DET-TRONICS

Product Bulletin

EQP compatible Enhanced X3301 Configuration with S³ and Version Incompatibilities

This Product Bulletin describes the compatibility requirements to support the Eagle Quantum Premier™ (EQP) Enhanced X3301 Flame Detectors and how to configure these models properly in the new Safety System Software (S^3) version.

The EQP compatible Enhanced X3301 has 6 parameters that customers can adjust to optimize the X3301 to their specific applications. One of these parameters is the Hangar Mode. Det-Tronics has released units preconfigured with Hangar Mode enabled that are identified by part numbers ending in "-034".

In December 2023, S^3 version 10.17.0.17 was released. This release included a new Enhanced Flame Detector device type in which the user can configure the parameters available on EQP compatible Enhanced X3301 models. With version 10.17.0.17, it is no longer necessary to order the "-034" configuration, since Hangar Mode can now be set using S^3.

Compatibility

Implementation of the EQP compatible Enhanced X3301 must be performed with the most recent EQP Controller (EQ3XXX) firmware version (at least 17.16 released July 2022) and the latest X3301 EMI EQP Output Board (Output Type 14) firmware version (at least 6.12 released September 2023), and the product must be configured as an Enhanced MIR Flame Detector device type using the latest S^3 software (at least 10.17.0.17 released December 2023).

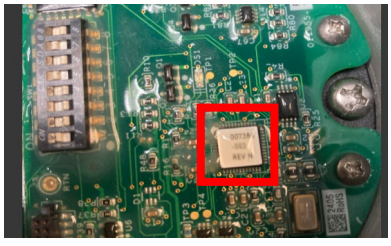
For installations with legacy systems, if any EQP compatible X3301 Hangar Mode flame detector with an EMI Output Board Firmware older than version 6.12 has its output board replaced, then the system must be updated with the EQP Controller (EQ3XXX) firmware version to at least 17.16 and the detector must be configured as an Enhanced MIR Flame Detector device type using the latest S^3.

The following tables list 4 possible incompatible scenarios that a user may encounter along with the required corrective action to ensure compatibility and configurability. The referenced controller and field device firmware versions can be verified through the EQP Controller electronic face plate display and the S^3 version can be found on the S^3 Shell screen.

	S³ Software Version	EQP Controller Firmware Version	X3301 EMI EQP Output Board Firmware Version*
SCENARIO 1	10.16.0.2 or older	16.22 or older	6.12
SCENARIO 2	10.16.0.2 or older	17.16	6.12
REQUIRED CORRECTIVE ACTION:	Upgrade S³ and the EQP Controller Firmware and reconfigure flame detectors as Device Type: Enhanced MIR Flame Detector (ENH X3301), as described in the next section of this Bulletin.		
SCENARIO 3	10.17.0.17	16.22 or older	6.12
REQUIRED CORRECTIVE ACTION:	Upgrade the EQP Controller Firmware and reconfigure the flame detectors as Device Type: Enhanced MIR Flame Detector (ENH X3301), as described in the next section of this Bulletin.		
SCENARIO 4	10.17.0.17	17.16	6.12
REQUIRED CORRECTIVE ACTION:	Verify the flame detectors are configured in S³ as Device Type: Enhanced MIR Flame Detector (ENH X3301) and if not, reconfigure them as described in the next section of this Bulletin.		

*Older versions do not require any action.

Alternatively, the Firmware Part Number (PN) and Revisions associated with the Versions above for the EQP Controller and X3301 EMI EQP Output Board can be found on the respective labels as shown in the following figures:

	EQP Controller Firmware	X3301 EMI EQP Output Board
Product Label:	Firmware PN: **010256-001** Revision: **U**	Firmware PN: **007386-003** Revision: **N**
Label Location:		
EQP Faceplate Display:	Firmware Version: **17.16**	Firmware ID (Version): **6.12**

X3301 EQP Hangar Mode Flame Detector Configuration

The following provides specific guidance on how to set up an Enhanced Flame Detector device type and elaborates on the descriptions in the S³ User Guide 95-8560.

The EQP X3301 Hangar Mode models must be set up as an Enhanced Flame Detector device type (ENH X3301). **IMPORTANT: Even if the standard Flame Detector device type is selected with the most recent S^3 version, default parameters in the X3301 EMI EQP Output Board (Output Type 14) override the X3301 Hangar Mode to OFF.**

The Enhanced Flame Detector configuration screen is shown in Figure 1 followed by a description of the configurable parameters and a final summary of recommended configurations.

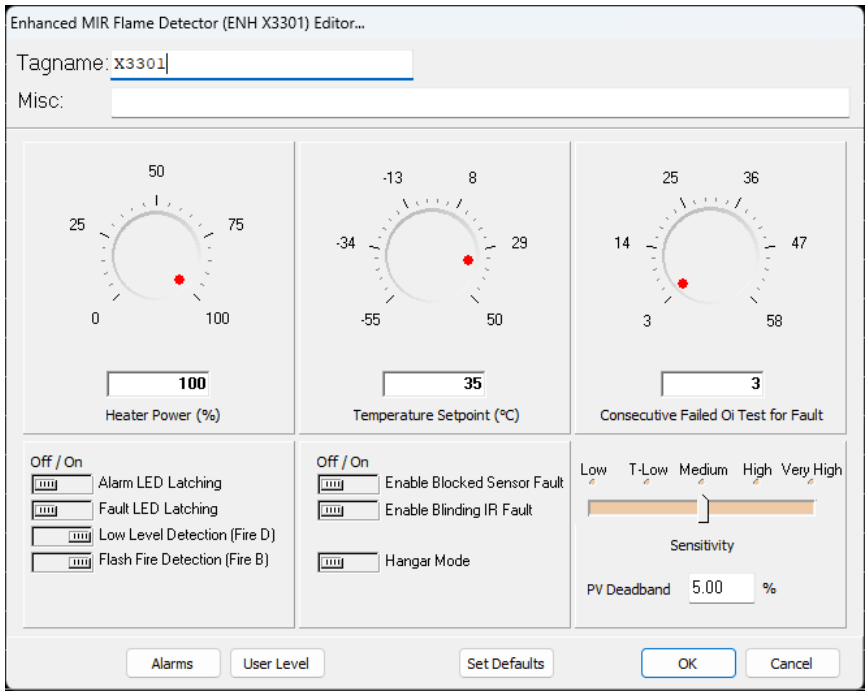


Figure 1 - Enhanced MIR Flame Detector (ENH X3301) Editor screen.

Tagname

User defined name for the field device.

Misc

Field for user to enter a custom description.

Heater Power (%) (Default is 100%)

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 (°C) (Default is +35 °C)

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.

Consecutive Failed Oi Test for Fault (Default is 3)

The detector automatically conducts Oi tests to check the integrity of the optical sensing systems. Three consecutive failed Oi tests generate a fault condition, which will be indicated by the LED on the face of the detector turning yellow. The EQP Controller and S^3 software will also annunciate this fault.

Alarm LED Latching (Default is Off, non-latching)

When this configuration parameter is set (On), the indicator LED on the front of the detector will change from green to red upon detection of a fire. The LED will stay red even after the alarm condition has cleared. The LED may be cleared from the Point Display, from user logic or by using the X3301 Magnetic Oi test which performs a self-test and resets the alarm state.

When set for non-latching the indicator LED will change from green to red when an alarm condition is detected, and from red to green when the alarm condition is cleared (i.e., fire is no longer detected).

Fault LED Latching (Default is Off, non-latching)

When this configuration parameter is set (On), the indicator LED on the front of the detector will change from green to yellow after a fault is detected. The LED will stay yellow even after the fault condition has cleared. The LED may be cleared from the Point Display, from user logic or by using the X3301 Magnetic Oi test which performs a self-test and resets the fault state. If the fault condition were to persists after the Magnetic Oi test the LED will return to yellow.

When set for non-latching the indicator LED will change from green to yellow when a fault condition is detected and from yellow to green when the fault condition is cleared.

Low Level Detection (Fire D) (Default is Enabled, On)

The Low-Level Detection (Fire D) algorithm is used for detecting very small fires or fires at the limit of the maximum effective detection range of the unit. Based on the signal analysis the detector performs, the minimum response time to a fire for this algorithm is approximately 6 to 9 seconds.

The Low-Level Detection (Fire D) algorithm can only be enabled (On) or disabled (Off) when Very High Sensitivity setting is selected. Enabled (On) is the default. With all the other sensitivity levels, the function is fixed automatically to Disabled (Off) but the selector is not automatically positioned to Off. Therefore, it is recommended to select Off to have the selector visually match the actual automatically defined state.

Flash Fire Detection (Fire B) (Default is Enabled, On)

The Flash Fire Detection (Fire B) algorithm can be disabled. Disabling this algorithm can help reduce false alarms in some situations but can also reduce fire detection capabilities. Temporary fires lasting less than 3 seconds may not be detected if Flash Fire Detection (Fire B) is disabled. The time to alarm to a sustained fire may also increase by 3 seconds compared to the FM performance data.

When Hangar Mode is not selected Flash Fire Detection (Fire B) can be disabled (Off) in all sensitivity settings except Low. In Low sensitivity Flash Fire Detection (Fire B) is automatically disabled (Off) and cannot be enabled. Therefore, it is recommended to select Off to have the selector visually match the actual automatically defined state.

Hangar Mode (Default is Disabled, Off)

The advantage of Hangar Mode is to maximize short duration event false alarm rejection by requiring multiple checks, which results in response times between 6 to 10 seconds depending on various factors such as sensitivity setting, fire size, and distance. As a result, Hangar Mode can ignore intentional short-duration (flash) fires such as from an auxiliary power unit starting ignition, a gas heater starting ignition, or an engine’s backfire. Enabling Hangar Mode has no effect on detection ranges or the field-of-view.

Enable Blocked Sensor Fault (Default is Disabled, Off)

When this parameter is enabled (On), a fault will be annunciated if a blocked detector condition exists. A blocked detector condition is defined to be when the Oi value of one or more sensors is below 3%.

Enable Blinding IR Fault (Default is Disabled, Off)

When this parameter is enabled (On), a fault will be annunciated if a blinding IR condition occurs. Blinding IR Fault signifies the presence of enough modulated IR energy to severely impair the X3301 Flame Detector's ability to detect fire.

Sensitivity (Default is medium)

There are five factory configured sensitivity levels available for the X3301 Flame Detector: Very High, High, Medium, Low, and T-Low.

Low sensitivity requires more processing time before alarming to a fire source. Both T-Low and Low use the same sensitivity thresholds. The difference between the modes can be seen when comparing FM listed response times between T-Low and Low. Low will have a slower response time.

PV Deadband (Default is 5.00%)

Online mode can be started from the main S^3 Shell screen "Start Monitoring" tile. This mode conducts continuous polls of all enabled ports and begins event monitoring, logging, and printing.

Normally, all field device 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.

Summary overview of possible configurations

The factory configured EQP compatible Enhanced X3301 with Hangar Mode enabled ("-034") is set to Medium Sensitivity which has both Low Level (Fire D) and Flash Fire (Fire B) parameters automatically fixed to disabled (Off). Other configurations are shown in the following table identifying the configurability of the Low Level (Fire D) and Flash Fire (Fire B).

Hangar Mode	Sensitivity	Low Level (Fire D)	Flash Fire (Fire B)
On	Very High	On[1]	Off[2]
On	High	Off[2]	Off[2]
On	Medium	Off[2]	Off[2]
** On	T-Low	Off[2]	Off[2]
** On	Low	Off[2]	Off[2]
Off	Very High	On[1]	On[1]
Off	High	Off[2]	On[1]
Off	Medium	Off[2]	On[1]
Off	T-Low	Off[2]	On[1]
Off	Low	Off[2]	Off[2]

** DO NOT USE Hangar Mode with T-Low or Low Sensitivities.

[1]These parameter settings shown in green are user configurable. The default is Enabled (On) but can be Disabled (Off) when configuring the X3301.

[2]These parameters are not user configurable and are automatically fixed to Disabled (Off). The recommendation is to select Off to have the selector visually match the actual automatically defined state.