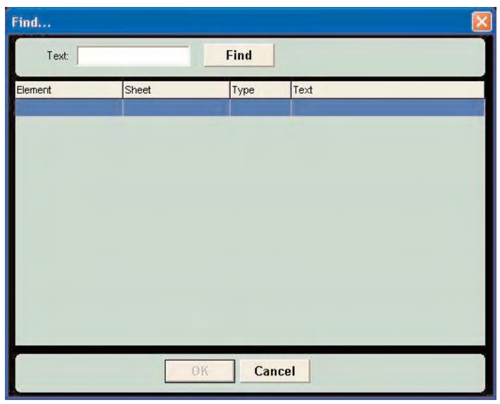


If there are unsaved changes to the configuration you will be prompted to save changes prior to exiting the logic editor.

Edit Menu: This menu contains the standard "Windows" routines for Cut, Copy and Paste that will be used throughout the program. In addition there is a "Find" command, "Select All" and "Preferences".

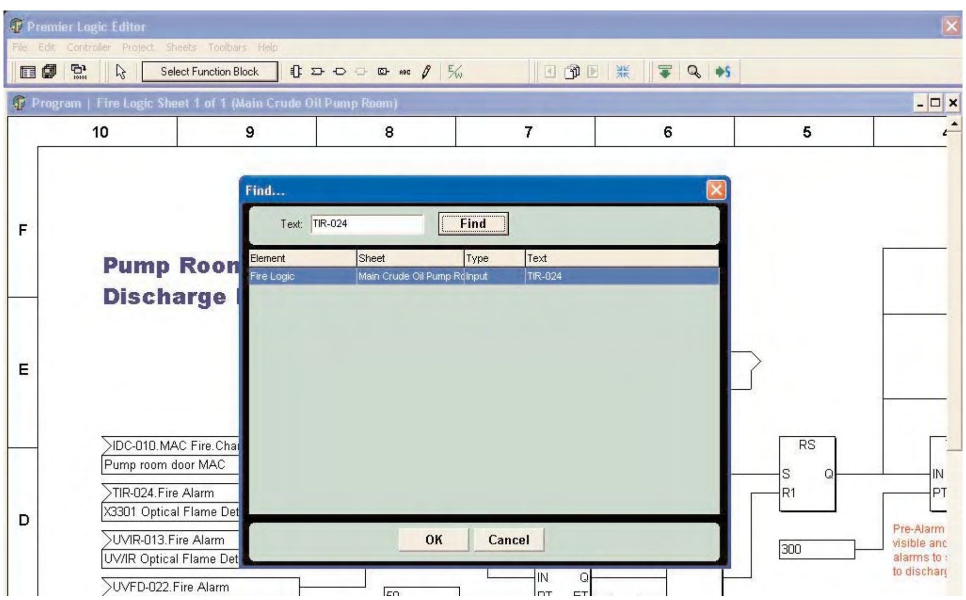


Find: This command will open the "Find" dialog box which provides a Text entry field and a Find button.

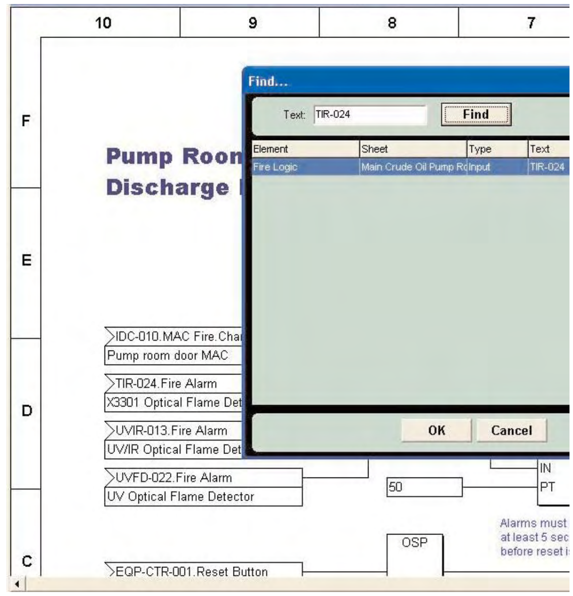


When a "Find" is initiated S^3 will search the logic drawings and list the matching elements along with their originating drawing sheet, element type and the full text associated with the search.

In the sample below, a logic page was opened and a search for the text string "TIR-024" was entered and the results are shown.

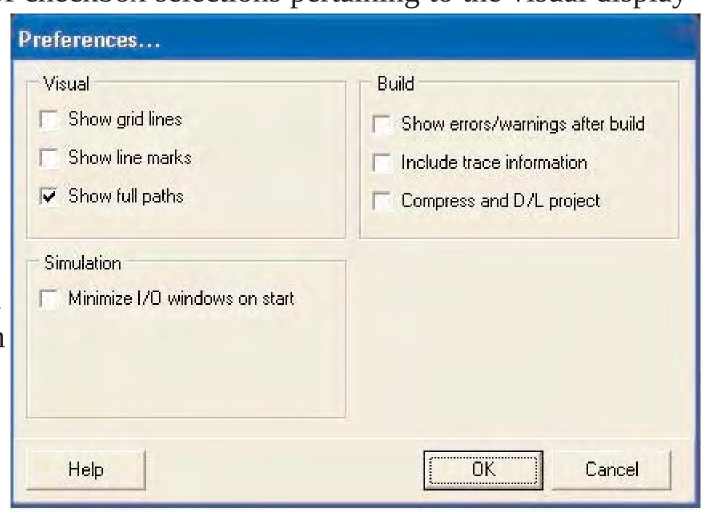


In this sample find, the listed *Element* is “Fire Logic” which is a program, the *Sheet Name* in the logic program is “Main Crude Oil Pump Room”, the *Type* is “Input” and finally the located *“Text”* is “TIR-024”.



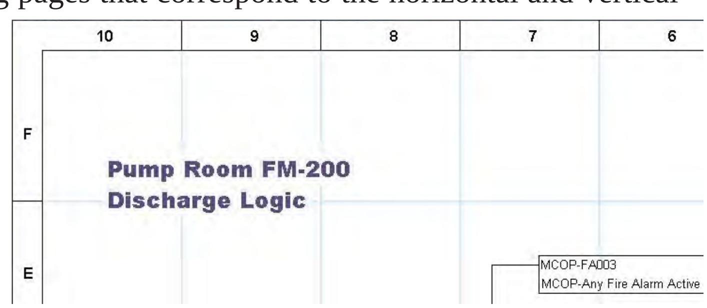
In the example to the right, you can see the input block “TIR-024 Fire Alarm” on the left side of the logic page partially behind the “Find...” dialog box.

Preferences: This selection opens the “Preferences...” dialog box which contains a number of checkbox selections pertaining to the visual display of the logic editor, compiling (Build) options and a Simulator selection.



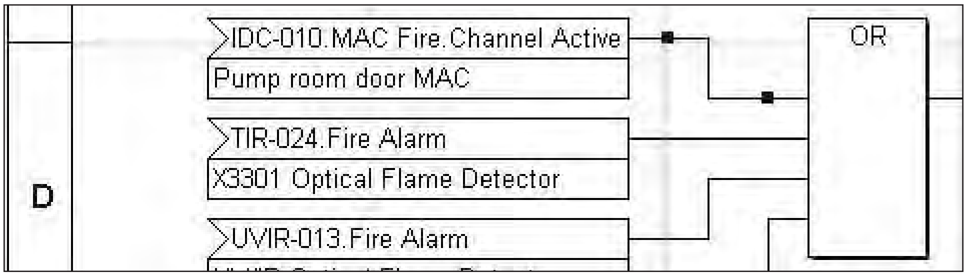
The example to the right shows the logic editors default configuration. Each of these selectable options are described in detail below.

Show grid lines: When selected this will display a faint cyan reference lines on the drawing pages that correspond to the horizontal and vertical references on the drawing title block.

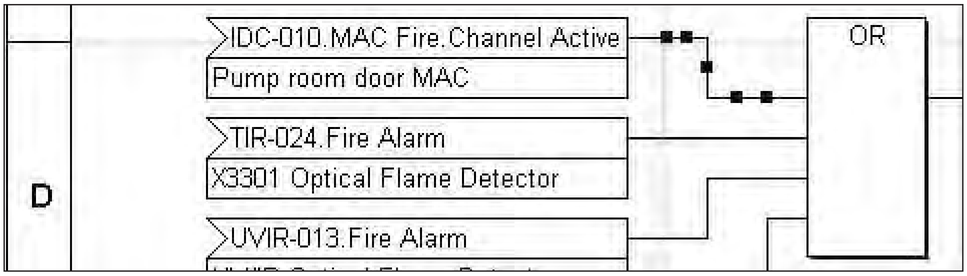


The grid lines are drawn “behind” the graphic logic elements.

Show Line Marks: In the logic editor when a line is selected by clicking on it, or, when the "Connection Tool" has been selected, a small black rectangle marks the beginning and end of each line as shown in the first example below.



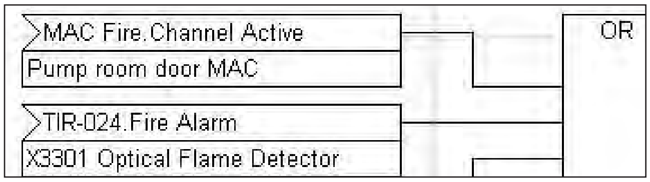
Selecting "Show Line Marks" as in the second example below, will display an additional three visual indicators spaced between the beginning



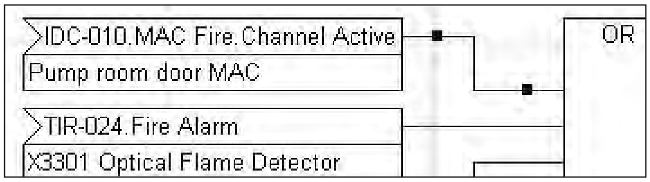
and end of the line to provide better visual cues on lines that are long or close to many others. This is only a visual cue and has no effect on the ability to select or edit the line.

Show Full Paths: A tagname might be a channel on an IDC or HDIO or it could be the complete device. This option allows for the complete path to be shown.

In the example to the right, an IDC which is tagged IDC-010 has two channels. One channel is "MAC Fire".

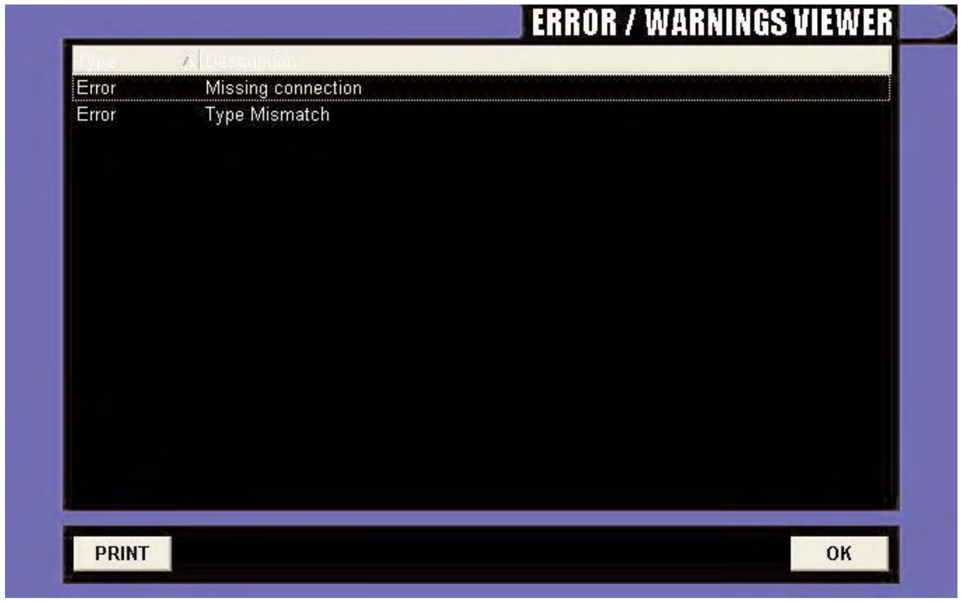


When "Show Full Paths" is enabled the channel tagname is to be shown to the left of the tagname, as shown in the example to the right. It now reads; "IDC-010.MAC Fire"



Show errors/warnings after build: When enabled, the logic editor will automatically display the "ERROR / WARNINGS VIEWER" at the completion of a project compile (build) listing any problems.

This can also be done manually by using the "Show Errors/Warnings" menu item under the "Project" menu or by using the "E/W" button on the toolbar.



Selecting one of the errors will close the viewer and display the section of logic containing the problem.

You may also choose to print out the list using the "Print" button in the lower left of the dialog box.

Include trace information: The compiler generates markers in the code for the troubleshooting of compiler or controller errors. Normally, for faster execution of the program, this would not be selected. If a non-logical error is occurring this could be used to aid in troubleshooting.

Compress and D/L project: When enabled the **complete project** is compressed and downloaded to the controller whenever the download command is executed. This powerful feature backs up all aspects of the project including any non-Premier ports and custom graphics. It is very similar to the routine of the "Backup/Restore" utility described in Chapter 7 except the compressed file is stored in non-volatile memory in the controller instead of on the OIS hard disk or network.

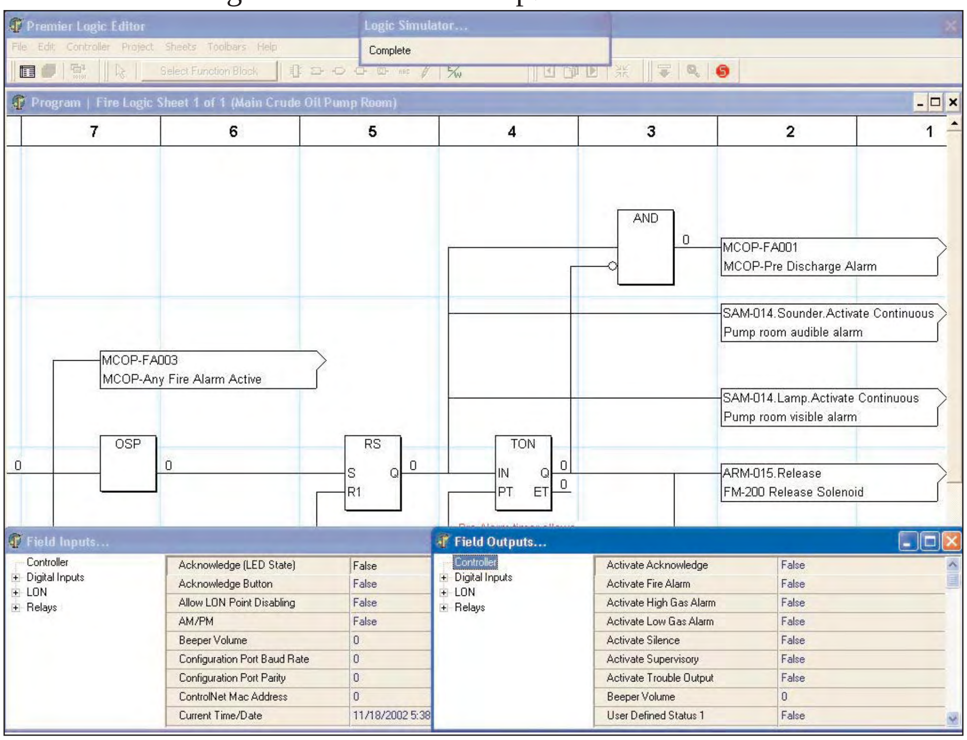
This option allows any S³ station to later "upload" the complete project for editing or display without needing an original copy.

If this option is not selected it will be **impossible** for an S³ station without the original project file to view, edit or troubleshoot the program in the controller. An attached S³ station will be able to determine the LON makeup and provide LON and device diagnostics, but access to the controller program will not be available.

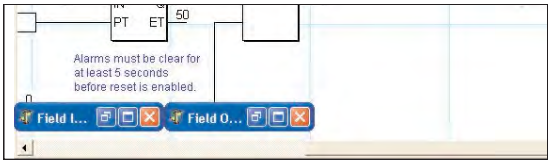
Note:
This option adds time to the build and download and is not required for proper operation of the program.

In practice this option is usually disabled until the user program and entire project are complete, tested and ready for service.

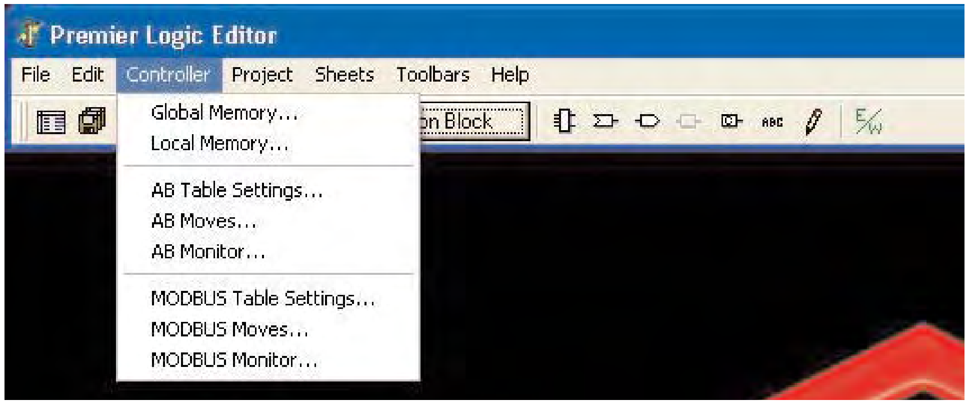
Minimize I/O windows on start: This option is used to control the look and feel of the logic simulator on startup. The simulator has two I/O



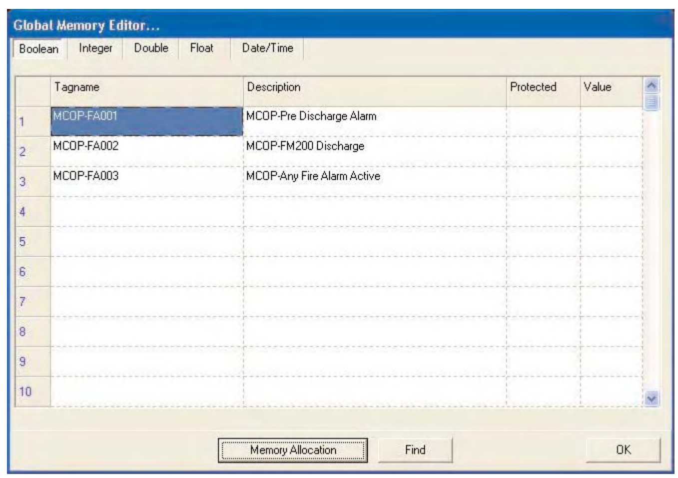
windows. One is inputs and the other is outputs. When the simulator starts these windows will normally open full size. If the checkbox is enabled they will open in the minimized state.



Controller Menu: This menu provides access to a variety of memory management functions for internal program variables and for the configuration of the Allen Bradley and Modbus tables used by outside systems to access the controllers data.



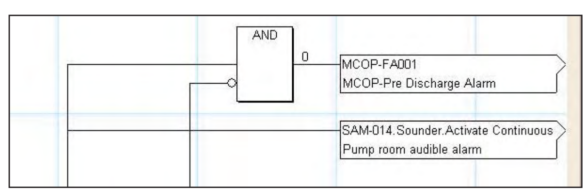
Global Memory: Global memory is typically used to exchange data with external devices such as Modbus or Allen-Bradley PLC's. This menu item opens the "Global Memory Editor..." which allows for the creation of and displays information on the five types of global memory. It also allows for the adjustment of memory allocations.



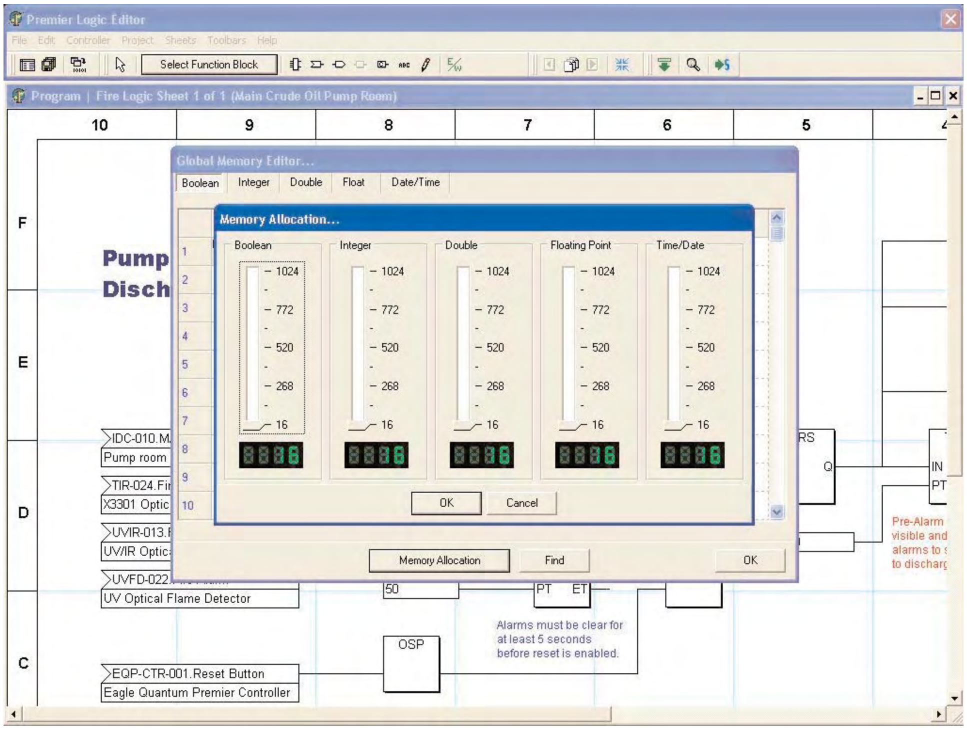
The dialog box is "tabbed" allowing for the selection of the memory type to be displayed/edited. In the example to the right, "Boolean" is selected and there are three points created.

To create a global memory point, put the editing cursor in the "Tagname" field and enter a tagname, then if desired enter a long name in the "Description" field.

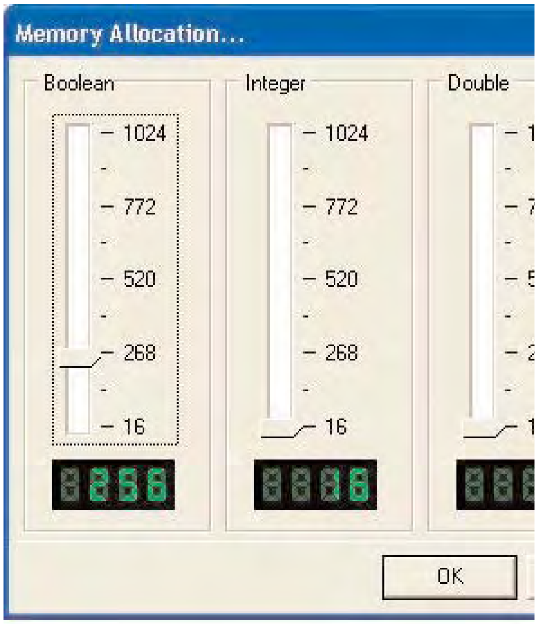
Once created, this global memory point will be available in the logic editor for use as an input to or output from logic elements.



Memory Allocation: The amount of memory set aside for each of the five types is adjustable. Clicking on the "Memory Allocation" button at the bottom of the memory editor dialog box will open the "Memory Allocation..." dialog box.



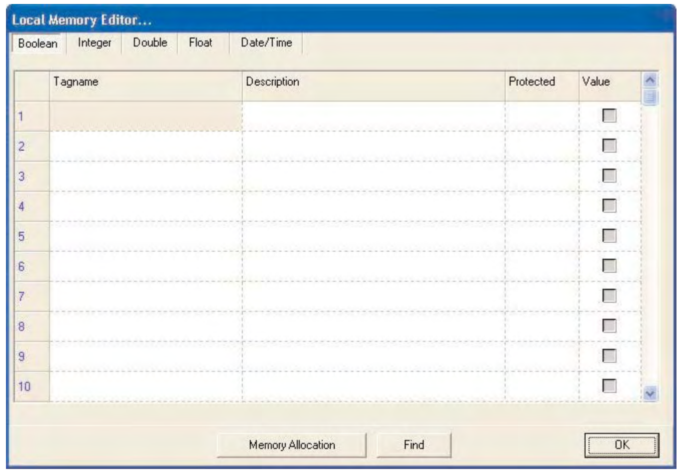
This dialog box provides five "slider" type adjustments to change the memory allocation for each type. The default setting is 16 and is adjusted by clicking on the slider and dragging it up or down until the desired quantity is reached.



Up to 1K (1024) can be allocated for each type of memory. The minimum like the default value is 16.

To set the memory allocation, move the slider to the approximate value desired. To set the exact value, observe the digital display and use the Up/Down arrow keys to change the value one number at a time.

Local Memory: This menu item opens the "Local Memory Editor..." which allows for the creation of and displays information on the five types of local memory. It also allows for the adjustment of memory allocations.



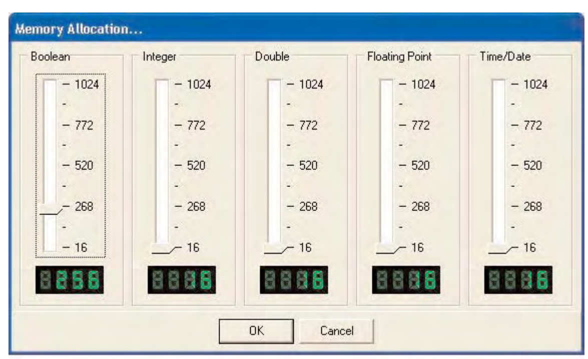
The dialog box is "tabbed" allowing for the selection of the memory type to be displayed/edited. In the example to the right, "Boolean" is selected and there are no points created yet.

To create a local memory point, put the editing cursor in the "Tagname" field and enter a tagname, then if desired enter a long name in the "Description" field.

Once created, this local memory point will be available in the logic editor for use as an input to or output from logic elements.

Value: The value column is available in each of the five local memory types and allows the setting of an initial value. This value will be used when the program begins execution and if the variable is not written to will remain unchanged.

Memory Allocation: Local Memory is allocated in the same manner as described earlier for Global Memory.

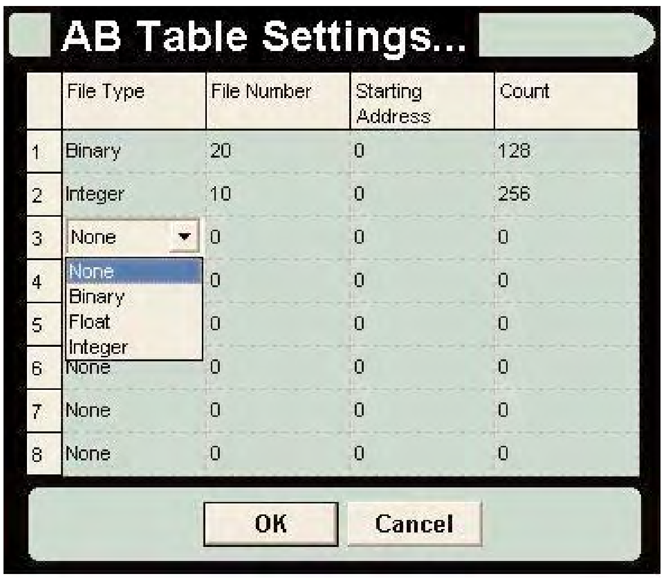


A "Memory Allocation..." dialog box provides a slider to adjust the amount of memory for each type.

AB Table Settings: This menu selection opens a dialog box which allows up to eight communication interface "tables" to be configured to allow for data to be "moved" between the Eagle Quantum Premier controller and an Allen-Bradley PLC or other system utilizing Allen Bradley communication protocols.

Clicking on any cell in the "File Type" column will activate a pop-up menu allowing the selection of the proper table type for the data to be exchanged.

The three file types are binary, floating point (Float) and Integer. To configure a table, select the appropriate file type, file number, starting address and the number of words to read (count).

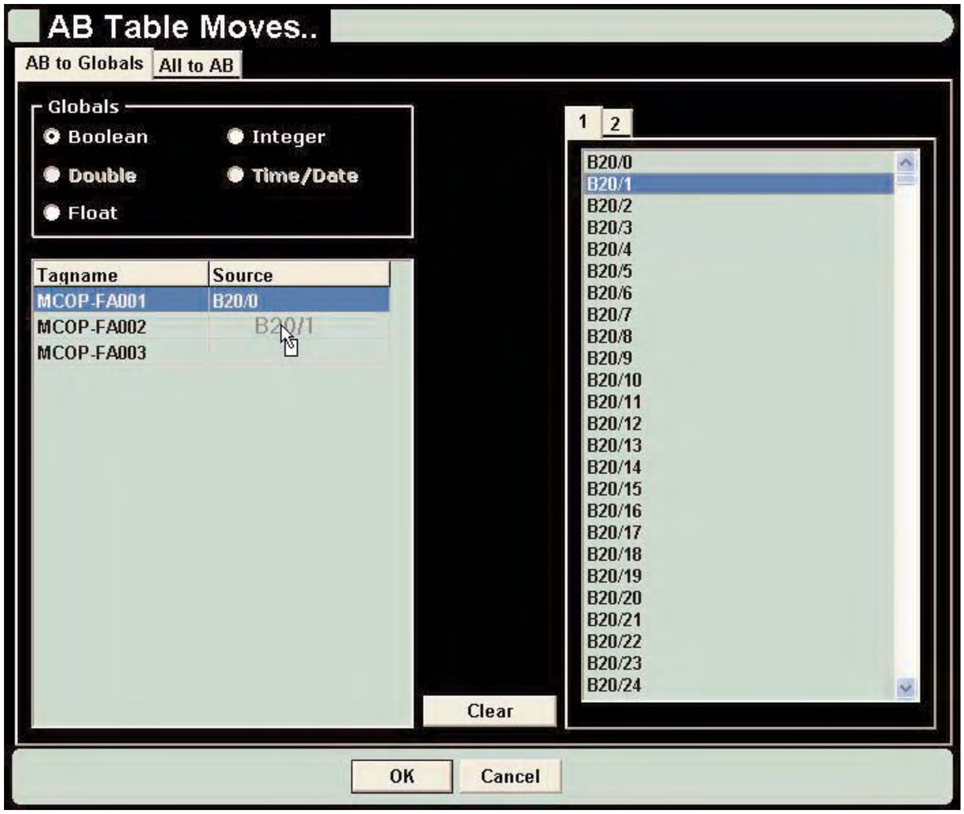


Once the tables are configured, click the "OK" button to allocate memory to support the new table configuration.

In the example above, table 1 is configured for binary data which will be stored in file 20. The table will be 128 words (16 bit registers) long and therefore support 2048 discrete "bits" of information.

AB Moves: This dialog box allows for the configuration of data moving between an Allen Bradley system and the Eagle Quantum Premier controllers memory.

The dialog box uses a tabbed interface with two tabs on the left side representing the two directions data can flow.



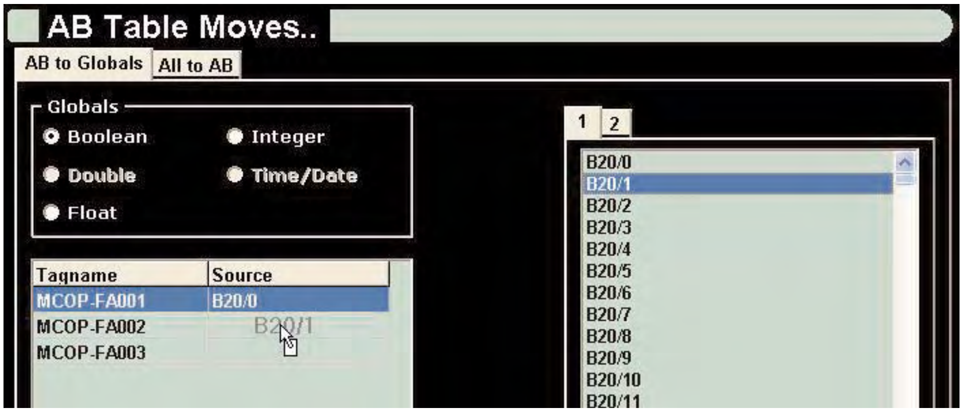
- Data to be moved from the AB system into the Premier controllers memory is configured under the “AB to Globals” tab.

- Data that will move from the Premier controller to the AB system is configured under the “All to AB” tab.

On the right side of the dialog box is a tabbed scrolling list representing configured data tables. In the example above, there are two tabs, one for each configured AB table (see previous page). There can be up to eight tabs representing the maximum number of configured data tables.

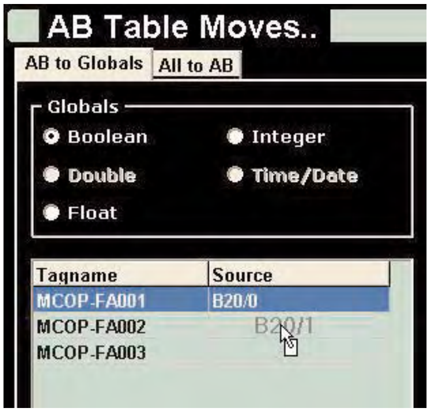
To configure data for movement, select and drag an address from the right hand side and drop it into the “Source” cell next to the desired “Tagname” in the left hand side.

AB Moves...continued: In the example below the AB address "B20/0" is configured to be moved to a Premier controller global variable "MCOP-FA001" and AB address "B20/1" in the process of being



"dropped" onto a Premier controller global memory point "MCOP-FA002".

The radio buttons on the left hand side of the dialog box will determine which configured global variables are displayed.



In the example to the right the "Boolean" radio button is selected and the three configured boolean globals are displayed as potential targets for data input.

Note:
Data coming from an AB system into the Premier controller can only be moved into global memory locations that have been configured using the Global Memory Editor as described on preceding pages of this manual.

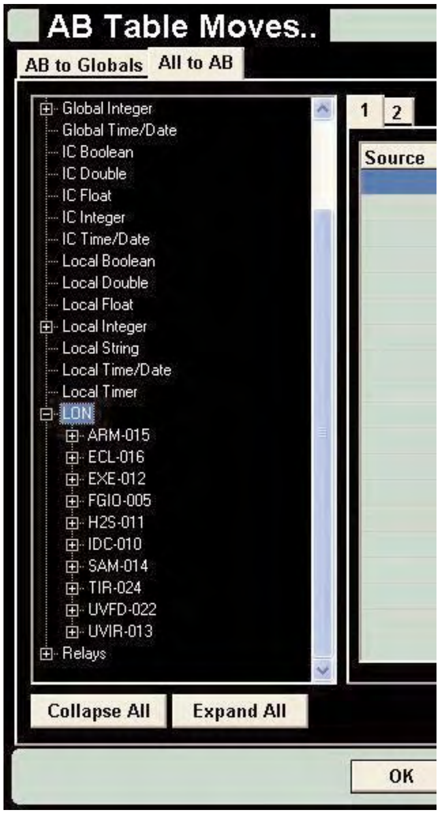
AB Moves...continued: When the “All to AB” tab is selected, a hierarchical list of “sources” is shown on the left hand side of the dialog box which can be selected for “movement” to “destinations” in the AB system.

Any item on the list that has a “+” before it has subordinate items and clicking on the “+” will expand the list showing all items that make up that category.

Below the list are two buttons that can “Expand” or “Collapse” all subordinate items in the list for easy viewing.

The first twelve items on the list provide access to controller status information and the globals database. The “LON” item will allow access to all field device information, the “Relays” item is for accessing the controllers onboard relay status.

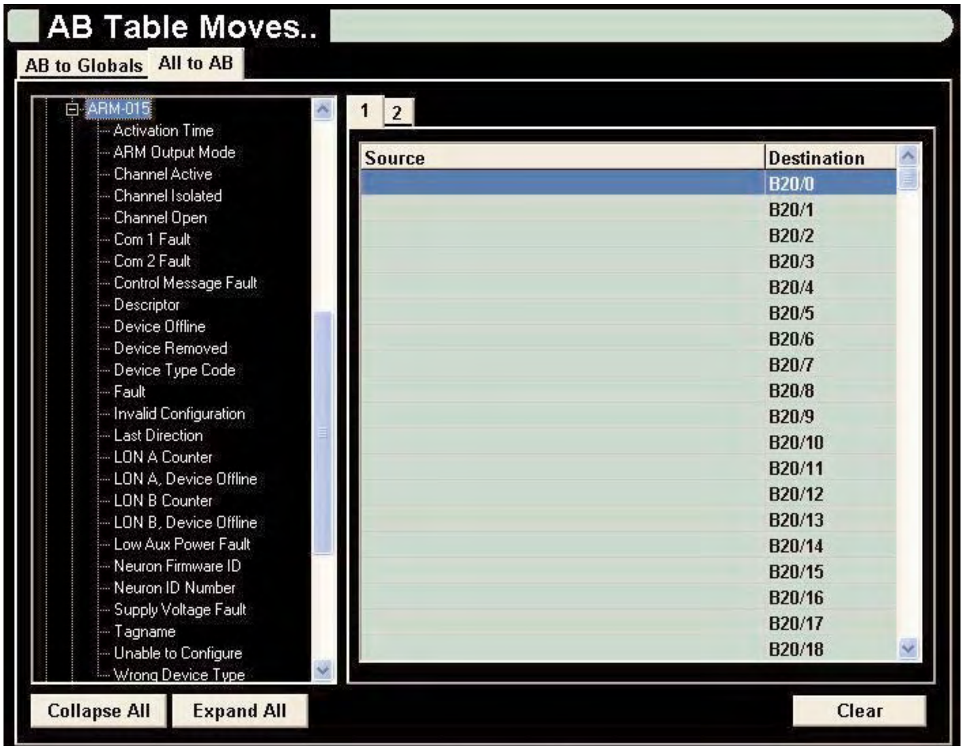
In the example to the right, the “LON” item has been expanded by clicking on the “+” sign and now shows ten subordinate items, each of which is a field device.



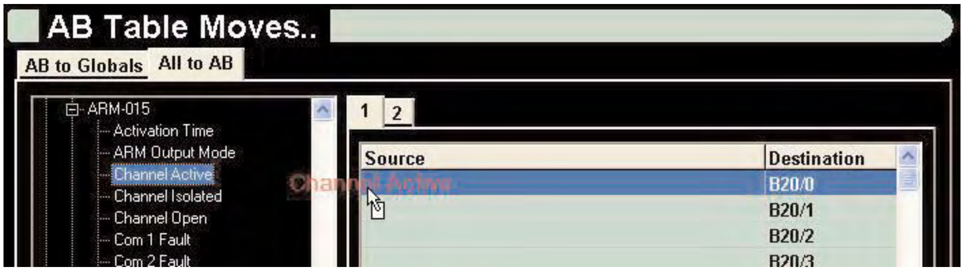
As these additional items are revealed, the list extends beyond the bottom and becomes scrolling.

The hierarchical arrangement of items provides an easy and logical method of accessing the thousands of potential items that could be configured as outputs on a large premier system.

In the example below, a field device on the LON, an Agent Release Module with the tagname “ARM-015” has been selected and “opened” to display its subordinate data. Any of the displayed items can be selected and configured for “movement” to the AB system utilizing the “drag and drop” method.



To configure a data point for “movement” click and “drag” the selected point to the right side of the dialog box and “drop” it on the desired Allen Bradley destination address.

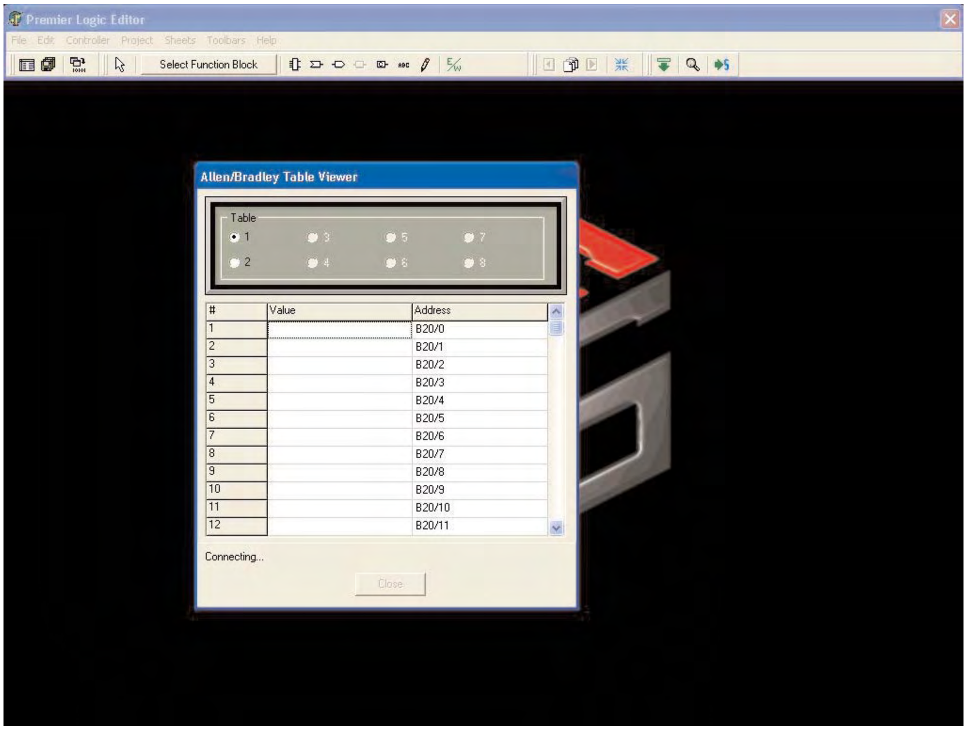


In the above example, the “Channel Active” point is in the process of being moved to the selected destination address “B20/0” in the AB table.

Once “dropped” in the desired cell in the “Source” column on the right side of the dialog box, the “Channel Active” status for “ARM-015” will now map to the Allen Bradley destination address of “B20/0”.

This process must be repeated for all data to be shared with the AB host device.

AB Monitor: This dialog box is a tool for checking the value of data in any of the eight configurable data tables used for exchanging data between the Premier controller and Allen Bradley systems.



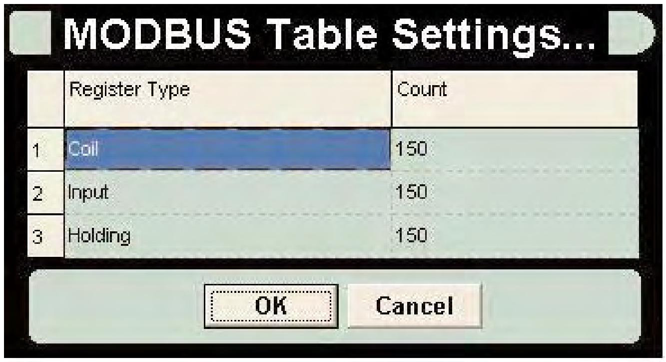
The desired table is selected with a radio button in the top portion of the dialog box and a scrolling list displays the data.

In the example above the viewer has just been activated and is attempting to establish communication with the Premier controller.

MODBUS Table Settings: This menu selection opens a dialog box which shows the three communication interface “tables” to be configured to allow for data to be “moved” between the Eagle Quantum Premier controller and a Modbus based system utilizing the industry standard Modbus RTU communication protocol.

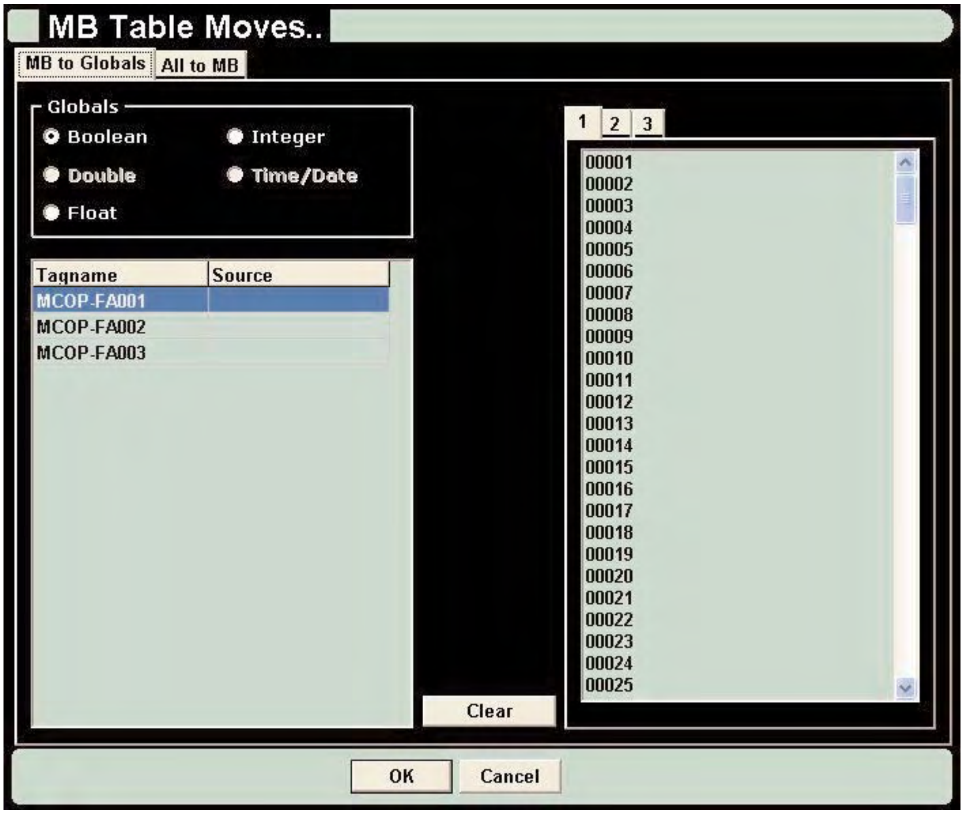
There are three register types, Coil, Input and Holding each of which are for the exchange of a different type of data. The default “Count” for each register type is 0.

Adjust the “Count” to match the number of registers required for each type. Once the tables are configured, click the “OK” button to allocate memory to support the new table configurations.



MODBUS Moves: This dialog box allows for the configuration of data moving between a “Modbus RTU Master” system and the Eagle Quantum Premier controllers memory.

The dialog box uses a tabbed interface with two tabs on the left side representing the two directions data can flow.



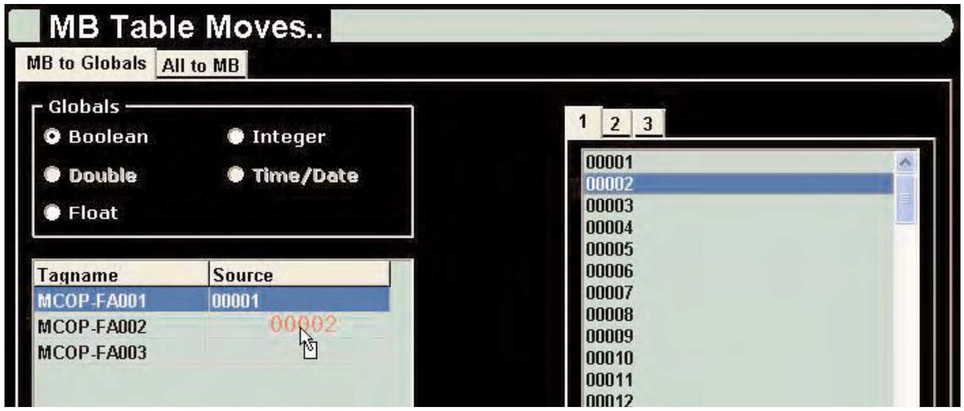
- Data to be moved from the MB system into the Premier controllers memory is configured under the “MB to Globals” tab.

- Data that will move from the Premier controller to the MB system is configured under the “All to MB” tab.

On the right side of the dialog box is a tabbed scrolling list representing configured data tables. In the example above, there are three tabs, one for each available MB table (see previous page).

To configure data for movement, select and drag an address from the right hand side and drop it into the “Source” cell next to the desired “Tagname” in the left hand side.

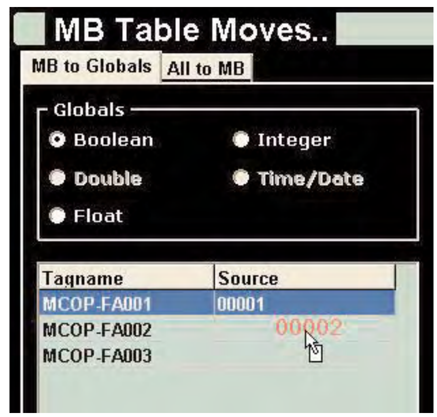
MODBUS Moves...continued: In the example below the MB address "00001" is configured to be moved to a Premier controller global variable "MCOP-FA001" and MB address "00002" in the process of being



"dropped" onto a Premier controller global memory point "MCOP-FA002".

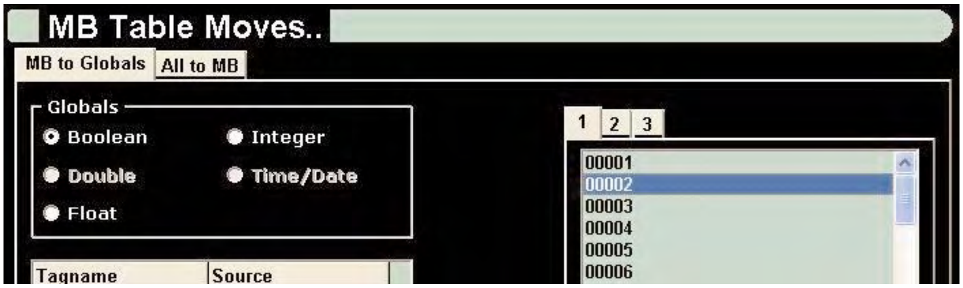
The radio buttons on the left hand side of the dialog box will determine which configured global variables are displayed.

In the example to the right the "Boolean" radio button is selected and the three configured boolean globals are displayed as potential targets for data input.



Note:
Data coming from a Modbus system into the Premier controller can only be moved into global memory locations that have been configured using the Global Memory Editor as described on preceding pages of this manual.

MODBUS Moves...continued: The three available Modbus data tables are accessed by the three tabs at the top of the right hand side of the dialog box.



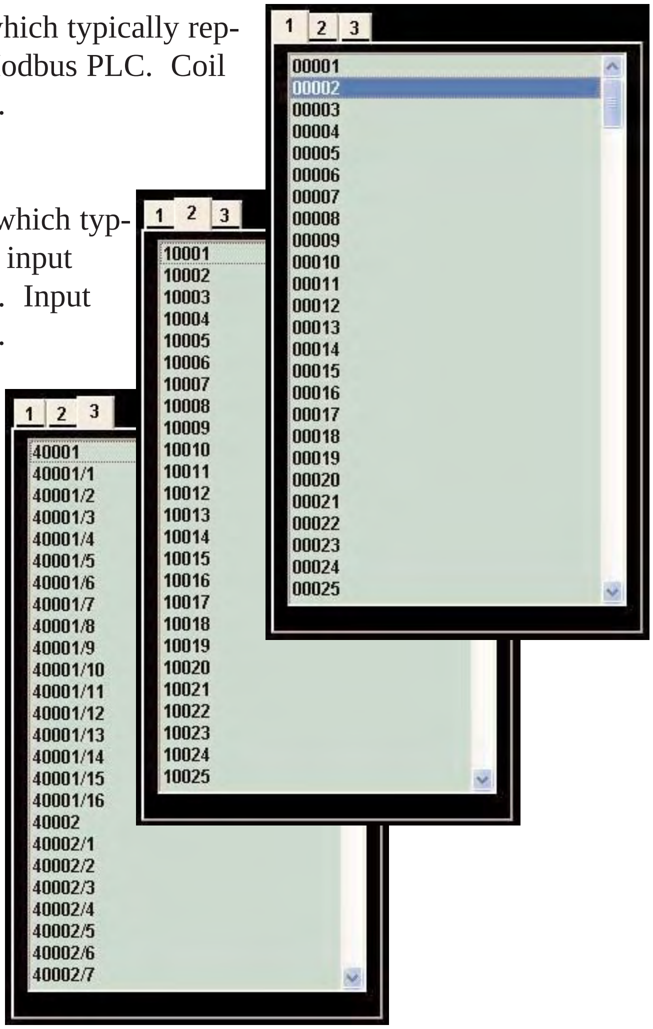
Select the table desired by clicking on the appropriate tab.

Tab 1: Is for "Coils" which typically represent "Outputs" in a Modbus PLC. Coil addresses start with "0".

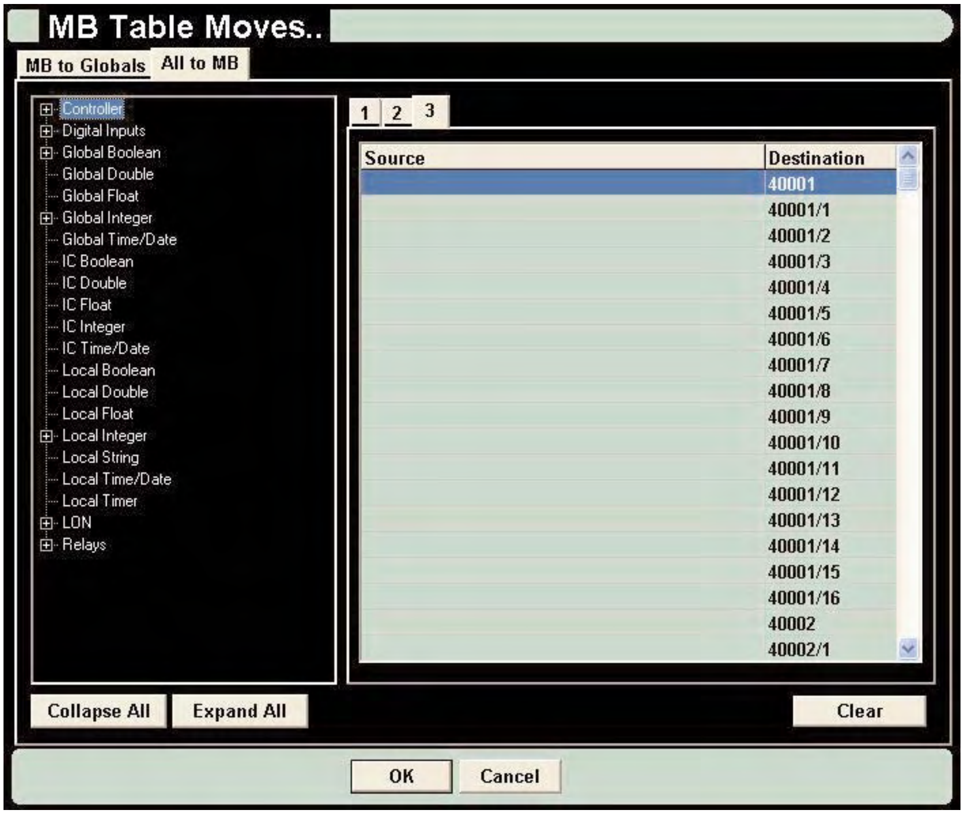
Tab 2: Is for "Inputs" which typically represent discrete input cards in a Modbus PLC. Input addresses start with "1".

Tab 3: Is for registers (16 bit words) that occupy an address range beginning with 40,001.

Registers can be used either as a whole "16 bit" word to move an integer value, or as sixteen individual "bits", into which boolean "ON/OFF" data can be moved.



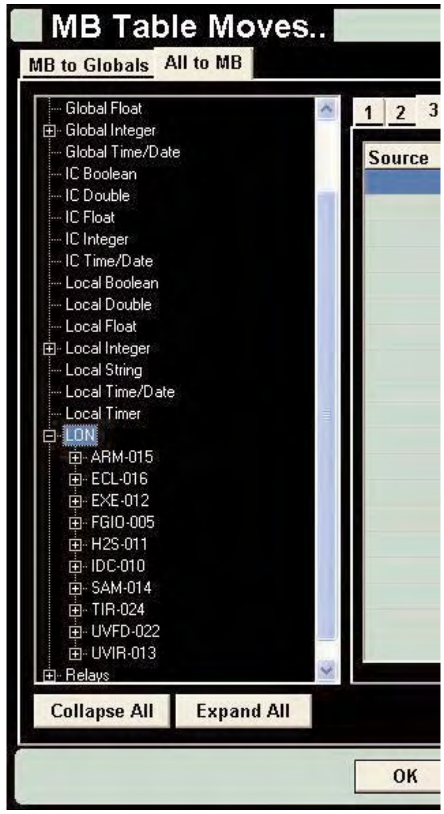
MODBUS Moves...continued: When the “All to MB” tab is selected, a hierarchical list of “sources” is shown on the left hand side of the dialog box which can be selected for “movement” to “destinations” in the AB system.



Any item on the list that has a “+” before it has subordinate items and clicking on the “+” will expand the list showing all items that make up that category.

Below the list are two buttons that can “Expand” or “Collapse” all subordinate items in the list for easy viewing.

The firsts twelve items on the list provide access to controller status information and the globals database. The “LON” item will allow access to all field device information, the “Relays” item is for accessing the controllers onboard relay status.



In the example to the right, the "LON" item has been expanded by clicking on the "+" sign and now shows ten subordinate items, each of which is a field device.

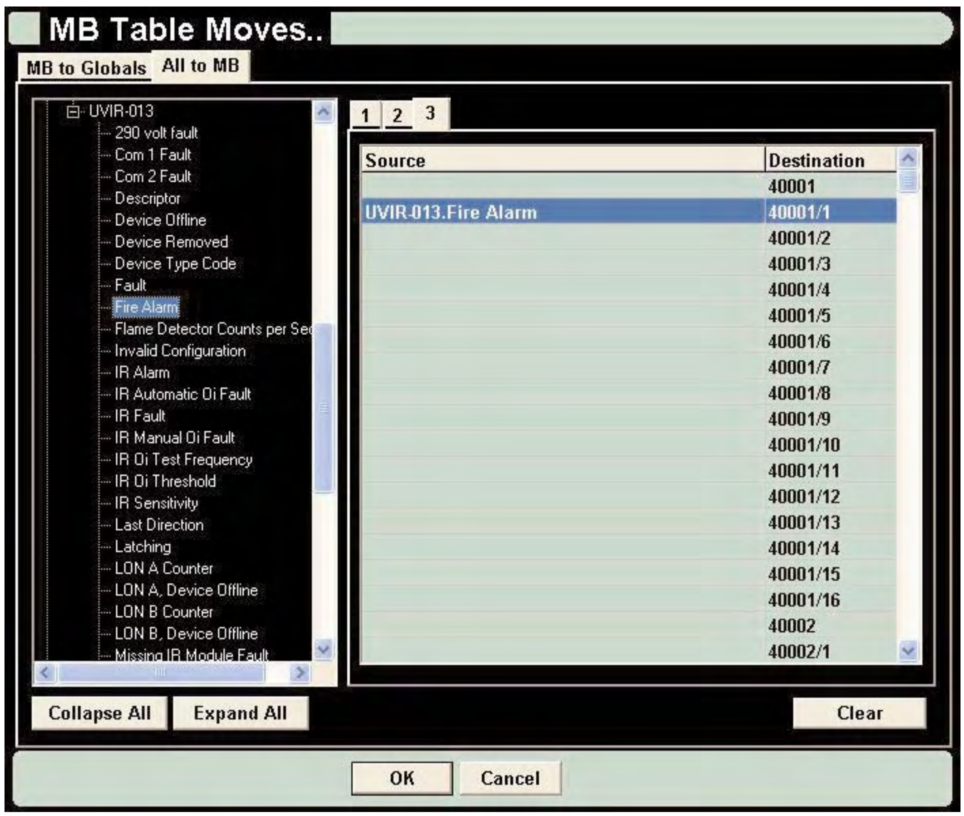
As these additional items are revealed, the list extends beyond the bottom and becomes scrolling.

The hierarchical arrangement of items provides an easy and logical method of accessing the thousands of potential items that could be configured as outputs on a large premier system.

In the example below, a field device on the LON, an UV/IR Fire Detector with the tagname "UVIR-013" has been selected and "opened" to display its subordinate data. Any of the displayed items can be selected and configured for "movement" to the MB system utilizing the "drag and drop" method.

To configure a data point for “movement” click and “drag” the selected point to the right side of the dialog box and “drop” it on the desired Modbus destination address.

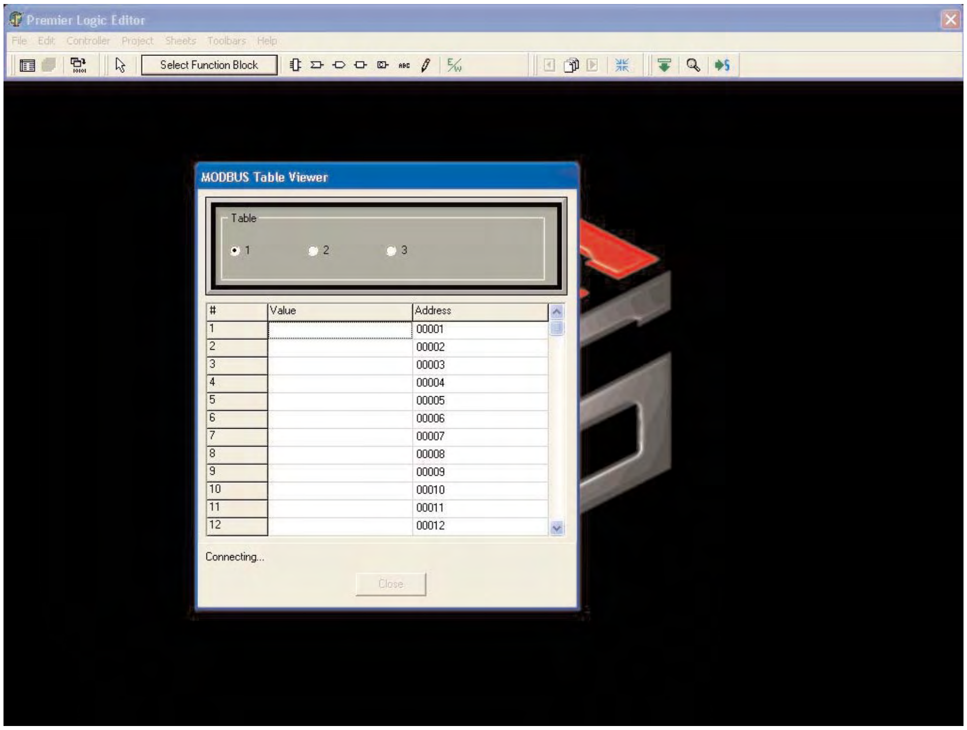
In the above example, the “Fire Alarm” point is in the process of being moved to the selected destination address “40001/1” in the MB table.



Once “dropped” in the desired cell in the “Source” column on the right side of the dialog box, the “Fire Alarm” status for “UVIR-013” will now map to the first “bit” of register 40000, Modbus destination address of “40001/1”

This process must be repeated for all data to be shared with the MB host device.

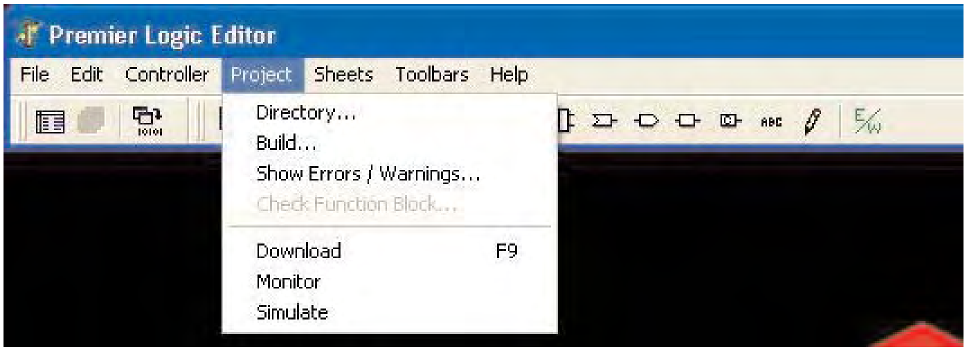
MODBUS Monitor: This dialog box is a tool for checking the value of data in any of the three configurable data tables used for exchanging data between the Premier controller and Modbus RTU systems.



The desired table is selected with a radio button in the top portion of the dialog box and a scrolling list displays the data.

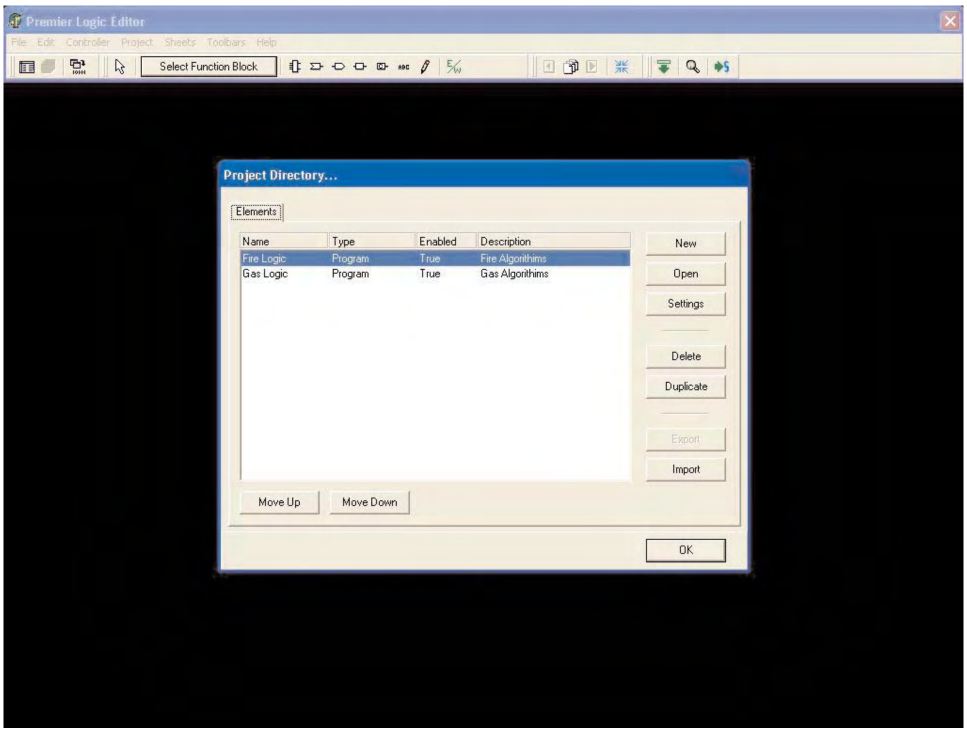
In the example above the viewer has just been activated and is attempting to establish communication with the Premier controller.

Project Menu: This menu allows access to the project directory as well as several functions related to logic creation, debugging, simulation and downloading to the controller.



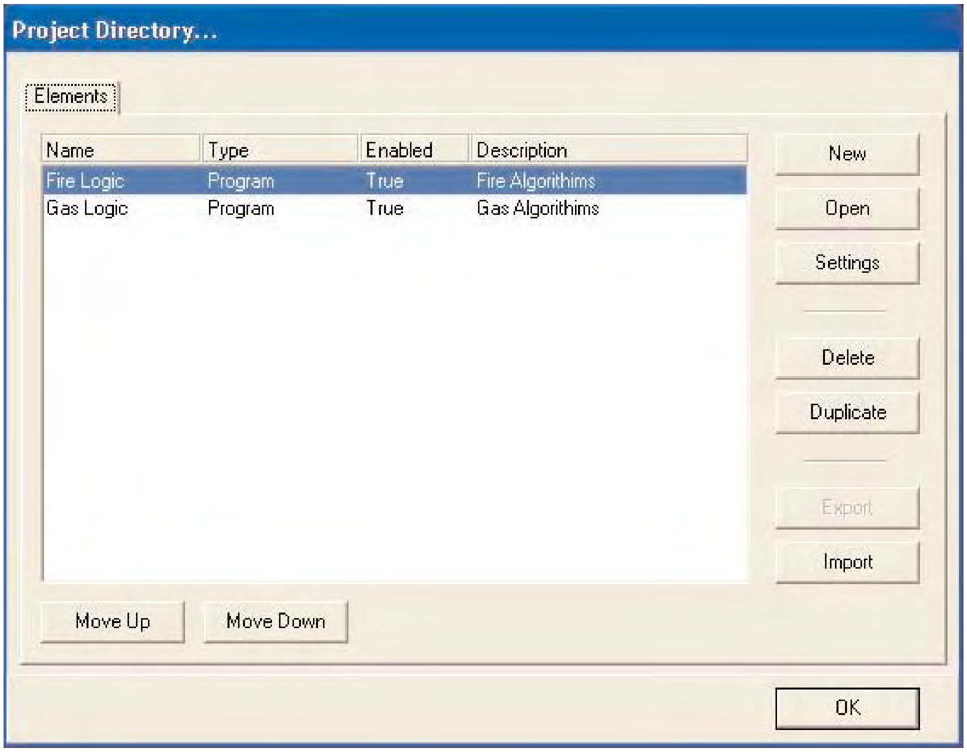
S^3 uses the international standard “IEC-1131” for the structure and style of the logic programming environment.

Selecting “Directory” will open the “Project Directory...” dialog box which lists the existing project “Elements” and provides tools for the cre-



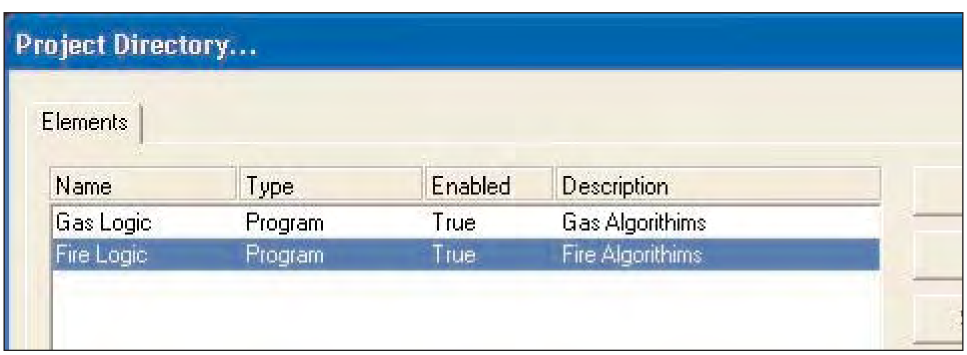
ation, editing, deletion, duplication and arrangement of these elements. In the S^3 programming environment an “Element” can be either a user program or a function block. In the example above, there are two existing elements, both of which are programs.

Move Up / Move Down: The Premier Controller executes its logic programs in the order that they appear in the "Elements tab" of the "Project Directory..." dialog box. In the example below, the controller will execute the program "Fire Logic" first and then process the "Gas Logic" program.

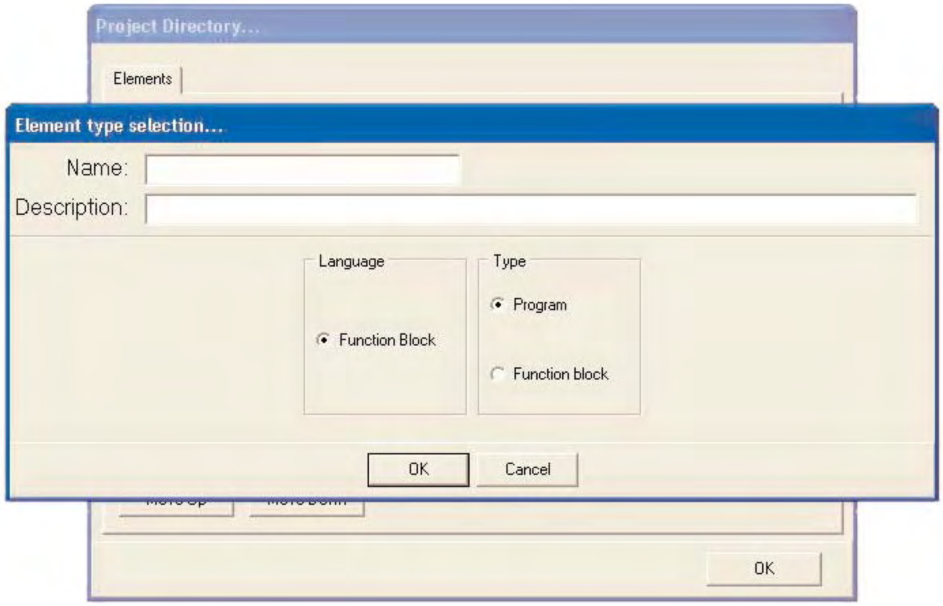


The "Move Up" and "Move Down" buttons located in the lower left of the "Project Directory..." dialog box are used to change the execution order of the programs. In the example above, the "Fire Logic" program is hilighted.

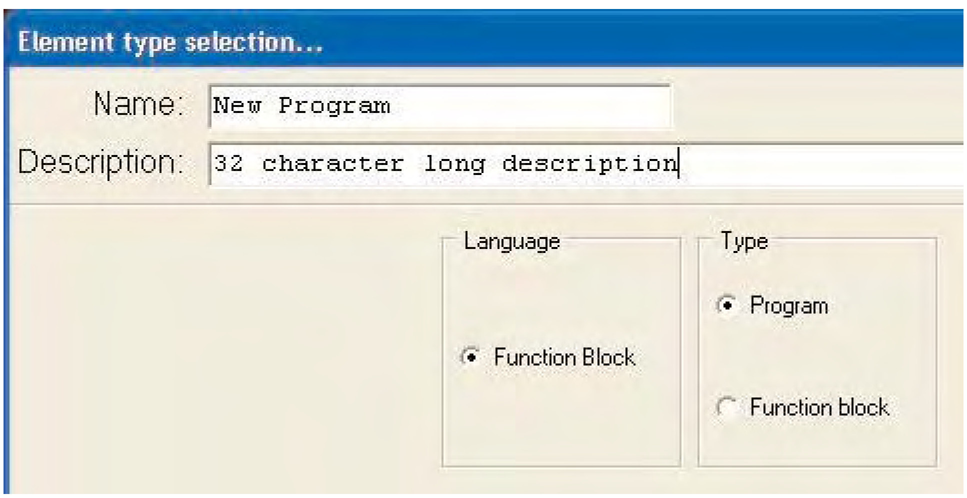
Selecting the "Move Down" button moves it down one position, in this case to the bottom of the two element list as shown in the example below.



New: This button opens the “Element type selection” dialog box used to configure a newly created element. Fields are provided for an element name and description along with radio buttons to select the “Type” of element to be created, “Program” or “Function block”.

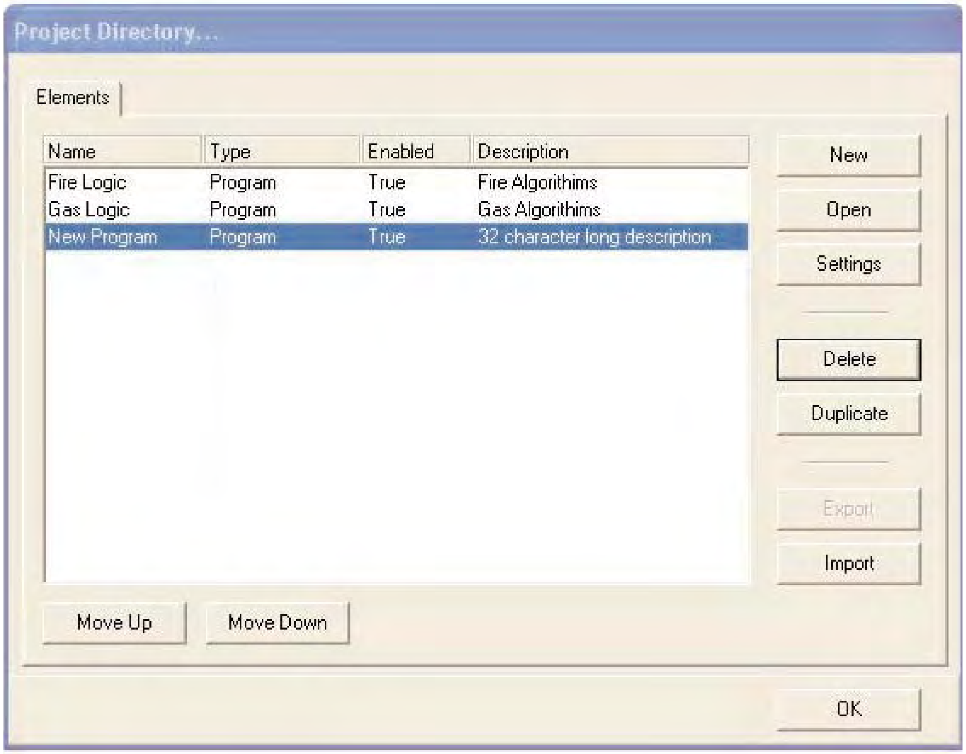


The default selection is for the creation of a new “Program”. The “Language” selection is fixed at “Function Block” as S^3 does not currently support any other languages.

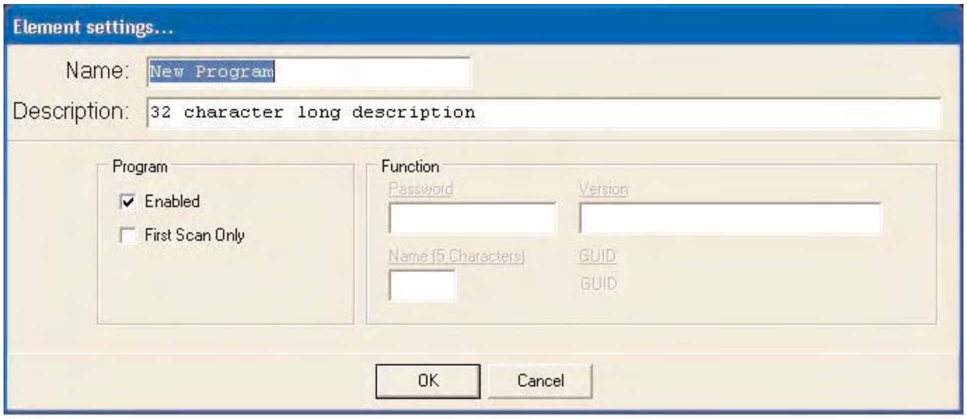


Enter a “Name” up to 20 characters long and an optional “Description” of up to 32 characters. Both the name and description show up in the directory window and help to identify the program or function block.

Select the “OK” button to return to the “Project Directory...” dialog box and the information on the newly created third element named “New Program” is now hilighted.



Settings: Select the “Settings” button to open the “Element settings...” dialog box which has two program control check boxes and some additional fields that pertain to “Functions” and will be covered later.



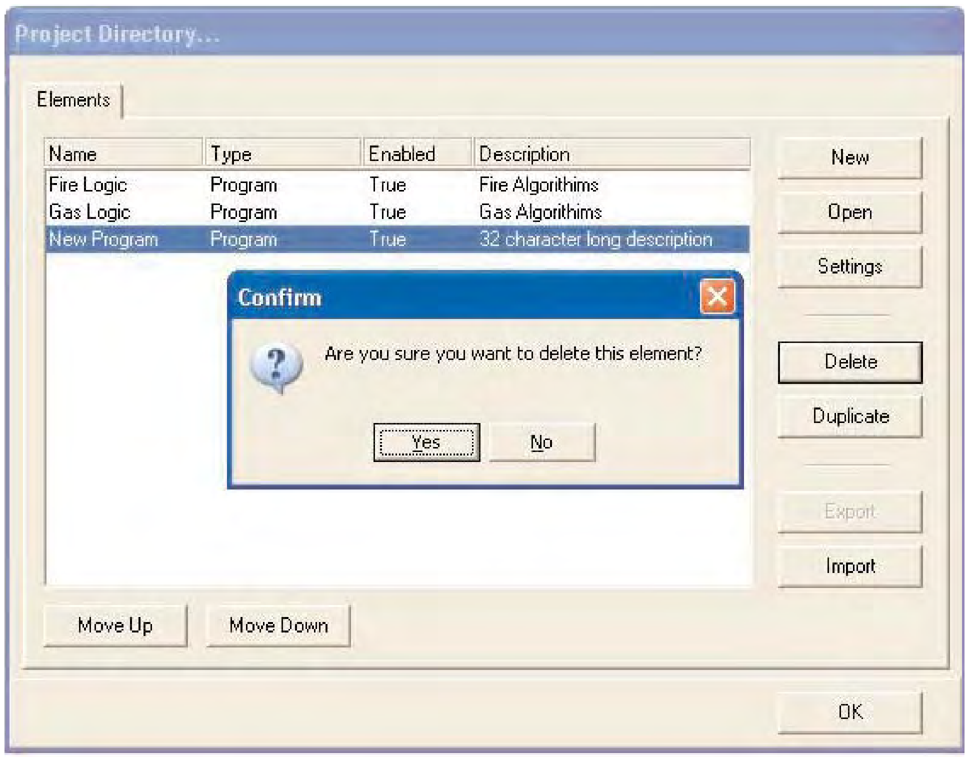
The “Program” check boxes are “Enabled” and “First Scan Only”.

Enabled: The enabled checkbox determines whether the program will be executed by the controller or not. When checked the program will run.

First Scan Only: When checked the program will run **once** when the controller executes its first logic scan and will not run again until the controller is stopped and restarted. This is typically used for a “setup” routine.

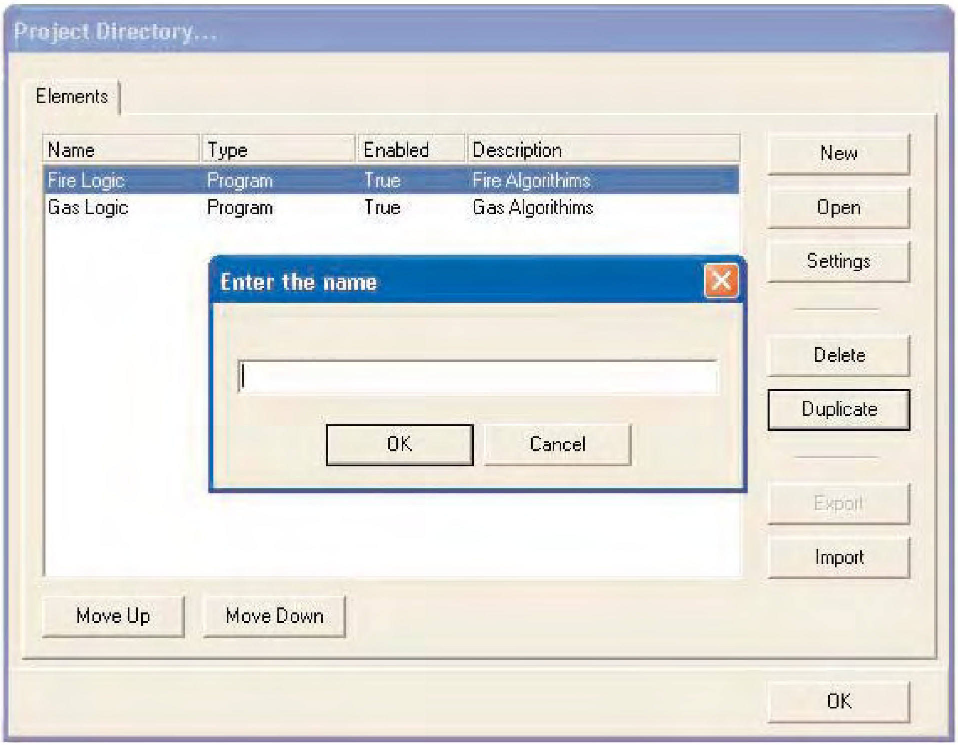
Delete: This button will remove the selected program or function block from the directory, project and hard drive. This function cannot be “undone”.

In the example below the element “New Program” is selected, choosing



the Delete button will display a dialog box asking to confirm the deletion of the element. Selecting “Yes” will permanently remove it.

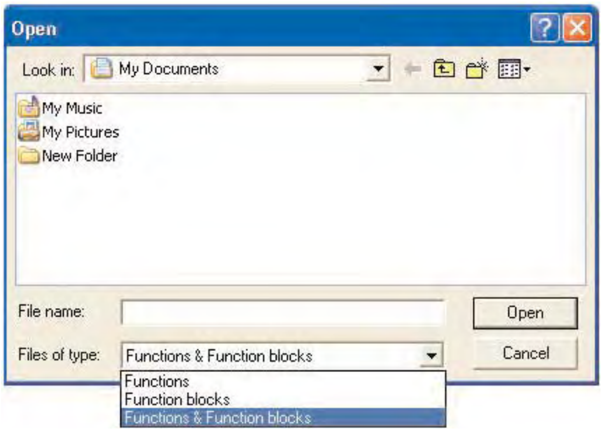
Duplicate: This button will make a copy of a selected element and add it to the project directory. When the Duplicate button is selected a dialog box will open allowing a new name to be entered for the duplicated element. Enter a name and then select "OK" to complete the duplication.



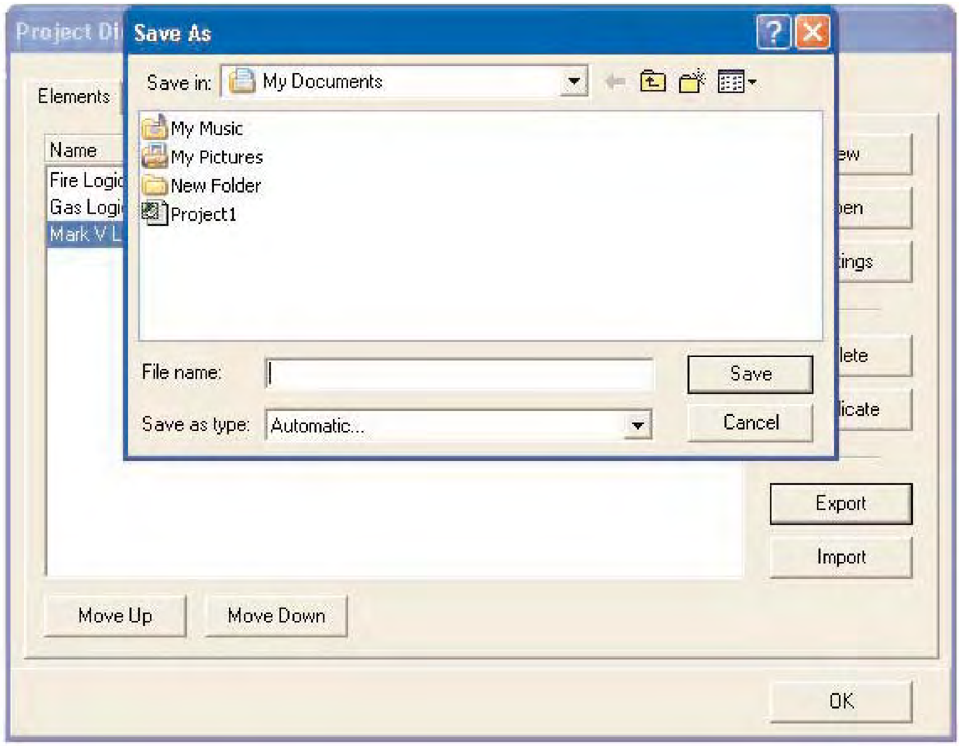
Selecting "Cancel" will abort the duplication.

Import: The import function facilitates bringing certain elements created in another project into the current one. These elements can be functions or function blocks.

When the "Import" button is selected, the standard Windows "Open" dialog box appears to allow navigation to the location of the source files to be "imported". A pull down menu allows filtering by type making it easier to locate the desired function or function block.

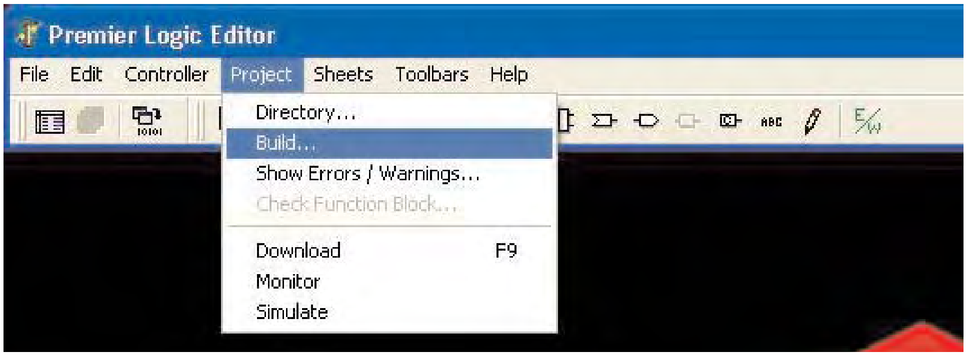


Export: If a function block or function is hilighted in the project directory window, the "Export" button will become active allowing the element to be exported.

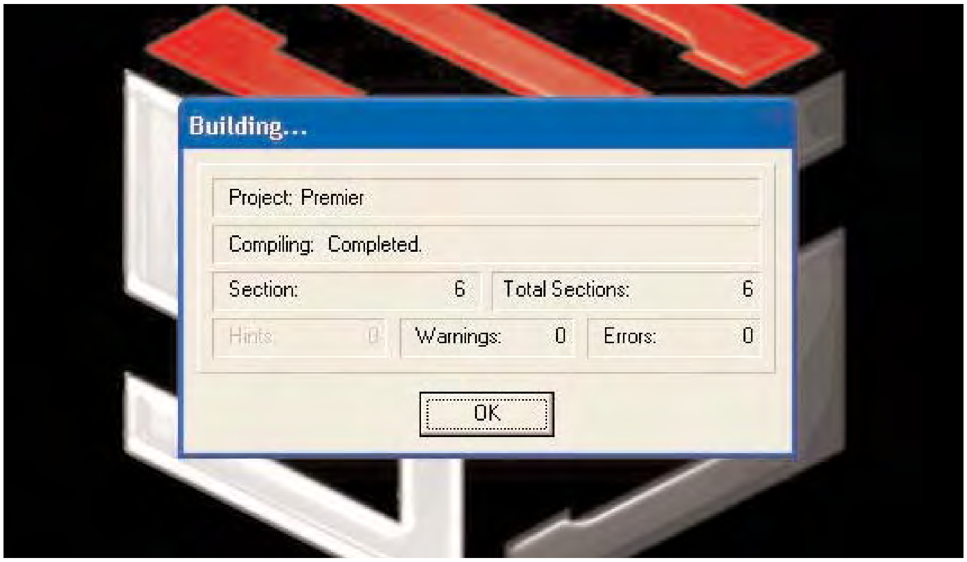


The standard Windows "Save As" dialog box allows for naming the file and choosing a destination to save to.

Build: The build option "compiles" the project. The project is a program that must be compiled to download to the controller.

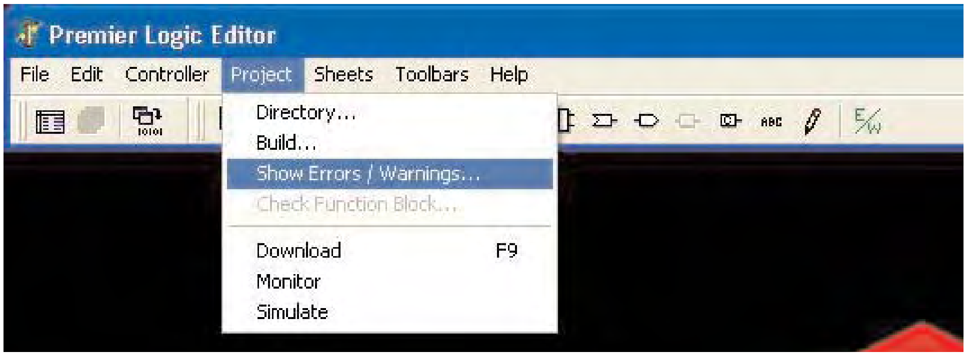


The build process allocates memory, validates tagnames, validates data types, etc.

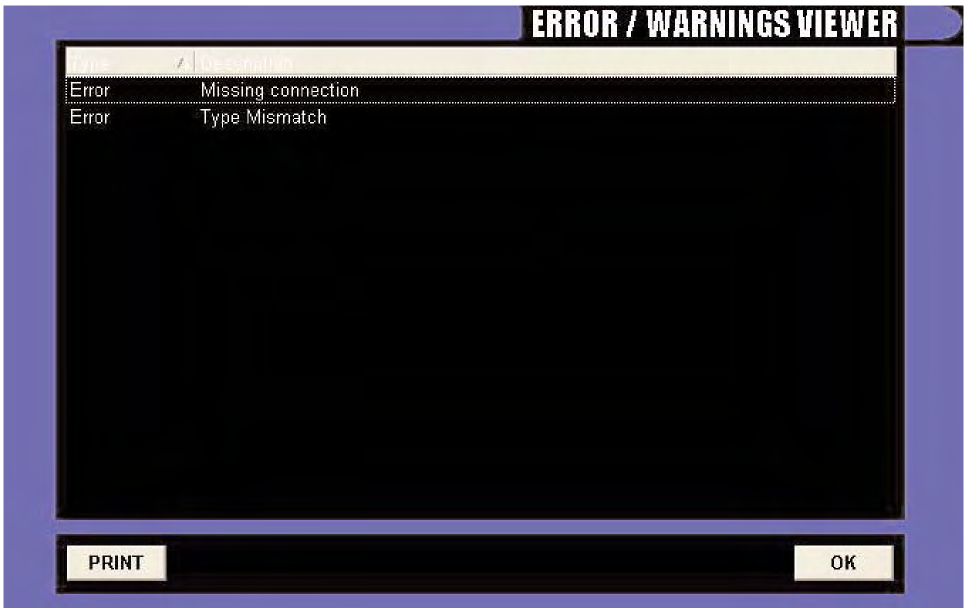


View the "Errors/Warnings" viewer if the build window indicates any errors or warnings. A preference selection will automatically open the "Errors/Warnings" viewer if selected.

Show Errors/Warnings: This menu selection opens the viewer and displays any problems found in the project during the last build (compile).



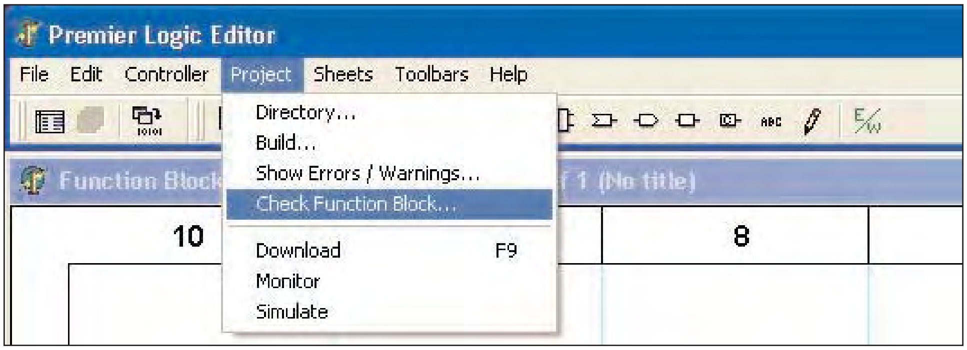
When enabled, the logic editor will display the "ERROR / WARNINGS VIEWER" at the completion of a project build listing any problems.



Selecting one of the errors will close the viewer and display the section of logic containing the problem.

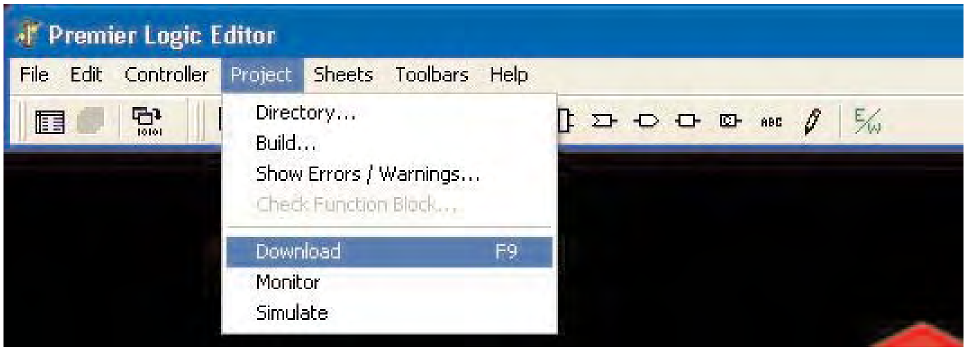
You may also choose to print out the list using the "Print" button in the lower left of the dialog box.

Check Function Block: When a function block is open for editing, this menu item becomes available. When selected S^3 will check the validity of the program and list any found errors or warnings.



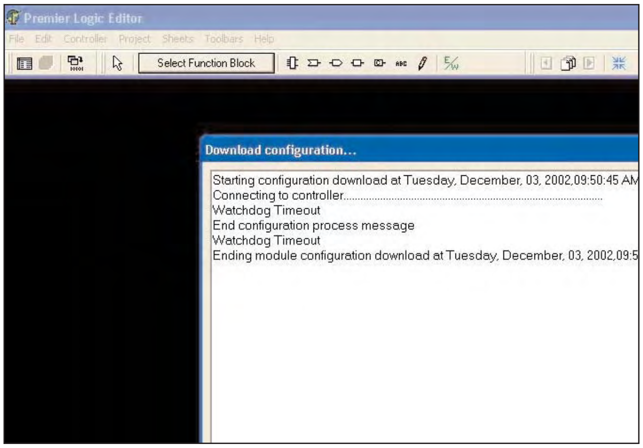
If a function block is not open for editing this feature is not available.

Download: Once the project has been "built" and no errors or warnings were discovered, selecting this menu item will transfer the project to the controller.

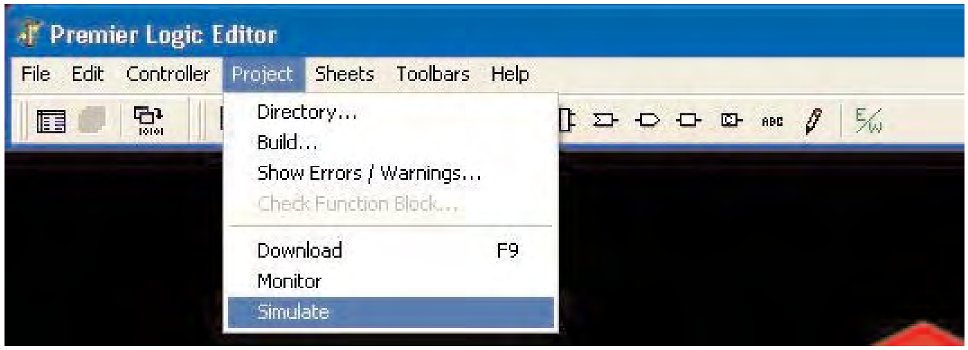


If a valid build is not found when the menu item is selected, S^3 will automatically initiate a build and if no errors or warnings are discovered, the program is downloaded to the controller.

During the download process, a dialog box will open displaying the establishing of the communication connection with the controller, the download progress and listing any errors or warnings that may occur.

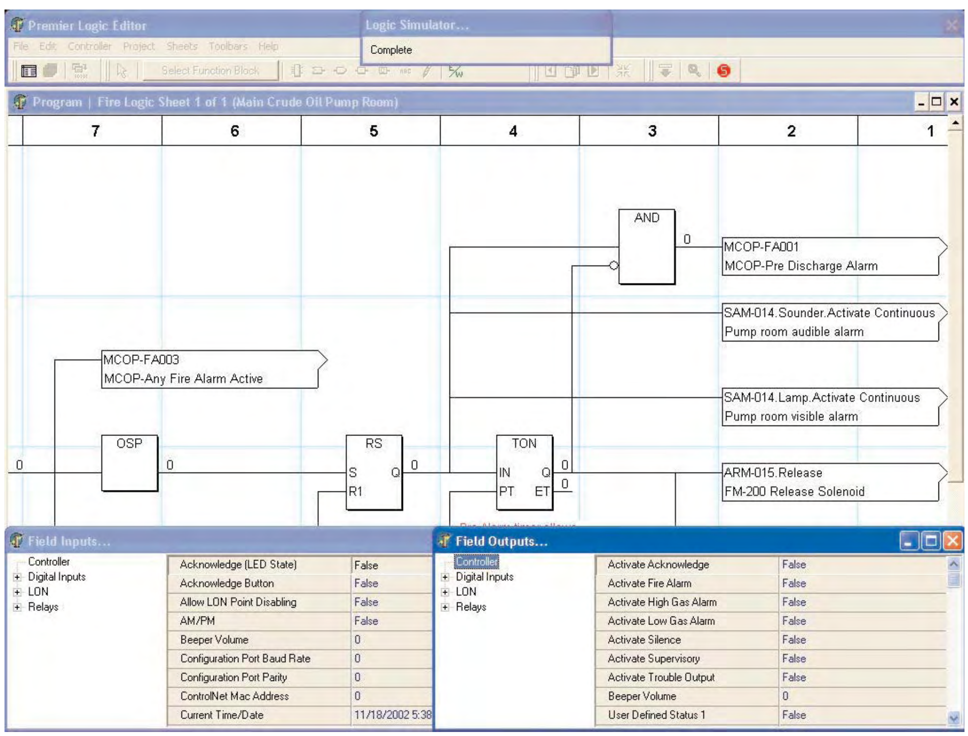


Simulate: If the project has been “built” and no errors were discovered then the program can be simulated within the S^3 environment.



Simulation allows for program testing and debugging without the need for an actual Eagle Quantum Premier controller being attached to the S^3 workstation.

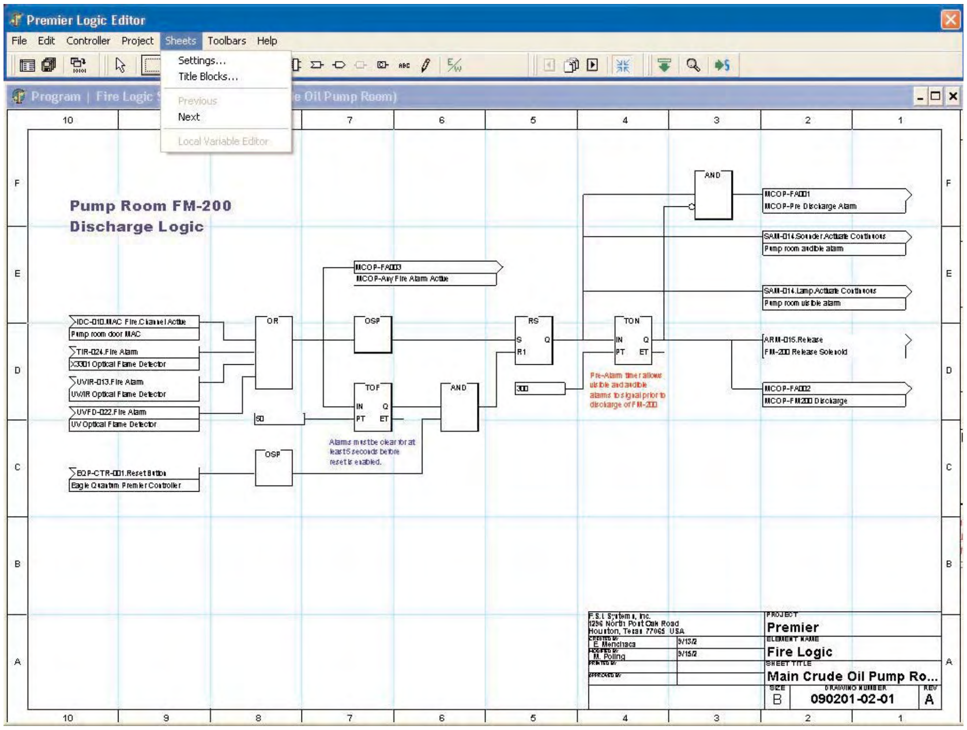
Below is an example of a program in the “simulation” mode. Details on setup and use of the S^3 logic simulator for Eagle Quantum Premier is covered in Chapter 19 of this users guide.



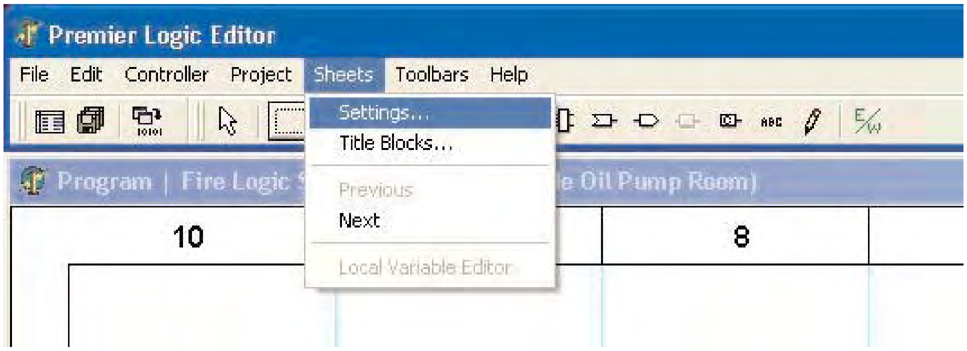
When the simulator is running, the value for each logic element is displayed on the screen to the right of the element. Inputs can be directly manipulated and variables can be modified as well. (See Chapter 19)

Sheets Menu: The S^3 logic editor utilizes a Computer Aided Design (CAD) style of program to create logic in much the same way that a draftsperson would have created drawings depicting logic in the past.

Drawing "sheets" are used to create the logic and also serve as documentation of this logic.

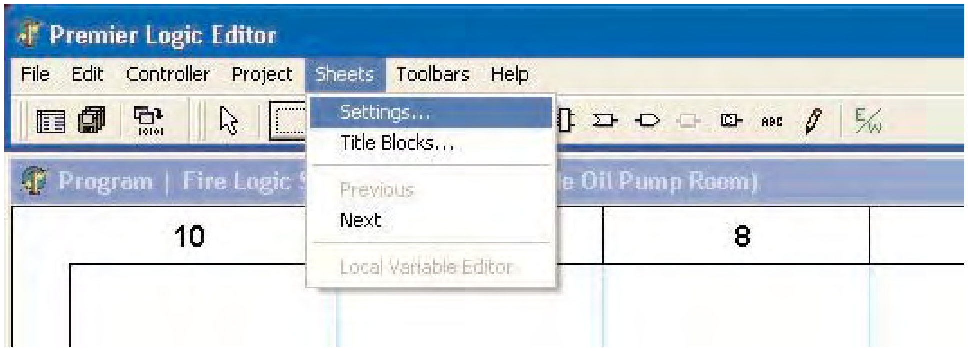


The "Sheets" menu provides access to features determining the layout of the logic pages along with the information in the title block.

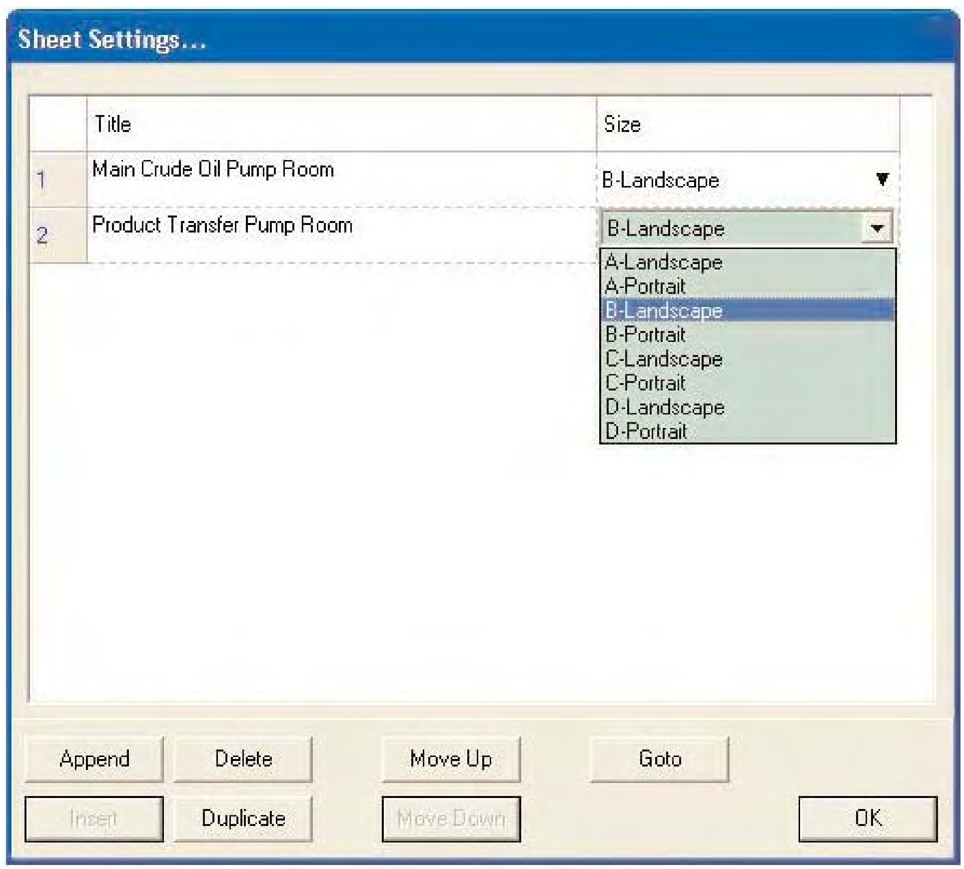


Note:
None of these menu items will "do" anything unless an element (program or function block) has been opened from the project directory window.

Settings: This menu item opens a dialog box where logic pages are given a "title" that appears in the title bar of the window for the drawing sheet, and a size and orientation for the drawing sheet can be selected.

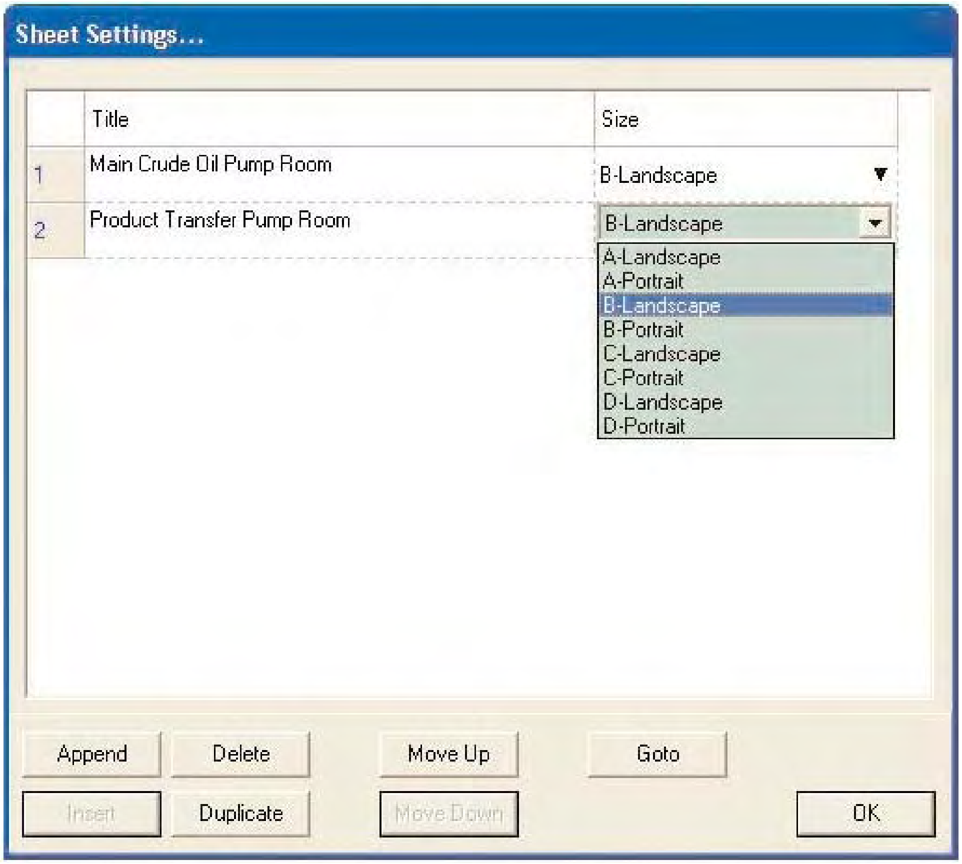


The "Sheet Settings..." dialog box will list all existing sheets that have been created for an element (program or function block) along with seven buttons for "sheet management" purposes.



Size: A pull down menu to the right of the sheets title allows for the selection of the logic sheets size and orientation.

Engineering drawing sizes ranging from “A” to “D” can be selected in either a Landscape (Horizontal) or Portrait (Vertical) orientation. In the example below, “B-Landscape” is selected which creates a sheet 17” wide by 11.5” high.



Append: This button will create a new sheet at the end of the list of existing sheets. On selection, a dialog box will open allowing the new sheet to be named upon creation.

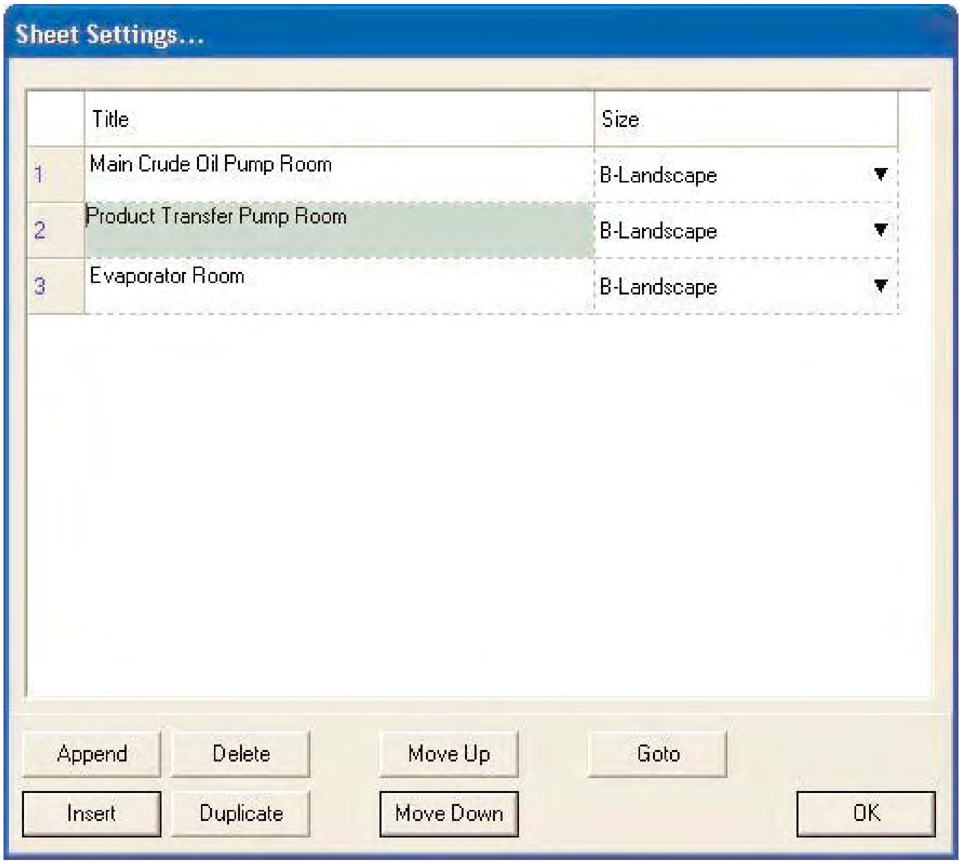
Delete: This button will remove a selected sheet from the element. This cannot be “undone” and should be used with caution!

Insert: This button will create a new sheet after the sheet currently hilighted in the list of existing sheets. On selection, a dialog box will open allowing the new sheet to be named upon creation.

Duplicate: This button will create a new sheet at the end of the list of existing sheets. This “duplicate” will have a copy of all logic and settings on the original sheet. A dialog box will open allowing the new sheet to be named upon creation.

Move Up / Down: These two buttons are used to change a sheets position within the elements execution list. This is an extremely important feature in that the Eagle Quantum Premier controller executes logic in the order the sheets appear in the "Sheet Settings..." list.

In the example below, Item 2, the "Product Transfer Pump Room" sheet is selected. In its current position its logic will execute after the "Main Crude Oil Pump Room" and before the logic for the "Evaporator Room".

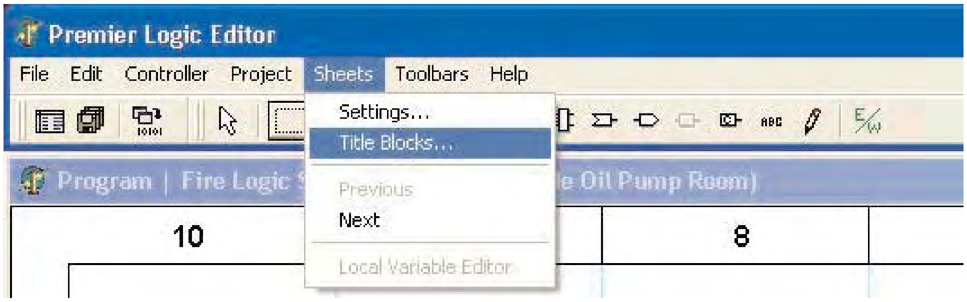


The "Move Down" button will place it after the "Evaporator Room" in both visible location in the list as well as logic execution order. The inverse would be true if the "Move Up" button were selected.

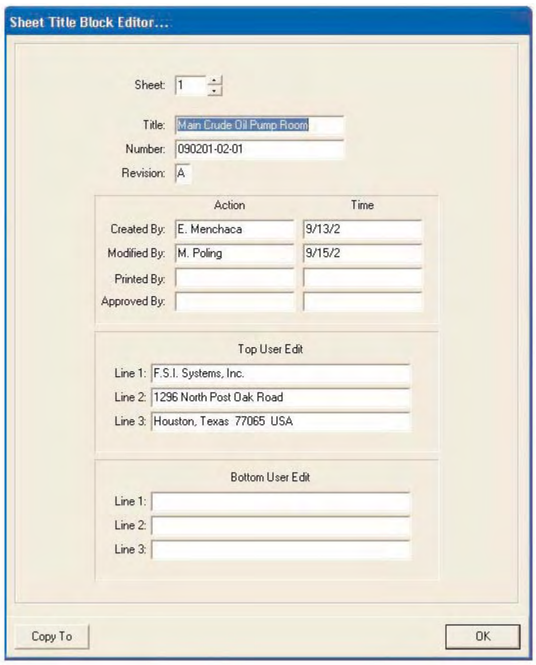
Goto: This button will open the sheet currently selected. In the example above, the Goto button will open the "Product Transfer Pump Room" sheet.

OK: The OK button will accept any changes and close the "Sheet Settings..." dialog box.

Title Blocks: In the lower right area of each drawing sheet is a “Title Block” area which contains fields typically used to describe the project and functionality of the logic on the sheet.



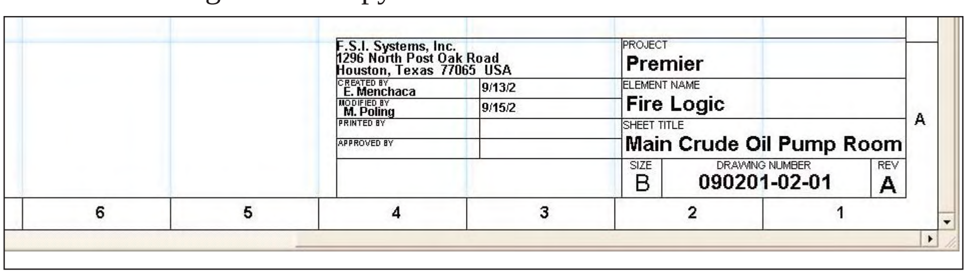
Selecting this menu item opens the “Sheet Title Block Editor...” dialog box. This dialog box provides 18 fields for data entry to describe the project and logic functionality.



The first field “Sheet” shows the current sheet number within the element (program or function block). Below that are fields for the sheet “Title”, drawing “Number” and drawing “Revision”.

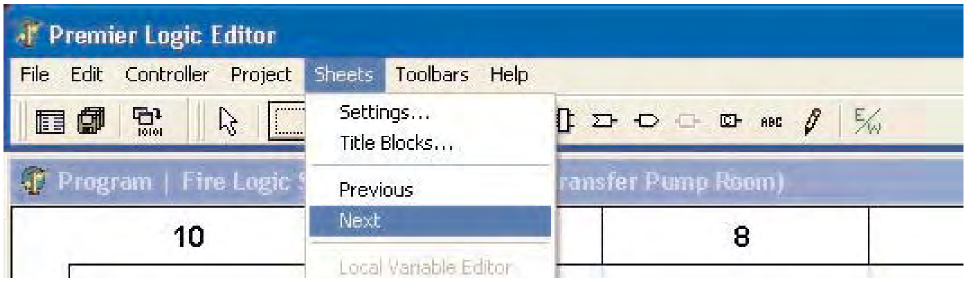
Below this are fields for tracking the creation of the logic and modifications.

Below this are three field each for a “Top” and “Bottom” user edit. The top area is three lines to the left of the project name, the bottom area is three lines to the left of the drawing size. In the lower left of the dialog box a “Copy To” button allows the entered information

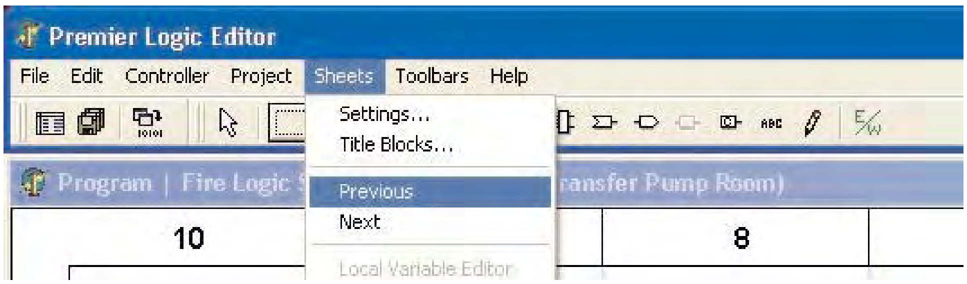


to be copied to any other selected sheets within the same element (program or function block).

Next / Previous: These menu items become active whenever an element has more than one logic sheet.

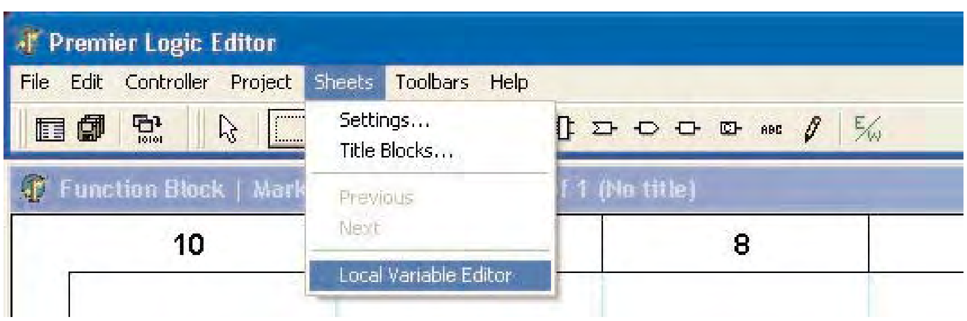


They change the displayed logic sheet to the next or previous one as is appropriate.



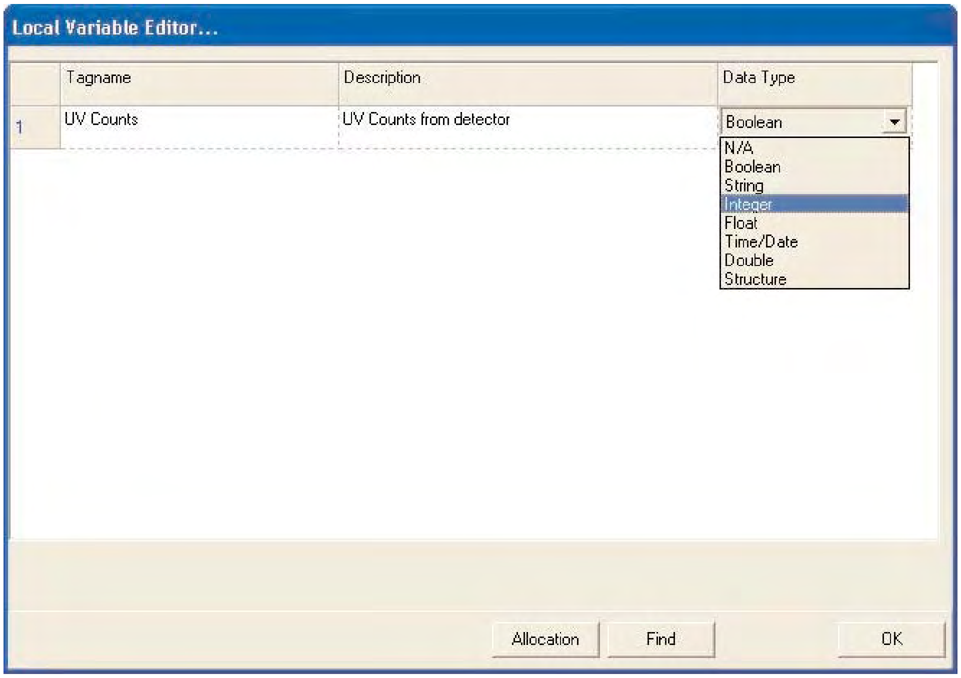
Local Variable Editor: Variables are used to store intermediate values within a logic program or function block. “Local Variables” are only used within a function block and their values are not accessible outside of that specific function block.

Before local variables can be used, they must first be created. This is done with the “Local Variable Editor...” accessible through the menu selection.



This menu selection is only available when a function block sheet is currently active.

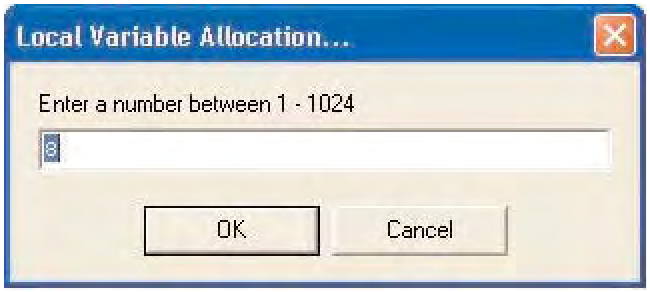
In the example below, a single variable is being created, the tagname “UV Counts” has been entered, the description has been entered, and the pull down menu is active in order to choose the appropriate “Data Type” for the variable.



The default quantity of local variables allocated by S3 is “1” and must be changed to meet the needs of the function block being created.

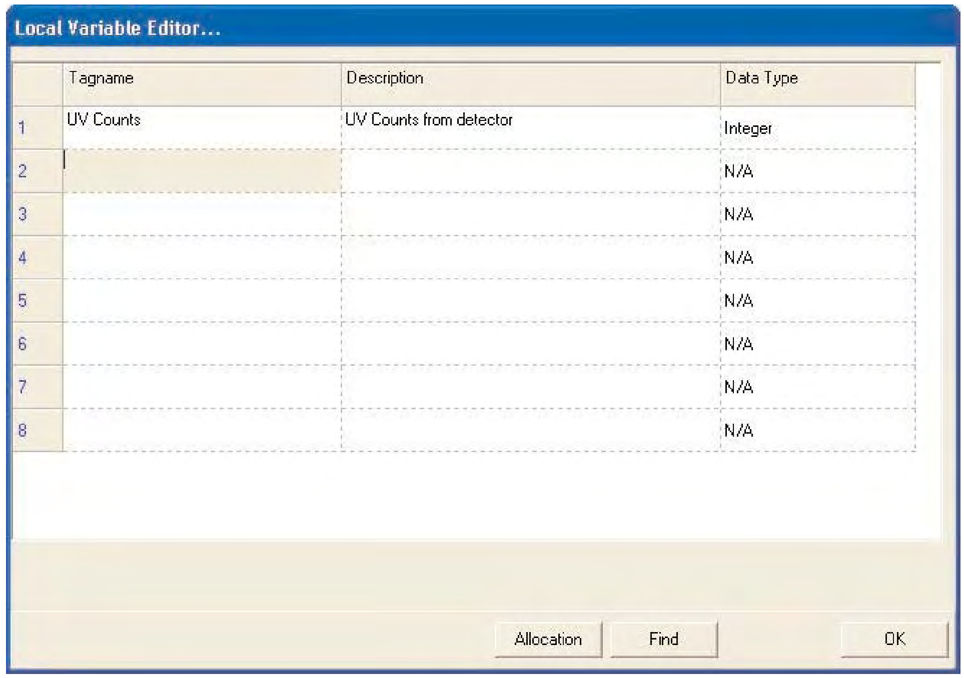
The “Allocation” button at the bottom center of the “Local Variable Editor...” dialog box will open the “Local Variable Allocation...” dialog box.

From here up to 1K (1024) local variables can be allocated. In the example to the right, “8” has been entered into the field and will be created.



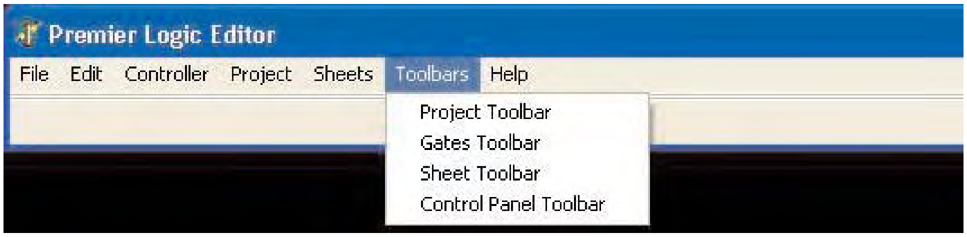
Once the “OK” button is selected, the allocation dialog box will close and 8 “slots” are now allocated for variable creation within the Local Variable Editor.

In the example below the creation of local variable #1 “UV Counts” has been completed and there are now additional slots to create up to eight local variables.



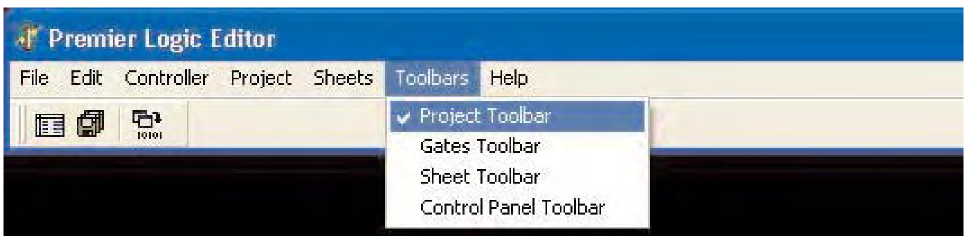
Note:
The number of local variables available (1-1024) is not dependent on the data type, i.e. you do not get more variables by choosing only boolean types instead of integer or floating point types.

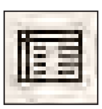
Toolbars: Toolbars provide “shortcuts” to many menu items described earlier. The “Toolbars” menu provides a mechanism for enabling or disabling any or all of the four “Toolbars” used in the logic editor. By default all are enabled.



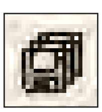
For the example above all have been disabled and the toolbar area of the logic editor (horizontal area just below the menu names) is empty.

Project Toolbar: This toolbar provides three shortcuts; Project Directory, Save Project and Build Project.

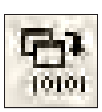




Project Directory: The project is divided into elements. These elements are made up of programs and function blocks. Selecting this icon provides access to the tools for the creation, opening, ordering, duplication, deleting and configuration of these project elements. It also allows for the importing and exporting of function blocks.

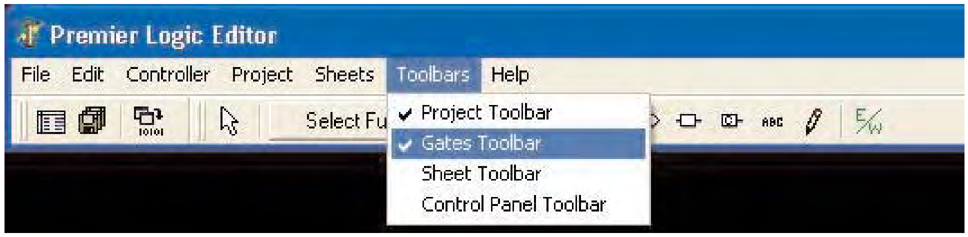


Save Project: Selecting this icon saves the project. Note that the project is automatically saved whenever the “Build” command is initiated.

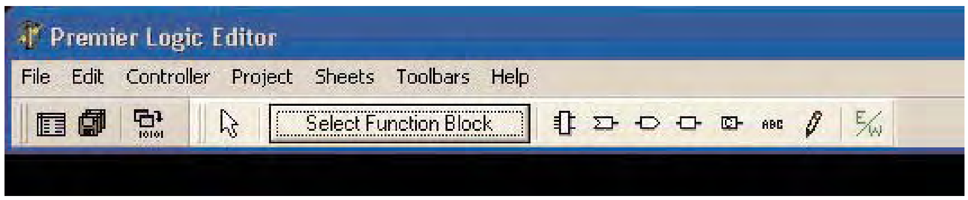


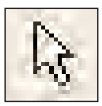
Build Project: Selecting this icon builds (compiles) the project. The project is a program that must be compiled before it can be downloaded to the controller. The build process allocates memory, validates tagnames, validates data types, etc.

Gates Toolbar: This toolbar provides access to all of the tools used in the creation of the logic programs and function blocks.



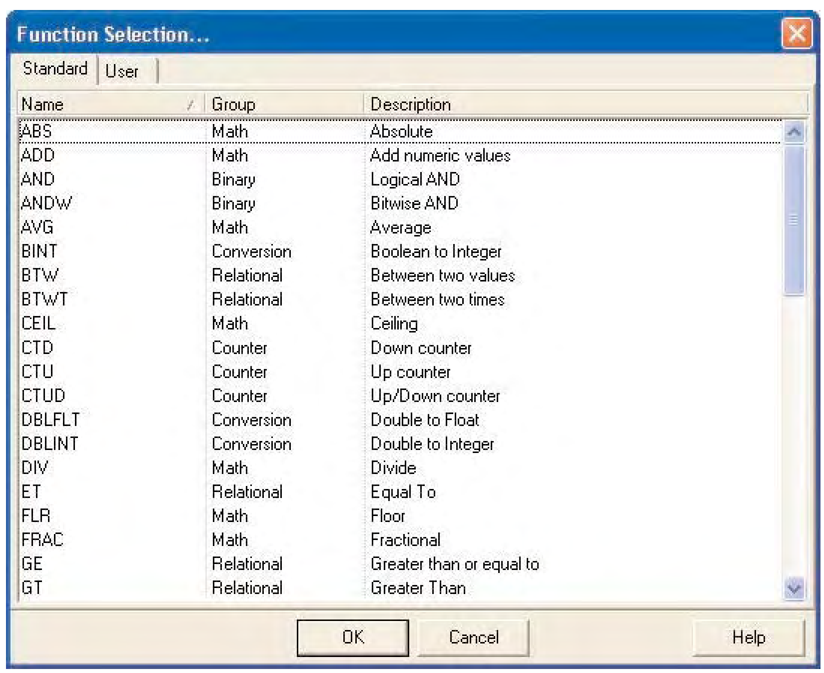
The “Gates Toolbar” provides access to ten logic creation, editing and verification tools.



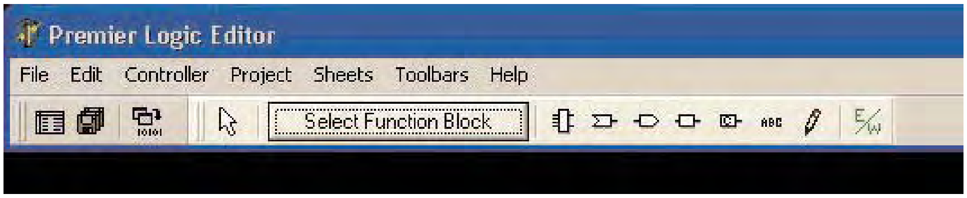


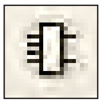
Pointer Tool: This arrow shaped tool is used to select and manipulate the position and or size of any logic function on a sheet.

Select Function Block: This button opens the “Function Selection” window which contains a scrolling list of all standard and user created functions available for selection.



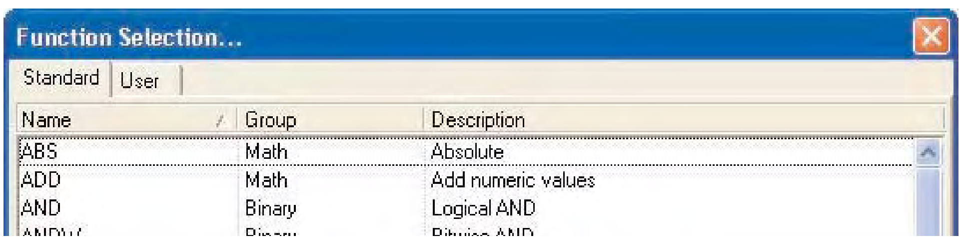
Gates Toolbar continued...



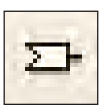


Function Block Icon: When the user selects a standard or a user created function block from the “Function Selection...” window, the selection is saved. The “Function Block” icon then becomes a shortcut to this last selected function block.

In the example below the “ABS” function is selected via the “Function Selection...” window. When the window is closed the “ABS” function will be assigned to the “Function Block” icon.

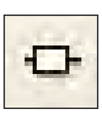


Subsequent selections of this icon will allow repeated selection and placement of this gate type without having to reopen the “Function Selection...” window.



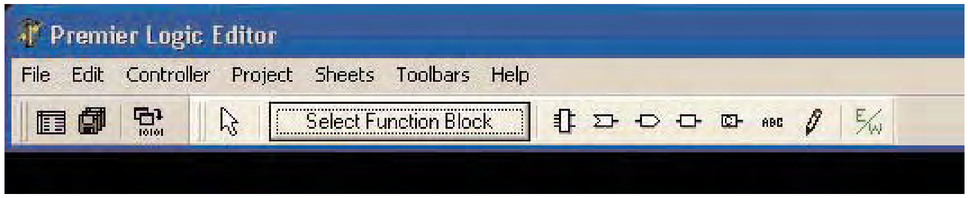
Input Variable: All input variables to a program or function are via this symbol. Once placed on a logic sheet, the input variable must be “linked” to a compatible parameter on the controller, a field device, or a location in controller memory.

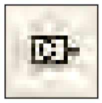
Output Variable: All output variables from a program or function are via this symbol. Once placed on a logic sheet, the output variable must be “linked” to a compatible parameter on the controller, a field device, or a location in controller memory.



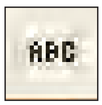
Local Variable: Local variables are available in function blocks only. If a sheet for a standard “Program element” is opened, this function will be grayed out. These variables provide for the transfer of values between sheets of a multi-sheet block and private local storage (local variables).

Gates Toolbar continued...

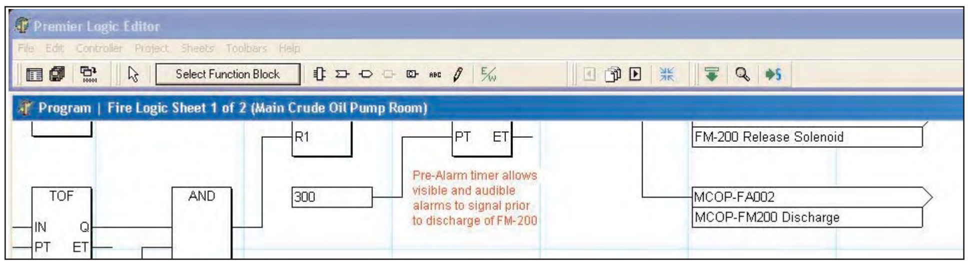




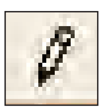
Constant Value: Constants allow for user set values to be input to a function or output variable that do not change during the execution of the program or function.



Comment: The user may want to place comments on the sheets to communicate what task a section of logic performs or any other annotation.



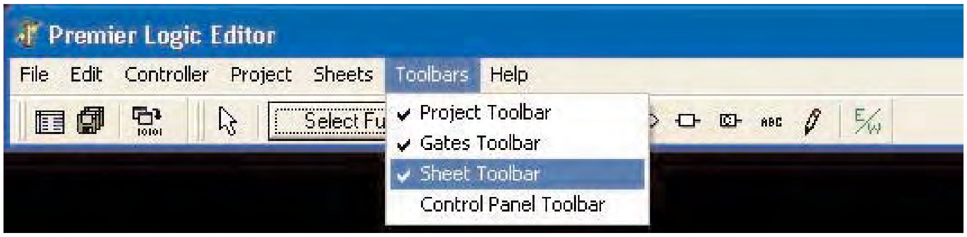
In the example above, there is a comment indicating “Pre-Alarm timer allows visible and audible alarms to signal prior to discharge of FM-200” below the timer that delays discharge while annunciation is in progress.



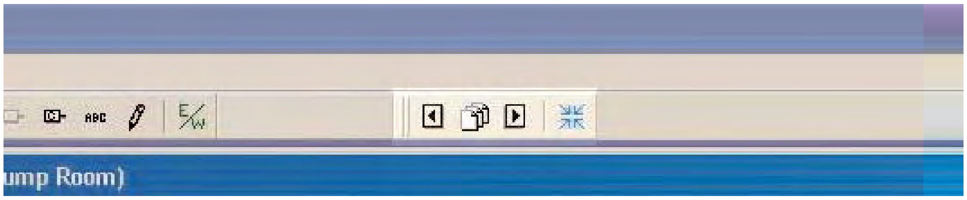
Connection Tool: The function block inputs and outputs are connected via the “Connection Tool”. This tool is also referred to as the “Line Tool” and the “Wire Tool”.

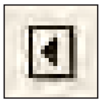
Errors/Warnings: When a build is performed any and all errors are reported via a window. This icon opens the “Error/Warning Viewer” described earlier in this chapter.

Sheet Toolbar: There are four icons which provide shortcuts to menu items having to do with logic sheets.

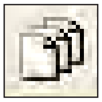


These four icons from left to right are; Previous Sheet, Sheet Settings, Next Sheet and Fit to Window.

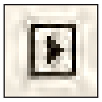




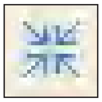
Previous Sheet: When a multi-sheet logic or function block element is open and a "previous sheet" exists, this button will hilight and its selection will open the previous sheet.



Sheet Settings: Sheets have a name, size and position. Via this icon the "Sheet Settings..." window is opened from which sheets can be created, deleted and have their name changed. In addition a sheets logic execution order can be changed.

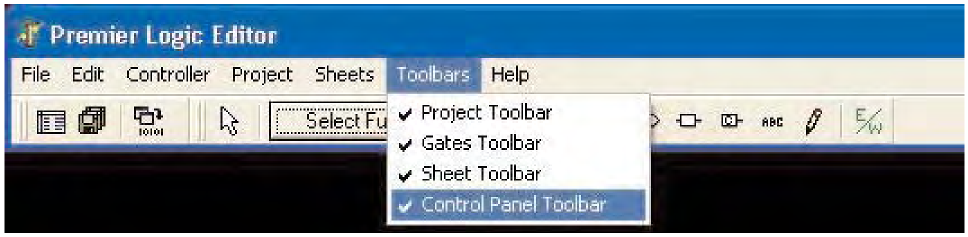


Next Sheet: When a multi-sheet logic or function block element is open and a "next sheet" exists, this button will hilight and its selection will open the next sheet.

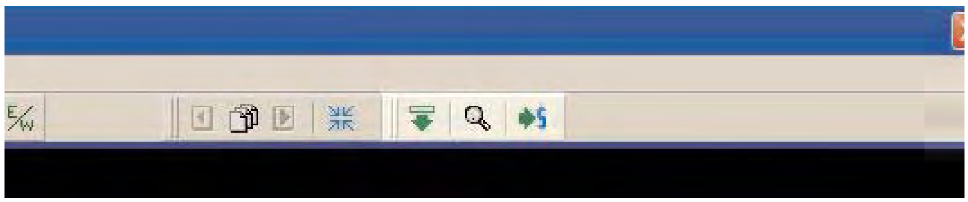


Fit to Window: This icon scales the drawing sheet so that the entire sheet can be viewed in one window. Editing is not allowed when the "Fit to Window" feature is active.

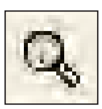
Control Panel Toolbar: There are three icons which provide shortcuts to menu items having to do with logic and the controller.



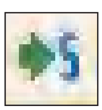
These three icons from left to right are; Download, Monitor and Simulate.



Download: When this icon is selected and the project has been "built" and no errors were discovered then the program is transferred to the controller. If a valid build is not found then a "build" is performed and if no errors are discovered the program will be downloaded to the controller.

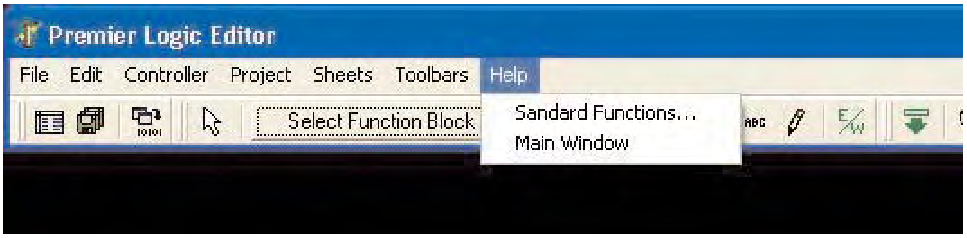


Monitor: When connected to a controller and the project matches the program in the controller, the logic of the program can be monitored. In the monitor mode, the logic sheet is displayed on screen and the results of all function block bins can be viewed.

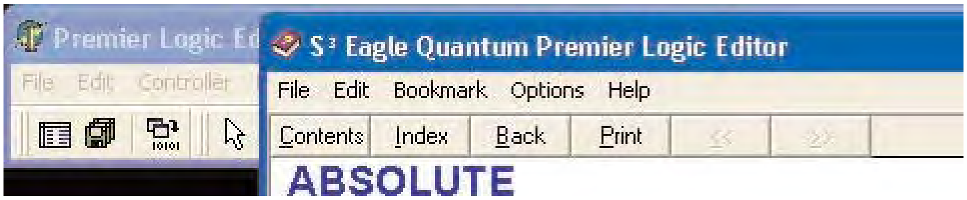


Simulate: If the project has been "built" and no errors were discovered then the program can be simulated on the S[3] workstation. If a valid build is not found, the build is automatically performed and if no errors are found the simulation is started.

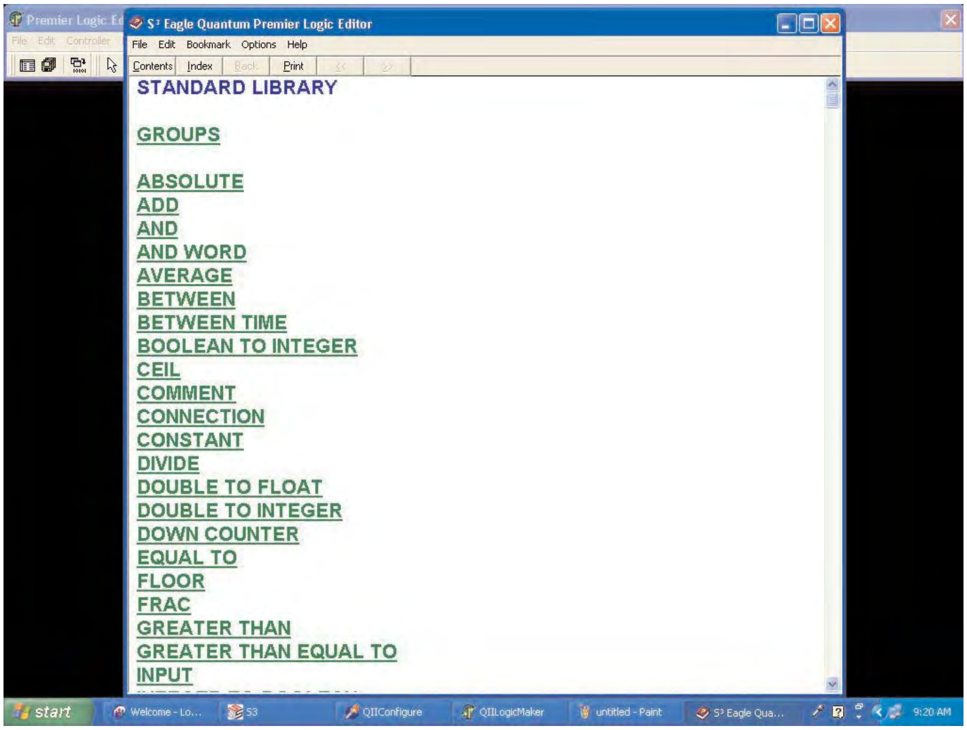
Help Menu: The help menu provides access to the online help system and has two areas; "Standard Functions" and "Main Window".



Standard Functions: This portion of the help system covers all of the available logic operators available for use in the logic editor.

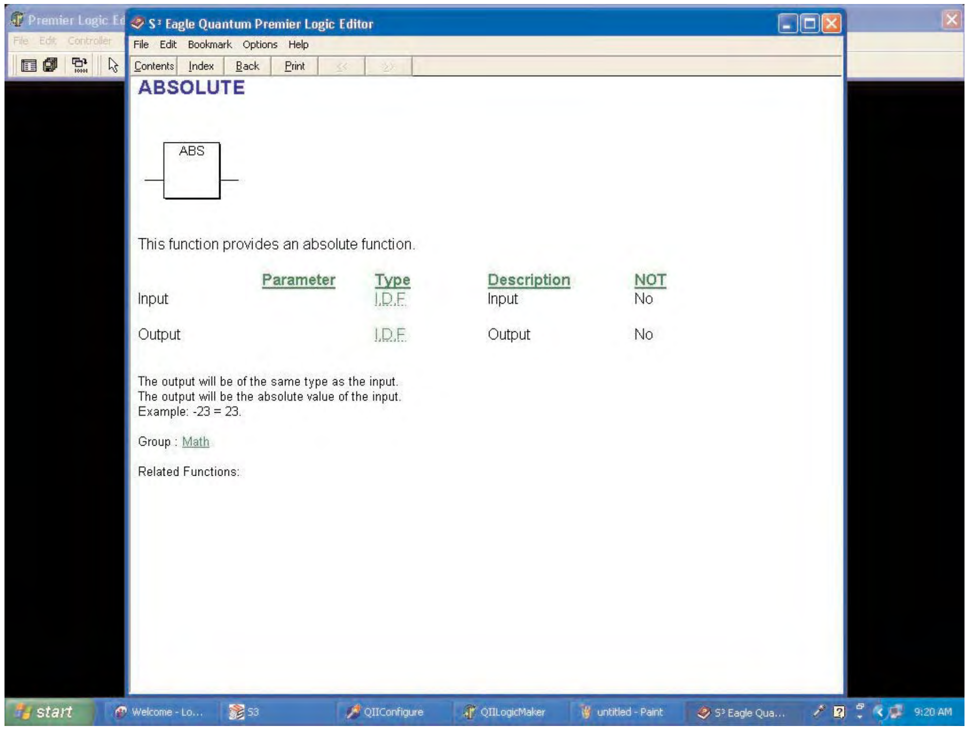


Selecting this menu item will open a hypertext linked help window featuring all available logical operators.



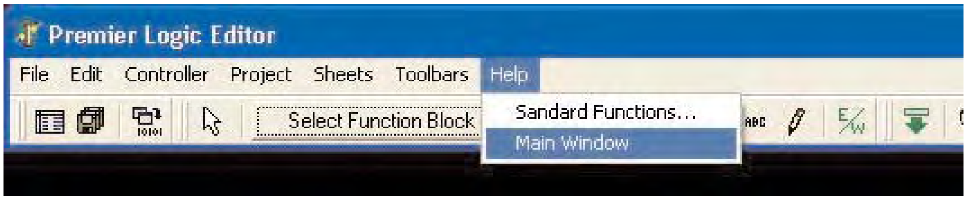
To access detailed information on a subject, click on a library function and the information will be displayed.

In the example below, the “Absolute” function was selected and the details of how to use this function are shown.

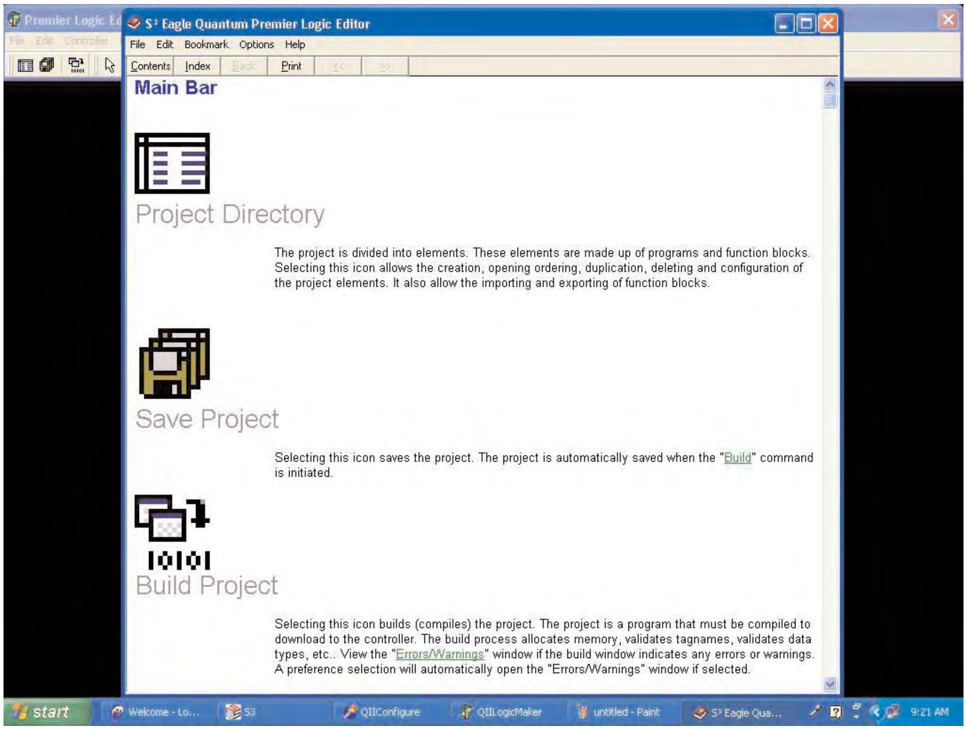


Use the Contents, Index, Back and Print buttons below the help windows menu bar to navigate the help system and print hard copies as required.

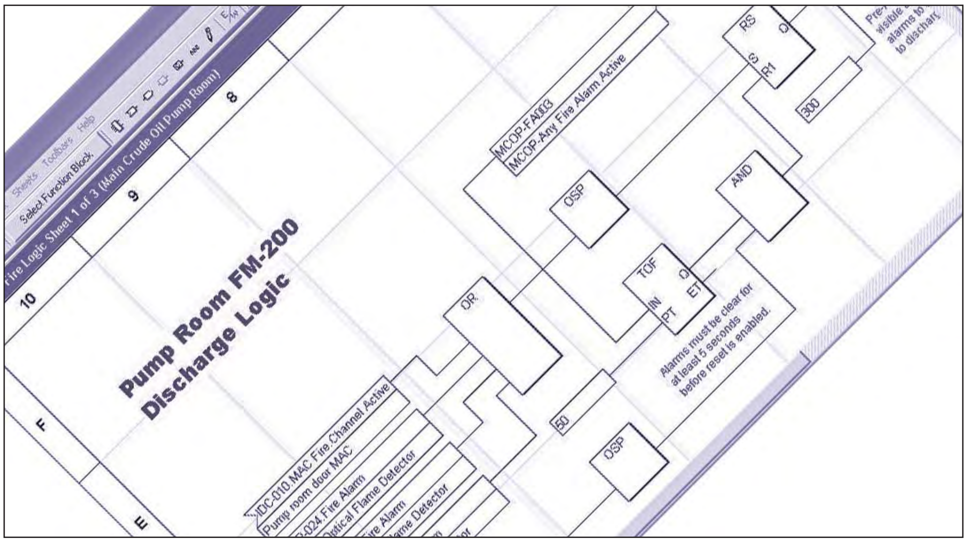
Main Window: This portion of the help system covers the description and operation of the icons in the logic editors tool bar.



Pictures of the tool bar icons are shown along with a description of their functions.



Use the Contents, Index, Back and Print buttons below the help windows menu bar to navigate the help system and print hard copies as required.



LOGIC CREATION

The S3 Logic Editor provides a modern full featured IEC-61131-3 style environment to generate, test and document user programmable logic for Eagle Quantum Premier controller.

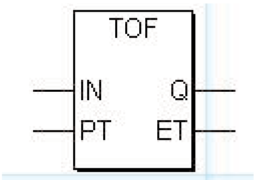
S3 utilizes the “Function Block Diagram (FBD) Language”.

FBD is a graphically oriented language that corresponds to block logic diagrams. The elements used in this language appear as blocks wired together to form logic circuits. The wires can communicate binary and other types of data between FBD elements. In FBD programming, a group of elements visibly interconnected by wires is known as a *network*. An FBD diagram may contain one or more networks. In the S3 programming environment these networks can span multiple sheets within a program or function block element.

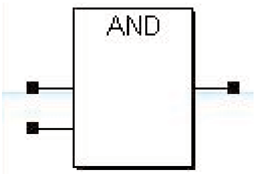
DEFINITIONS

Programs: Programs are the highest-level executable elements within an S^3 project. Programs can invoke functions or function blocks, but cannot invoke other programs. Projects are typically partitioned into multiple programs based on the operational requirements of an installation.

Function Blocks: In S^3 a function block is an executable element that yields one or more values and is generally used to perform repetitive operations. Variables within a function block persist from one evaluation of the function block to the next, so that the values calculated for one evaluation can be used in the next. Therefore, invocation of the same function block with the same input values may not yield the same output values. Examples of such function blocks are timers and counters like the Timer OFF delay (TOF).

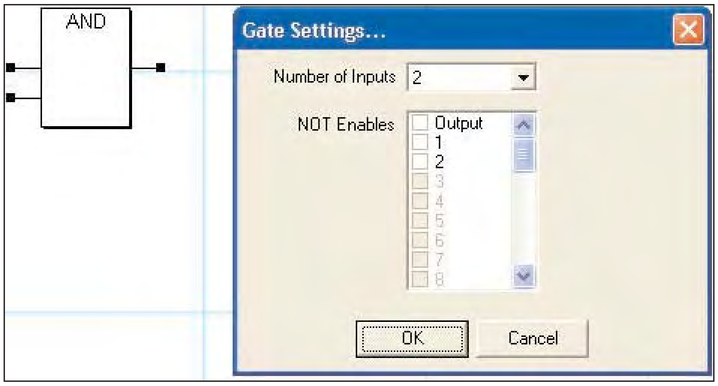


Functions: A function is an executable element that yields exactly one result. Unlike function blocks, variables in a function do not persist from one evaluation to the next. An example of a typical function is the boolean “AND” gate. Two or more inputs are evaluated and result in a single output.



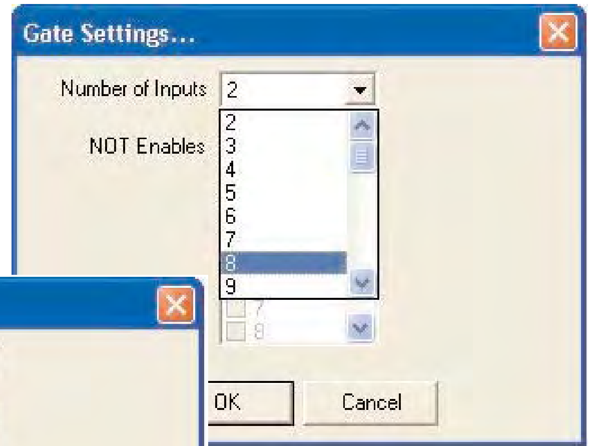
Extensible Functions: These functions have a minimum of two (2) inputs and can have a maximum of thirty two (32). The number of inputs into the function can be adjusted by double clicking on it.

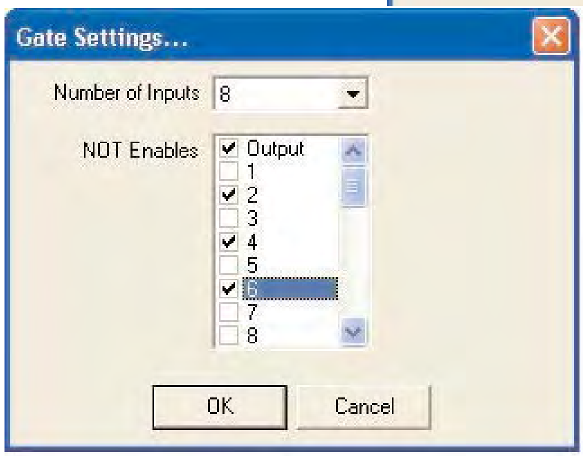
This will open a dialog box allowing the input number to be set and also may allow inverting any or all of the inputs as well as the output.



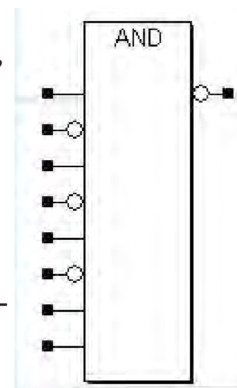
In the AND gate example to the right, the default of two non inverted inputs and a non inverted output are shown. To change the extensible number of inputs, click on the arrow to the right of the “Number of Inputs” field.

The “Gate Settings...” dialog box provides a scrolling pull-down menu from which the number of inputs can be adjusted anywhere between Two (2) and Thirty Two (32).



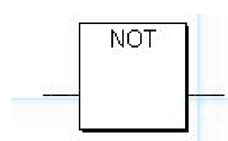


In the examples above and to the left, eight inputs were selected and then inputs Two (2), Four (4) and Six (6) were inverted by clicking on the “NOT Enable” checkbox corresponding to those inputs. In addition, the output was inverted in the same manner.



Once these selections were made, clicking on the “OK” button closes the “Gate Settings...” window and the reconfigured function appears as in the example to the right.

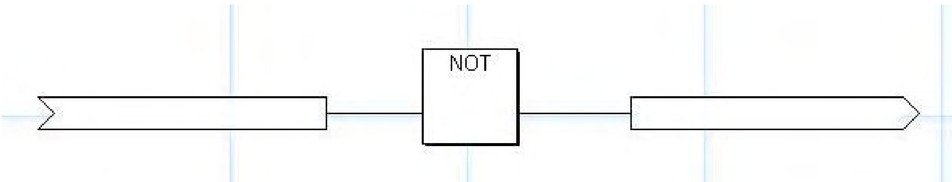
Note the small circles on the output and input “pins” indicate that these signals are “Inverted” from their normal state.



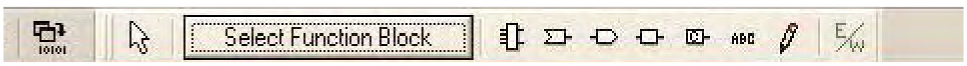
Non-Extensible Functions: These functions have a single non expandable input. One example of a non-extensible function is the boolean “NOT” gate, as shown in the example to the right. A single input with a single output.

Placing Logic Operators on a Sheet: To develop a program the user must be able to use the Logic Editor to place functions, function blocks, variables, inputs and outputs on a sheet within an element and then connect them together into viable networks.

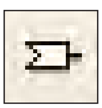
Below is an example of one of the simplest networks possible, a non-extensible function with a single input and a single output.



To create this network you must open a sheet within a created element and place the three logic operators on the sheet and connect them together.



1. All logic operators are selected via the icons on the "Gates Toolbar" shown above and described earlier in this chapter.



2. Click on the "Input Variable" icon on the Gates Toolbar.

   The cursor will change to a miniature input variable symbol when positioned within the drawing area of the current sheet.

3. Place the Input Variable on the sheet by positioning the mouse cursor over the sheet and clicking the left mouse button.

   The cursor will return to the "Arrow" symbol and this tool can be used to move the placed Input Variable to the desired location on the sheet. It may also be moved using the arrow keys.

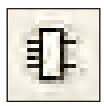
4. Activate the 

   button on the "Gates Toolbar" to open the "Function Selection..." dialog box.

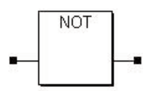
5. Scroll down the list of available logical operators (function blocks or functions) and locate the binary "NOT" operator.

   Note: If you know the name of the desired operator, it can be located quickly by typing its name. As you begin typing S³ will automatically reposition the scrolling list.

6. Select **NOT** and click "OK".

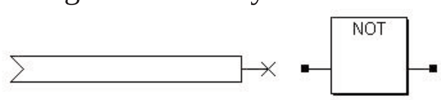


   The cursor will change to a miniature function block symbol when positioned within the drawing area of the current sheet.

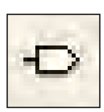


7. Place the "NOT" function on the sheet by positioning the mouse cursor over the sheet and clicking the left mouse button.

   The cursor will return to the "Arrow" symbol and this tool can be used to move the placed function to the desired location on the sheet. It may also be moved using the arrow keys.

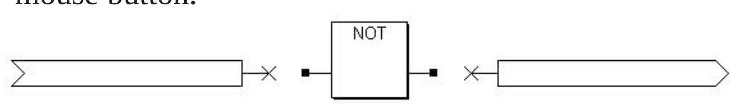


8. Click on the "Output Variable" icon on the Gates Toolbar.



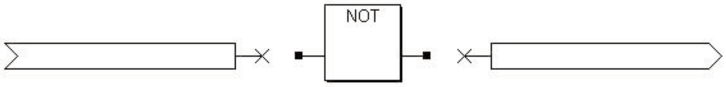
   The cursor will change to a miniature output variable symbol when positioned within the drawing area of the current sheet.

3. Place the Output Variable on the sheet by positioning the mouse cursor over the sheet and clicking the left mouse button.

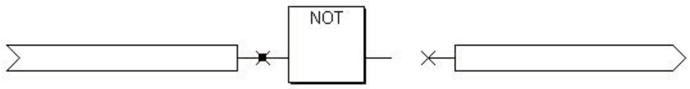


   Once all three logic operators are placed on the sheet, they must be connected together before the program can be considered finished and ready to be compiled.

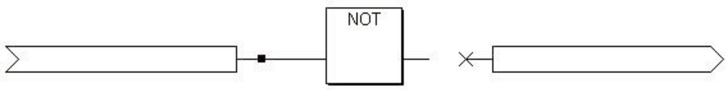
Connecting Logic Operators: Inputs, outputs, constants, functions, function blocks, etc. can be connected to each other either directly or by using "wires". In the example to the right, connections must be made between the input, output and NOT gate.



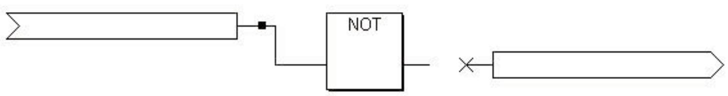
Direct Connection: To use the "direct connect" method, use the mouse to select the Input Variable and drag it to the right until its output connector mates with the NOT gates input connector as shown below.



At this point, the S[3] has linked the Input Variable to the input of the NOT gate and moving the Input Variable away with the mouse will automatically create a "wire" to keep the connection, as shown to the right.

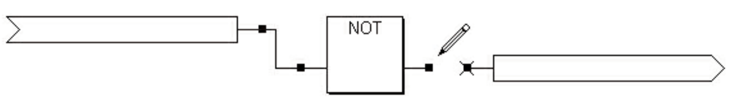


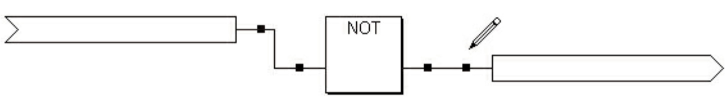
Once this connection is established, the input variable can be repositioned anywhere left of its connection point and the connection wire will change size and shape to keep the connection.



Using Wires: Click on the "Wire Tool" to activate it. The cursor changes to a miniature wire tool or pencil when it is positioned anywhere within the drawing area of the sheet. This means that wires can be drawn from one logic operator to another to connect them.

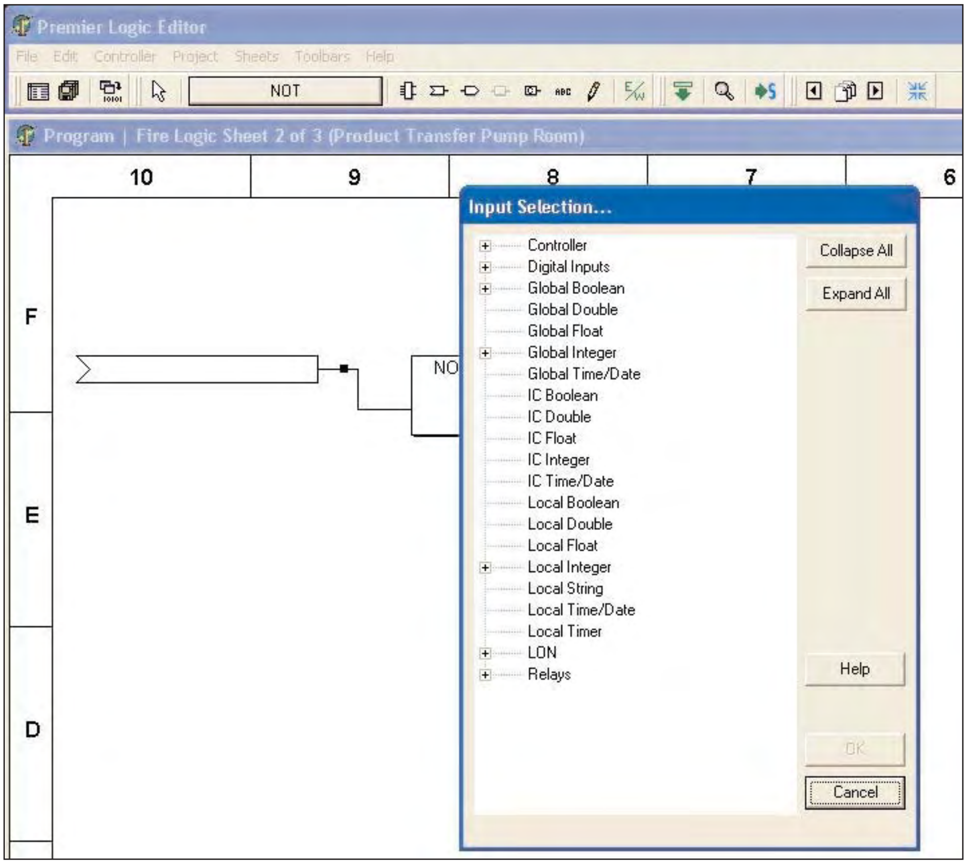
When active, the wire tool appears as in the example below. Using the wire tool, connect the output of the NOT gate to the input of the Output Variable. This will complete the drawing of this three logic operator network.





Next, the Input Variable and Output Variable must be "linked" to an appropriate I/O point or memory location in the controller.

Linking Variables: Input and output variables must be linked to compatible field device or controller memory data. Using the three logic operator “example network” created on the previous page, double-clicking on the “Input Variable” will open the “Input Selection...” dialog box which provides access to the Eagle Quantum Premier’s database.



The “Input Selection...” dialog box presents the database as a hierarchical list of sources.

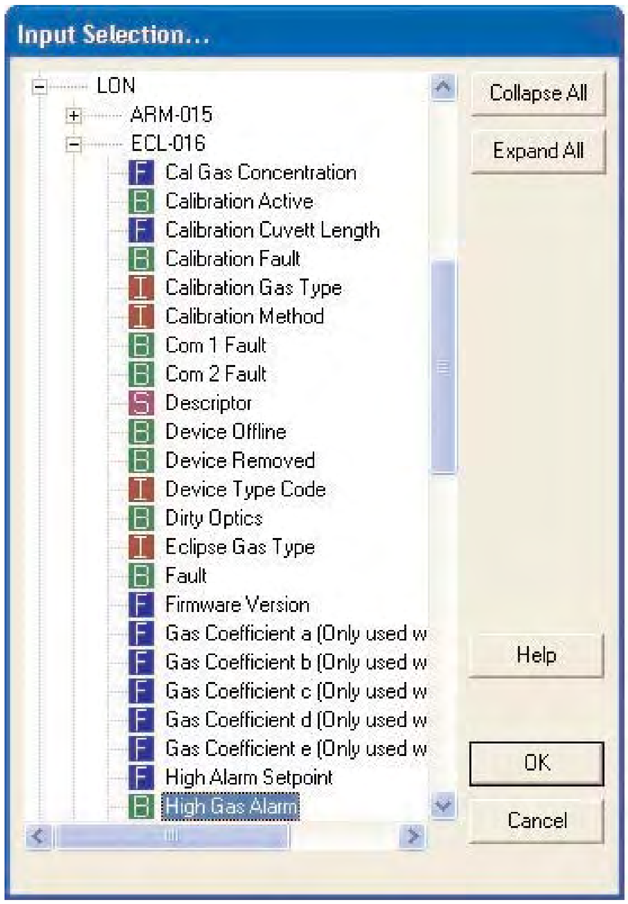
Any item on the list that has a “+” before it has subordinate items and clicking on the “+” will expand the list showing all items that make up that category.

To the right of the list are two buttons that can “Collapse All” or “Expand All” subordinate items in the list for easy viewing.

The first nineteen items on the list provide access to controller status information and the globals database. The “LON” item will allow access to all field device information, the “Relays” item is for accessing the controllers onboard relay status.

Linking Variables continued...

In the example below, the "LON" category has been expanded to reveal the field devices and then an Eclipse Infra-Red (IR) hydrocarbon gas detector tagged "ECL-015" has been expanded. The data available for this device exceeds the window length and the list has become "scrolling" to accommodate the expanded data.

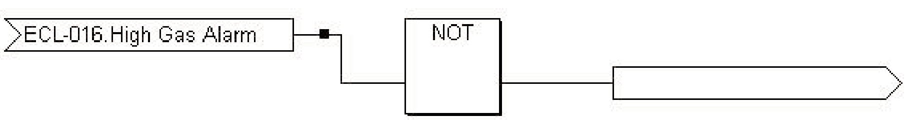


In this example, a "Boolean*" or "Binary" data element named "High Gas Alarm" has been selected by clicking on it with the mouse. Its selection is noted by its text description being hilighted.

The "block" with a letter preceding the data points name indicates the "Data Type" for that point.

The NOT gate in our example network requires a "Binary" data type for both inputs and outputs. The "High Gas Alarm" selected meets this criteria.

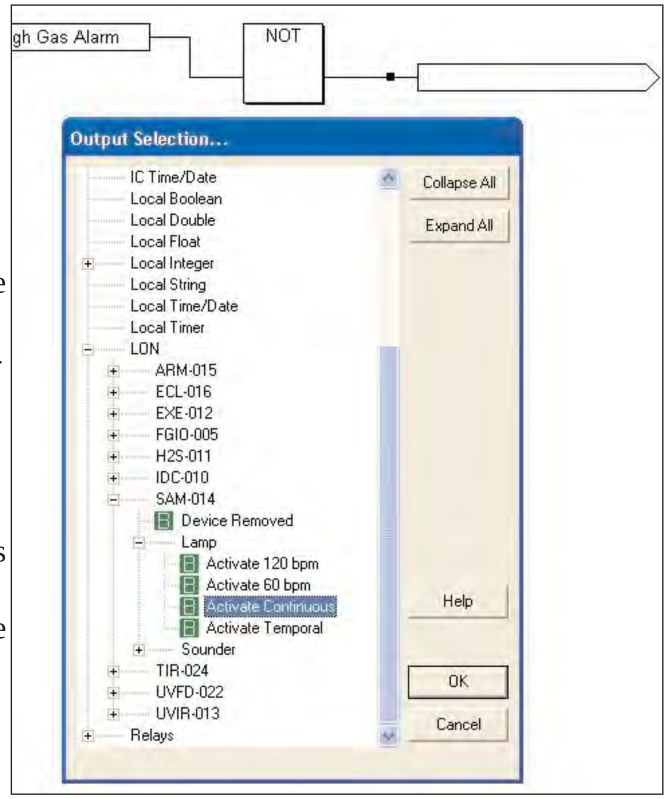
Selecting the "OK" button closes the "Input Selection..." dialog box and "links" the "ECL-015 High Gas Alarm" to the "Input Variable" of the example network, as shown below.



***Note:**

For detailed "Data Type" definitions, structures and ranges, refer to the last page of this Chapter.

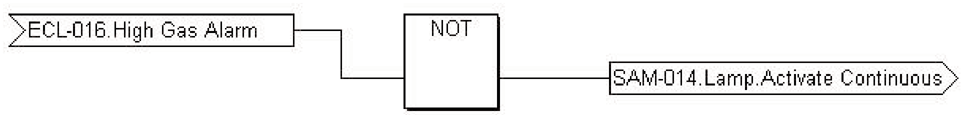
Linking Variables continued...:
The final step in completing the example network is to link the NOT gates output variable to an appropriate point.



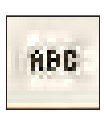
Double clicking on the "Output Variable" opens the "Output Selection..." dialog box.

This dialog box presents the database in the same manner as described on the previous page for the input selection process.

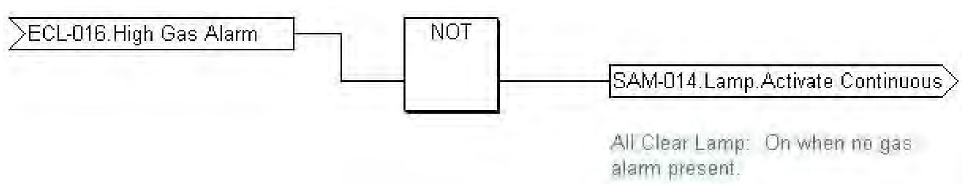
For this example, the LON data structure has been expanded, a Signal Audible Module (SAM) with the tagname "SAM-014" has been expanded and the Binary data point "Activate Continuous" for the Lamp output has been selected. Selecting the "OK" button will close the "Output Selection..." dialog box and link this output to the output variable as shown below.



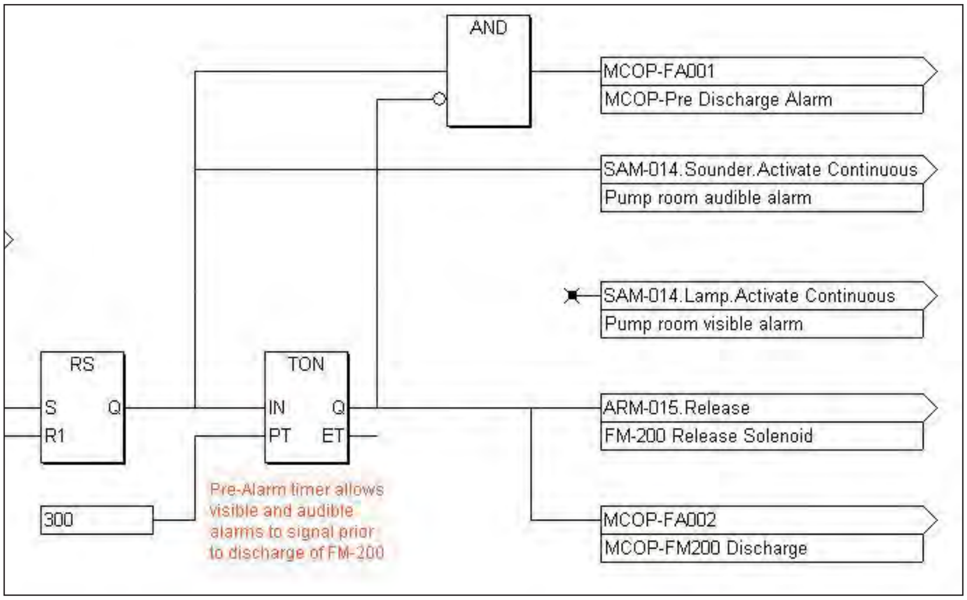
The network is now complete, when the High Gas Alarm for ECL-016 goes "ON" the lamp controlled by SAM-014 goes "OFF".



Using the "Comment Tool" a description can be added to explain the purpose of the output.

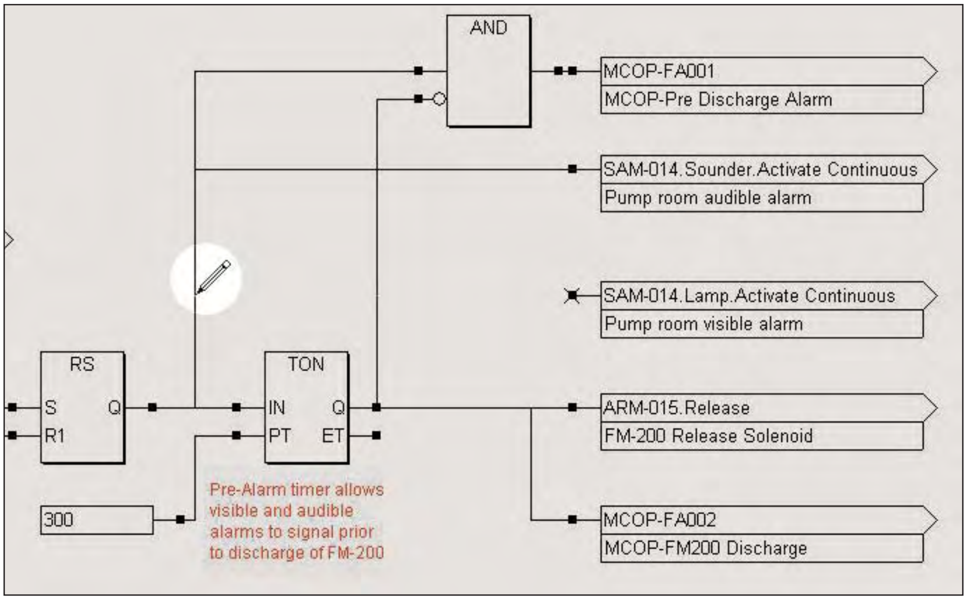


Wire-on-Wire: This type of connection is used when a single signal needs to be routed to multiple destinations as in the example below.

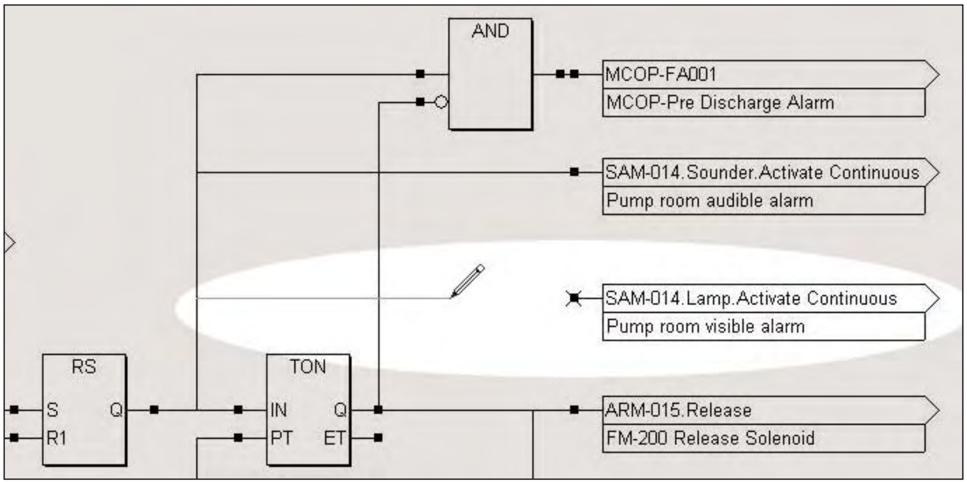


In this example the output "Q" of a "Reset-Set (RS)" block needs to be routed to the input of an "AND" gate, to the input of a timer (TON) and to two output locations on SAM-014. The first connection to SAM-014's audible alarm is complete, the second connection to SAM-014's visible alarm output needs to be created.

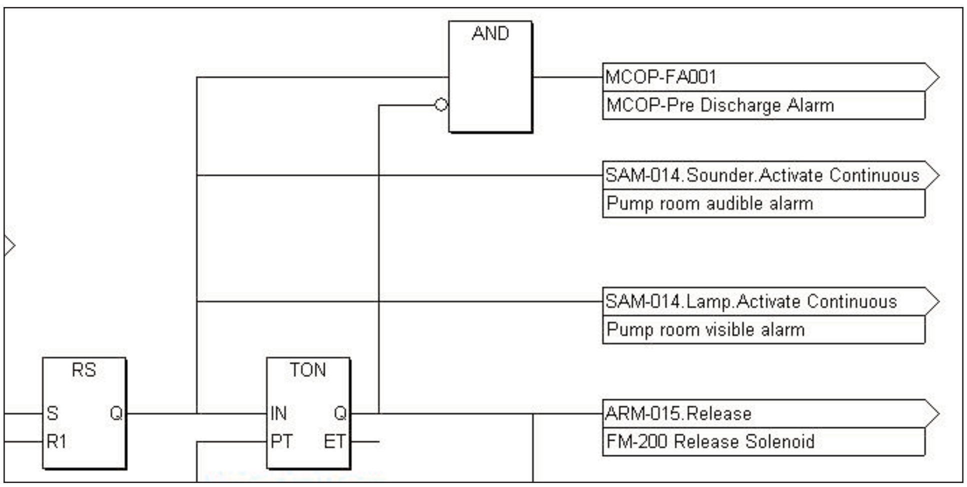
To accomplish this type of connection the "Wire Tool" is used. Select



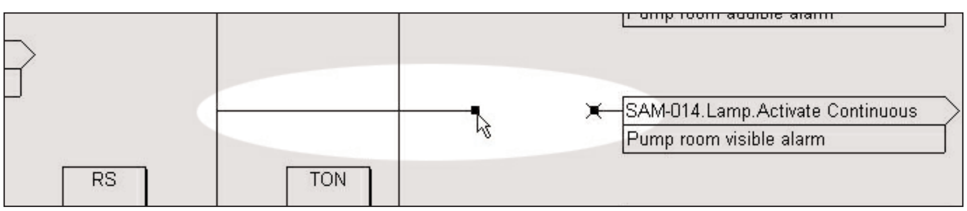
the "Wire Tool" and place it on an existing "wire" where a connection is desired. Click to and drag to make the connection and create a wire. Draw the wire from the initial wire-to-wire connection point to the input of the desired variable.



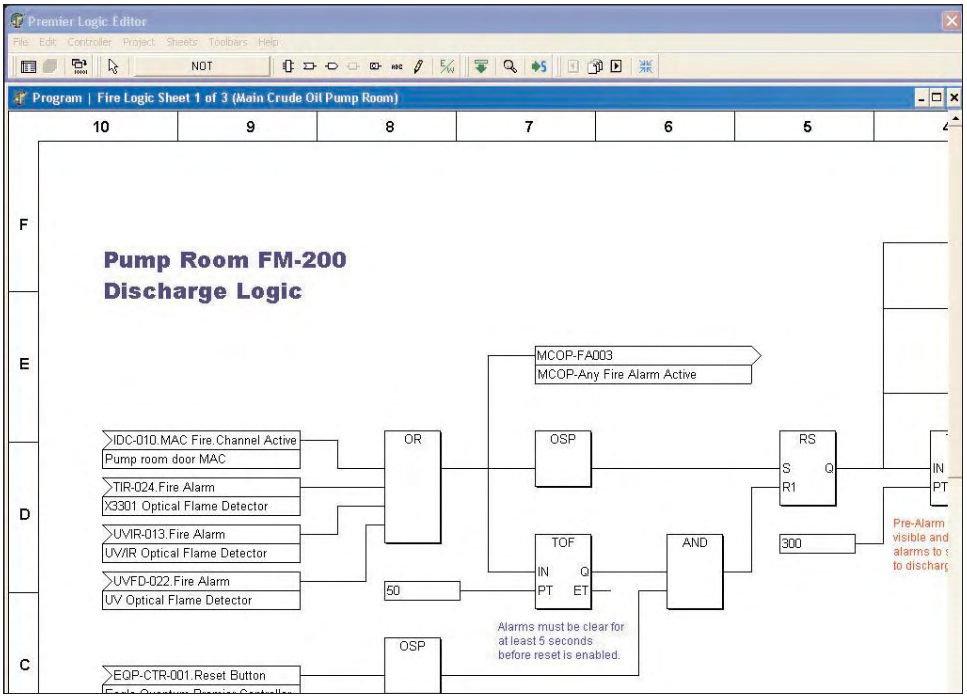
The completed circuit will look like the example below.



If the mouse button is released while "drawing" the wire, before completing the connection, an incomplete line segment will be created. To complete this segment, use the arrow tool to click and drag the incomplete end of the wire to its desired destination.



Combining the techniques described in the last few pages with the comprehensive standard set of S^3 functions and function blocks, virtually any kind or complexity of logic can be created quickly and easily.



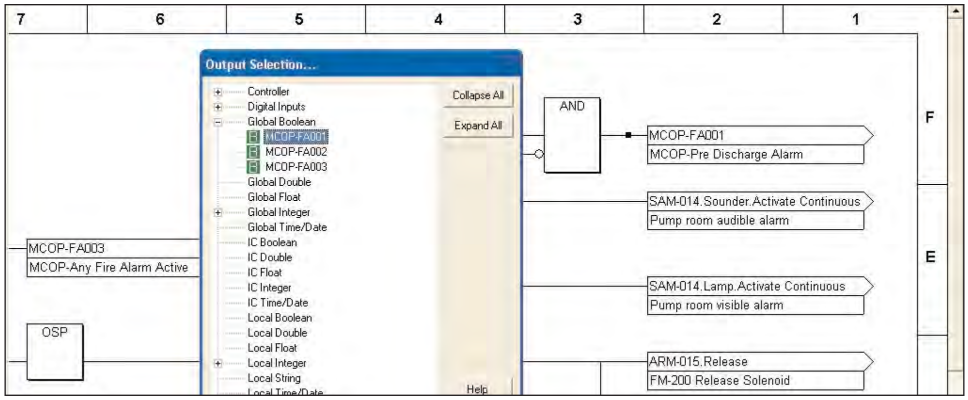
The example above utilizes a binary OR, a One Shot Pulse (OSP), a binary AND, a Reset/Set (RS) and text comments to create a portion of the protection logic for a pump room.

In some cases, the complexity of the logic being designed or just the number of logic operators required may use more room than is available on the selected sheet size.

In these cases, the sheet can be made larger by selecting the “Settings” item of the “Sheets” menu. Sheet size can be increased from the minimum “A” size up to a maximum “D” size.

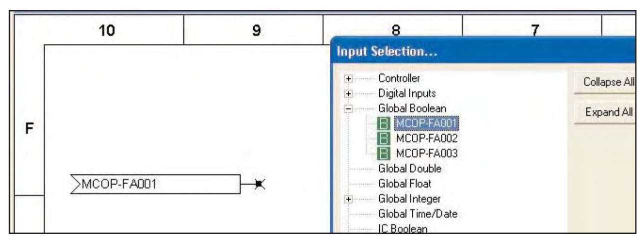
If once the desired sheet size has been selected more room for logic is still required, information can be sent “between” the sheets in an element.

Sheet-to-Sheet Network Linking: For very complex logic situations, it may be necessary for a logic network to span more than one sheet. This is fully supported and easy to implement. By assigning an "Output Variable" to a compatible "Global Variable" memory location in the controller, the value can then be accessed on another sheet.

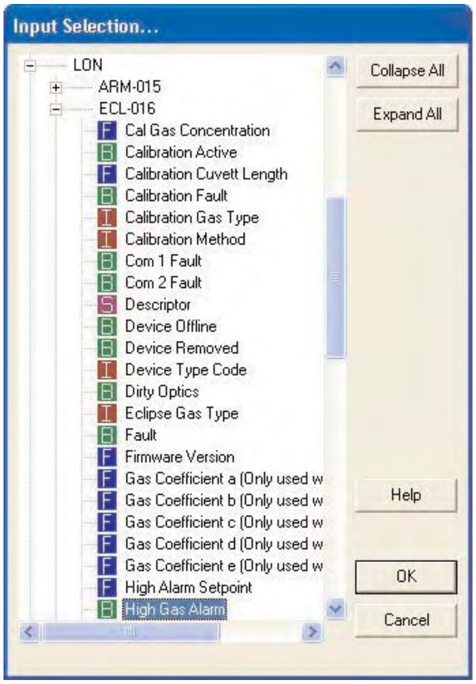


In the example to the below, an Input Variable was placed and linked to a global memory point "MCOP-FA001".

The value for this point was generated on the preceding sheet where it was assigned to the global database. Once placed in the global database, the value of "MCOP-FA001" can be used as an "Input Variable" on any other sheet in the project.



Data Types: Functions and Function blocks typically require a specific data type to be attached to their input and output pins. The S^3 online help file provides detailed information on both the data type compatibility requirements as well as how each logic operator functions. Below is a definition of the available data types, within the S^3 database these types are represented as follows:



B	=	Boolean
I	=	Integer
D	=	Double
F	=	Float
S	=	String
T	=	Time/Date

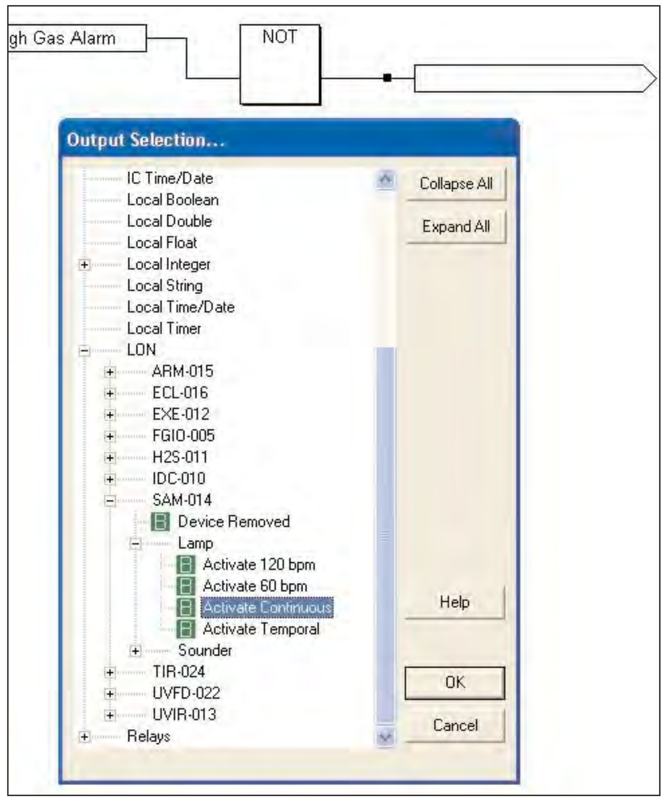
Detector	IEC 1131-3	Range
Boolean	Boolean	8 bit value, 1 = True, 0 = False
Integer	Integer	2 bytes, 16 bit value, -32,768..32,767
Double	Double Integer	4 bytes, 32 bit value, -2,147,483,648..2,147,483,647
Float	Real	4 bytes, 32 bit value (IEEE 754 single precision) Most positive number 3.4028E+38 Least positive number 1.1754E-38 Least negative number -1.1754E-38 Most negative number -3.4028E+38

NOTE: When floats are used in a comparison for Equal (=), the comparison will be true if the values are within 0.01 of each other.

Detector	IEC 1131-3	Range		
String	String	80 bytes	(Not supported as an I/O variable)	
Time/Date	Undefined	Item ID	Description	Data Type
		1	Seconds (0-59)	Integer
		2	Minutes (0-59)	Integer
		3	Hours (0-23)	Integer
		4	Day (1-31)	Integer
		5	Month (1-12)	Integer
		6	Year	Integer
	When displayed as a string the format is mm/dd/yyyy hh:mm:ss			
Structure	Structure	A structure that does not have a fixed length.		

DEVICE ITEMS REFERENCE

As described earlier, inputs and outputs to the logic must be "linked" to variables in the S^3 database for the controller in which the logic resides. As the database is "browsed" to locate the desired variable for a LON device, controller or memory location a very large array of device "items" are presented.



These items are listed in alphabetic order under each tagname in the database.

Many of these items are familiar, like the standard "fire & gas" device types "Fire Alarm", "Lo Gas Alarm" etc.

Others like "Neuron ID" and "Firmware Version" are not.

In addition to the standard F&G alarms each LON device and the controller itself have a great deal of additional status and diagnostic information that can be utilized in logic.

The following pages of this users guide provide a reference to over 300 of these "Device Items" so that the programmer can determine whether they could be used to enhance the user program being worked on.

Item Descriptions:

Item : 1 Firmware ID String:

The controller automatically polls LON devices for an ID string. The ID string contains an abbreviated device name and firmware version. As an example, "DCU 3.01" is the ID string for a DCU. The first three characters hold the device ID and the last 5 characters hold the firmware version. In multi processor units like the Eclipse and X3301 this represents the version of the software running on the neuron chip. For the controller, this variable holds the version of the main program, not the neuron firmware. Firmware version is used to determine device type and available functionality.

Item : 2 Neuron ID number:

Each neuron holds a unique 48 bit "Neuron ID" number. Neuron ID numbers could be used as an alternative method to dip switch addressing in a future version.

Item : 3 Firmware Version:

The firmware version is represented as a floating-point number. In multi processor units like the Eclipse and X3301 this represents the version of the software running on the main processor, not the neuron chip.

Item : 4 Serial Number:

This location holds a unique serial number used for device identification.

Item : 5 Manufacture Date:

Date of device manufacture.

Item : 6 OEM Device Code:

This code is used to synchronize software features to a customer. This item can only be set at the factory by the controller final test fixture. It is not part of the user configuration.

Device Codes

Value	Description
0	Detector Electronics
1	Solar Turbines

Item : 7 Device Code:

Each device type has a unique code associated with it. Controller to PC configuration software use "Device Codes" to identify device types. The Controller to field device interface uses "LON Type Code" for backward compatibility.

Device Code Code	Device	LON Type
1	DCU	95
2	IDC	91
3	UV Detector	92
4	SAM	93
5	ARM	94
6	UV/IR Detector	96
7	PSM	97
8	8 Point DC I/O Module	110
9	8 Point Relay Module	111
10	8 Point Analog Input Module	112
11	8 Point Pulsed Input Module	113
12	Eclipse PIR	98
13	X3301	99
14	X2200 UV	114
15	X9800 IR	115
16	X5200 UV/IR	116
17	IPM (DCIO Smoke)	117
100	Premier Controller	200

Item : 8 Tag Name:

User defined 20 character ASCII string.

Item : 9 Descriptor:

User defined 32 character ASCII string.

Item : 10 Update Rate:

The frequency of field device status transmission is adjusted with this variable. The allowable range is from 1,000 to 10,000 ms.

Item : 11 Time and Date of Configuration:

The time and date of the configuration information is saved in this variable.

Item : 12 Unique Configuration Number:

Each configuration will be assigned a unique number, which can be used to identify the configuration.

Item : 13 Configuration Port Baud Rate:

Serial baud rate for the controller configuration port is set with this variable. A code is used to represent each rate.

Baud Rate Codes

Code	Speed
1	2400
2	4800
3	9600
4	19.2K
5	38.4K
6	57.6K
7	115.2K

Item : 14 Configuration Port Parity:

Controller configuration port parity setting is set with this variable. A code is used to represent each type.

Parity

Code	Type
1	None
2	Odd
3	Even

Item : 15 LON Address:

Each device on the LON network must have a unique address. Valid controller addresses are in the range of 1 to 4. Field device addresses are in the range of 5 to 250.

Controller LON Address:

Primary controllers will set this variable to 1 while secondary controllers will have a value of 2. User logic and external interfaces can use this variable to determine which controller is currently the master. Host configuration software need not write to this item.

Item : 16 Option Board Type:

This variable defines the type of option board installed.

Option Board Types

Value	Description
1	No Option Board Installed
2	ControlNet

Item : 17 Current Time and Date:

The controller real time clock can be set or read with this variable.

Item : 18 User Name:

The name of the PC user can be saved with this variable.

Item : 19 ControlNet MAC Address:

The ControlNet MAC address is set with this variable. Allowable values range from 1 to 99.

Item : 20 Serial Port 1 Protocol:

The second serial port protocol is set with this variable.

Serial Port Protocols

Value	Description
1	Port not used
2	Modbus Slave
3	Modbus Master

Item : 21 Serial Port 1 Baud Rate:

Serial baud rate for the controller RS485 serial port is set with this variable. The default baud rate is 9600.

Item : 22 Serial Port 1 Parity:

The controller second serial port parity setting is set with this variable. The default parity is “None”.

Item : 23 Serial Port 1 Address:

The address field is only used for Modbus protocol. Valid Modbus addresses are in the range from 1 to 247. The default address is 1.

Item : 24 Allow LON Point Disabling:

If this variable is set true, LON device disabling will be allowed. This feature has not been implemented, at this time disabling is always allowed.

Item : 25 Beeper Volume:

The volume level of the internal beeper can be adjusted with this variable. Values from 1 (lowest) to 4 (highest) are allowed.

Beeper Volume

Value	Description
1	Off
2	Low
3	Medium
4	High

Item : 26 Channel Type:

This variable is used to configure a DCIO channel as an input or output.

Value	Definition
1	Input
2	Output
3	Smoke Detector (not implemented yet)

Note: When smoke is selected, only supervision option 3 (opens and shorts) and static logic mode fire is allowed.

Item : 27 Low Alarm Latching:

When this configuration variable is set low alarms are latched until the unit is power cycled or a reset command is issued.

Item : 28 High Alarm Latching:

When this configuration variable is set high alarms are latched until the unit is power cycled or a reset command is issued.

Item : 29 DCU Type Code:

See the DCU section for a description of this variable.

Item : 30 Gas Mode:

Gas Mode is used to determine if static logic should activate high and low gas alarms. When mode 1 is selected static logic will activate the controller gas alarms. Mode 2 should be used for non-gas detector inputs.

Gas Mode

Value	Definition
1	Gas Detector
2	Other (Non Gas)

Item : 31 Engineering Zero Value:

Zero range corresponds to the 4 ma value on the sensor input. For example, if 4 ma equates to 10.0 MPH of air flow the engineering zero value should be set to 10.0.

Item : 32 Engineering Full Scale Value:

Full scale range corresponds to the 20 ma value on the sensor input. For example, if 20 ma equates to 900.0 MPH of air flow the engineering zero value should be set to 900.0.

Item : 33 Calibration Level:

This variable determines the calibration point for the 4 to 20 ma input. Valid values are in the range of 20 to 100% of full scale.

Item : 34 Low Alarm Setpoint:

Alarm setpoints must be within the limits listed on the DCU type code table. Alarm determination is done at the DCU not the controller. However, user logic could be created within the controller to allow for many more alarm levels.

Item : 35 High Alarm Setpoint:

Alarm setpoints must be within the limits listed on the DCU type code table. Alarm determination is done at the DCU not the controller. However, user logic could be created within the controller to allow for many more alarm levels.

Item : 36 Units Text:

This field holds the engineering units as a text string. The text string shall be displayed with the process variable on the faceplate display. Future versions of DCUs with on board displays may also utilize this information for display.

Item : 37 PV Change Dead-band:

The process variable dead-band can be adjusted with this variable. This is only used during “Online” operation and is expressed as a percentage of full scale. When the host computer instructs the controller to operate in online mode the controller sends exception messages to the host computer when device variables change. However, many analog values are constantly changing which many cause an abundance of unneeded messages. The “PV Change Dead-band” variable is provided to limit how often the value is sent. The value must change by the "PV Change Dead-band" amount or more fro the value to be sent.

Item : 38 Input Static Logic Mode:

Input mode is used to determine if static logic should activate controller alarms on input activation. For example, if mode 1 is selected, static logic will activate the controller fire alarm when the input is activated.

Mode	Definition
0	Invalid
1	Fire Alarm
2	Trouble
3	Low Gas Alarm
4	High Gas Alarm
5	Supervisory
6	Other

Item : 39 UV Sensitivity:

Sensitivity
Value Definition Standard Mode
Star Mode
1 Low 96 cps 96 cps
2 Medium (Default) 48 cps
48 cps
3 High 24 cps 24 cps
4 Very High 8 cps 8/16 cps

Item : 40 Time Delay:

Valid times are from 0 to 7 seconds with a default value of 5 seconds.

Item : 41 UV Arc Rejection:

UV Arc Rejection

Value	Definition	Gate Length
1	Low	.250
2	Medium (Default)	.125
3	High	.0625
4	Very High	.0625

Item : 42 UV Processing Mode:

UV processing mode can be selected with this variable.

UV Processing Mode

Value	Definition
0	Standard
1	Star

Item : 43 Oi Mode:

Optical Integrity mode can be selected with this variable.

Oi Mode

Value	Definition
0	Automatic
1	Manual

Item : 44 Latching:

0 = non-latching ouput.
1 = latching output.

Item : 45 ARM Output Mode:

See the ARM section for a description of this variable.

Item : 46 Activation Time:

The output hold on time can be set with this variable.

Item : 47 IR Sensitivity:

IR Sensitivity

Value Definition UV/IR
X3301
Counts per Gate
Effective counts per second
1 Low 8 64
Low (not used)
2 Medium (Default) 6
48 Medium
3 High 4 32
High (not used)
4 Very High 2 16
Very High (Default)

The IR for UV/IR detectors always uses 0.125 second gate length for sampling the counter. The signal is compared to the threshold every _ second.

Item : 48 IR Oi Threshold:

IR Oi Threshold

Value	Definition	Counts per Second
1	Low	64
2	Medium (Default)	48
3	High	32
4	Very High	16

The Oi test will run for a maximum of five seconds.

Item : 49 IR Oi Test Frequency:

IR Oi Test Frequency

Value	Definition
1	1 minute (Default)
2	1 Hour
3	2 Hours
4	4 Hours

Three consecutive failures are required to fault, and three consecutive good tests are required to return to normal. While an IR oi fault is active the test frequency is reduced to once per minute.

Item : 50 Full Scale Value:

The Engineering unit full scale value is configurable and must match the current rating of power supply monitor. Only one model has been defined, 80 Amp, with a range of -16 Amps to +80 Amps.

Item : 51 AC Fault Threshold:

The power supply monitor fault threshold can be set with this variable.

Item : 52 Supervision Option Select:

An I/O channel can be configured with or without supervision.

Mode	Definition
1	No Supervision
2	Monitor for opens
3	Monitor for opens and shorts

Item : 53 Eclipse Gas Type:

This field allows the Eclipse to be configured for different gas types.

Code	Description
1	Methane (Default)
2	Ethane
3	Propane
4	Ethylene
5	Propylene
6	Butane
7	Reserved
8	Reserved
9	Reserved
10	Special

Item : 54 Calibration Gas Type:

Calibration gas type is selected with this code.

Description	Code
Same as Measured (Default)	1
Methane	2
Propane	3

Item : 55 Calibration Method:

Description	Code
Standard (Default)	1
Cuvett	2

Item : 56 Cuvett Length:

1.0 to 150.0 mm, default 150mm

Item : 57 Calibration Gas Concentration:

The allowable range is from 20 to 100% with 50% as the default.

Item : 58 Volume at LEL:

Used for programming a special gas type, the default value is 5%.

Item : 59 Gas Coefficient a:

Used for programming a special gas type.

Item : 60 Gas Coefficient b:

Used for programming a special gas type.

Item : 61 Gas Coefficient c:

Used for programming a special gas type.

Item : 62 Gas Coefficient d:

Used for programming a special gas type.

Item : 63 Gas Coefficient e:

Used for programming a special gas type.

Item : 64 Device Removed:

The user sets this bit when the device has been removed from the system. Configuration information shall be retained in the controller to allow the device to be added at a later time. If the removed bit is set when program mode is exited, the status will be saved during a power cycle.

This item is used to tell the controller a device has been removed from the network. The controller will signal the “Extra LON Device” fault if the device is on-line with the removed item is set.

Item : 65 Static Logic Inverted:

Setting this item tells the controller invert the signal when used with-in static logic. This can be used to have a normally energized controller relay or a normally active digital input.

Item : 66 Alternate Function:

Each controller relay has a predefined alternate function. When an alternate function is enabled, static logic controls the relay. When a relay is configured for alternate function, it can not be used by user logic.

Item : 67 Fire Alarm:

Fire alarm is indicated with this item. For the controller this item represents the state of the fire alarm LED and relay, if programmed for the alternate function.

Item : 68 Trouble:

This item represents the state of the trouble LED and relay on the controller.

Item : 69 First Scan:

This item is intended for use with-in user logic, it is true only during the first scan of user logic after program mode is exited.

Item : 70 High Alarm:

High alarm is indicated with this item. For the controller this item represents the state of the high gas alarm LED and relay, if programmed for the alternate function.

Item : 71 Low Alarm:

Low alarm is indicated with this item. For the controller this item represents the state of the low gas alarm LED and relay, if programmed for the alternate function.

Item : 72 Acknowledge:

This bit tracks the state of the controller Acknowledge LED.

Item : 73 Silence:

This bit tracks the state of the controller Silence LED.

Item : 74 Program Mode:

This bit tracks the state of the controller mode and LED, 1 equals program mode.

Item : 75 Acknowledge Button:

This item tracks the state of the acknowledge button on the controller faceplate and is intended for use by user logic.

Item : 76 Silence Button:

This item tracks the state of the Silence button on the controller faceplate and is intended for use by user logic.

Item : 77 Temperature Out of Range Fault:

This item is set for a temperature out of range fault

Item : 78 Reset Button:

This item tracks the state of the Reset button on the controller faceplate and is intended for use by user logic.

Item : 79 CPU Fault:

The item indicates a problem with a processor or memory system, the cause of this fault is device dependent.

Item : 80 Supervisory:

This item tracks the state of the controller Supervisory LED and relay, if programmed for the alternate function.

Item : 81 Channel Active:

This item tracks the state of an I/O channel.

Item : 82 Control Message Fault:

This item is set when a field device does not receive the output control message from the controller.

Item : 83 Channel Shorted:

This item indicates when an I/O channel is shorted.

Item : 84 Channel Open:

This item indicates when an I/O channel is open.

Item : 85 Channel Isolated:

This item indicates when an I/O channel is isolated.

Item : 86 Normalized Process Variable:

Normalized process variable holds the analog value read from the device as a floating point value. For devices with adjustable ranges, values are calculated by using the zero and full scale range values.

Item : 87 Raw Process Variable:

Raw process variable holds the analog value read from the device as an integer value. For devices with adjustable ranges, values are calculated by using the zero and full scale range values.

When the raw integer format is used values are in the range of 0 to 4095.

Values for an ideal 4 to 20 ma sensor are:

DCU Process Variable

Input	Output
0 ma	0
4 ma	682
12 ma	2048
20 ma	3413
24 ma	4095

Item : 88 AC Voltage:

The AC voltage can be read with this variable.

Item : 89 Temperature:

The temperature in degrees C can be read with this variable.

Item : 90 Battery Current:

This variable represents the battery charge or discharge current level. Positive values indicate battery charging while negative values represent battery discharge.

Item : 91 Flame Detector Counts per Second:

This variable represents the counts per second from flame detectors.

Item : 92 Supply Voltage:

Field device supply voltage as measured at the device can be read with this item.

Item : 93 Wrong Device Type:

This item is reserved to signal that the controller has detected a wrong device type. (Not supported in the first release)

Item : 94 Extra LON Device:

This item is used to signal that the controller has detected an extra device on the LON.

Item : 95 Logic Error Reference Number:

If the controller detects an error in user logic, the last trace number is stored in this item.

Item : 96 Logic Error Code:

If the controller detects an error in user logic, an error number is stored in this item.

Logic Error Code	
0	No Error
1	Unknown Instruction Type
2	Unsupported address mode
3	No Execute function has been defined for this instruction
4	An error was detected in a gate parameter
5	Too many items on the stack for this operation
6	Logic Memory Overflow

Item : 97 Memory Fault:

When this item is true, a fault has been detected in the memory system.

Item : 98 RTC Fault:

When this item is true, the real time clock needs to be set, or the clock circuitry has malfunctioned.

Item : 99 LON Ground Fault:

When this item is true, the controller has detected a ground fault.

Item : 100 Duplicate Address:

Not supported.

Item : 101 LON A Interface Fault:

This bit is set when a problem is detected with LON interface channel A.

Item : 102 LON B Interface Fault:

This bit is set when a problem is detected with LON interface channel B.

Item : 103 Inhibit Status:

This item is set when a device or channel has been inhibited.

Item : 104 Zero Drift:

This item is set when a gas detector goes negative to point of a fault.

Item : 105 Option Board Fault:

The controller sets this item true when a fault is detected in the controller option board.

Item : 106 Invalid Configuration:

This item is set on new units, when the address is changed, or when invalid data is transferred to the device. A valid configuration must be downloaded to clear the item.

Item : 107 Fault:

The controller performs a logical OR of all field device faults to control this item.

Item : 108 Unable to Configure:

This item is set when the controller is unable to successfully transfer configuration information to the field device.

Item : 109 Last Direction:

The controller has two LON channels A and B. In normal operation, both channels receive status messages from all devices. However, during network fault conditions messages will only be received from one side. This item indicates the last side status information was received from. This along with the offline bits can be used in determining the location of a network break. When the bit has a value of 0, channel A was the last side, a value of 1 indicates channel B was the last side.

Item : 110 Lon A Device Offline:

This item is set when the controller has not recently received status messages from the device on the first Lon channel.

Item : 111 Lon B Device Offline:

This item is set when the controller has not recently received status messages from the device on the second Lon channel.

Item : 112 Device Offline:

Three offline item are provided for enhanced fault diagnostics. The controller maintains offline timers for every device on the network. The controller sets the LON x device offline item when it has not received messages from the device on that channel, A or B. The device offline fault item is set when both LON A and B offline bits are set (totally offline). The controller will not attempt to talk to devices that are offline. The item are automatically cleared when status messages are received.

Item : 113 Com 1 Fault:

Each field device contains two network relays used to isolate network wiring faults. A status item is provided for each relay and is set when the fault isolation circuitry has detected and isolated a wiring fault.

Item : 114 Com 2 Fault:

See com 1 fault.

Item : 115 Sensor Fault:

Field devices set this bit to indicate a sensor related fault. Older field devices may also set this fault to signal invalid configuration data.

Item : 116 Calibration Active:

Field devices set this bit to indicate that the sensor calibration process is active.

Item : 117 Power up:

This bit is set during the power up time delay.

Item : 118 Calibration Fault:

This bit is set when a fault is detected during the calibration process.

Item : 119 Supply Voltage Fault:

This item is set when the field device input voltage is below 17.5 volts but still has enough voltage to operate. Many devices can read the input voltage.

Item : 120 UV Automatic Oi Fault:

This item is set when the field device fails an automatic optical integrity test on the ultraviolet detector.

Item : 121 IR Automatic Oi Fault

This item is set when the field device fails an automatic optical integrity test on the IR detector.

Item : 122 Fire Pre Alarm:

This item is set when the field device detects a pre fire alarm condition.

Item : 123 Manual Oi Test Started:

The field device sets the item to indicate that a manual Oi test has started. The bit is self clearing when the test completes.

Item : 124 UV Manual Oi Fault:

The field device sets the item to indicate that a manual Oi test failed.

Item : 125 IR Manual Oi Fault:

The field device sets the item to indicate that a manual Oi test failed.

Item : 126 Missing UV Tube Module:

The field device sets the item to indicate that the UV tube was not detected on start-up.

Item : 127 Missing IR Module:

The field device sets the item to indicate that the IR module was not detected on start-up.

Item : 128 Sensor Initialization Fault:

The field device sets the item to indicate that the sensor was bad at start-up. If the detector is set for Manual Oi the Sensor Initialization Test is conducted on start-up by turning on the test lamp. If less then 2 counts are received the Sensor Initialization fault is set. The Sensor Initialization fault bit is cleared any time 2 counts per second are received.

Item : 129 290 Volt Fault:

The field device sets this item to indicate low or high voltage. Some devices just check for low voltage while others monitor for low and high voltage conditions.

Item : 130 Low Aux Power Fault:

The field device sets this item to indicate low voltage on the aux power input.

Item : 131 UV Fault:

The field device sets this item to indicate a fault with the UV sensor. For the EQ2200 UVIR the UV fault bit is set when an auto UV Oi fault or missing UV tube or manual UV Oi fault or 290 volt fault is detected.

Item : 132 IR Fault:

The field device sets this item to indicate a fault with the IR sensor. For the EQ2200 UVIR the IR fault bit is set when an auto IR Oi fault or missing IR module or manual IR Oi fault is detected

Item : 133 UV Alarm:

The field device sets this item to indicate a UV fire alarm.

Item : 134 IR Alarm:

The field device sets this item to indicate a IR fire alarm.

Item : 135 UV/IR Counts:

This item signals whether the process variable holds the UV or IR counts.

Item : 136 AC Failed:

The field device sets this item to indicate missing AC power input.

Item : 137 Battery Fault:

The field device sets this item to indicate a fault with the battery.

Item : 138 Ground Fault +:

A device sets this item to indicate a ground fault on the plus side of the power supply.

Item : 139 Ground Fault -:

A device sets this item to indicate a ground fault on the negative side of the power supply.

Item : 140 Power Supply Fault:

A device sets this item to indicate a fault on the power supply.

Item : 141 Dirty Optics:

A device sets this item to indicate that the optics need to be cleaned.

Item : 142 Internal Comm Fault:

A device sets this item to indicate that a fault has occurred in the communications between the LON and host processors.

Item : 143 Warm-up:
A device sets this item during the warm-up period.

Item : 144 Open Lamp:
A device sets this item to indicate an open lamp fault.

Item : 145 Alarm Logs:
Up to 8 alarm logs are held in this item.

Item : 146 Calibration Logs:
Up to 8 calibration logs are held in this item.

Item : 147 Activate Output:
Setting this control item will activate the output.

Item : 148 Reset Application:
Setting this control item will reset the device application program.

Item : 149 Request Supply Voltage:
Setting this control item instructs the controller to retrieve the input voltage from the field device.

Item : 150 Inhibit Control:
Setting this control item instructs the controller to retrieve the input voltage from the field device.

Item : 151 Request AC Voltage:
Setting this control item instructs the controller to retrieve the AC voltage from the field device.

Item : 152 Activate Reset:
Setting this control item instructs the controller to send a reset command to the field device.

Item : 153 Start Manual Oi Test:
Setting this control item instructs the controller to send a start manual Oi test command to the field device.

Item : 154 Release:
Setting this control item instructs the controller to send

release command to the ARM module. This will cause the output to activate.

Item : 155 Isolate:

Setting this control item instructs the controller to send isolate command to the field device. This will cause the output to go to the isolate mode.

Item : 156 Select UV or IR:

Changing this control item instructs the UV/IR detector to send the UV or the IR signal.

Item : 157 Activate Continuous:

Setting this control item instructs the field device output to turn on in the continuous mode.

Item : 158 Activate 60 bpm:

Setting this control item instructs the field device output to turn on in the 60 bpm mode.

Item : 159 Activate 120 bpm:

Setting this control item instructs the field device output to turn on in the 120 bpm mode.

Item : 160 Activate Temporal:

Setting this control item instructs the field device output to turn on in the temporal mode.

Item : 161 Request Extended Status:

Setting this control item instructs the controller to retrieve the extended status information from the fielded device.

Item : 162 Activate Timed:

Setting this control item instructs the controller to activate an output in the timed mode.

Item : 163 Activate Fire Alarm:

Setting this control item in the controller activates the fire alarm output. When this bit is set in a field device the output signals the temporal fire alarm pattern.

Item : 164 Activate Trouble Output:

Setting this control item in the controller activates the trouble output. When this bit is set in a field device the output signals the trouble pattern.

Item : 165 Activate Low Gas Alarm:

Setting this control item in the controller activates the low gas alarm output.

Item : 166 Activate High Gas Alarm:

Setting this control item in the controller activates the high gas alarm output.

Item : 167 LON A Counter:

Within the controller object, this status variable holds the number of heartbeat messages received. Resetting the controller will also reset this counter. When this variable is used with a field device it shows the number of received status messages. The counters are helpful for diagnosing wiring problem on the Lon network.

Item : 168 LON B Counter:

Within the controller object, this status variable holds the number of heartbeat messages received. Resetting the controller will also reset this counter. When this variable is used with a field device it shows the number of received status messages. The counters are helpful for diagnosing wiring problem on the Lon network.

Item : 169 Display Text Line 1:

This variable holds the ASCII test string on the controller faceplate.

Item : 170 Display Text Line 2:

This variable holds the ASCII test string on the controller faceplate.

Item : 171 Display Text Line 3:

This variable holds the ASCII test string on the controller faceplate.

Item : 172 Display Text Line 4:

This variable holds the ASCII test string on the controller faceplate.

Item : 173 Heater Enable Status:

This item is true when the Optics heaters are enabled. They may or may not actually be on at the time depending on the temperature.

Item : 174 LON Fault:

The controller sets this item when a Lon fault is detected.

Item : 175 Signal to Noise Ratio:

A detector's signal to ratio is held in this variable.

Item : 176 Activate Silence:

Setting this control bit activates the controller silence status bit and LED. The LED and status bit will stay true until the controller is reset. The controller clears this control bit after the action is taken.

Item : 177 Activate Acknowledge:

Setting this control bit activates the controller acknowledge status bit, LED, and silences the internal beeper. The LED and status bit will stay true until the controller is reset. However, the beeper will resound if new alarms are received. The controller clears this control bit after the action is taken.

Item : 178 Start IR Oi Calibration:

Setting this control bit will cause the controller send a start IR Oi calibration message to the field device. The controller clears this control bit after the action is taken.

Item : 179 Activate Supervisory:

Setting this control bit activates the controller supervisory output, status bit and LED. The output, LED and status bit will stay true until the controller is reset. The controller clears this control bit after the action is taken.

Item : 180 Latching Fault:

Setting this configuration parameter causes the field device to latch the fault status until the device is reset.

Item : 181 Quick Fire Enable:

Setting this configuration parameter enables quick fire detection method.

Item : 182 Bin Disabled Signaled by LED:

Setting this configuration parameter enables “Bin Disabled Signaled by LED” feature in the X3301.

Item : 183 Heater Power:

This configuration parameter determines what percent of power will be used for the optics heaters.

Item : 184 Temperature Setpoint:

This configuration parameter determines the temperature at which the internal heaters are activated.

Item : 185 Consecutive Failed Oi Tests for Fault:

This configuration parameter determines how many consecutive Oi tests must fail before a fault is generated.

Item : 186 User Logic Scan Time:

This status variable holds the number microseconds needed to complete the user logic.

Item : 187 Power Fail 1:

This controller sets this status variable when low voltage is detected on the power input #1.

Item : 188 Power Fail 2:

This controller sets this status variable when low voltage is detected on the power input #2.

Item : 189 Output Inhibit:

This controller sets this status variable when any outputs are inhibited, this includes the controller and field device outputs.

Item : 190 High Energy Detected:

A field device sets this status bit to indicate that high energy was detected.

Item : 191 High Energy Fault:

A field device sets this status bit to indicate that high energy was detected for a sustained period of time.

Item : 192 Non-Ratio Mode Fault:

A field device sets this status bit to indicate that a non-ratio mode fault occurred.

Item : 193 Bin Disable:

A field device sets this status bit to indicate that the bin fire detection mode is disabled.

Item : 194 Quick Energy Disabled:

A field device sets this status bit to indicate that the quick energy detection mode is disabled.

Item : 195 No Oi High Energy Fault:

A field device sets this status bit to indicate that the No Oi High Energy Fault is true.

Item : 196 Flash Fire:

A field device sets this status bit to indicate that it has detected a flash type fire.

Item : 197 Bin Fire:

A field device sets this status bit to indicate that it has detected a bin type fire.

Item : 198 Low Level Fire:

A field device sets this status bit to indicate that it has detected a low level type fire.

Item : 199 Non-Ratio Mode Fire:

A field device sets this status bit to indicate that it has detected a non-ratio mode type fire.

Item : 200 Quick Fire:

A field device sets this status bit to indicate that it has detected a quick type fire.

Item : 201 AM/PM:

This variable is intended for use by user logic to determine the time of day, 1 equals PM and 0 is AM.

Item : 202 Day of Week:

This variable is intended for use by user logic to determine the day of week, the value is 1 for Sunday and 7 for Saturday.

Item : 203 Device Download Active:

The controller sets this variable while it is downloading configuration information.

Item : 204 to 215 User Defined Status 1 to 12:

User defined status is provided as a method to exchange information between the controller and the ControlNet interface. Information placed here is transmitted on ControlNet along with other scheduled data. See the ControlNet specifications for more details.

Item : 216 Logic Engine Fault:

The controller sets this variable true when a fault is detected in the user program.

Item : 217 ControlNet Firmware Version:

This variable hold the firmware version of the ControlNet board.

Item : 218 Activate Trouble Tone:

Setting this control bit will cause the field device output to output the trouble pattern.

Item : 219 Activate Supervisory Tone:

Setting this control bit will cause the field device output to output the supervisory pattern.

Item : 220 Request Alarm Logs:

Setting this control bit will cause the controller to retrieve the alarm logs from a device.

Item : 221 Request Calibration Logs:

Setting this control bit will cause the controller to retrieve the calibration logs from a device.

Item : 222 Request Temperature:

Setting this control bit will cause the controller to retrieve the temperature from a device.

Item : 223 Heater Enable Control:

This item is used to control the optics heater from user logic. This allows the user to disable the heater when AC power is lost.

Item : 224 to 239 User Parameters 1-16:

User parameters can be used as part of a self configuration process. The values are saved in flash memory when program mode is exited.

Item : 240 Start Manual Oi Fire Test:

Setting this control bit will instruct the flame detector to conduct an Oi test and activate the fire alarm output if the unit passes the test. This feature must be password protected.

Item : 241 Sustained Fire:

A field device sets this status bit to indicate that it has detected a sustained type fire. In the X3301 this is the ORED status of Bin fire, low level fire, and non-ratio fire bits.

Item : 242 Lon CPU Memory Fault:

A field device sets this status bit to indicate that it has detected a problem with the memory used with the LON CPU.

Item : 243..247 New Alarms:

The bit is set for one scan of logic when new alarms occur. Intended for resounding silenced alarms in user logic.

Item : 248 Install Network Extender:

Setting this control item instructs the controller to request the network extenders neuron Ids. The Ids are used to address the device when getting network diagnostic information. The neuron Ids will be retained in flash memory when program mode is exited.

Item : 249 Request Lon Diagnostic Info:

Setting this control item instructs the controller to request the Lon Diagnostic Information from the device. Items 250 to 254 are updated.

Item : 250 Transmission Errors:

The number of CRC errors detected during packet reception. These may be due to collisions or noise on the transceiver input.

Item : 251 Transaction timeouts:

The number of times that the node failed to receive expected acknowledgements or responses after retrying the configured number of times. These may be due to the destination node being offline.

Item : 252 Rcv Transaction Full:

The number of times that an incoming packet was discarded because there was no room in the transaction database.

Item : 253 Lost Messages:

The number of times that an incoming packet was discarded because there was no application buffer available.

Item : 254 Missed Messages:

The number of times that an incoming packet was discarded because there was no network buffer available.

Item : 255 IR Processing Mode:

This item is used to select the processing mode for the IR detector.

Value	Description
1	TDSA
3	TDSA and Quick

Item : 256 UV Auto Oi Test Frequency:

This item is used to select how often the automatic Oi test is conducted, see the device for the allowable range.

Item : 257 IR Auto Oi Test Frequency:

This item is used to select how often the automatic Oi test is conducted, see the device for the allowable range.

Item : 258 Consecutive UV Failed Oi Tests for Fault:

This item is used to select how many consecutive automatic Oi tests must fail before a fault is annunciated.

Item : 259 UV Counts per Second:

This item will display the UV signal level.

Item : 260 IR Signal Level:

This item will display the IR signal level.

Item : 261 TDSA IR Alarm:

This item comes true when the IR detector generates a TDSA fire alarm.

Item : 262 UV Pre Alarm:

For the new flame platform detectors, this item comes true when the number of UV counts per second exceeds _ of that needed to signal an alarm.

Item : 263 IR Pre Alarm:

For the new flame platform detectors, this item comes true when 18 or more valid turning points are found during a 10 second period.

Item : 264 UV Oi Calibration Active:

This item comes true while the UV Oi calibration is active.

Item : 265 IR Oi Calibration Active:

This item comes true while the IR Oi calibration is active.

Item : 266 UV Oi Fault:

This item comes true when a manual or automatic UV Oi fault occurs.

Item : 267 IR Oi Fault:

This item comes true when a manual or automatic IR Oi fault occurs.

Item : 268 UV Oi Calibration Fault:

This item comes true when an UV Oi calibration fault occurs. The UV Oi lamp is activated and allowed to stabilize for 2 seconds. An average counts per second is determined. The average counts must be within a targeted window (150 to 250). Otherwise, an Oi calibration fault will occur.

Item : 269 IR Oi Calibration Fault:

This item comes true when an IR Oi calibration fault occurs. The IR Oi lamp is activated and allowed to stabilize for 1 second. The Oi level is set to 1.55v. An average energy level is determined. If the energy level is outside of the targeted window (68 to 72), the Oi level is increased or decreased by 1 D/A step (20mv). This sequence is repeated every 320ms until the energy is inside the target window. The new Oi test energy threshold is _ of the found target. The threshold and the corresponding Oi level are saved in non-volatile memory. If the target is not found within 15 seconds, an IR Oi calibration fault will occur.

Item : 270 Start UV Oi Calibration:

This command item is provided for starting the UV Oi calibration process. The controller will clear the item after the command is sent to the detector.

Item : 271 Comm Fail Mode:

The item defines what state an output should go to on loss of communication with the controller.

Value	Mode
1	Hold Last State *
2	Failed Off
3	Failed On

* - Default

Item : 272 Heater Enable Config:

This item defines the initial state of the heater enable. The heater enable will assume this state on power-up.

Item : 273 Activate Cancel:

Setting this control bit triggers the same action as pressing the cancel button on the controller faceplate. The controller clears this control bit after the action is taken.

Item : 274 Activate Enter:

Setting this control bit triggers the same action as pressing the enter button on the controller faceplate. The controller clears this control bit after the action is taken.

Item : 275 Activate Next:

Setting this control bit triggers the same action as pressing the next button on the controller faceplate. The controller clears this control bit after the action is taken.

Item : 276 Activate Previous:

Setting this control bit triggers the same action as pressing the previous button on the controller faceplate. The controller clears this control bit after the action is taken.

Item : 277 Actual State:

This variable holds the actual input state before inhibits are applied.

Item : 278 Device Config Step:

This item holds the device configuration step. This item is only intended for system diagnostics.

Item : 279 Ma Range Low:

This value defines the low/zero point for a 4 to 20 mA input channel expressed in mAs. Typical values would be 0.0 or 4.0.

Item : 280 Ma Range High:

This value defines the full scale point for a 4 to 20 mA input channel. A typical value would be 20.0.

Item : 281 Out of Range Low Level (mA):

This value defines the low level current threshold for the out of range low fault.

Item : 282 Out of Range High Level (mA):

This value defines the high level current threshold for the out of range high fault.

Item : 283 Out of Range Low Fault:

This item comes true when the analog input reading is below the “Out of Range Low Level”.

Item : 284 Out of Range High Fault:

This item comes true when the analog input reading is above the “Out of Range High Level”.

Item : 285 Low Alarm Direction:

This item determines if an alarm should be signaled as the signal level is increasing or decreasing. If this item is set to 1 the alarm will be active while the signal is above the threshold. If this item is set to 2 the alarm will be active while the signal is below the threshold.

Value	Mode
1	Alarm above threshold
2	Alarm below threshold

Item : 286 High Alarm Direction:

See item 284.

Item : 287 Low Alarm Deadband:

This item determines the amount of deadband that should be used for the low alarm.

Item : 288 High Alarm Deadband:

This item determines the amount of deadband that should be used for the high alarm.

Item : 289 Redundancy Enable:

This item determines if the controller is part of a redundancy pair. The system will fault if redundancy is selected and the controllers are not working together. This item should be set to 0 on non-redundant systems and 1 for a primary redundant controller.

Item : 290 Redundancy Fault:

This item indicates a fault has been detected with redundancy. See the Redundancy Fault Code (item 291) for details on the cause of the fault.

Item : 291 Redundancy Fault Code:

This item can be used to determine the cause of a Redundancy fault.

Lots of work to do here, I will be providing a list of faults and associated display strings.

Code	Description
0	No Fault
1	
2	

Item : 292 Request Manual Switch:

This control item is only used with a redundant controller configuration. When this bit is set in a Master controller a switch to the standby controller is initiated. The switch will only occur if the standby controller is online and in a health state.

Item : 293 Beeper Status:

The status of the internal audible beeper is reflected with this variable.

Beeper Status

Value	Description
0	Off
1	Gas Alarm
2	Trouble
3	Supervisory
4	Fire

Item : 294 Communication Option Board Type:

This configuration item determines what type of Communication Option Board is attached.

Communication Board Type

Value	Description
0	None
1	Type A

Item : 295 Smoke Detector Type:

This item selects a type of smoke detector.

Value	Detector Type
0	Invalid
1	Apollo
2	Fenwal

Item : 296 Abort Mode:

This item selects the type of abort mode.

Value	Mode
0	Invalid
1	Mode 1
2	Mode 2
3	IRI Mode

Mode 1: Upon activation, timer will count down to and hold at 10 seconds; upon release, timer will continue to count down to zero. **Only this mode complies with UL 864.**

Mode 2: Upon activation, timer will reset to initial value; upon release, timer will continue to count down to zero.

IRI Mode: This function is similar to “Mode 1” with the exception that the abort will only function if held prior to receiving the second alarm.

Item : 297 Detection Style:

This item selects the Detection Style – Single or Cross Zoned. When single zone is selected, a release is activated if ether input is activated. Cross zone requires that both inputs be active before a release is activated.

Value	Mode
0	Invalid
1	Single Zone (1 zone release)
2	Cross Zoned (2 zone release)

Item : 298 Control Mode:

This item selects the embedded logic control mode.

Value	Mode
0	Invalid
1	Embedded Logic Only
2	Controller Only
3	Back-up Mode

Embedded Logic Only: In this mode the device will always use the embedded logic and ignore control messages from the controller.

Controller Only: In this mode the device will accept control information from the controller and never use embedded logic. If communication with the controller is lost the outputs shall retain their last state.
Back-up Mode: In this mode the device will accept control information from the controller and only use embedded logic when communication with the controller is lost.

Item : 299 Detection Circuit Delay:

This item allows the selection of a delay time that will apply to detector circuits, as well as a manual release (30 second max. for manual release, this will be handled by the field device). Time delay selection range from 0 to 60 seconds in 10-second increments. This could also be called an abort timer; it gives the user an opportunity to hold off a release during an investigation time.

Item : 300 Abort Active:

This item is true while the release abort input is active. First used with the IPM (DCIO smoke) module.

Item : 301 Manual Release Active:

This item is true while the Manual Release input is active. First used with the IPM (DCIO smoke) module.

Item : 302 and 303 Zone 1 and 2 Alarm:

These items reflect the alarm status of smoke detector loops. First used with the IPM (DCIO smoke) module.

Item : 304 Signal Circuit Active:

This item is true while the alarm signal circuit (SAM output) is active. First used with the IPM (DCIO smoke) module.

Item : 305 and 306 Release Circuit 1 and 2 Active:

These items reflect the state of the release outputs. First used with the IPM (DCIO smoke) module.

Item : 307 Manual Reset Required:

This item comes true when the IPM requires a manual reset.

Item : 308 Embedded Abort Timer:

This item holds the amount of time remaining in the embedded abort timer.

Item : 309 One Zone Bell Tone:

This item is used to select the bell tone when one zone of the IPM is in alarm and embedded logic mode is enabled.

Value	Tone
0	Off
1	Continuous
2	60 BPM
3	120 BPM
4	Temporal
5	Trouble
6	Supervisory

Item : 310 Two Zone Bell Tone:

This item is used to select the bell tone when the second zone of the IPM is in alarm and embedded logic mode is enabled. See Item 309 for a list of available tones. The Marketing specification states that "The software will prevent both selections (309 and 310) from being the same".

Item : 311 Manual Release Delayed:

First used with the IPM to select if the manual release input should be delayed or not. When set, the release output will be delayed by the selected time, if cleared the release is immediate.

Item : 312 Serial Port 2 Protocol:

The second configurable serial port protocol is set with this variable.

Serial Port Protocols

Value	Description
1	Port not used
2	Modbus Slave
3	Modbus Master

Item : 313 Serial Port 2 Baud Rate:

The baud rate for the second configurable serial port is set with this variable. The default baud rate is 9600.

Item : 314 Serial Port 2 Parity:

The parity setting for the second configurable serial port is set with this variable. The default parity is "None".

Item : 315 Serial Port 2 Address:

This address field is used for Modbus protocol, valid Modbus addresses are in the range from 1 to 247 with a default value of 1.

Item : 316 Serial Port 3 Protocol:

Serial Port Protocols

Value	Description
1	Port not used
2	Modbus Slave
3	Modbus Master
4	S3

Item : 317 Serial Port 3 Baud Rate:

Serial baud rate for serial port 3 is set with this variable. The default baud rate is 9600.

Item : 318 Serial Port 3 Parity:

Serial port 3 parity is set with this variable. The default parity is "None".

Item : 319 Serial Port 3 Address:

The address field is only used for Modbus protocol. Valid Modbus addresses are in the range from 1 to 247. The default address is 1.

Item : 320 Serial Port 4 Protocol:

Serial Port Protocols

Value	Description
1	Port not used (Debug Output)
2	Modbus Slave
3	Modbus Master

Item : 321 Serial Port 4 Baud Rate:

Serial baud rate for serial port 3 is set with this variable. The default baud rate is 9600.

Item : 322 Serial Port 4 Parity:

Serial port 3 parity is set with this variable. The default parity is "None".

Item : 323 Serial Port 4 Address:

The address field is reserved for future use.

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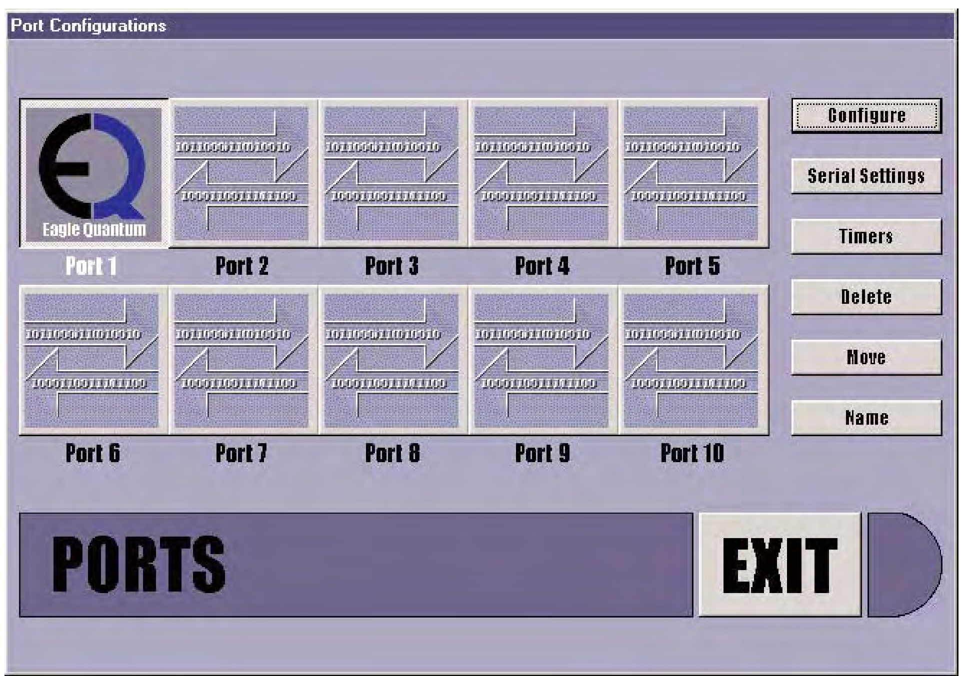
EAGLE QUANTUM CONFIGURATION

One of the supported communication port types is for the Detector Electronics Corporation Eagle Quantum fire & gas system.

System configuration consists of three major phases.

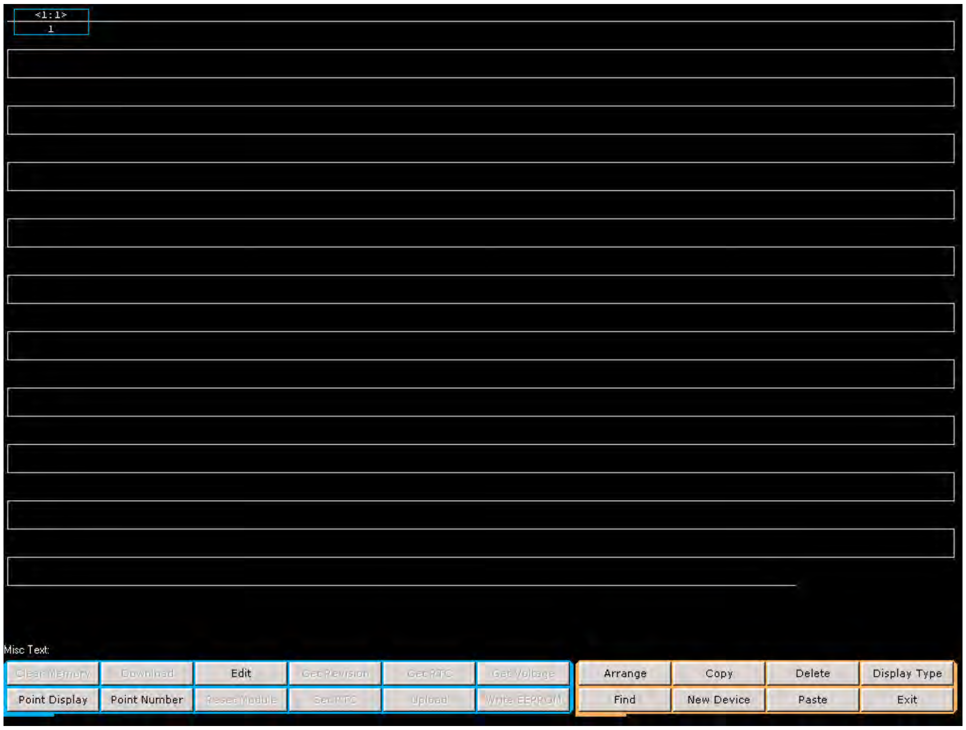
• Identifying all of the devices on the network.
• Configuring the operating parameters of each of these devices.
• Downloading the configuration data over the network to the devices.

Prior to configuration, ensure communication with the Eagle Quantum LCU is established. Reference the "Ports" (Section 2) area of this users guide on establishing serial communications.



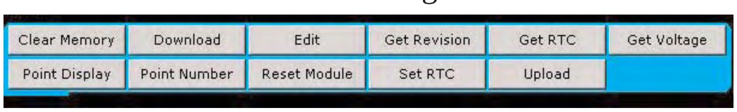
Enter the Eagle Quantum configuration screen by either double-clicking on the port button or by selecting the port and then choosing "Configure" from the buttons on the right of the Ports screen.

Eagle Quantum Configuration Screen: The main configuration screen is divided into two functional areas. The top area, which has a schematic representation of the Local Operating Network (LON™) upon which all of the field devices reside, and the lower area which contains context sensitive buttons for accessing features and performing functions.



On a newly configured loop, as represented in the sample above, the LON schematic has a single device, the communication gateway shown at the upper left corner, addressed as "Node 1". This node is automatically placed on the LON because without a gateway, no further configuration or monitoring can take place.

Button Bar Overview: There are two button bars located at the bottom of the screen, the "Command Bar" and the "Configuration Bar". The Command Bar is used to query or directly manipulate field devices on the LON. The Configuration Bar is used to create, delete, modify or view data about devices on the LON.



The function of each button will be described in detail in the following pages.

Command Bar: The command bar has eleven buttons, each of which initiates a command to a field device to perform a certain function, return a value, or feed “real-time” information to S^3 to be displayed.

The command issued is specific to the node selected in the upper section. In some cases, multiple nodes may be selected using either the shift-click or drag methods and the command can be sent to all applicable nodes in the selected set.

To initiate a command using the command bar, select either a single node or a group of nodes, then click on the desired command button. In most cases a progress monitor will appear and display text messages tracking the execution of the command.

Command Definitions

Clear Memory: This command is only available when a communication gateway is selected. It will command the gateway to delete its point configuration database. This database tells the gateway how many and what kind of field devices are on the LON along with the individual device configuration parameters. This command is typically used on initial setup, or following gateway replacement, prior to downloading new LON configuration data.

Download: Sends all configuration data from S3’s LON configuration database to the gateway for all selected nodes. This command is typically used after changing the configuration of a node or group of nodes.

To download to all devices on the LON, de-select all nodes by clicking between the button bar and the LON schematic and then choose “Download”. This will cause S^3 to sequentially download the configuration of all nodes, starting with 1 and ending with 250.

Edit: Displays the detailed configuration data for a single selected node. Only one node at a time can be edited. You can also enter the edit mode for a particular node by double-clicking on the rectangle representing the node on the LON schematic. Detailed examples of node editing will be shown later in this document.

Get Revision: Requests the software revision of the selected node. The gateway forwards the request to the field device which returns the data to the gateway and then on to S^3. This feature is used to verify software revision levels in field devices. Different revision levels of the same type of device may have different features and capabilities.

Get RTC: Requests the "Real Time Clock" data from the communication gateway. The gateway will return the current date and time, according to its internal clock. Verify this date and time against that of the S^3 station for accuracy. If it is not the same as the S3 station, use the Set RTC command described later to correct the discrepancy.

Get Voltage: Requests the 24vdc input supply voltage of the selected node. This feature can be used in troubleshooting power distribution problems.

Point Display: Shows detailed information about a selected node including status and diagnostics, alarm history, calibration history and trend, and if applicable the current analog value.

Point Number: Allows a node on the LON schematic to be given a different address. This is typically used when like nodes are copy & pasted to preserve a particular set of configuration parameters. After the paste function, the "new" node may have an incorrect address and it must then be changed.

Reset Module: Forces a soft "re-boot" of the selected field device.

Set RTC: Sends the current date and time of the S^3 station to the communication gateway, synchronizing them. Since the field devices all use the gateways date and time pulse when storing their own alarm and calibration data, it is important that it match the clock used by S3 station for event monitoring and tracking.

Upload: Queries the communication gateway for configurations of selected nodes and then takes this data and updates S^3's database.

Configuration Bar: The configuration bar has eight buttons, each of which is used in the configuration of LON devices.

Configuration Definitions

Arrange: This button allows the re-arrangement of the nodes on the LON schematic for the purpose of matching the physical and logical order of the network. The LON address of each node has nothing to do with the order in which the network is wired.

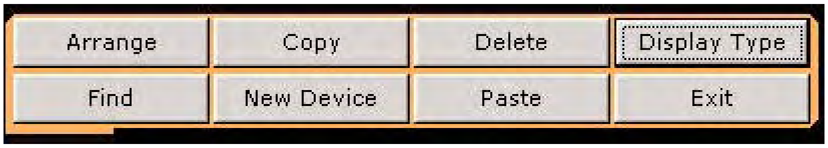
On the network schematic shown in the upper section of the configuration screen, the node order is shown numerically. Node 1 being the gateway, followed sequentially by nodes 2, 3, 4, 5, 6 ....etc. In the plant, it's entirely possible that "Node 5" may wire to "Node 20" and the overall order could be 1, 5, 20, 21, 23 ... etc.

The "Arrange" button allows you to move the location of the nodes on the schematic representing the LON to match the actual way the LON is wired in the field. This is an important step for ease of future LON troubleshooting.

To use the "Arrange" function, click on the button and drag the nodes into their desired locations. To move a node, click and drag it over the area between the two nodes where you would like it to be, then release the mouse button. The node will then be moved to this location but retain its original address.

Copy: Used in conjunction with the "Paste" command, "Copy" allows a nodes configuration to be duplicated elsewhere on the LON while retaining the configuration data. This is very useful when there are to be many nodes of the same type and configuration on a LON. The detailed configuration only needs to be done once, then copy and paste as many as needed with only the new nodes tag name and address needing to be manually entered.

Delete: Removes a selected node from the LON configuration.



Display Type: A "toggle button" that allows either the default Node Number to be displayed on the LON schematic, as shown in the example below, or the device type.

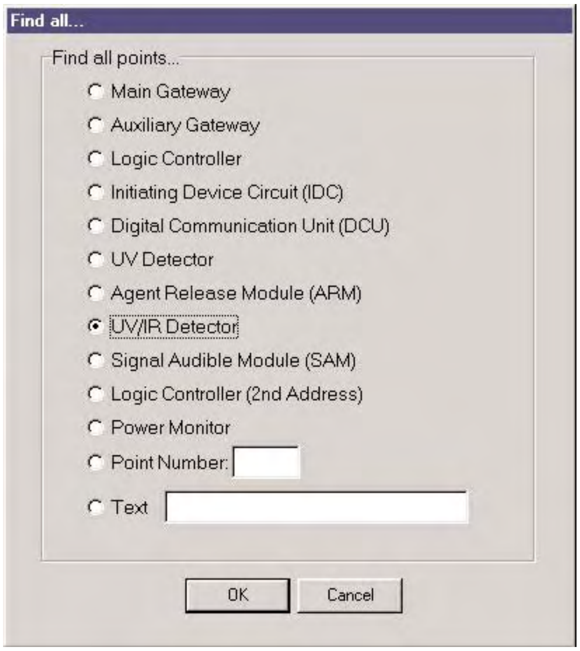
When the "Display Type" button is selected, the LON schematic will substitute the device type for the node number, as shown below.

When the device type is being displayed, the button on the configuration bar will toggle to say "Display Number", and when selected shifts the

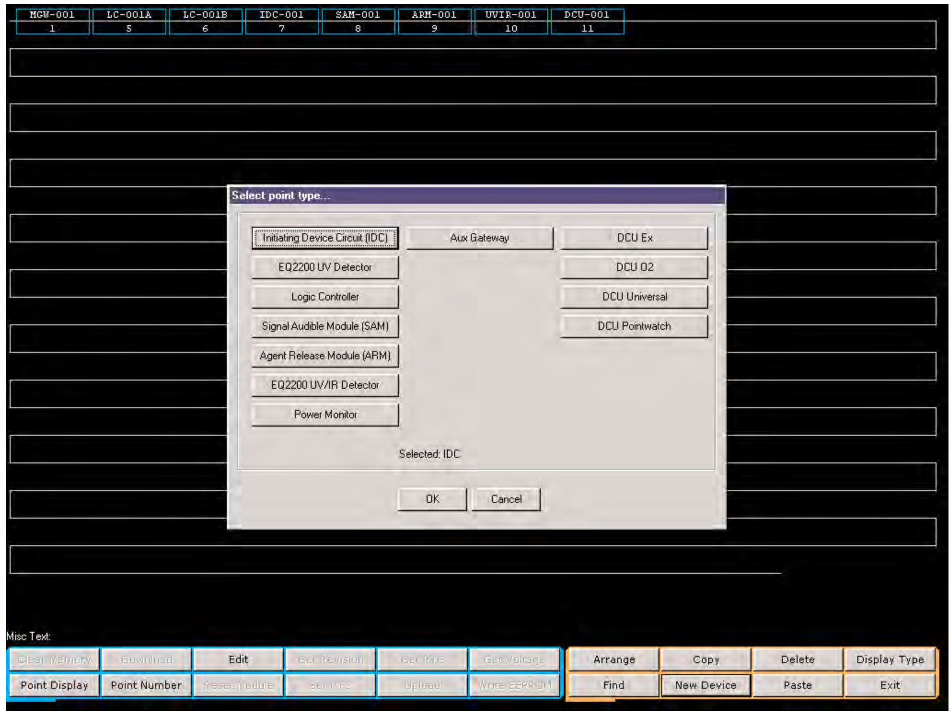
LON schematic display back to the default Node Number view.

Find: Displays a dialog box that allows the configuration database to be searched for specific types of field devices, a specific node address, or specific text. Items found matching the search criteria are highlighted in blue on the LON schematic.

This is particularly useful when trying to find a specific tag name on very large systems with hundreds of points.



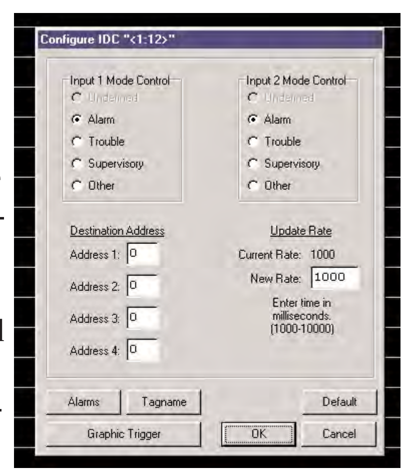
New Device: Opens the “Select Point Type” dialog box from which you can choose the type of new device to add to the LON.



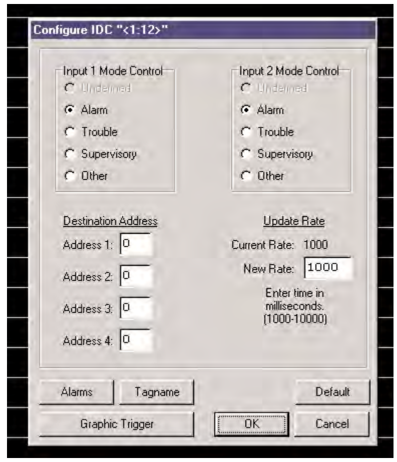
In the example above, “Initiating Device Circuit (IDC)” has been selected. The selected choice will be displayed in the lower center of the dialog box, along with the button for the selected choice being outlined.

At this point, selecting the “OK” button would add an IDC to the LON, just after the last configured device.

In addition, the configuration dialog box for the selected point type is displayed. This dialog box provides access to all of the programmable parameters for the selected device type. In the example to the right, an IDC was selected and the configuration parameters for this device type are shown. Details on the configuration of each individual device type will be covered later, but first, all device types have some common setup procedures that must be followed. The IDC example will be used to

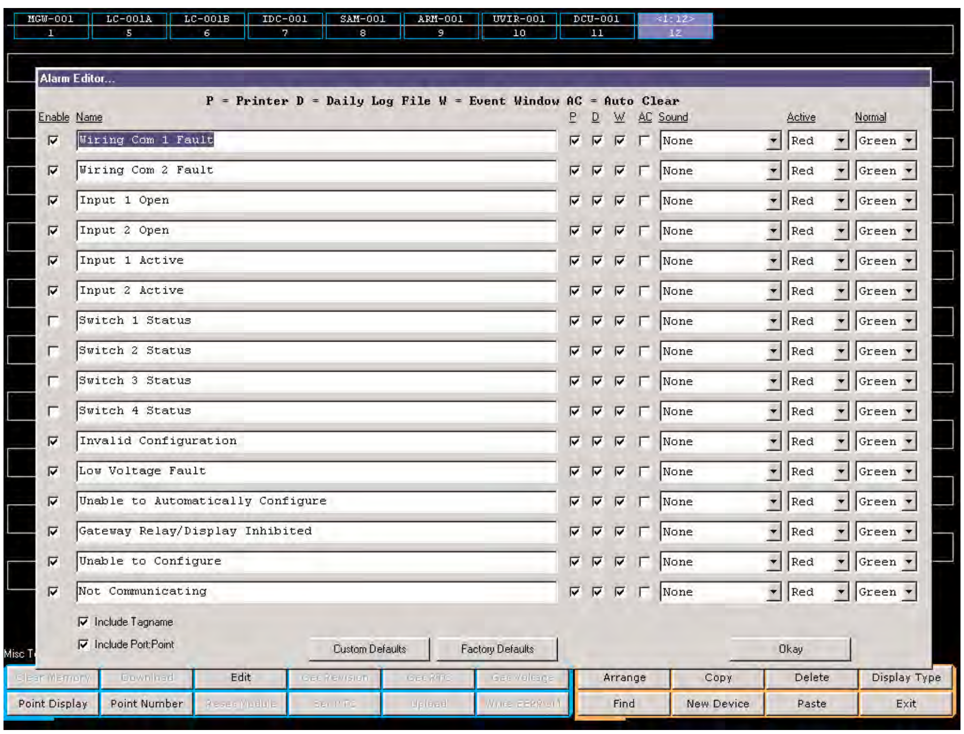


explore these configuration steps. At the bottom of the example "Configure IDC" dialog box are a group of buttons. These buttons are found on all LON device configuration screens. They are:



Alarms, Tagname, Graphic Trigger, Default OK and Cancel.

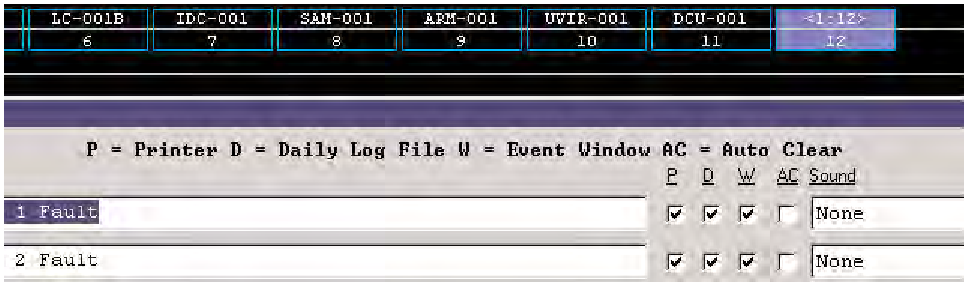
Alarms: The alarm button will open a dialog box displaying all of the preconfigured alarms and events that are applicable for the type of device being configured. In most cases this equates to sixteen discrete alarms and events.



In the example above, the "Factory Default" event configuration for an IDC is automatically configured. Other devices will show their specific default event configurations.

These events can be selectively enabled or disabled by use of check boxes on the left-most side of the dialog box. The default event name is displayed and can be edited if desired.

To the right of the name are a variety of self explanatory configurable selections accessed by check box or pull-down menu.



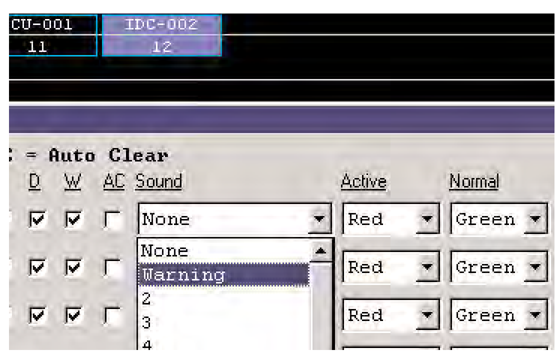
The selection of the checkboxes P,D,W,AC, determine if the event will be routed to the Printer, Daily Log File or Event Window.

Auto Clear: The AC or "Auto Clear" selection determines whether the logged event will track the real time occurrence of the event or when the operator acknowledgement is factored in.

If the AC checkbox is not selected, which is the default, when an event occurs it will be logged to the appropriate locations, as configured by the P, D, W selections, with the date and time of occurrence. When the event returns to its normal state, nothing will happen until the operator activates the "Acknowledge" button. The system will then log the date and time of the event returning to "Normal". In reality it's logging the first time the operator activates the Acknowledge button after the event has returned to normal.

If the AC checkbox is selected, when an event occurs it will be logged to the appropriate locations, as configured by the P, D, W selections, with the date and time of occurrence. When the event returns to its normal state, the system will then log the date and time of the event returning to "Normal".

Sound: Each event may have a sound attached to it which plays when the event occurs, until the Acknowledge button is actuated. The sound can be the default "Warning" or any of sixty three custom sounds. Use the pull down menu to select the desired sound.

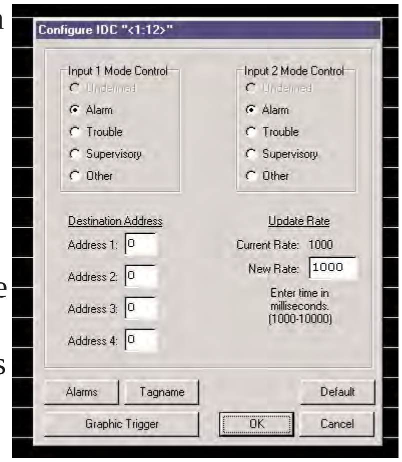


Event Color: You can select one of four different colors for recording when events occur or return to normal. These color selections are made from the pull down menu located to the right of the event on the alarm editor dialog box. The color selections apply to both printed and screen presentations of the event. In the example above, the event will be shown in Red when active and Green when it returns to normal.

Factory Defaults: Replaces the displayed event configurations with the standard event configurations, in English.

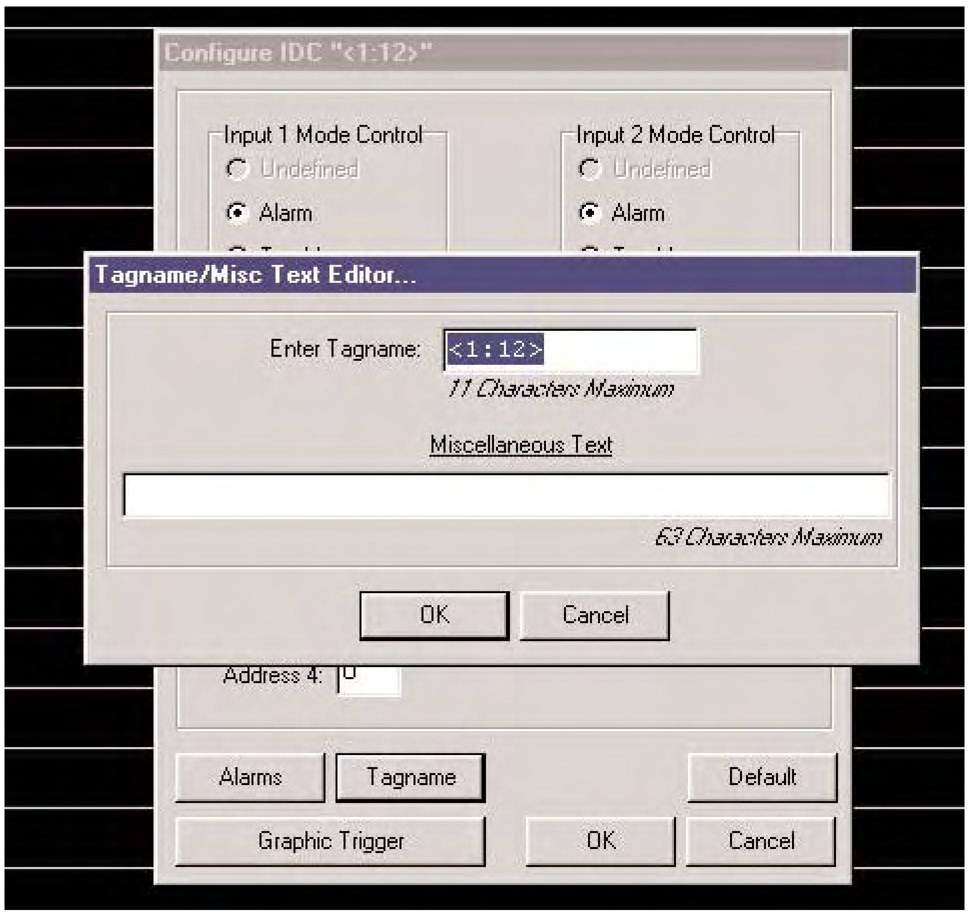
Custom Defaults: Replaces the displayed event configurations with custom versions if the user has configured the second language dictionary, as described earlier in this users guide.

Tagname: The tagname button will open a dialog box allowing both a short and log description for the LON device to be entered.



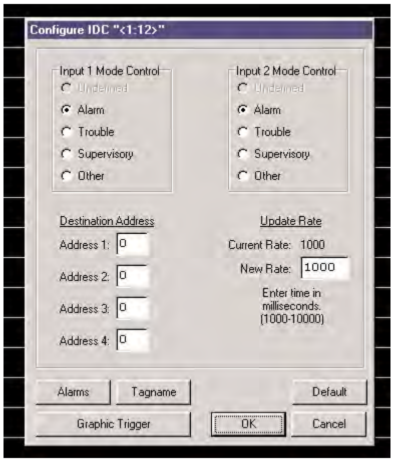
The short name, commonly referred to as the "tag name" will be displayed inside the top portion of the rectangle representing the node on the LON schematic. This tag name can be up to 11 characters long and is used throughout the system to identify the device.

The long name can be up to sixty three characters and allows for a better description of the device, its function or location to be entered. This long



name appears in the bottom left corner of the LON schematic when the cursor positioned over one of the LON devices on the schematic.

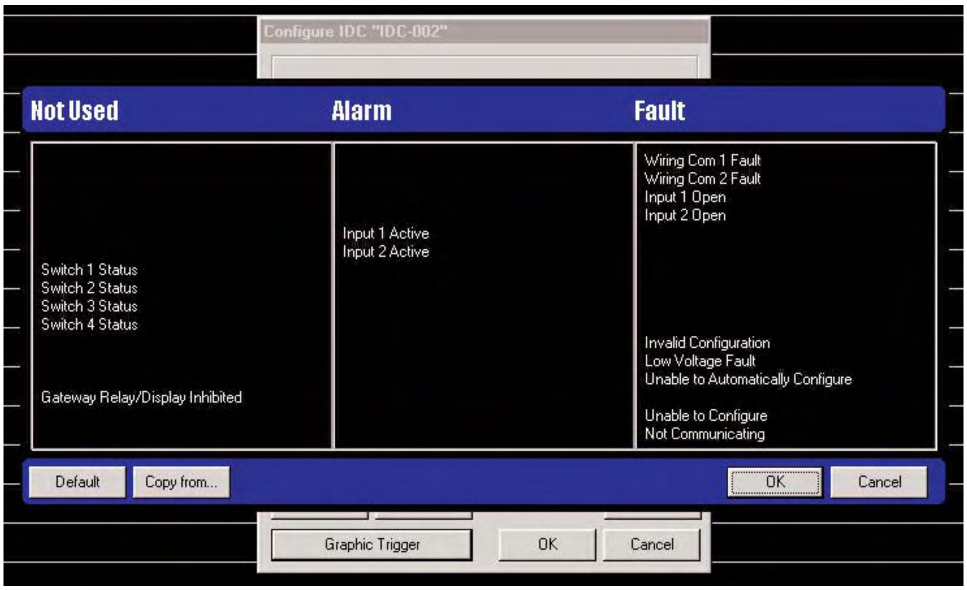
Graphic Trigger: When a system is being configured that utilizes “Online Graphics” the graphic trigger configuration for each device determines how the symbol representing the device will respond when ever it changes state.



Each Eagle Quantum device has four potential states. Listed in order of increasing precedence they are; Normal, New Fault, Fault, New Alarm, Alarm.

Each of these states can have a color combination assigned to the symbol representing a field device in the online graphics. This is done within the graphic editor, described elsewhere.

The key to this capability resides in the configuration of the Graphic Trigger.



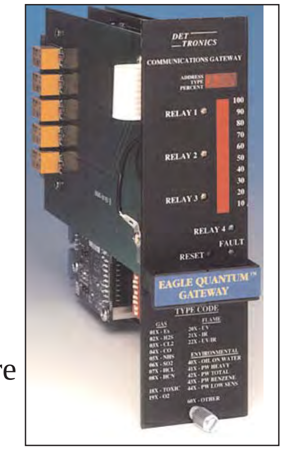
The graphic trigger configuration dialog box displays a list of the sixteen status and diagnostic elements that S^3 can track for the selected device type, in this case an IDC. These elements must be placed into one of the thee columns, Not Used, Alarm, and Fault. This will determine what constitutes an alarm, a fault, or has no effect on the online graphic element.

To reposition the elements from one column to another, simply click and drag the element from its original column to the desired one and release. To save time, there is also a facility to copy a configuration from another previously configured graphic trigger.

The default button will arrange the trigger configuration into the most common setup for the selected point type.

The OK and Cancel buttons are self explanatory.

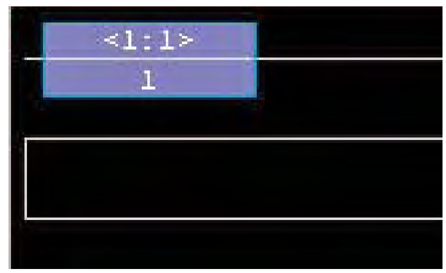
Communication Gateway: The “Gateway” is the first device on any Eagle Quantum Local Operating Network (LON). This device is used to connect the S3 Operator Interface Station (OIS) to the LON for configuration and monitoring purposes.



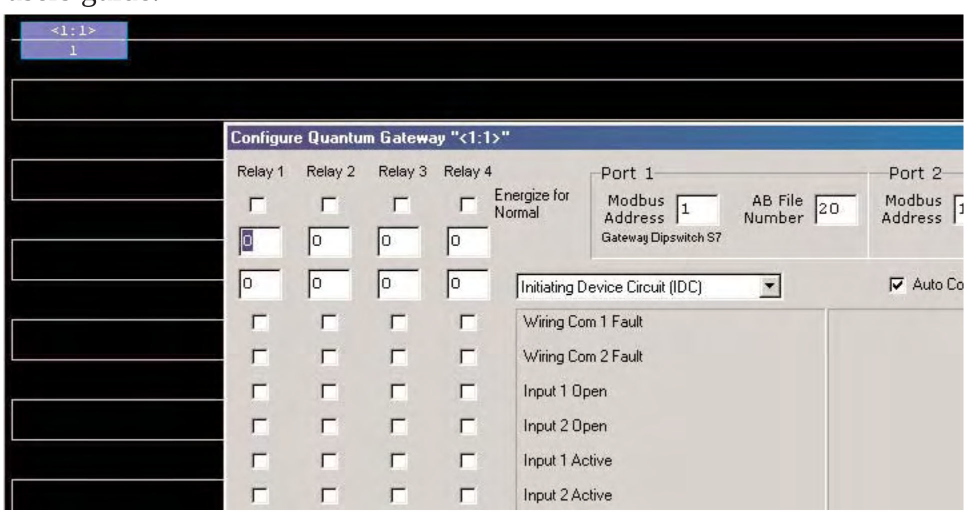
The configuration for all of the LON devices is first created and stored in the S3 configuration database, then downloaded to the Gateway, which in turn downloads this information to the field devices where it is stored in their non-volatile memory.

A copy of the configuration data is also stored in the gateways own non-volatile memory.

When an Eagle Quantum port is first created, the LON schematic is empty except for a “node rectangle” representing the Gateway, as shown in the example to the right.



The node rectangle is divided in half horizontally with the tag name in the top and node address in the bottom. S3 has assigned `<1:1>` as a temporary tag name. This is replaced by the user assigned tag name as described in the “Point Configuration • Common Settings” section of this users guide.

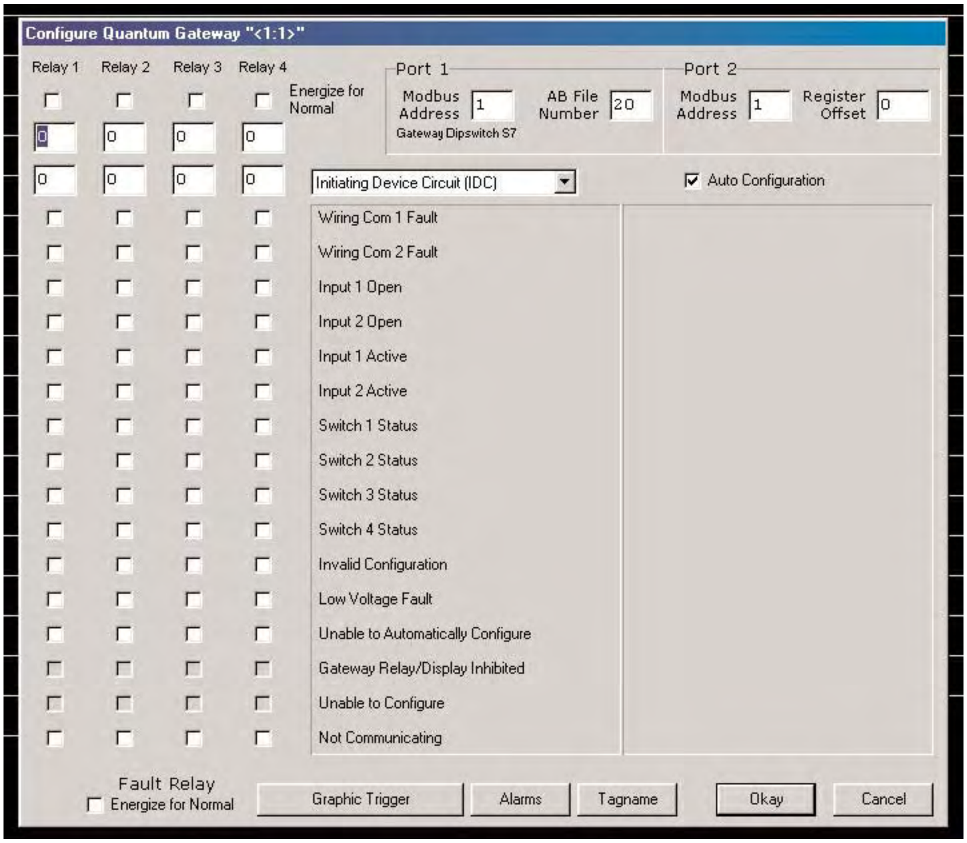


Double-clicking on the node rectangle, or single clicking on it and choosing “Edit” button from the command bar, will open the “Configure Quantum Gateway” dialog box.

This dialog box contains all of the configuration parameters for the gateway.

Most of the dialog box pertains to the configuration of the four onboard programmable relays. These 5 amp form-C relays can be configured to perform a simple "OR" voting function on a contiguous group of LON devices.

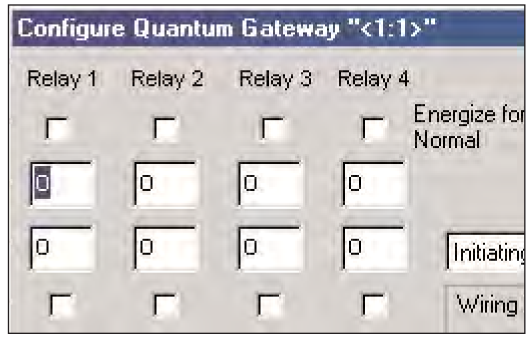
All relays can be configured to be energized or de-energized in normal operation. Gateway relay operation is independent of the OIS.



Relay Configuration: There are four vertical columns, one for each relay, on the left side of the dialog box. Each column has sixteen check boxes, one for each of the possible pieces of status or diagnostic information available for a field device. To the right of these columns is a description of what each check box represents. In the example above, an IDC is selected from the device pull-down menu. You can select any type of available device to display its unique parameters. Typically these relays are used for "like" types of nodes.

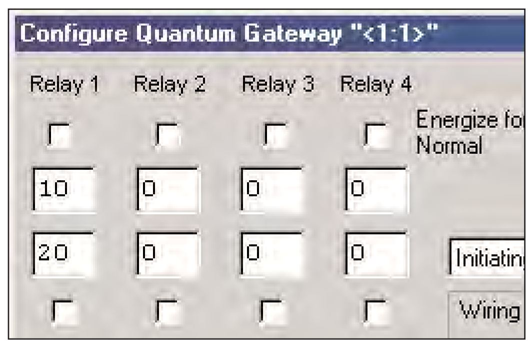
At the top of each column is a label indicating which relay the column represents. Below the relay number is a check box to determine the relay coil operational configuration, whether it is normally energized or de-energized.

In the default configuration the box is un-checked and the relay coil is de-energized until the conditions matching its configuration are met.

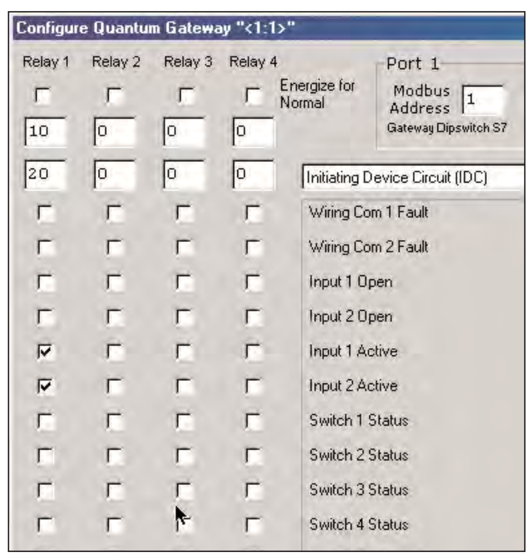


Under the coil configuration check box are two fields. The top one is for entry of the starting address, the one below is for the ending address. The initial configuration has a zero in both causing the relay to be non-functional.

In the example to the right, Relay 1 has been configured to have a starting address of 10 and an ending address of 20, inclusive. In this configuration, any node in that range which meets the criteria determined by the check boxes in that column will cause the relay coil to energize.



In this example, Relay 1 is configured to respond to <u>either</u> "Input 1 Active" OR "Input 2 Active".

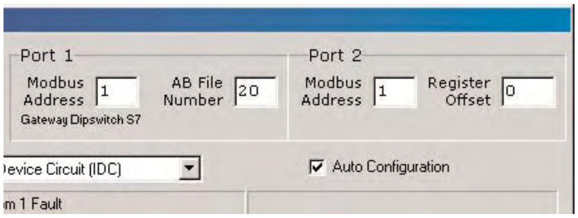


Only Input 1 or Input 2 being "ON" for any node between 10 and 20 will cause the relay to change state.

Repeat this configuration process for all four relays.

Note: In addition, at the bottom of the dialog box is a checkbox (not shown) for the operation of the fault relay. Set as required!

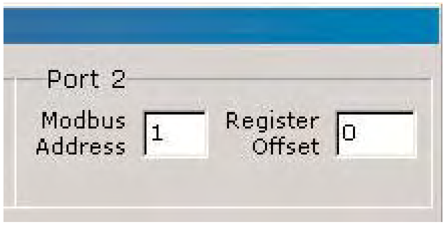
Port Configuration: The gateway has two serial communication ports that can be used for connecting to other systems. These ports are very flexible and depending on the hardware dipswitch settings and software settings can be used in a variety of configurations. Port 1 can be configured as either a Modbus RTU slave, or for the Allen-Bradley DF-1 protocol.



If configured as a Modbus port, the default station address in the S^3 software is “1”. If another station address is required, both the software and hardware dipswitch S7 must be configured to match.

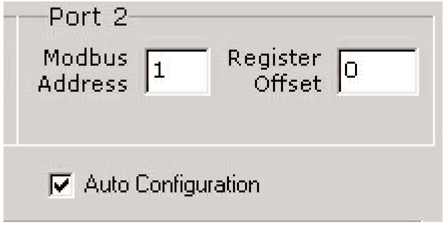
If configured for DF-1, you must set the AB File Number (Default is 20 as shown in the example above).

Port 2 can be configured as either a Modbus RTU slave, or as a Modbus RTU master. If configured as a master (refer to Eagle Quantum hardware manual for appropriate dipswitch settings) the gateway will continuously send a copy of its datatables to the specified Modbus station address.



In addition, you may specify an offset in the destination devices memory. The default is 0 which equates to a destination address of 40000. As an example, if you enter an offset of 10, the starting destination address would become 40010.

Auto Configuration: Below the serial port configuration area is a checkbox labeled Auto Configuration. When selected, the gateway will automatically download configuration data to any new device that comes online, provided its configuration resides in the S^3 database. This feature is designed to make replacing failed units “automatic” since no operator action is required. With auto configuration, simply set the address DIP switches on the new device to the same settings as the one it is replacing, remove the old unit, install the replacement unit and power it up. The gateway will download the configuration automatically after device powerup.



Initiating Device Circuit (IDC) module
Dual supervised input circuits

IDC's have two independent supervised digital inputs. Each input has an individually configurable "Mode Control" setting which determines if the input will report as an Alarm, Trouble, Supervisory or Other.

Alarm: Creates a "Fire Alarm" signal which is indicated on the logic controller by both audible and visible means.

Trouble: Creates a "Trouble" signal which is indicated on the logic controller by both audible and visible means.

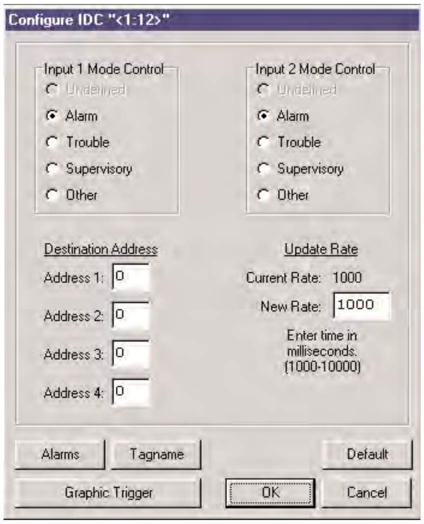
Supervisory: Creates a "Supervisory" signal which is indicated on the logic controller by both audible and visible means.

Other: Has no visible or audible indication.

Regardless of which mode the input is operating in, it may be used in user configured logic to do a variety of functions.

Update Rate: Displayed and set in milliseconds, the value in this field determines how often the IDC will send its periodic reports. The default value is 5000 (5 seconds) and is typically adequate. A change of state in one of the input channels is always sent immediately.

Destination Address: IDC's can be configured to send their diagnostic and status information directly to as many as four different Logic Controllers on the same LON.



Enter the LON address of the destination logic controllers in the supplied address fields on the "Configure IDC" dialog box.

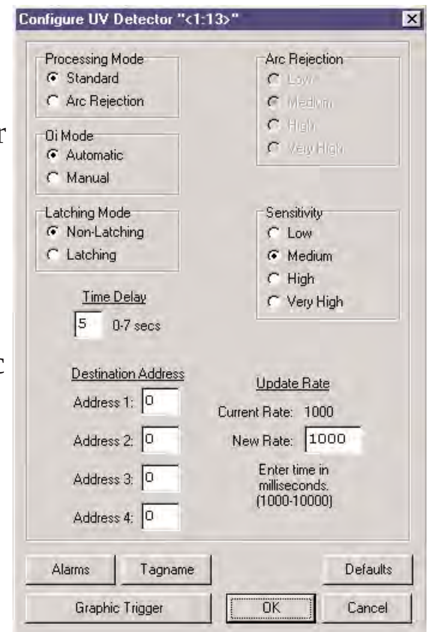
Common Settings: The bottom of the "Configure IDC" dialog box contains buttons for setting all of the common settings on the device.

Refer to chapter 10 of this users guide for details on these features.

Completing Configuration: When all parameters have been set, select the OK button to return to the LON configuration screen.

Download the new configuration to the IDC, or configure other devices.

Ultraviolet (UV) Optical Flame Detector

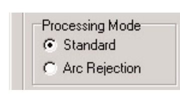


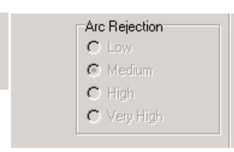
The EQ220UV Series UV Flame Detector contains a UV sensor module and control circuitry in an explosion proof, watertight enclosure. The detector is equipped with both automatic and manual optical integrity test capability.

Adjustable parameters for this detector include the Processing Mode, Optical Integrity (Oi) Mode, Latching Mode, Arc Rejection, Sensitivity, and Time Delay.

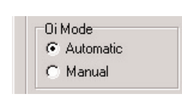
Processing Mode: Select either Standard or Arc Rejection.

<u>Standard Mode</u> is recommended for applications where background electrostatic energy has been verified to be absent.

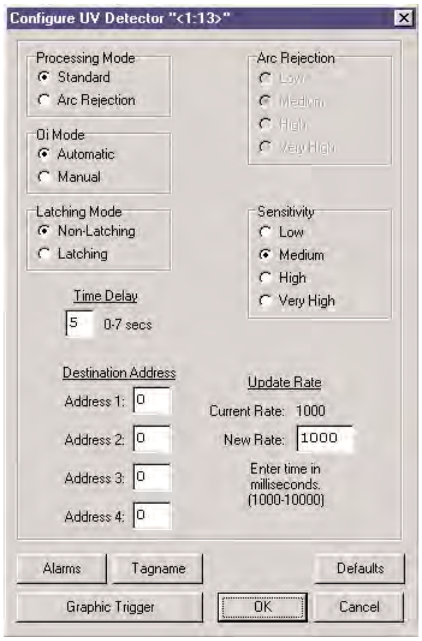




<u>Arc Rejection</u> enables the detector to prevent nuisance fire alarms caused by UV from short-duration electrical arcs or electrostatic discharge, while maintaining the ability to reliably detect the UV given off by a flame. The arc rejection mode is not recommended unless these false alarm sources are present within the application to be protected.



Oi Mode: The Oi system uses an internally generated UV test signal to determine the relative condition of the detector and its optical surfaces. If automatic Oi testing is selected, the Oi test is automatically performed once every minute. The automatic Oi test does not generate an alarm output or interfere with normal detector operation.



The manual Oi test is initiated using a button on the Point Display screen on the S^3 Operator Interface Station (OIS). The manual test can be used in addition to the automatic Oi to verify correct operation of relays, LEDs and field wiring.

Note: The Point Display screen can be accessed from within the configuration environment by selecting the point on the LON schematic and then selecting the Point Display button on the Command Bar at the bottom left of the screen.

Latching Mode: When latching mode is selected, the fire alarm signal is cleared by removing input power for a minimum of 0.1 seconds, or, by selecting the “Reset Output” button on the devices Point Display.

Sensitivity: Whether the Standard or Arc Rejection mode is selected, the sensitivity setting must always be programmed. The selected sensitivity level determines the fire alarm threshold setpoint. The higher the sensitivity level, the greater the detection range, but the possibility of false alarms will be increased. Four sensitivity levels are selectable.

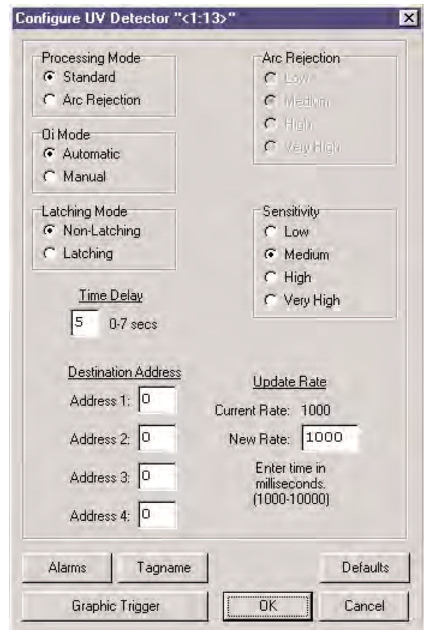
The sensitivity setting must be appropriate for the anticipated fire size at the required distance from the detector.

Time Delay: An time delay, adjustable from 0 - 7 seconds, can be applied and depending on the processing mode will perform as follows;

Standard Mode - A fire output is generated only if the fire signal exceeds the sensitivity setting for the entire duration of the programmed time delay.

Arc Rejection Mode - If the fire signal meets the programmed arc rejection requirements, the time delay begins. A fire output is generated if the fire signal continues for the duration of the time delay.

Destination Address: UV detectors can be configured to send their diagnostic and status information directly to as many as four different Logic Controllers on the same LON.



Enter the LON address of the destination logic controllers in the supplied address fields on the “Configure UV Detector” dialog box.

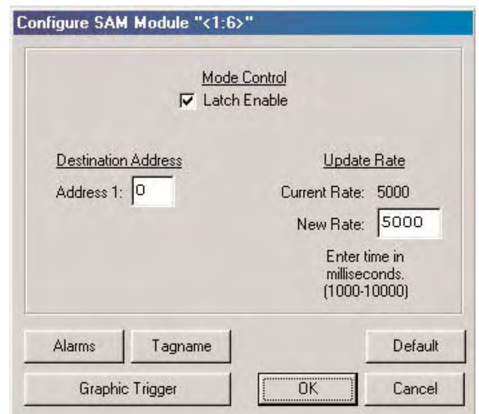
Common Settings: The bottom of the “Configure UV Detector” dialog box contains buttons for setting all of the common settings on the device.

Refer to chapter 10 of this users guide for details on these features.

Completing Configuration: When all parameters have been set, select the OK button to return to the LON configuration screen.

Download the new configuration to the UV detector, or configure other devices.

Signal Audible Module (SAM)
Dual supervised output circuits



The EQ2500SAM series Signal Audible Module (SAM) provides two indicating circuits for controlling UL Listed 24 vdc polarized audible/visual indicating appliances. The device is located on the LON/SLC and is controlled by programmable logic in the Eagle Quantum's Logic Controller.

Each output circuit is independently programmable to allow annunciation of separate events. In release applications, signal outputs can be programmed to provide signaling for pre-release, release or post-release. Each output can be individually activated for any one of the following pre-defined coded outputs:

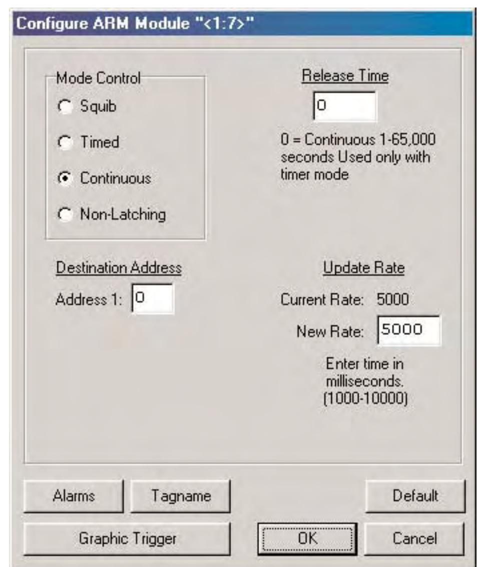
1. Continuous until reset
2. 60 beats per minute
3. 120 beats per minute
4. Temporal pattern.

These coded outputs are only accessible in user created logic, within the Eagle Quantum Logic Controller.

Destination Address: A SAM can only report to and be controlled by a single Logic Controller. Enter the address for the logic controller designated to control the SAM in the field provided (Address 1).

Mode Control: SAM outputs can be latching or non-latching. Non-latching follows the condition of the user programmed logic. Latching requires a keyswitch reset of the logic controller it reports to.

Agent Release Module (ARM)
Supervised release output circuit



The EQ2500ARM Series Agent Release Module (ARM) is located on the LON/SLC and provides agent release capability for the Eagle Quantum system.

The device is controlled by programmable logic in the Logic Controller and can be programmed for “Single,” “Cross” or “Counting” Zone Style initiation.

Optional time delay, abort and manual release sequences allow the output to be programmed for use in unique applications.

The Agent Release Module can monitor and control two output devices (rated for 24 vdc), which are energized together. The release circuits are compatible with a variety of solenoid or initiator (squib) based suppression systems. The release circuit is supervised for open circuit conditions. If a trouble condition occurs (open circuit or solenoid supply voltage less than 19 volts), it will be indicated at the LCU.

Destination Address: An ARM can only report to and be controlled by a single Logic Controller. Enter the address for the logic controller designated to control the ARM in the field provided (Address 1).

Mode Control: ARM outputs can be latching or non-latching. Non-latching follows the condition of the user programmed logic. Latching requires a keyswitch reset of the logic controller it reports to.

Ultraviolet (UV) / Infrared (IR) Optical Flame Detector

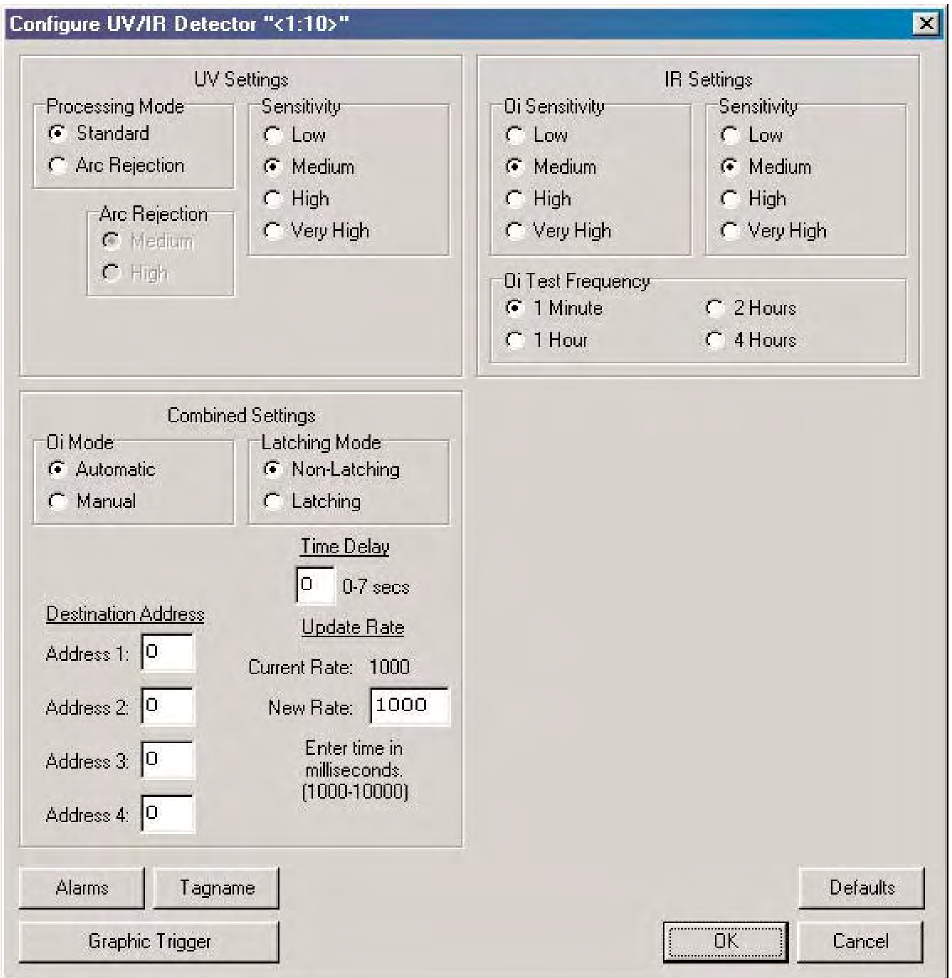
The EQ2200UVIR Series Flame Detector is designed to provide reliable fire protection in applications where the use of either ultraviolet (UV) or infrared (IR) detectors alone can result in false alarms.

The microprocessor based EQ2200UVIR combines both a UV and a single frequency IR sensor in a single detector and requires simultaneous response of both sensors to generate a fire alarm. These two detecting elements monitor different portions of the radiation spectrum and have virtually no common sources of false alarms. This enables the detector to respond to a real fire while ignoring potential false alarm sources such as arc welding, x-rays, or hot vibrating objects.

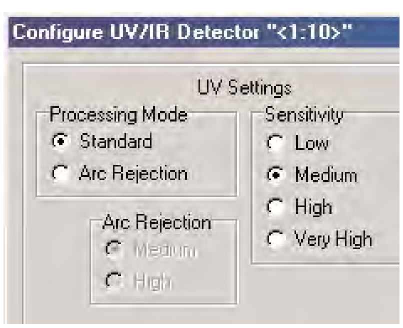
Microprocessor based circuitry located inside the detector junction box continuously monitors the two sensors, evaluating the signal(s) with fire and fault algorithms to determine the current status of the detector. When both sensors simultaneously detect the presence of fire, the microprocessor generates a fire signal, which is immediately sent over the LON/SLC to the logic controller in the Local Control Unit (LCU).

Detector Output: The output of the device is a status message that is sent to the gateway and logic controller in the LCU along the communication loop. System response to the message is determined at the time of configuration. The detector supports ANSI/NFPA 72 Class A, Style 7 communication with the LCU.

The UVIR detector is a very sophisticated unit with a variety of adjustable parameters for each of its main sensors, in addition to its combined and common settings. These adjustable parameters are all accessible through the “Configure UV/IR Detector” dialog box, shown below.

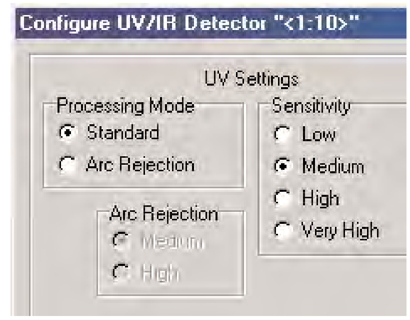


Processing Mode: The UV portion of the detector offers a choice of two different types of logic that can be used for processing fire signals — either standard or arc rejection.



<u>Standard Mode</u>: In the standard processing mode, the UV sensor output (measured in counts per second) is compared to the fire threshold (the “sensitivity” setting as described below). If the radiant energy level from the fire exceeds the selected alarm threshold level, the time delay

begins (if a time delay is selected). If the radiant energy level from the fire remains above the selected sensitivity level for the duration of the time delay, a fire alarm signal is generated. In every application, it is crucial to ensure that the radiant energy level from the expected fire at the required distance from the detector will exceed the selected sensitivity level.



Standard signal processing is recommended for applications where background electrostatic energy has been verified to be absent.

Arc Rejection Mode: The arc rejection mode enables the detector to prevent nuisance fire alarms caused by short-duration electrical arcs or electrostatic discharge, while maintaining the ability to reliably detect a flame. The arc rejection mode is not recommended unless these false alarm sources are present within the application to be protected.

Typical applications that benefit from arc rejection logic include any uncontrolled environments where transient radiation sources can be present, such as many typical outdoor applications.

The arc rejection algorithm examines the radiant energy level detected within a specified unit of time (timed gate). The output of the detector is determined by three variables:

— sensitivity level
— gate length
— number of consecutive gates required.

Different combinations of these variables allow for various levels of transient arc rejection capability. There are two arc rejection levels (medium and high) that are selectable for the detector through the OIS. The proper arc rejection setting for a given application must be determined through testing.

It is recommended that each detector be thoroughly tested at the programmed arc rejection setting within the ambient conditions that will be present during normal operation. This will help to ensure that the selected arc rejection setting is proper for the application.

Sensitivity: Whether the Standard or Arc Rejection mode is selected, the sensitivity setting must always be programmed. The selected sensitivity level determines the fire alarm threshold setpoint. The higher the sensitivity level, the greater the detection range, but the possibility of false alarms will be increased. Four sensitivity levels are selectable.

(Sensitivity levels for UV and IR are selected separately.)

The sensitivity setting must be appropriate for the anticipated fire size at the required distance from the detector. Refer to the “Specifications” section of the Det-Tronics Eagle Quantum instruction manual for additional information.

Time Delay: A time delay from 0 to 7 seconds is selectable.

Standard Mode: A fire output is generated only if the fire signal exceeds the sensitivity setting for the entire duration of the programmed time delay.

Arc Rejection Mode: If the fire signal meets the programmed arc rejection requirements, the time delay begins. A fire output is generated if the fire signal continues for the duration of the time delay.

Automatic or Manual oi: The EQ2200UVIR is equipped with the Optical Integrity (oi) feature. The oi test is performed on both the UV and IR sensors to check the cleanliness of the detector optics, as well as the proper functioning of the sensors and electronic components of the detector.

If a problem should occur, it is quickly detected. The detector is user programmable (from the OIS) for automatic oi testing. If automatic testing is selected, the oi test is automatically performed on each sensor.

The rate for the UV sensor test is once per minute. The rate for the IR sensor is field selectable from once a minute to once every four hours.

If a fault is detected, a trouble signal is sent to the LCU over the LON/SLC. A fault condition is indicated at the logic controller and the gateway and also by the LEDs on the detector’s UV sensor.

The automatic oi test does not generate an alarm output or interfere with normal detector operation.

The manual oi test is initiated using a button on the point display screen at the OIS.

A successful test is signaled by the OIS. The manual oi test can be used in addition to automatic oi to verify correct detector operation.

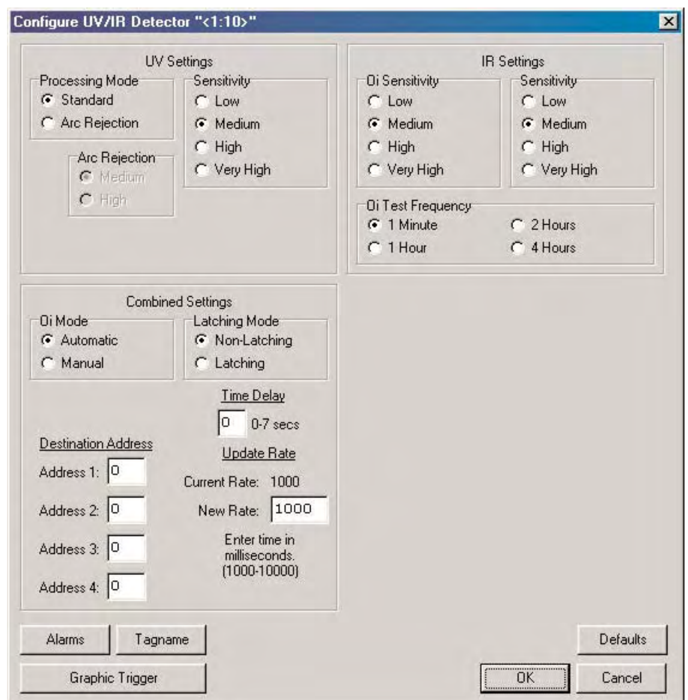
NOTE The manual oi test does not generate an alarm output or actuate any system outputs.

Fire Output Latching: When latching operation is selected, the fire alarm signal is present until cleared by a reset command from the OIS.

Destination Address: UV/IR detectors can be configured to send their diagnostic and status information directly to as many as four different Logic Controllers on the same LON.

Enter the LON address of the destination logic controllers in the supplied address fields on the “Configure UV/IR Detector” dialog box.

Common Settings: The bottom of the “Configure UV/IR Detector” dialog box contains buttons for setting all of the common settings on the device.



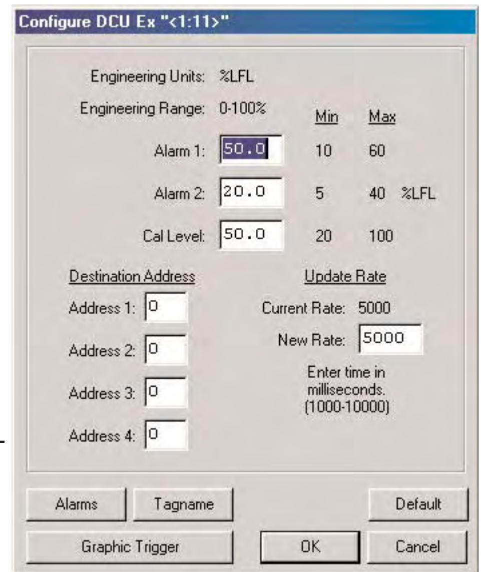
Refer to chapter 10 of this users guide for details on these features.

Completing Configuration: When all parameters have been set, select the OK button to return to the LON configuration screen.

Download the new configuration to the UV/IR detector, or configure other devices.

Digital Communication Unit (DCU)
For gas detectors and other analog inputs

DCU's are analog input modules for the Eagle Quantum LON. S^3 provides for variations of software support for DCU's, as follows:



DCU Ex: Used with catalytic bead combustible gas detectors.

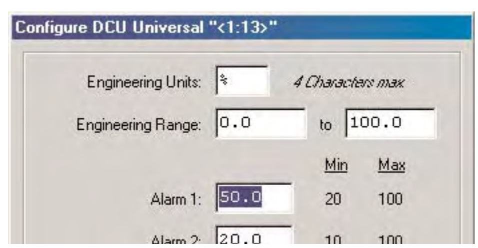
DCU O2: Used with electrochemical oxygen depletion cells.

DCU Universal: Used with any standard 4-20ma analog input. Allows user configurable units and ranges.

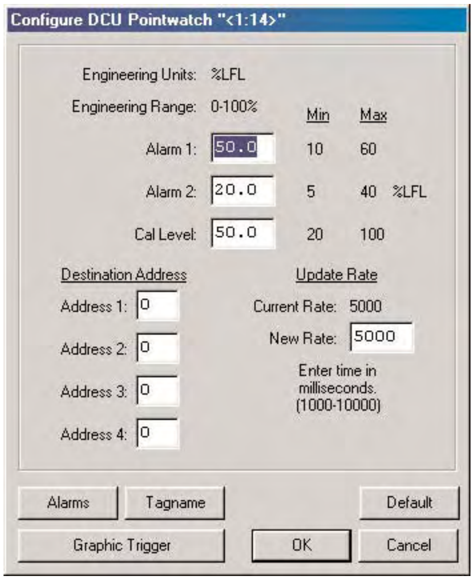
DCU Pointwatch: Used with Detector Electronics PointWatch infrared point hydrocarbon detectors.

From a configuration standpoint, they all have the same basic adjustable parameters; Alarm 1, Alarm 2, and Calibration gas concentration (Cal Level).

The DCU Universal also has a field for input of the engineering units for the attached sensor.



Destination Address: UV detectors can be configured to send their diagnostic and status information directly to as many as four different Logic Controllers on the same LON.



Enter the LON address of the destination logic controllers in the supplied address fields on the "Configure DCU" dialog box.

Common Settings: The bottom of the "Configure DCU" dialog box contains buttons for setting all of the common settings on the device.

Refer to chapter 10 of this users guide for details on these features.

Completing Configuration: When all parameters have been set, select the OK button to return to the LON configuration screen.

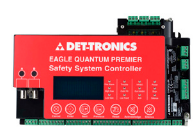
Download the new configuration to the DCU, or configure other devices.


FlexSonic® Acoustic
Leak Detector


X3301 Multispectrum
IR Flame Detector


PointWatch Eclipse® IR
Combustible Gas Detector


FlexVu® Universal Display
with GT3000 Toxic Gas Detector



Eagle Quantum Premier®
Safety System

Specifications subject to change without notice.

Det-Tronics manufacturing system is certified to ISO 9001—
the world's most recognized quality management standard.

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