Addendum

HART Communication
with the
FlexSonic® Acoustic Detector

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HART Communication
with the
FlexSonic® Acoustic Detector

ATX10 Transmitter

AC100 Sensor

Digital communication with the FlexSonic® Acoustic Detector allows the operator to monitor the status of the detector, determine factory settings, adjust field settings, and initiate field tests. This addendum provides guidance for establishing HART communication, and describes the HART menu structure when using the acoustic detector with a HART Handheld Communicator, a PC, or other process interface device that supports DDL.

NOTE
A minimum level of understanding with regard to the operation and navigation of the HART Communicator is required. Refer to the instruction manual supplied with the HART Communicator for basic operating instructions.

INTERCONNECTING THE HART COMMUNICATOR WITH THE ACOUSTIC DETECTOR

The HART Communicator can connect to the acoustic detector at any wiring termination point in the analog output signal loop. Connect the HART communicator in parallel with the analog signal or load resistor. The HART connections are non-polarized.

IMPORTANT WIRING NOTE
The HART Communicator does not measure loop current directly, but instead reads a voltage signal across a resistance (250-600 ohms) in the loop. The recommended connection point is across the input impedance of the signal receiver (PLC), which is a nominal 250 ohms. See Figure 1. If testing/programming on a bench, a 250 ohm load resistor must be used. See Figure 2.

Switch on the HART Communicator. If a device is found, the HART Communicator displays the Main menu. If no device is found, check the connections and verify the presence of a minimum of 250 ohms load resistance in series in the loop.

PLC 4-20 mA INPUT CARD

INPUT

4-20 mA

250 OHMS MINIMUM

24 VDC

ATX10 TRANSMITTER BOARD

INTERFACE TO SOFTWARE CONFIGURATOR

P3-4
P3-3 JUMPER TO GND
P3-2 GND
P3-1 B
A

24 VDC +
4-20 mA
24 VDC –
SHIELD

P1-4
P1-3
P1-2
P1-1

POWER AND OUTPUT

A
B
24 VDC + J3-1
24 VDC – J3-2
SHIELD J3-3
J3-4
J3-5

SENSOR

A2608
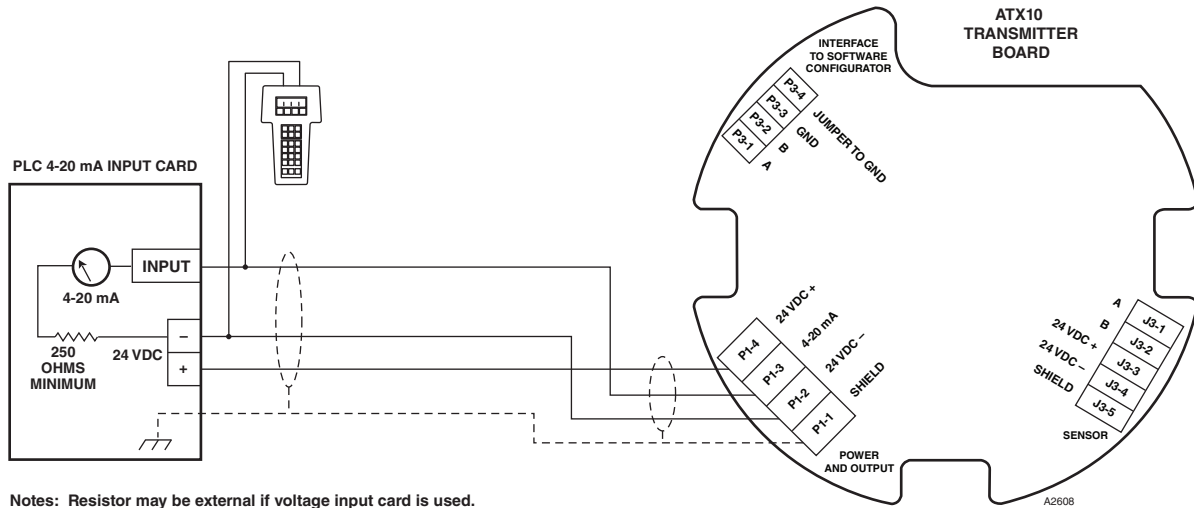
Notes: Resistor may be external if voltage input card is used. Sinking resistance at PLC must be 250 ohms minimum for HART communication.

Device housings must be electrically connected to earth ground.

Figure 1—ATX10 Transmitter Wired to PLC

Note: Minimum input impedance for proper HART operation = 250 ohms. Maximum loop impedance including input impedance of PLC = 600 ohms.

ATX10 TRANSMITTER

P3-4
P3-3 JUMPER TO GND
P3-2 GND
P3-1 B
A

24 VDC +
4-20 mA
24 VDC –
SHIELD

P1-4
P1-3
P1-2
P1-1

24 VDC

250 OHMS

A
B
24 VDC +
24 VDC –
SHIELD

J3-1
J3-2
J3-3
J3-4
J3-5

IS GROUND

HART HANDHELD COMMUNICATOR

AC100 ACOUSTIC SENSOR

A2617
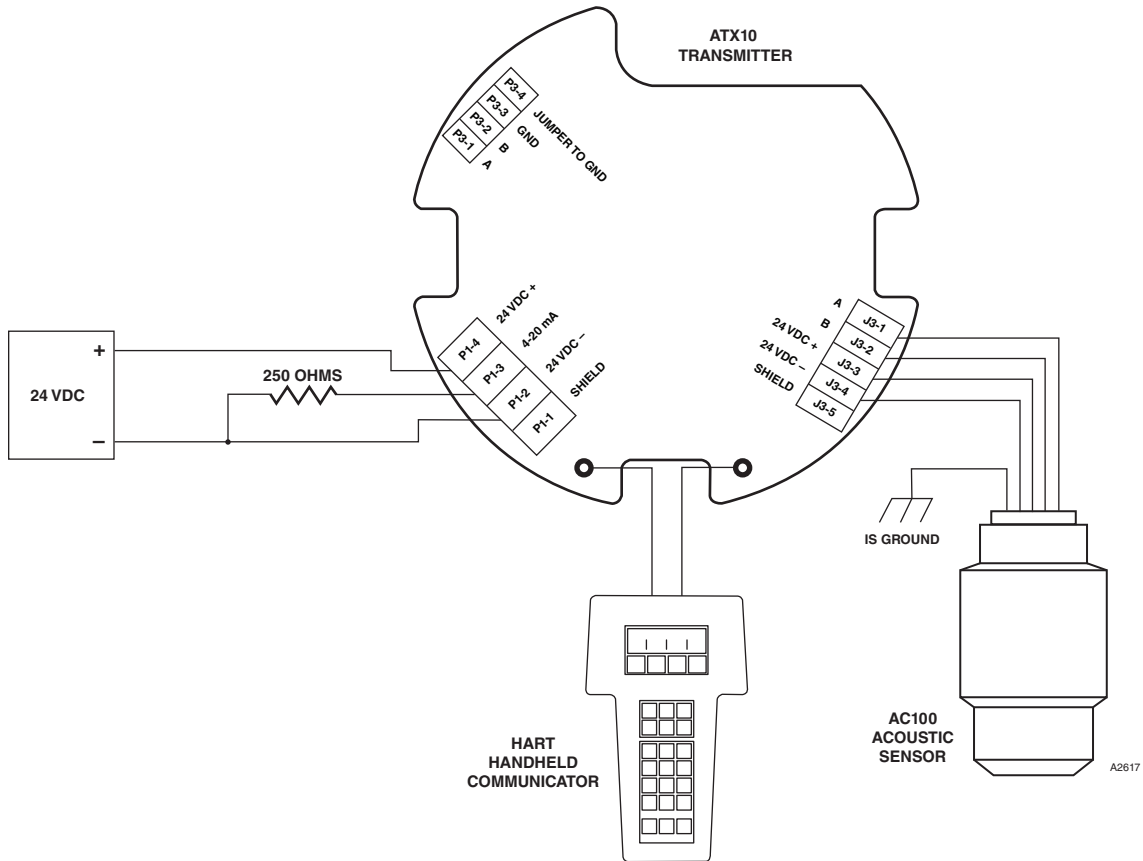
Figure 2—Wiring the Acoustic Detector for Benchtop Testing/Programming Using HART Protocol

HART DEVICE DESCRIPTION LANGUAGE

The HART protocol incorporates a concept called the Device Description Language (DDL) that enables all suppliers of HART instruments to define and document their products in a single consistent format. This format is readable by handheld communicators, PCs and other process interface devices that support DDL. DDL enables full interoperability of devices, regardless of manufacturer, allowing full functionality from any HART device.

In the event that your Communicator does not establish communications with the FlexSonic Acoustic Detector, ensure that the appropriate DDLs for the Acoustic Detector have been programmed into your Communicator. To review the DDLs programmed into your HART Communicator:

1. From the Main menu, access the Offline menu.

2. From the Offline menu, select New Configuration to access the list of device descriptions programmed into the HART Communicator.

3. Select Det-Tronics and review the list of models to determine if the ATX10 DDLs are installed in your Communicator.

If the ATX10 DDLs have not been programmed into the HART Communicator, you must use the generic interface built into your HART Communicator.

The HART Communication Foundation manages a library of Manufacturer Device Descriptions, which are distributed to programming sites for inclusion in master devices. A complete listing of the HCF DD Library is available for download in manufacturer and device type sequence at hartcomm.org.

PASSWORD PROTECTION

The ATX10 allows the use of a password for restricting changes to configuration parameters and limiting access to safety critical commands.

To enable/disable the Write Protect feature, navigate to the Write Protect screen.
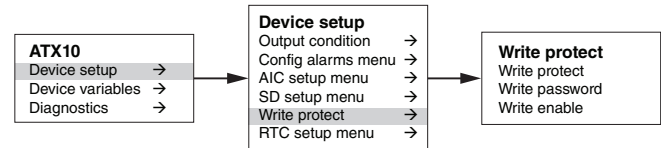
Select WRITE PROTECT to turn the Write Protect feature on.

Select WRITE ENABLE to turn the Write Protect feature off.

Select WRITE PASSWORD to enter a new password.

The default password is 1*******.

IMPORTANT
Take care not to lose the password. Future changes cannot be made without a password.

DETECTOR WIRING

Refer to the FlexSonic instruction manual (form number 95-8657) for complete instructions regarding detector installation and wiring.

MENU HELP

Status menus only allow the user to view the data. The Setup menus allow the user to both view and edit the data.

Range values
PV USL mA
PV LSL mA
PV URV mA
PV LRV mA

General status menu
xmtr status 2
Alarm
PreAlarm
AIC active
Warm up
AIC alarm
Manual AIC active
rsvd
rsvd

Fault menu 1
xmtr fault 1
Snsr hdwr fault
Mag switch advisory
Snsr comm fault
SD disk full
SD type invalid
SD invalid config advisory
SD config/learn mismatch
rsvd

Fault menu 2
xmtr fault 2
Fault
AIC fault
SD card fault
Tx hdwr fault
SD advisory
Memory fault
Temperature range
Voltage range

Hardware status menu
AC100 temperature
AC100 input voltage
AC100 chg/volt level
ATX10 temperature
ATX10 line voltage
Learn enabled
SD file

AIC status menu
Last AIC reading
AIC failures
AIC active
Manual AIC active
AIC alarm
AIC fault
AIC interval setting
AICconsecutive fails setting
Factory

Alarm settings menu
Alarm mode (basic/profile)
Alarm level (dB)
Alarm delay (sec)
Alarm recovery (sec)
Alarm latch enabled
PreAlarm enabled
PreAlarm sensitivity
Alarm sensitivity
Alarm band count
Alarm threshold type

Process variables
PV mA
Loop current mA
PV % rnge %
Fault
Alarm
SD log enabled
Range values →
(PV strip chart)
(Spectrum bar chart)

Device info
Manufacturer
Dev id
Model
Part number
Manufactured date
AC100 major version
AC100 minor version
ATX10 major version
ATX10 minor version
Software rev
Hardware rev
Write protect

HART info
Tag
Long tag
Message
Descriptor
Final asmbly num
Poll addr
Num req preams
Date
Write protect
Universal rev
Fld dev rev
DD build number

Status/Fault menu
General status menu→
Fault menu 1 →
Fault menu 2 →
Hardware status menu→
AIC status menu →

Detector settings
Write protect
SD log enabled
SD file
AIC interval settings
AICconsecutive fails setting
Alarm settings menu →

( ) On Graphic Host Only

Learn profile select menu
Learn profile selected
Select previous profile
Select next profile
Activate selected profile
Goto active profile slot
Write buffer to slot

History
Event log

RTC status menu
RTC second
RTC minute
RTC hour
RTC date
RTC month
RTC year

Review
Manufacturer
Dev id
Model
Tag
Long tag
Descriptor
Message
PV Snsr unit
PV USL
PV LSL
PV URV
PV LRV
Final asmbly num
AI Alrm typ
Write protect
Date
Universal rev
Fld dev rev
Software rev
Poll addr
Num req preams

Learn menu
Learn enabled
Active profile slot
Enable learn
Disable learn
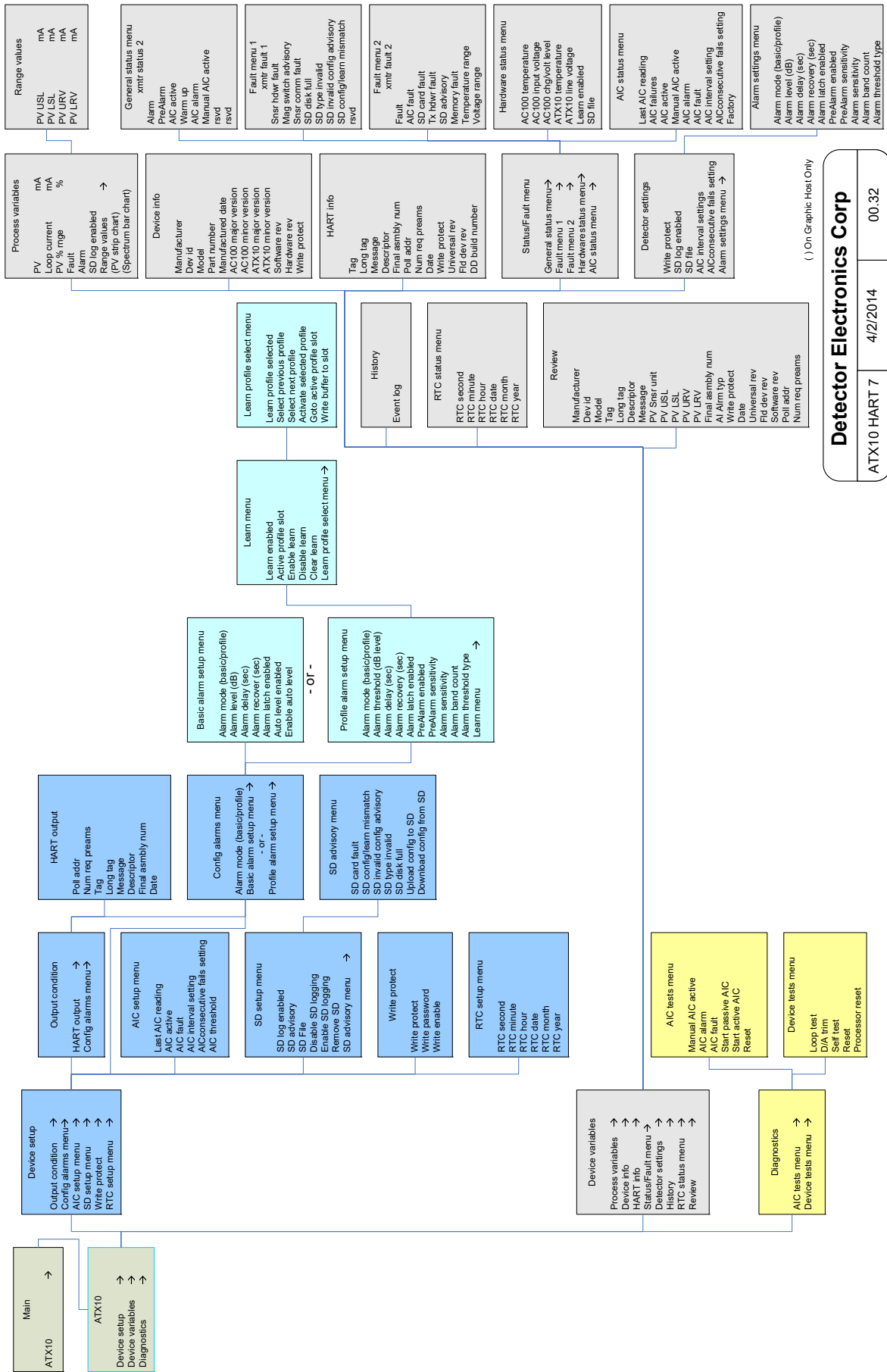Clear learn
Learn profile select menu →

Basic alarm setup menu
Alarm mode (basic/profile)
Alarm level (dB)
Alarm delay (sec)
Alarm recover (sec)
Alarm latch enabled
Auto level enabled
Enable auto level

- or -

Profile alarm setup menu
Alarm mode (basic/profile)
Alarm threshold (dB level)
Alarm delay (sec)
Alarm recovery (sec)
Alarm latch enabled
PreAlarm enabled
PreAlarm sensitivity
Alarm sensitivity
Alarm band count
Alarm threshold type
Learn menu →

HART output
Poll addr
Num req preams
Tag
Long tag
Message
Descriptor
Final asmbly num
Date

Config alarms menu
Alarm mode (basic/profile)
- or -
Basic alarm setup menu →
Profile alarm setup menu →

SD advisory menu
SD card fault
SD config/learn mismatch
SD invalid config advisory
SD type invalid
SD disk full
Upload config to SD
Download config from SD

Output condition
HART output →
Config alarms menu→

AIC setup menu
Last AIC reading
AIC active
AIC fault
AIC interval setting
AICconsecutive fails setting
AIC threshold

SD setup menu
SD log enabled
SD advisory
SD File
Disable SD logging
Enable SD logging
Remove SD
SD advisory menu →

Write protect
Write protect
Write password
Write enable

RTC setup menu
RTC second
RTC minute
RTC hour
RTC date
RTC month
RTC year

Device setup
Output condition →
Config alarms menu→
AIC setup menu →
SD setup menu →
Write protect →
RTC setup menu →

Device variables
Process variables →
Device info →
HART info →
Status/Fault menu →
Detector settings →
History →
RTC status menu →
Review →

AIC tests menu
Manual AIC active
AIC alarm
AIC fault
Start passive AIC
Start active AIC
Reset

Device tests menu
Loop test
D/A trim
Self test
Reset
Processor reset

Diagnostics
AIC tests menu →
Device tests menu →

Main
ATX10 →

ATX10
Device setup →
Device variables →
Diagnostics →

Detector Electronics Corp

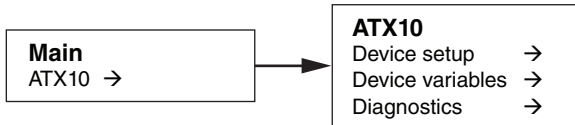| ATX10 HART 7	4/2/2014	00.32

ATX10 MAIN MENU

When HART communication is established, the first menu displayed is the ATX10 Main menu. From here, navigate to the ATX10 Menu:

ATX10 MENU

This is the top level menu.

```
┌─────────────────┐        ┌───────────────────────────┐
│ Main            │        │ ATX10                     │
│ ATX10  →        │───────▶│ Device setup      →       │
│                 │        │ Device variables  →       │
└─────────────────┘        │ Diagnostics       →       │
                           └───────────────────────────┘
```

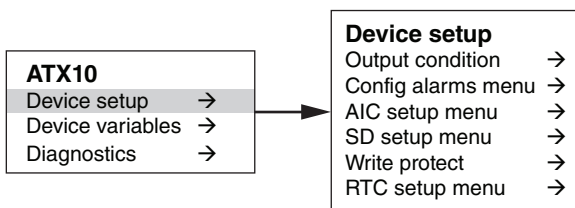|	
Device Setup	This menu contains several submenus which allow the setting of parameters to configure the device and modify its operation.
Device Variables	This menu provides access to various information regarding the specific device.
Diagnostics	This menu provides status and fault information, as well as troubleshooting capabilities.

DEVICE SETUP

```
┌─────────────────────┐        ┌───────────────────────────┐
│ ATX10               │        │ Device setup              │
│ Device setup     →  │        │ Output condition     →    │
│ Device variables →  │───────▶│ Config alarms menu   →    │
│ Diagnostics      →  │        │ AIC setup menu       →    │
└─────────────────────┘        │ SD setup menu        →    │
                               │ Write protect        →    │
                               │ RTC setup menu       →    │
                               └───────────────────────────┘
```

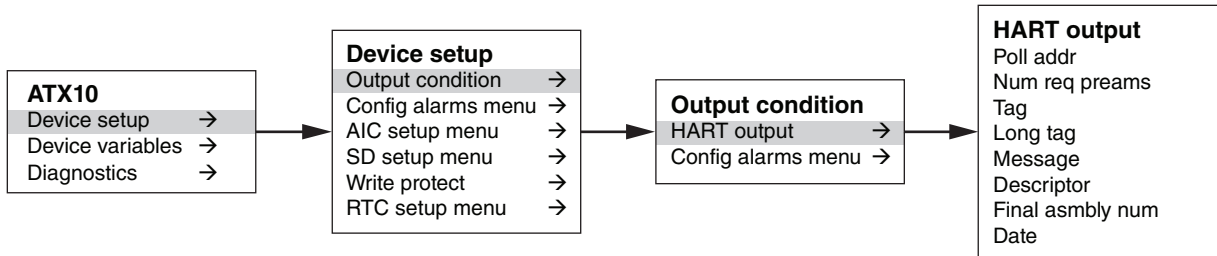|	
Output Condition	Detector alarm and HART configuration.
Config alarms menu	Menu for selecting Basic or Profile mode, and access to alarm configuration menus.
AIC setup menu	Refer to sub-menu.
SD Setup menu	Refer to sub-menu.
Write protect	This menu item is used to navigate to the write protect menu.
RTC setup menu	Menu for setting the real time clock.

OUTPUT CONDITION

```
ATX10                        Device setup
Device setup      →          Output condition    →       Output condition
Device variables  →          Config alarms menu  →       HART output         →
Diagnostics       →          AIC setup menu      →       Config alarms menu  →
                             SD setup menu       →
                             Write protect       →
                             RTC setup menu      →
```
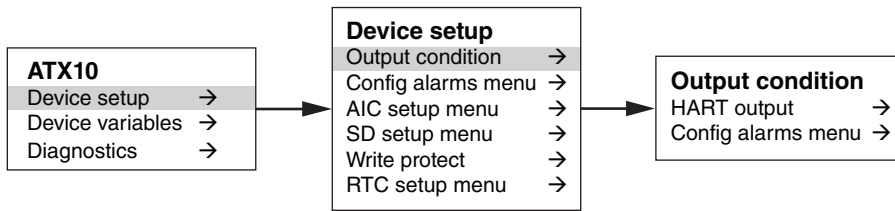
HART Output   Refer to sub-menu.

Config Alarms Menu   Refer to sub-menu.

HART OUTPUT

Menu for checking HART settings.

```
ATX10                        Device setup                                    HART output
Device setup      →          Output condition    →                          Poll addr
Device variables  →          Config alarms menu  →       Output condition    Num req preams
Diagnostics       →          AIC setup menu      →       HART output      →  Tag
                             SD setup menu       →       Config alarms menu → Long tag
                             Write protect       →                          Message
                             RTC setup menu      →                          Descriptor
                                                                            Final asmbly num
                                                                            Date
```

Poll Addr   Address used by the host to identify a field device.

Num Req Preams   Number of Request Preambles.

Tag   Text that is associated with the field device installation. This text can be used by
                             the operator in any way.

Long Tag   Text that is associated with the field device installation. This text can be used by
                             the operator in any way.

Message   Text associated with the field device that can be used by the operator in any way.
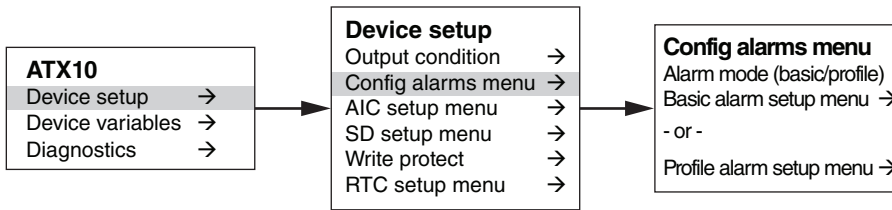
Descriptor   Text associated with the field device that can be used by the operator in any way.

Final Assy Number   A number that is used for identification purposes, and is associated with the overall
                             field device.

Date   Any date chosen by the operator to be used for any purpose.

CONFIG ALARMS MENU
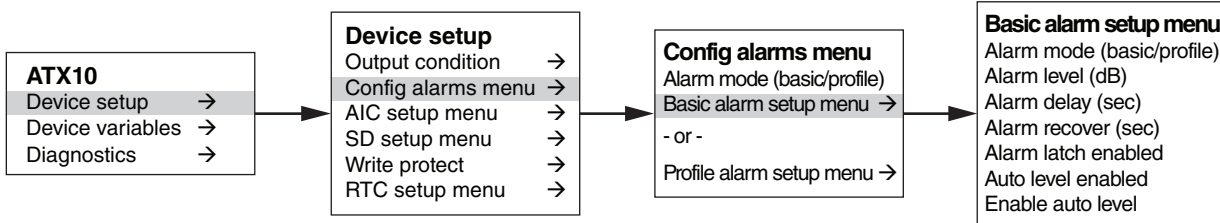
Menus for configuring alarm settings for the device.

```
┌──────────────────┐      ┌──────────────────────────┐      ┌────────────────────────────┐
│ ATX10            │      │ Device setup             │      │ Config alarms menu         │
│ Device setup   → │ ──▶  │ Output condition       → │ ──▶  │ Alarm mode (basic/profile) │
│ Device variables →│     │ Config alarms menu     → │      │ Basic alarm setup menu   → │
│ Diagnostics    → │      │ AIC setup menu         → │      │ - or -                     │
└──────────────────┘      │ SD setup menu          → │      │ Profile alarm setup menu → │
                          │ Write protect          → │      └────────────────────────────┘
                          │ RTC setup menu         → │
                          └──────────────────────────┘
```

Alarm Mode (basic/profile)	Displays and permits changes to the alarm mode. Possible settings include "BASIC" or "PROFILE."
Basic alarm setup menu	Refer to sub-menu.
Profile alarm setup menu	Refer to sub-menu.

BASIC ALARM SETUP MENU

Menu containing settings relevant only to BASIC alarm mode.

```
┌──────────────────┐   ┌──────────────────────────┐   ┌────────────────────────────┐   ┌────────────────────────────┐
│ ATX10            │   │ Device setup             │   │ Config alarms menu         │   │ Basic alarm setup menu     │
│ Device setup   → │──▶│ Output condition       → │──▶│ Alarm mode (basic/profile) │──▶│ Alarm mode (basic/profile) │
│ Device variables →│  │ Config alarms menu     → │   │ Basic alarm setup menu   → │   │ Alarm level (dB)           │
│ Diagnostics    → │   │ AIC setup menu         → │   │ - or -                     │   │ Alarm delay (sec)          │
└──────────────────┘   │ SD setup menu          → │   │ Profile alarm setup menu → │   │ Alarm recover (sec)        │
                       │ Write protect          → │   └────────────────────────────┘   │ Alarm latch enabled        │
                       │ RTC setup menu         → │                                     │ Auto level enabled         │
                       └──────────────────────────┘                                     │ Enable auto level          │
                                                                                        └────────────────────────────┘
```

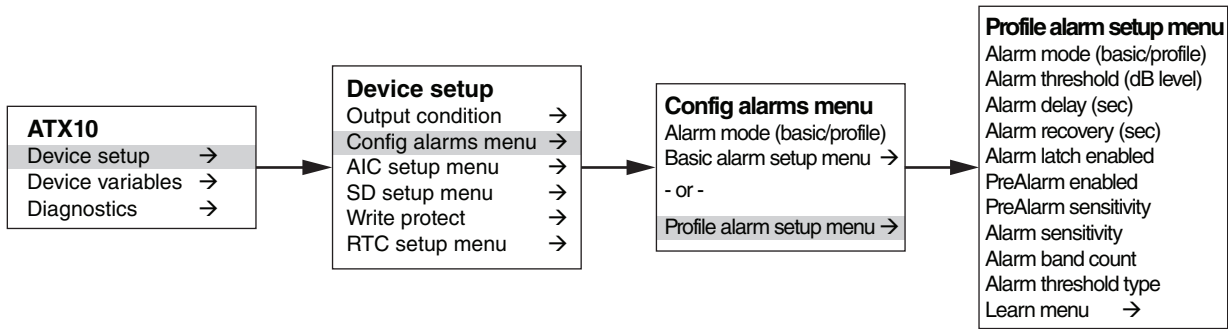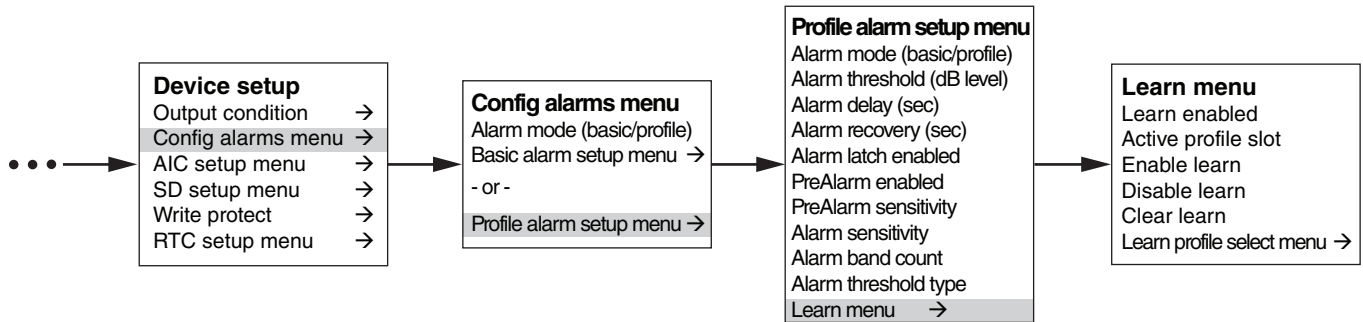|	
Alarm Mode (basic/profile)	Displays and permits changes to the alarm mode. Possible settings include "BASIC" or "PROFILE."
Alarm Level (dB)	This setting specifies the threshold (in dB) where bands are considered for alarm should they exceed that level.
Alarm Delay (sec)	This setting specifies the delay time, in seconds, that elapses from the moment the alarm criteria are met, until the alarm is annunciated.
Alarm Recover	This setting specifies the time (in seconds) that elapses from the moment the alarm declared criteria are no longer met until the alarm is cleared.
Alarm Latch Enabled	When latching is enabled, alarms remain annunciated until the MASTER RESET command is sent, or the reset magnetic switch is tripped.
Auto level enabled	Displays 'Y' if an autolevel is in process.
Enable auto level	This command starts an autolevel process to dynamically choose the Basic mode level.

PROFILE ALARM SETUP MENU

Menu containing settings relevant only to PROFILE alarm mode.

Alarm Mode (basic/profile) Displays and permits changes to the alarm mode. Possible settings include "BASIC" or "PROFILE."

Alarm Threshold (dB level) This setting specifies a single alarm threshold (in dB) for all frequency bands. This is applicable only when Alarm Threshold is set to LEVEL. When Alarm Threshold is set to LEARN, each band has its own alarm threshold based on the learned profile.

Alarm Delay (sec) This setting specifies the delay time, in seconds, that elapses from the moment the alarm criteria are met, until the alarm is annunciated.

Alarm Recover (sec) This setting specifies the time (in seconds) that elapses from the moment the alarm declared criteria are no longer met until the alarm is cleared.

Alarm Latch Enabled When latching is enabled, alarms remain annunciated until the MASTER RESET command is sent, or the reset magnetic switch is tripped.

PreAlarm Enabled Select 'Y' to enable the prealarm feature. This allows a second sensitivity to be set for an alternate alarm annunciation.

PreAlarm Sensitivity An offset that is subtracted from the alarm threshold in each band to generate a prealarm with higher sensitivity than the standard alarm. All the alarm threshold settings and alarm parameters apply to prealarm, but greater sensitivity is realized by adjusting the threshold level or profile with this setting.

Alarm Sensitivity An offset (in dB) that is added to the level or learn threshold for each band. A larger setting reduces the sensitivity of the detector to alarms.

Alarm Band Count The number of bands that must exceed the alarm threshold to declare an alarm.

Alarm Threshold Type The type of alarm threshold being used (LEVEL/LEARN). LEVEL is a single dB value alarm threshold across the alarm range, while LEARN is a dynamic alarm threshold with varying dB levels across the alarm range based on the learned acoustic profile.

Learn Menu Refer to sub-menu.

LEARN MENU

This menu allows the management of the learn functionality and saving and selecting of recorded profiles.

```
                        Device setup              Config alarms menu                Profile alarm setup menu      Learn menu
                        Output condition    →     Alarm mode (basic/profile)        Alarm mode (basic/profile)    Learn enabled
• • • ─────→            Config alarms menu  →     Basic alarm setup menu  →         Alarm threshold (dB level)    Active profile slot
                        AIC setup menu      →     - or -                            Alarm delay (sec)             Enable learn
                        SD setup menu       →                                       Alarm recovery (sec)          Disable learn
                        Write protect       →     Profile alarm setup menu →        Alarm latch enabled           Clear learn
                        RTC setup menu      →                                       PreAlarm enabled              Learn profile select menu →
                                                                                    PreAlarm sensitivity
                                                                                    Alarm sensitivity
                                                                                    Alarm band count
                                                                                    Alarm threshold type
                                                                                    Learn menu        →
```

Learn Enabled   Read Only. 'Y' Signifies the Learn feature is enabled and a profile is being acquired and updated as the RECORDED profile.

Active Profile Slot   Identifies the memory slot (0-9) of the profile actively being used to calculate the alarm threshold in profile mode.

Enable Learn   This command enables the learn feature and begins updating the RECORDED profile.

Disable Learn   This command disables the learn feature, terminating updates to the RECORDED profile.
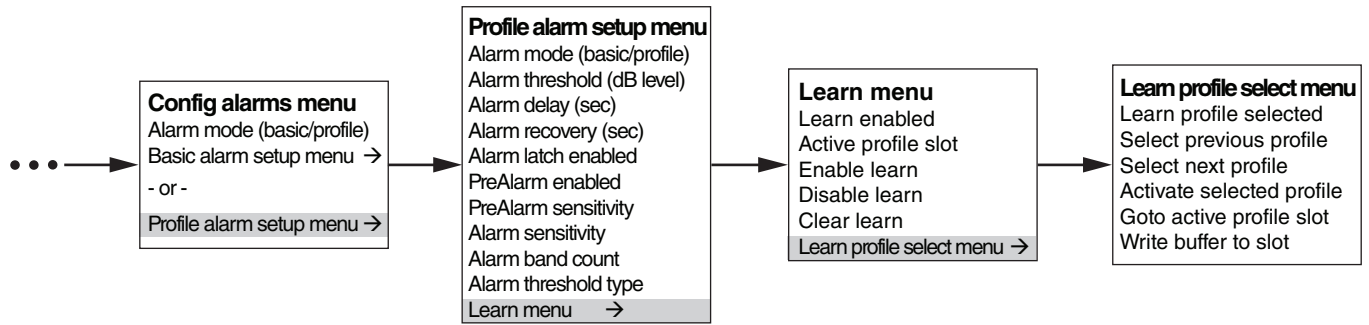
Clear Learn   This command empties the RECORDED profile, resetting all bands to the minimum values.
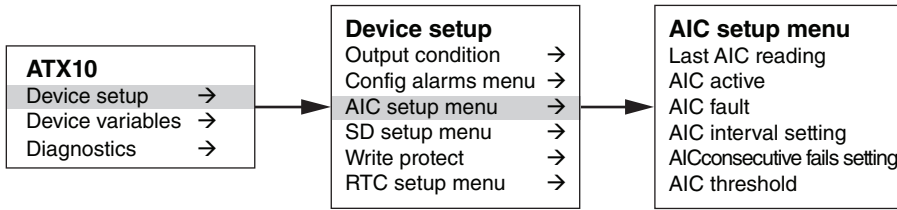
Learn Profile Select Menu Refer to sub-menu.

LEARN PROFILE SELECT MENU

Config alarms menu
Alarm mode (basic/profile)
Basic alarm setup menu →
- or -
Profile alarm setup menu →

Profile alarm setup menu
Alarm mode (basic/profile)
Alarm threshold (dB level)
Alarm delay (sec)
Alarm recovery (sec)
Alarm latch enabled
PreAlarm enabled
PreAlarm sensitivity
Alarm sensitivity
Alarm band count
Alarm threshold type
Learn menu →

Learn menu
Learn enabled
Active profile slot
Enable learn
Disable learn
Clear learn
Learn profile select menu →

Learn profile select menu
Learn profile selected
Select previous profile
Select next profile
Activate selected profile
Goto active profile slot
Write buffer to slot

Learn Profile Selected   The alarm profile in the current memory slot has been selected.

Select Previous Profile   Navigate to the previous profile in memory.

Select Next Profile   Navigate to the next profile in memory.

Activate Selected Profile   Use the profile in the currently selected memory slot to calculate the alarm threshold.

Goto Active Profile Slot   Navigate to the memory slot of the currently active alarm profile.

Write Buffer to Slot   Write the RECORDED profile in buffer to the currently selected memory slot.

AIC SETUP MENU

```
┌─────────────────────┐     ┌──────────────────────────────┐     ┌──────────────────────────────┐
│ ATX10               │     │ Device setup                 │     │ AIC setup menu               │
│ Device setup     →  │ ──▶ │ Output condition          →  │ ──▶ │ Last AIC reading             │
│ Device variables →  │     │ Config alarms menu        →  │     │ AIC active                   │
│ Diagnostics      →  │     │ AIC setup menu            →  │     │ AIC fault                    │
└─────────────────────┘     │ SD setup menu             →  │     │ AIC interval setting         │
                            │ Write protect             →  │     │ AICconsecutive fails setting │
                            │ RTC setup menu            →  │     │ AIC threshold                │
                            └──────────────────────────────┘     └──────────────────────────────┘
```

Last AIC Reading   The numeric level returned by the AIC at the last check, acquired by measuring the amplitude of the microphone response to the emitter.

AIC Active   Indicates "Y" if an AIC is currently in progress.

AIC Fault   Indicates "Y" if the AIC has failed, indicating the microphone or emitter are degraded.

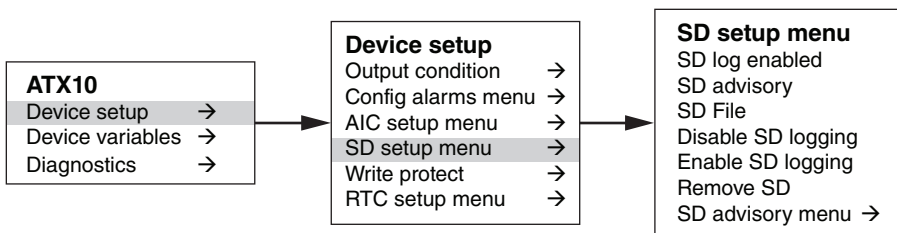**AIC Interval Setting**   The number of minutes elapsed until an AIC is performed automatically.

AIC Consecutive Fails Setting The number of consecutive failures of the AIC permitted before an AI Fault is annunciated.

AIC Threshold   The AI READING calibrated at the factory, to which the AIC measurement is compared.

SD SETUP MENU

```
┌─────────────────────┐     ┌──────────────────────────────┐     ┌──────────────────────────────┐
│ ATX10               │     │ Device setup                 │     │ SD setup menu                │
│ Device setup     →  │ ──▶ │ Output condition          →  │ ──▶ │ SD log enabled               │
│ Device variables →  │     │ Config alarms menu        →  │     │ SD advisory                  │
│ Diagnostics      →  │     │ AIC setup menu            →  │     │ SD File                      │
└─────────────────────┘     │ SD setup menu             →  │     │ Disable SD logging           │
                            │ Write protect             →  │     │ Enable SD logging            │
                            │ RTC setup menu            →  │     │ Remove SD                    │
                            └──────────────────────────────┘     │ SD advisory menu          →  │
                                                                 └──────────────────────────────┘
```

SD Log Enabled   Displays 'Y' if Real Time Data is being written to the SD Memory Module.

SD Advisory   'Y' signifies that intervention is needed for an issue with the SD Memory Module.

SD File   The file name to which Real Time Data is being logged on the SD Memory Module.

Disable SD Logging   This command disables the SD Memory Module and annunciation of SD ADVISORY on the 4-20 mA and LED outputs.

Enable SD Logging   This command re-enables the SD Memory Module if it has been disabled.
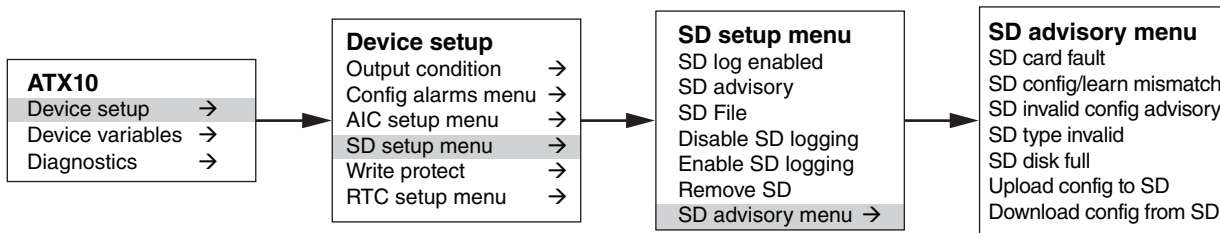
Remove SD   This command temporarily halts the SD Memory Module so it can be removed safely. It is advisable to wait until SD LOGGING changes to 'N' before replacing the SD card.

SD Advisory Menu   Refer to sub-menu.

SD ADVISORY MENU

This menu provides a breakdown of the type of SD ADVISORY and provides commands for various intervention options.

ATX10	Device setup	SD setup menu	SD advisory menu
Device setup →	Output condition →	SD log enabled	SD card fault
Device variables →	Config alarms menu →	SD advisory	SD config/learn mismatch
Diagnostics →	AIC setup menu →	SD File	SD invalid config advisory
	SD setup menu →	Disable SD logging	SD type invalid
	Write protect →	Enable SD logging	SD disk full
	RTC setup menu →	Remove SD	Upload config to SD
		SD advisory menu →	Download config from SD

SD Card Fault   SD card is out-of-sync with the ATX10 on-board flash.

SD Config/Learn Mismatch   Indicates that the CONFIG and PROFILE data do not match the contents of the ATX10.

SD Invalid Config Advisory   Indicates that the CONFIG and PROFILE data are corrupt of partially missing. This prevents the ability to select DOWNLOAD CONFIG, but UPLOAD CONFIG may be used to establish new CONFIG and PROFILE data from the contents of the ATX10.

SD Type Invalid   Indicates that the microSD card in the SD Memory Module may not meet manufacturer specifications.

SD Disk Full   The SD disk is full. The ATX10 was unable to prevent the SD disk from reaching capacity. There is an error in the SD card and SD logging has stopped.
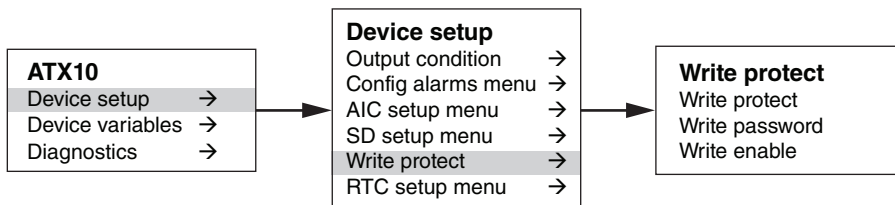
Upload Config to SD   This command uploads the contents of the ATX10 to the SD Memory Module, replacing the CONFIG and PROFILE data files.

Download Config from SD   This command downloads the contents of the SD Memory Module to the ATX10, changing the configuration and saved profile data in use by the device.

WRITE PROTECT

ATX10	Device setup	Write protect
Device setup →	Output condition →	Write protect
Device variables →	Config alarms menu →	Write password
Diagnostics →	AIC setup menu →	Write enable
	SD setup menu →	
	Write protect →	
	RTC setup menu →	

Write Protect   This indicates whether variables can be written to the device, or whether commands that cause these actions to be performed in the device can or cannot occur.

Write Password   The password is used to validate the command to enable or disable writes in the device. (The factory default password is: 1*******. Once the password has been changed, the default password is no longer valid.)
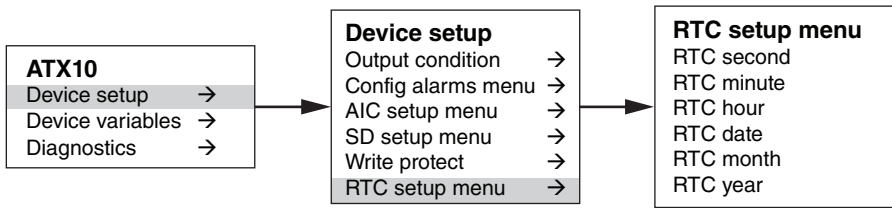
CAUTION
Always record the new password. If the password is forgotten, the device must be returned to the factory for re-programming.

Write enable   With Write Protect "On", variables cannot be written to the device and commands that cause actions to be performed in the device cannot occur.
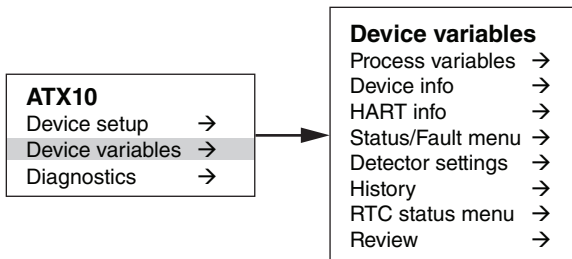
RTC SETUP MENU

This menu allows setting of the real time clock date and time. Note that the RTC must be set properly for the SD Memory Module to function as expected, and to provide accurate time stamps to the ATX10 onboard event logging.
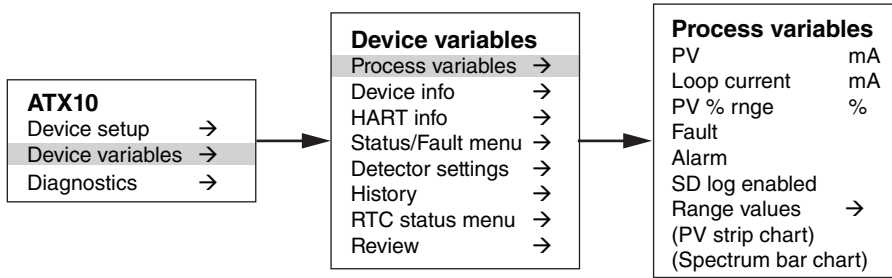
```
┌─────────────────────────┐     ┌────────────────────────────────┐     ┌──────────────────────┐
│ ATX10                   │     │ Device setup                   │     │ RTC setup menu       │
│ Device setup       →    │ →   │ Output condition         →     │ →   │ RTC second           │
│ Device variables   →    │     │ Config alarms menu       →     │     │ RTC minute           │
│ Diagnostics        →    │     │ AIC setup menu           →     │     │ RTC hour             │
└─────────────────────────┘     │ SD setup menu            →     │     │ RTC date             │
                                │ Write protect            →     │     │ RTC month            │
                                │ RTC setup menu           →     │     │ RTC year             │
                                └────────────────────────────────┘     └──────────────────────┘
```

RTC Second	0 to 59
RTC Minute	0 to 59
RTC Hour	0 to 23
RTC Date	1 to 31
RTC Month	1 to 12
RTC Year	0 to 99

DEVICE VARIABLES

```
┌─────────────────────────┐     ┌────────────────────────────────┐
│ ATX10                   │     │ Device variables               │
│ Device setup       →    │     │ Process variables  →           │
│ Device variables   →    │ →   │ Device info        →           │
│ Diagnostics        →    │     │ HART info          →           │
└─────────────────────────┘     │ Status/Fault menu  →           │
                                │ Detector settings  →           │
                                │ History            →           │
                                │ RTC status menu    →           │
                                │ Review             →           │
                                └────────────────────────────────┘
```

Process Variables	Refer to sub-menu.
Device Info	Identification information specific to the device.
HART Info	HART Specific Variables.
Status/Fault Menu	Current operating status and/or diagnostic information.
Detector Settings	Device settings relating to SD operation, AIC and alarm parameters.
History	Access to event data logs.
RTC Status Menu	Read only menu for viewing the real time clock.
Review	Displays a list of variables that are defined in the device.

PROCESS VARIABLES

ATX10
Device setup →
Device variables →
Diagnostics →

Device variables
Process variables →
Device info →
HART info →
Status/Fault menu →
Detector settings →
History →
RTC status menu →
Review →

Process variables
PV   mA
Loop current   mA
PV % rnge   %
Fault
Alarm
SD log enabled
Range values   →
(PV strip chart)
(Spectrum bar chart)

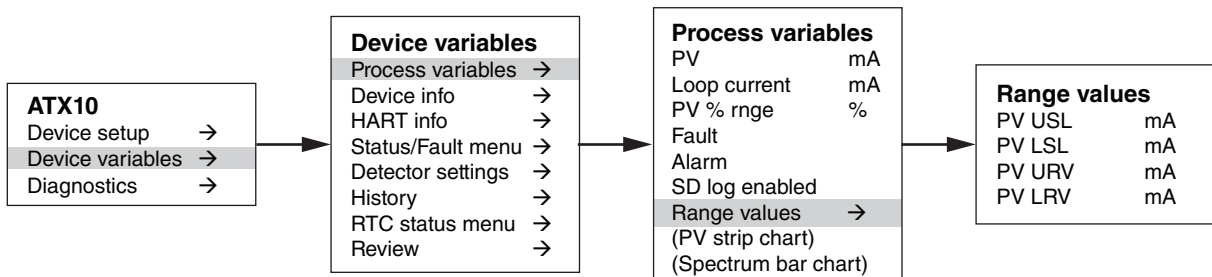| **PV**	Process variable.
Loop Current	Value of the primary variable being measured.
PV % Rnge	Percent of Range. The variable that tracks the Digital Value representation with respect to the range defined by the Lower Range Value and Upper Range Value, for normal operating modes. The units of this variable are always in percent.
Fault	Indicates "Y" if a fault condition exists.
Alarm	Indicates "Y" if the device is in alarm status.
SD Log Enabled	Event logging to the SD card is enabled.
Range Values	Operational endpoints of the analog value being measured.
(PV Strip Chart)	Displays the primary variable as a strip chart.
(Spectrum Bar Chart)	Displays the acoustic spectral data as a bar graph.

RANGE VALUES

ATX10
Device setup →
Device variables →
Diagnostics →

Device variables
Process variables →
Device info →
HART info →
Status/Fault menu →
Detector settings →
History →
RTC status menu →
Review →

Process variables
PV   mA
Loop current   mA
PV % rnge   %
Fault
Alarm
SD log enabled
Range values   →
(PV strip chart)
(Spectrum bar chart)

Range values
PV USL   mA
PV LSL   mA
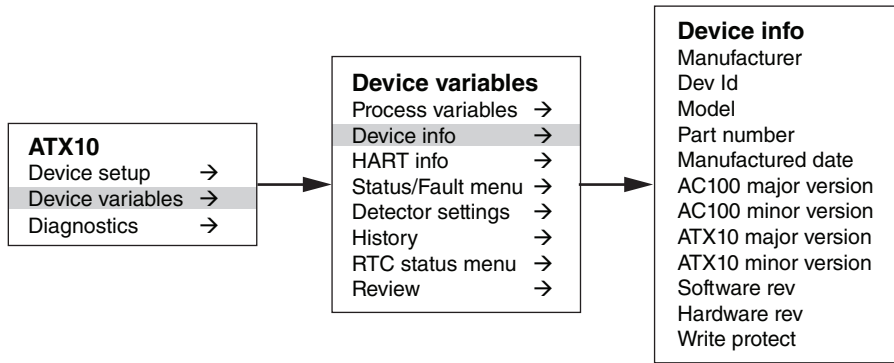PV URV   mA
PV LRV   mA

PV USL	The upper sensor limit value defines the maximum usable value for the upper range of the sensor.
PV LSL	The lower sensor limit value defines the minimum usable value for the lower range of the sensor.
PV URV	Upper range value.
PV LRV	Lower range value.

DEVICE INFO

```
                                     ┌────────────────────────┐
                                     │ Device info            │
                                     │ Manufacturer           │
                                     │ Dev Id                 │
                ┌──────────────────┐ │ Model                  │
                │ Device variables │ │ Part number            │
                │ Process variables→│ │ Manufactured date      │
┌─────────────┐ │ Device info     →│ │ AC100 major version    │
│ ATX10       │ │ HART info       →│ │ AC100 minor version    │
│ Device setup  →│ Status/Fault menu→│ ATX10 major version    │
│ Device variables→│ Detector settings→│ ATX10 minor version    │
│ Diagnostics   →│ History         →│ Software rev            │
└─────────────┘ │ RTC status menu →│ Hardware rev            │
                │ Review          →│ Write protect           │
                └──────────────────┘ └────────────────────────┘
```

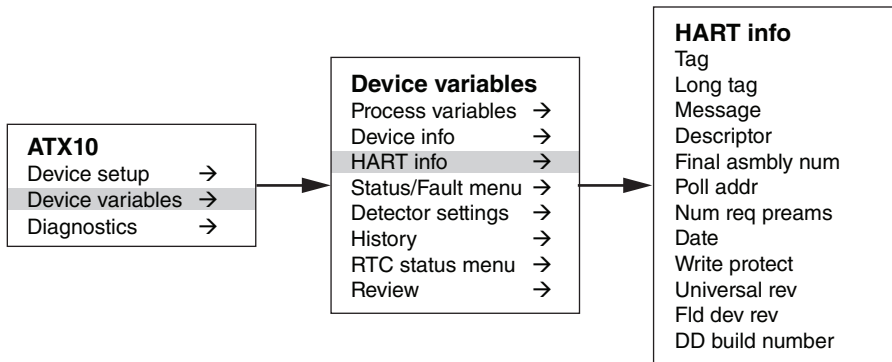**Manufacturer**   Det-Tronics

Dev id   A number used to identify a unique field device.

Model   ATX10

Part Number   Manufacturer's part number for this device.

Manufactured Date   Date of manufacture shown as XX/XX/XX (month/day/year).

AC100 Major Version   First two digits in AC100 Version format **XX**.XX

AC100 Minor Version   Last two digits in AC100 Version format XX.**XX**

ATX10 Major Version   First two digits in ATX10 Version format **XX**.XX

ATX10 Minor Version   Last two digits in ATX10 Version format XX.**XX**

Software Rev   Revision of Device Software in Hexadecimal format.

Hardware Rev   Revision of Device Hardware in Hexadecimal format.

Write Protect   This indicates whether variables can be written to the device, or whether commands that cause these actions to be performed in the device can or cannot occur.

HART INFO

This menu allows editing of the following functions:

```
ATX10                          Device variables              HART info
Device setup      →            Process variables  →          Tag
Device variables  →            Device info        →          Long tag
Diagnostics       →            HART info          →          Message
                               Status/Fault menu  →          Descriptor
                               Detector settings  →          Final asmbly num
                               History            →          Poll addr
                               RTC status menu    →          Num req preams
                               Review             →          Date
                                                             Write protect
                                                             Universal rev
                                                             Fld dev rev
                                                             DD build number
```

Tag
Text that is associated with the field device installation. This text can be used by the operator in any way.

Long Tag
Text that is associated with the field device installation. This text can be used by the operator in any way.

Message
Text associated with the field device that can be used by the operator in any way.

Descriptor
Text associated with the field device that can be used by the operator in any way.

Final Asmbly num
A number that is used for identification purposes, and is associated with the overall field device.

Poll Addr
Address used by the host device to identify a field device.

Num Req Preams
HART specific synchronization messages.

Date
Any date chosen by the operator to be used for any purpose.

Write Protect
This indicates whether variables can be written to the device, or whether commands that cause these actions to be performed in the device can or cannot occur.

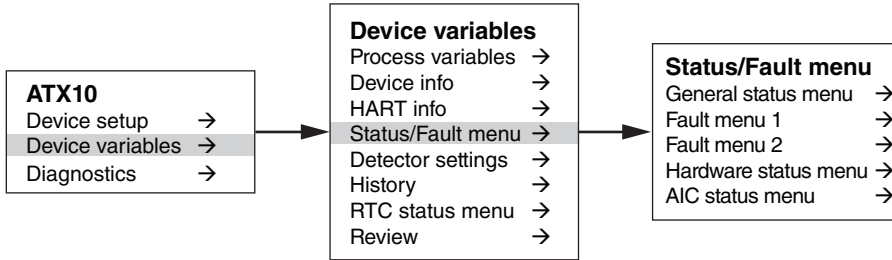**Universal Rev**
HART universal revision.

Fld Dev Rev
HART field device revision.

DD Build Number
Indicates the internal version number of the DD.

STATUS/FAULT MENU

This menu (read only) provides access to status/fault information about the detector.

```
ATX10                          Device variables              Status/Fault menu
Device setup       →           Process variables  →          General status menu    →
Device variables   →           Device info        →          Fault menu 1           →
Diagnostics        →           HART info          →          Fault menu 2           →
                               Status/Fault menu  →          Hardware status menu   →
                               Detector settings  →          AIC status menu        →
                               History            →
                               RTC status menu    →
                               Review             →
```

General Status Menu   Refer to sub-menu.

Fault Menu 1   Refer to sub-menu.

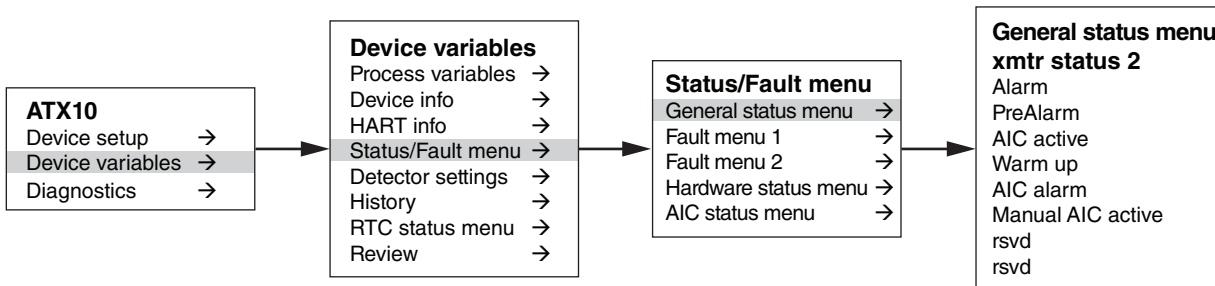**Fault Menu 2**   Refer to sub-menu.

Hardware Status Menu   Provides voltage and temperature as well as other hardware related information.

AIC Status Menu   Provides information regarding the AIC function of the device.

GENERAL STATUS MENU

```
ATX10                   Device variables            Status/Fault menu          General status menu
Device setup       →    Process variables  →        General status menu  →     xmtr status 2
Device variables   →    Device info        →        Fault menu 1         →     Alarm
Diagnostics        →    HART info          →        Fault menu 2         →     PreAlarm
                        Status/Fault menu  →        Hardware status menu →     AIC active
                        Detector settings  →        AIC status menu      →     Warm up
                        History            →                                   AIC alarm
                        RTC status menu    →                                   Manual AIC active
                        Review             →                                   rsvd
                                                                                rsvd
```

Alarm   Indicates "Y" if the device is in alarm status.

PreAlarm   Indicates "Y" if pre-alarm is enabled, and the device is in pre-alarm status.

AIC Active   Indicates "Y" if an AIC is currently in progress.

Warm Up   Device is in the power-up (initialization) time delay mode.

AIC Alarm   Indicates "Y" if the device is in AIC alarm status.

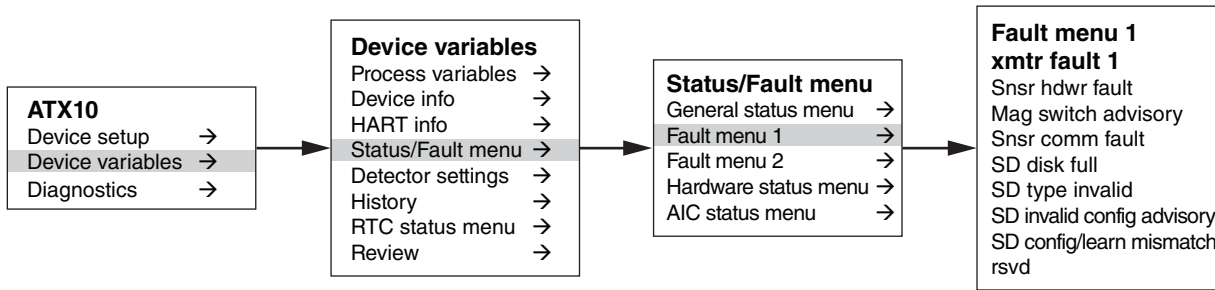**Manual AIC Active**   Indicates "Y" if a manual AIC is currently in progress.

Rsvd   Reserved for future use.

Rsvd   Reserved for future use.

FAULT MENU 1

ATX10			
Device setup	→		
Device variables	→		
Diagnostics	→		

Device variables
Process variables →
Device info →
HART info →
Status/Fault menu →
Detector settings →
History →
RTC status menu →
Review →

Status/Fault menu
General status menu →
Fault menu 1 →
Fault menu 2 →
Hardware status menu →
AIC status menu →

Fault menu 1
xmtr fault 1
Snsr hdwr fault
Mag switch advisory
Snsr comm fault
SD disk full
SD type invalid
SD invalid config advisory
SD config/learn mismatch
rsvd

Snsr Hdwr Fault   Indicates a hardware fault on the AC100 Sensor.

Mag Switch Advisory   The magnetic switch for initiation of a manual AIC (located on the ATX10 faceplate) is stuck on.

Snsr Comm Fault   Communication loss between ATX10 and AC100.

SD Disk Full   The SD disk is full. The ATX10 was unable to prevent the SD disk from reaching capacity. There is an error in the SD card and SD logging has stopped.

SD Type Invalid   Indicates that the microSD card in the SD Memory Module may not meet manufacturer specifications.

SD Invalid Config Advisory Indicates that the CONFIG and PROFILE data are corrupt of partially missing. This prevents the ability to select DOWNLOAD CONFIG, but UPLOAD CONFIG may be used to establish new CONFIG and PROFILE data from the contents of the ATX10.
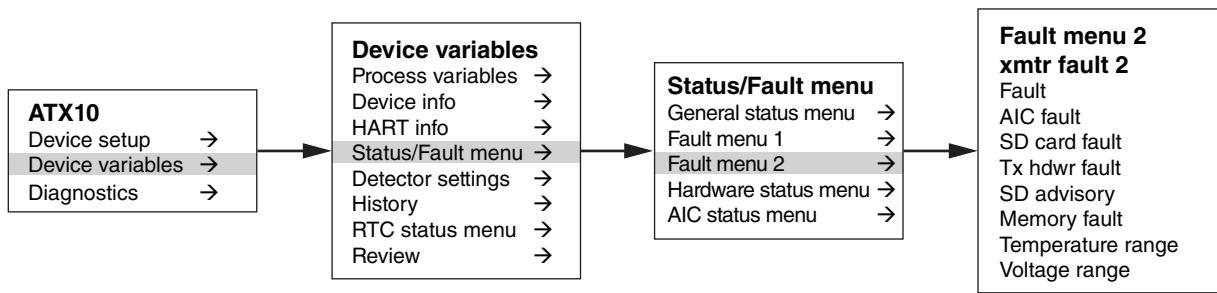
SD Config/Learn Mismatch   Indicates that the CONFIG and PROFILE data do not match the contents of the ATX10.

Rsvd   Reserved for future use.

FAULT MENU 2

|		
Fault	Indicates "Y" if a fault condition exists.	
AIC Fault	Indicates "Y" if the AIC has failed, indicating the microphone or emitter are degraded.	
SD Card Fault	SD card is out-of-sync with the ATX10 on-board flash.	
Tx Hdwr Fault	Indicates a hardware fault on the ATX10 Transmitter.	
SD Advisory	Indicates "Y" if the SD Memory Module has an issue that requires intervention.	
Memory Fault	Indicates "Y" if there is a corruption with Flash Memory.	
Temperature Range	Detector operating temperature is out of tolerance.	
Voltage Range	Detector operating voltage is out of tolerance.	

HARDWARE STATUS MENU

This menu shows measurements taken at the device to monitor its operation.
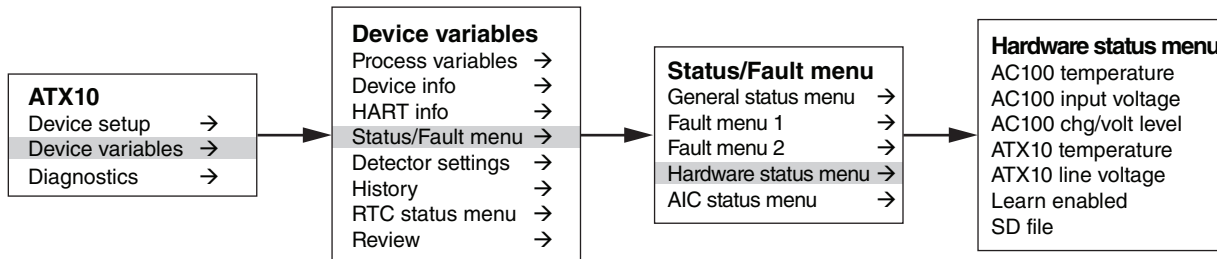
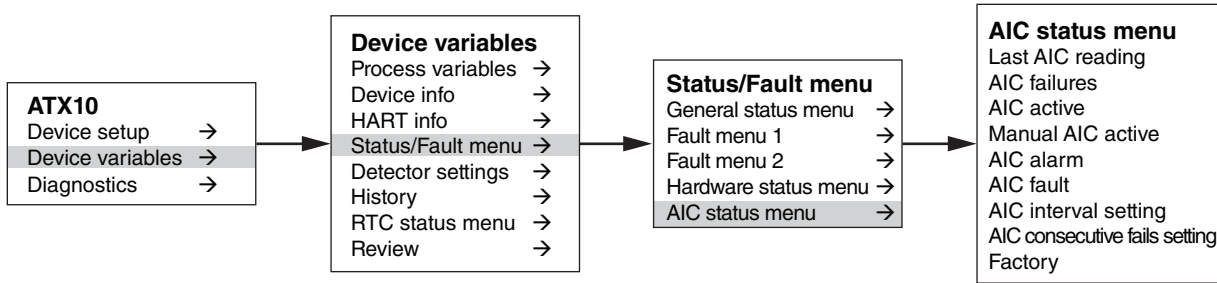|	
AC100 Temperature	The temperature of the AC100 in degrees C.
AC100 Input Voltage	Operating voltage at the input to the AC100.
AC100 Chg/Volt Level	The preamplifier bias voltage.
ATX10 Temperature	The temperature of the ATX10 in degrees C.
ATX10 Line Voltage	Operating voltage at the input to the ATX10.
Learn Enabled	Indicates whether the Learn function is active.
SD File	The file name to which Real Time Data is being logged on the SD Memory Module.

AIC STATUS MENU

```
                    ┌─────────────────────────┐                                      ┌────────────────────────────────┐
                    │ Device variables        │                                      │ AIC status menu                │
                    │ Process variables  →     │                                      │ Last AIC reading               │
┌──────────────────┐│ Device info        →     │  ┌──────────────────────────┐        │ AIC failures                   │
│ ATX10            ││ HART info          →     │  │ Status/Fault menu        │        │ AIC active                     │
│ Device setup   → ││ Status/Fault menu  →     │  │ General status menu   →   │        │ Manual AIC active              │
│ Device variables→││ Detector settings  →     │  │ Fault menu 1          →   │        │ AIC alarm                      │
│ Diagnostics    → ││ History            →     │  │ Fault menu 2          →   │        │ AIC fault                      │
└──────────────────┘│ RTC status menu    →     │  │ Hardware status menu  →   │        │ AIC interval setting           │
                    │ Review             →     │  │ AIC status menu       →   │        │ AIC consecutive fails setting  │
                    └─────────────────────────┘  └──────────────────────────┘        │ Factory                        │
                                                                                      └────────────────────────────────┘
```

Last AIC Reading — The numeric level returned by the AIC at the last check, acquired by measuring the amplitude of the microphone response to the emitter.

AIC Failures — The number of consecutive failures of the AIC check that have occurred. If this number exceeds the AIC Consecutive Fails Setting, then an AI Fault is annunciated.

AIC Active — Indicates "Y" if an AIC is currently in progress.

Manual AIC Active — Indicates "Y" if a manual AIC is currently in progress.

AIC Alarm — Indicates "Y" if the device is in AIC alarm status.

AIC Fault — Indicates "Y" if the AIC has failed, indicating the microphone or emitter are degraded.

AIC Interval Setting — The number of minutes elapsed until an AIC is performed automatically.
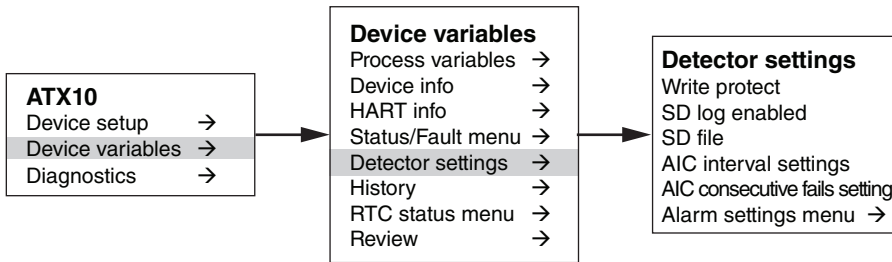
AIC Consecutive Fails Setting — The number of consecutive failures of the AIC permitted before an AI Fault is annunciated.

Factory — The AI READING calibrated at the factory, to which the AIC measurement is compared.

DETECTOR SETTINGS

```
┌─────────────────────────┐
│ ATX10                   │
│ Device setup        →   │
│ Device variables    →   │
│ Diagnostics         →   │
└─────────────────────────┘
```

```
┌──────────────────────────────┐
│ Device variables             │
│ Process variables        →   │
│ Device info              →   │
│ HART info                →   │
│ Status/Fault menu        →   │
│ Detector settings        →   │
│ History                  →   │
│ RTC status menu          →   │
│ Review                   →   │
└──────────────────────────────┘
```

```
┌────────────────────────────────────┐
│ Detector settings                  │
│ Write protect                      │
│ SD log enabled                     │
│ SD file                            │
│ AIC interval settings              │
│ AIC consecutive fails setting      │
│ Alarm settings menu            →   │
└────────────────────────────────────┘
```

Write Protect

This indicates whether variables can be written to the device, or whether commands that cause these actions to be performed in the device can or cannot occur.

SD Log Enabled

Event logging to the SD card is enabled.

SD File

The file name to which Real Time Data is being logged on the SD Memory Module.

AIC Interval Setting

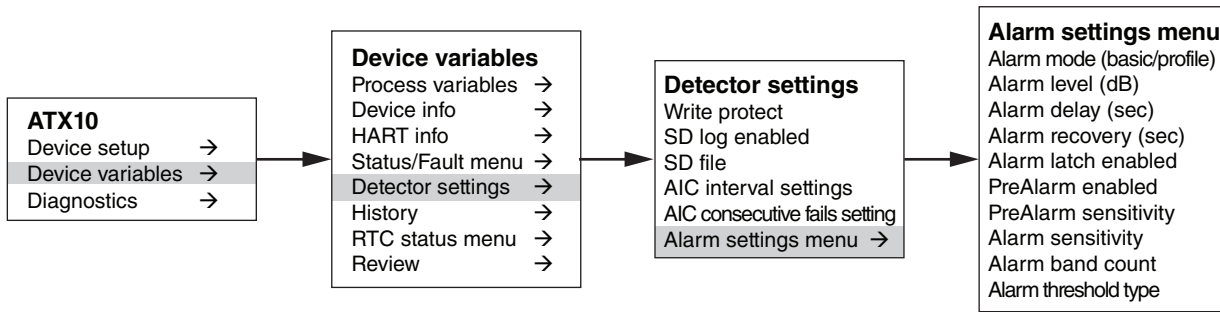The number of minutes elapsed until an AIC is performed automatically.

AIC Consecutive Fails Setting

The number of consecutive failures of the AIC permitted before an AI Fault is annunciated.

Alarm Settings Menu

Indicates the currently set alarm parameters.

ALARM SETTINGS MENU

```
┌──────────────────┐      ┌──────────────────────┐
│ ATX10            │      │ Device variables     │
│ Device setup   → │  →   │ Process variables  → │  →
│ Device variables →│      │ Device info        → │
│ Diagnostics    → │      │ HART info          → │
└──────────────────┘      │ Status/Fault menu  → │
                          │ Detector settings  → │
                          │ History            → │
                          │ RTC status menu    → │
                          │ Review             → │
                          └──────────────────────┘
```

```
┌──────────────────────────────┐      ┌──────────────────────────────┐
│ Detector settings            │      │ Alarm settings menu          │
│ Write protect                │  →   │ Alarm mode (basic/profile)   │
│ SD log enabled               │      │ Alarm level (dB)             │
│ SD file                      │      │ Alarm delay (sec)            │
│ AIC interval settings        │      │ Alarm recovery (sec)         │
│ AIC consecutive fails setting│      │ Alarm latch enabled          │
│ Alarm settings menu →        │      │ PreAlarm enabled             │
└──────────────────────────────┘      │ PreAlarm sensitivity         │
                                       │ Alarm sensitivity            │
                                       │ Alarm band count             │
                                       │ Alarm threshold type         │
                                       └──────────────────────────────┘
```

Alarm Mode (Basic/Profile)   Displays and permits changes to the alarm mode. Possible settings include "BASIC" or "PROFILE."

Alarm Level (dB)   This setting specifies the threshold (in dB) where bands are considered for alarm should they exceed that level.

Alarm Delay (sec)   This setting specifies the delay time, in seconds, that elapses from the moment the alarm criteria are met, until the alarm is annunciated.

Alarm Recovery (sec)   This setting specifies the time (in seconds) that elapses from the moment the alarm declared criteria are no longer met until the alarm is cleared.

Alarm Latch Enabled   When latching is enabled, alarms remain annunciated until the MASTER RESET command is sent, or the reset magnetic switch is tripped.

PreAlarm Enabled   'Y' indicates the prealarm feature is enabled. This allows a second sensitivity to be set for an alternate alarm annunciation.

PreAlarm Sensitivity   An offset that is subtracted from the alarm threshold in each band to generate a prealarm with higher sensitivity than the standard alarm. All the alarm threshold settings and alarm parameters apply to prealarm, but greater sensitivity is realized by adjusting the threshold level or profile with this setting.
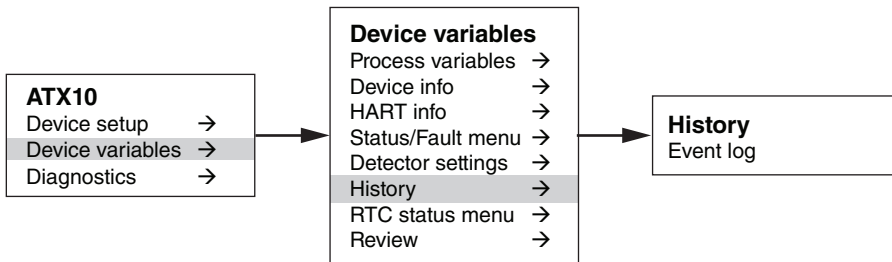
Alarm Sensitivity   An offset (in dB) that is added to the level or learn threshold for each band. A larger setting reduces the sensitivity of the detector to alarms.

Alarm Band Count   The number of bands that must exceed the alarm threshold to declare an alarm.

Alarm Threshold Type   The type of alarm threshold being used (LEVEL/LEARN). LEVEL is a single dB value alarm threshold across the alarm range, while LEARN is a dynamic alarm threshold with varying dB levels across the alarm range based on the learned acoustic profile.

HISTORY

This menu provides historical information about the detector in a format suitable for the limited on board flash memory on the ATX10. When the log is full, the oldest event is overwritten. The most recent event is displayed first.
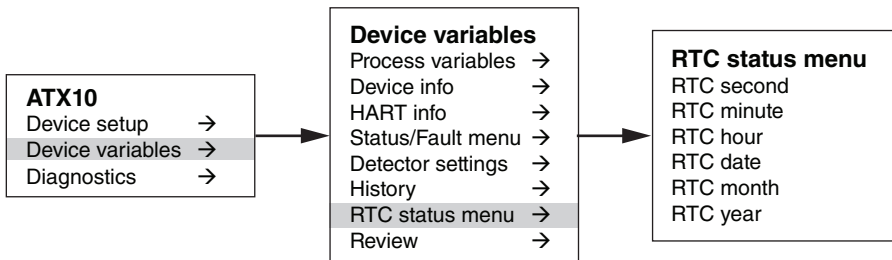
```
ATX10                          Device variables
Device setup      →            Process variables  →            History
Device variables  →            Device info        →            Event log
Diagnostics       →            HART info          →
                               Status/Fault menu  →
                               Detector settings  →
                               History            →
                               RTC status menu    →
                               Review             →
```

Event Log   Select to scroll through the event logs, containing Alarm, Fault, and Configuration Logs with time, date, and temperature stamp.
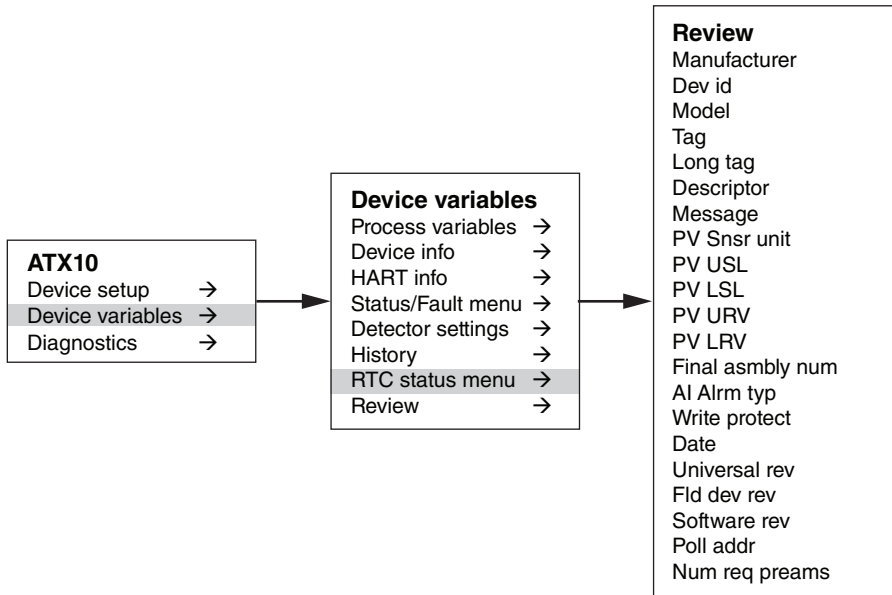
RTC STATUS MENU

Read only menu for viewing the real time clock.

```
ATX10                          Device variables
Device setup      →            Process variables  →            RTC status menu
Device variables  →            Device info        →            RTC second
Diagnostics       →            HART info          →            RTC minute
                               Status/Fault menu  →            RTC hour
                               Detector settings  →            RTC date
                               History            →            RTC month
                               RTC status menu    →            RTC year
                               Review             →
```

RTC Second   0 to 59

RTC Minute   0 to 59

RTC Hour   0 to 23

RTC Date   1 to 31

RTC Month   1 to 12

RTC Year   0 to 99

REVIEW

```
                                                          ┌─────────────────────┐
                                                          │ Review              │
                                                          │ Manufacturer        │
                                                          │ Dev id              │
                                                          │ Model               │
                                                          │ Tag                 │
                                                          │ Long tag            │
                                       ┌──────────────────────────┐ Descriptor  │
                                       │ Device variables    │    │ Message     │
                                       │ Process variables  →│    │ PV Snsr unit│
                  ┌──────────────────┐ │ Device info        →│    │ PV USL      │
                  │ ATX10            │ │ HART info          →│    │ PV LSL      │
                  │ Device setup   → │→│ Status/Fault menu  →│→   │ PV URV      │
                  │ Device variables→│ │ Detector settings  →│    │ PV LRV      │
                  │ Diagnostics    → │ │ History            →│    │ Final asmbly num│
                  └──────────────────┘ │ RTC status menu    →│    │ AI Alrm typ │
                                       │ Review             →│    │ Write protect│
                                       └─────────────────────┘    │ Date        │
                                                          │ Universal rev       │
                                                          │ Fld dev rev         │
                                                          │ Software rev        │
                                                          │ Poll addr           │
                                                          │ Num req preams      │
                                                          └─────────────────────┘
```

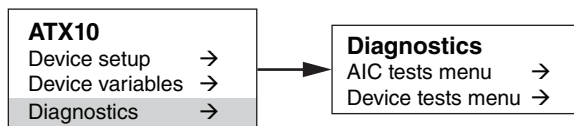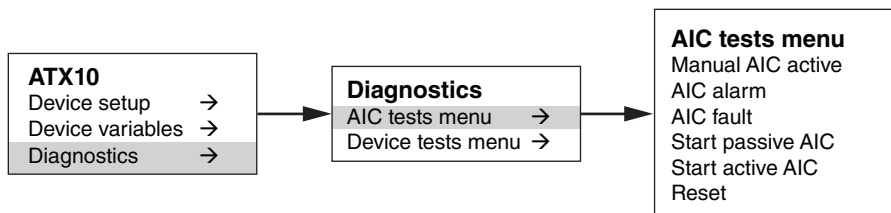|	
Manufacturer	Det-Tronics
Dev id	A number used to identify a unique field device.
Model	ATX10
Tag	Text that is associated with the field device installation. This text can be used by the operator in any way.
Long Tag	Text that is associated with the field device installation. This text can be used by the operator in any way.
Descriptor	Text associated with the field device that can be used by the operator in any way.
Message	Text associated with the field device that can be used by the operator in any way.
PV snsr Unit	ATX10
PV USL	The upper sensor limit value defines the maximum usable value for the upper range of the sensor.
PV LSL	The lower sensor limit value defines the minimum usable value for the lower range of the sensor.
PV URV	Upper range value.
Pv LRV	Lower range value.
Final Assmbly Num	A number that is used for identification purposes, and is associated with the overall field device.
AI Alrm Type	HART variable, not used by ATX10.
Write Protect	This indicates whether variables can be written to the device, or whether commands that cause these actions to be performed in the device can or cannot occur.

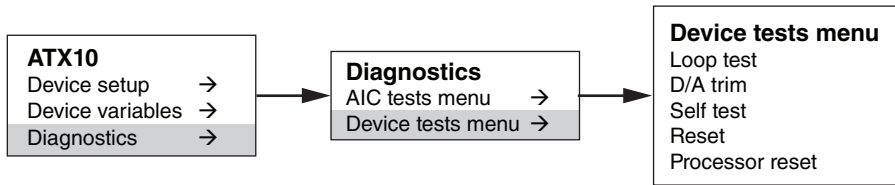|	
Date	Any date chosen by the operator to be used for any purpose.
Universal Rev	HART universal revision.
Fld Dev Rev	HART field device revision.
Software Rev	HART device software revision.
Poll Addr	Address used by the host to identify a field device.
Num Req Preams	Number of Request Preambles.

DIAGNOSTICS

```
┌─────────────────────────┐
│ ATX10                   │        ┌──────────────────────────┐
│ Device setup      →     │───────▶│ Diagnostics              │
│ Device variables  →     │        │ AIC tests menu    →      │
│ Diagnostics       →     │        │ Device tests menu →      │
└─────────────────────────┘        └──────────────────────────┘
```

AIC Tests Menu	Refer to sub-menu.
Device Tests Menu	Refer to sub-menu.

AIC TESTS MENU

```
                                              ┌──────────────────────┐
                                              │ AIC tests menu       │
┌─────────────────────────┐                   │ Manual AIC active    │
│ ATX10                   │  ┌──────────────────────────┐  AIC alarm │
│ Device setup      →     │─▶│ Diagnostics              │─▶ AIC fault │
│ Device variables  →     │  │ AIC tests menu    →      │  Start passive AIC │
│ Diagnostics       →     │  │ Device tests menu →      │  Start active AIC  │
└─────────────────────────┘  └──────────────────────────┘  Reset     │
                                              └──────────────────────┘
```

Manual AIC Active	Indicates "Y" if a manual AIC is currently in progress.
AIC Alarm	Indicates "Y" if the device is in AIC alarm status.
AIC Fault	Indicates "Y" if the AIC has failed, indicating the microphone or emitter are degraded.
Start Passive AIC	A PASSIVE AI test command starts an AIC manually. This AI test runs much like the regularly scheduled automatic AI. Regardless of the pass/fail status of the test, the 4-20 mA output does not change state.
Start Active AIC	An ACTIVE AI test command starts an AIC manually. This AI check annunciates its result on the 4-20 mA output. Alarm (20 mA) is annunciated in the event of a passing test to also provide the capability to check the propagation of the alarm signal. Regardless of the alarm latching setting, this output is latched until it is cleared via a Reset command or the reset magnetic switch.
Reset	This command clears all latched alarms and faults.

DEVICE TESTS MENU

```
┌─────────────────────────┐        ┌─────────────────────────┐        ┌─────────────────────────┐
│ ATX10                   │        │ Diagnostics             │        │ Device tests menu       │
│ Device setup      →     │───────▶│ AIC tests menu    →     │───────▶│ Loop test               │
│ Device variables  →     │        │ Device tests menu →     │        │ D/A trim                │
│ Diagnostics       →     │        └─────────────────────────┘        │ Self test               │
└─────────────────────────┘                                          │ Reset                   │
                                                                     │ Processor reset         │
                                                                     └─────────────────────────┘
```

Loop Test   This test allows the operator to manually set the analog signal output (4-20 mA) to a fixed user defined value.

D/A Trim   This function allows adjustment of the 4-20 mA output calibration.

Self Test   Internal tests are performed and any detected problems are reported.

Reset   This command clears all latched alarms and faults.

Processor Reset   This function re-initializes the microprocessor and resets the operating software,

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

DET-TRONICS