USER MANUAL

Honeywell FS20X Plus

Advanced multi-spectrum UV/3IR Flame detector

Honeywell

Channel Partner: sales@norrscope.com

Advanced Multi-Spectrum Electro-Optical Flame Detector.

FS20X Plus: UV + 3IR

Applications

Refineries	Gas Processing Plants	Offshore Drilling and Production Platforms
Co-generation Plants	Gas Collection Facilities	Petroleum Pipelines & Pumping Stations
Petrochemical Plants	Gas Turbine Enclosures	Commercial and Military Aircraft Hangars
Airport Terminals	LPG Storage/Distribution	Rail and Truck Loading/Unloading Terminals
Engine Test Cells	General Warehouses	Gasoline Loading Terminals
Power Plants	Aerosol Filling Facilities	Product Storage Terminals
Marine Terminals	Paint and Solvent Storage	Crude & Product Tank Farms
Cold Storage Warehouses	Marine Engine Rooms	Gas Compressor Buildings

Contents

1. Introduction

Safety

For additional Cautions and Warnings, see Appendices 1 and 2

DANGER RISK OF IMPROPER FLAME DETECTION

- Installation, commissioning, periodic testing, calibration, and all other maintenance must be performed only by trained professionals.
- Install in accordance with all local codes.
- Follow all warnings, cautions, and instructions.
- The suitability of the system installed is the responsibility of that system's designer and installer.
- Routinely check the system for proper operation and/or damage.
- Replace damaged and/or non-operating devices.

WARNING RISK OF IMPROPER FLAME DETECTION

- Install only in areas in accordance with the environmental and hazardous area ratings.
- Carefully review mounting area and position in accordance with the Performance Appendix and this Manual to ensure optimal flame detection regarding the angle of device and unobstructed view.
- Avoid potential sources of direct or indirect radiation in the flame detector field of view.
- Do not touch the sensors on the front of the electronics module.
- Avoid direct sunlight into the flame detector window – use provided sunshade, aim flame detectors down at 40 degrees or more when possible, and use multiple detectors to cover hazardous areas from different directions.
- Avoid close proximity to rapid modulation/chopping of sunlight (creating moving dark shadows) as optical sensor performance can be reduced, e.g. close trees in the wind, rotating blades.
- Use shielded cable for all wirings and ground the shield at one end as detailed in the Wiring section.
- Keep all devices and wire runs away from mercury vapor lights, variable speed drives, radio repeaters and other sources of electromagnetic interference.
- Follow local cabling and glanding rules.
- Seal all unused conduit entries and install proper drains/taps as required by local codes.
- Do not try to service parts inside the electronics module, there are no field serviceable parts.

⚠ CAUTION RISK OF PRODUCT DAMAGE

- Do not install where there are incidents of high mechanical damage. Protect the detector from physical damage (forklifts, scaffolding, etc.).
- Failure to follow all warnings, cautions, and instructions may void the warranty.
- Clean detector body and window with a damp cloth.
- Some regulatory agencies require the use of hazardous area approved plugs. Follow local rules.
- To maintain IP66/67 integrity, seal the conduit entries with thread sealant such as Loctite 565.

⚠ WARNING RISK OF IMPROPER FLAME DETECTION – HIGH TEMPERATURE

- If internal temperatures rise above acceptable levels, the FS20X Plus will issue a warning, and if temperatures rise further, the unit will shut off to protect the internal components.
- The detector may be damaged if external temperatures exceed 75ºC.
- Perform a test with a Honeywell test lamp to assure proper function. The detector must be returned to Honeywell for service if a high-temperature shutdown occurs.

⚠ CAUTION RISK OF VULNERABILITY IN NETWORKS

The FSX Plus flame detectors may be vulnerable to a cyber-attack on the HART® and RS-485 networks. Thus, a cautious installation requires physical protection of the 4-20mA loop and the RS- 485 wiring.

Disclaimer

In no event shall Honeywell be liable for any damages or injury of any nature or kind, no matter how caused, that arises from the use of the equipment referred to in this manual.

Strict compliance with the safety procedures set out and referred to in this manual, and extreme care in the use of the equipment, are essential to avoid or minimize the chance of personal injury or damage to the equipment.

The information, figures, illustrations, tables, specifications, and schematics contained in this manual are believed to be correct and accurate as at the date of publication or revision. However, no representation or warranty with respect to such correctness or accuracy is given or implied and FS20X Plus will not, under any circumstances, be liable to any person or corporation for any loss or damages incurred in connection with the use of this manual.

The information, figures, illustrations, tables, specifications, and schematics contained in this manual are subject to change without notice. Unauthorized modifications to the flame detection system or its installation are not permitted, as these may give rise to unacceptable health and safety hazards.

Any software forming part of this equipment should be used only for the purposes for which FS20X Plus supplied it. The user shall undertake no changes, modifications, conversions, translations into another computer language, or copies (except for a necessary backup copy).

In no event shall Honeywell be liable for any equipment malfunction or damages whatsoever, including (without limitation) incidental, direct, indirect, special, and consequential damages, damages for loss of business profits, business interruption, loss of business information, or other pecuniary loss, resulting from any violation of the above prohibitions.

Warranty

Honeywell warrants the FS20X Plus system against defective parts and workmanship and will repair or (at its discretion) replace any components that are or may become defective under proper usage within 3 years from shipment from Honeywell.

This warranty does not cover consumables, batteries, fuses, normal wear and tear, or damage caused by accident, abuse, improper installation, unauthorized use, modification or repair, ambient environment, contaminants or abnormal operating conditions.

This warranty does not apply to sensors or components that are covered under separate warranties, or to any 3rd-party cables and components.

Any claim under the Honeywell Product Warranty must be made within the warranty period and as soon as reasonably practicable after a defect is discovered. Please contact your local Honeywell Service representative to register your claim.

This is a summary. For full warranty terms please refer to the Honeywell General Statement of Limited Product Warranty, which is available on request.

* A Honeywell approved representative is a qualified person trained or employed by Honeywell Analytics, or a qualified person trained in accordance with this manual.

Copyright Notice

Security Guide

The construction of a reliable flame detection system requires protecting the equipment from unauthorized changes. The installer should comprehensively consider all types of tampering, including across digital networks.

Honeywell recommends the following steps to build a secure and reliable flame detection system:

1) Limit access to the detector by unauthorized personnel.
2) Regularly perform end-to-end testing.
3) Leave the HART interface disabled unless needed. If it is used, the password should be changed from the default.
4) Protect all cabling from unauthorized access including, the milliamp loop, the 24 V power, the relay wiring, and the RS-485 network.
5) Protect the USB connector from unauthorized access. Secure the enclosure with the supplied set screw.
6) Do not open the electronics module. There are no user-serviceable parts inside.

Note that the HART interface is disabled by default. If desired, it can be enabled using FlameManager.

Note that by default the RS-485 interface is configured for FP2, not Modbus. It can be switched between these protocols using FlameManager.

Specifications

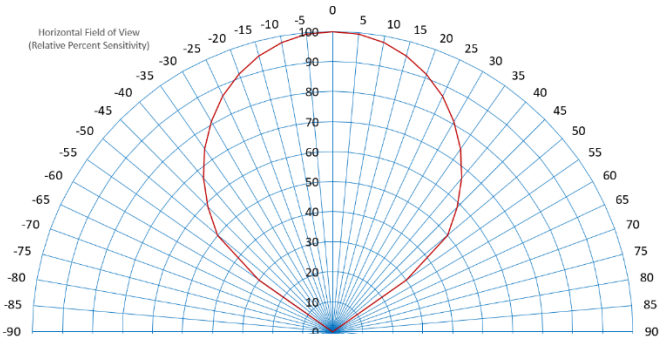
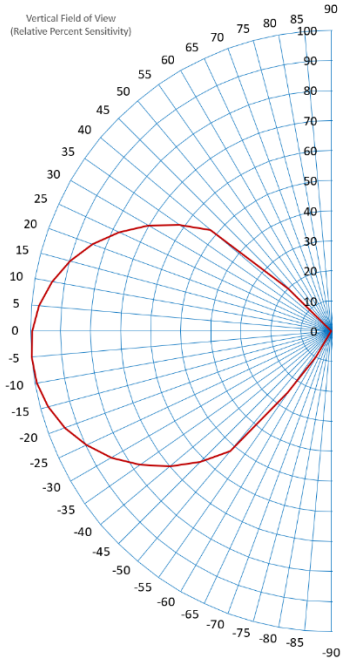
Temperature:	Operating Temperature (ATEX/IECEx): Storage Temperature (ATEX/IECEx): Operating Temperature (North America): Storage Temperature (North America):	-55°C to +75°C -55°C to +85°C -50°C to +75°C -50°C to +85°C
Humidity:	0 to 99% relative humidity	
Field of View (Conical) for Standard and Marine Mount:	The detector has an oval cone of view of 100° horizontal and 90° vertical (left 50°, right 50°, up 40°, down 50°) with the very high sensitivity on the central axis. Note: At 50% of on-axis distance horizontally and indoors and outdoors at very high sensitivity the FoV can extend to 120° (+/-60°).  	
	Note: See Appendix 2: FS20X Plus FM Performance Appendix for FM 3260 FoV performance.	
EN 54-10 Field of View:	EN 54-10 Field of View approved to symmetrical 90° (45° off axis horizontal and vertical rotation).	
Test Lamp:	FS20X Plus flame detectors are compatible with the Honeywell TL- 1055 and TL-2055 test lamps. Verification test distance: 3 to 8m (10 – 25 ft) at high sensitivity. Recommended test every 3 months.	
Operating Voltage:	24 VDC nominal (18-32 VDC) - Regulated	
Power Consumption:	1.8 Watts (nominal) 2.4 Watts (Alarm) 12 Watts (max) = 0.50 A @ 24 V with heater ON	

Table 1 -- Specifications

	Notes: When first energized temperatures below 13ºF [-25ºC] heaters will be activated for up to 30 minutes. During this time, the internal microcontrollers will not run, the Halo will be off, the relays will be de-energized, and the current loop will report less than 1.5 mA. 12W = 0.67 A at 18 V or 0.5 A at 24 V worst case. Inrush Current is 0.75A for a maximum duration of less than 5ms.
Weight:	Aluminum 3 lbs. 11 oz. (1.7 kg) Stainless Steel 7 lbs. 7 oz. (3.4 kg)
Flame Detection Performance:	See Appendix 2: FS20X Plus FM Performance Appendix for details of specific fuels, detection distances, and false alarm immunity. Note that fire is random and chaotic. The Flame detector will typically respond in less than 5 seconds.
Mean Time Before Failure:	>10-year MTBF with a commonly used database (e.g. MIL-217, MIL-217D, or Siemens SN29500). Two calculations - all components and only safety critical components.
Housing material:	Low Copper (less than 0.25%) marine grade red painted cast aluminum of ASTM A356.0 grade. Polished cast stainless steel of ASTM CF8M grade.
Outputs:	• Fault, Alarm and Auxiliary SPDT relays Max. 32 VDC/AC, max. 2 A, min 10 mA at 12 V resistive load. • 4-20 mA source, sink, or isolated current output. Uncertainty is 1% of reading. Capable of driving 20 mA up to 600 Ohm resistance (including any cable resistance) at the lowest operating voltage of 18 VDC • FP2 over RS-485 and USB (USB is accessible through electronic module only). • Modbus over RS-485.
HART	The FS20X Plus Flame detector has HART 7 communication; registered with FieldComm Group. EDD and DTM files are available.
Mounting Bracket:	Compatible with SM4 which has 10-degree increments of adjustment in horizontal and vertical directions. SM4-M marine version available.
Enclosure:	Diameter: 125 mm (4.92 in) x 115 mm (4.52 in) deep; Two M25 X 1.5P or two ¾" NPT conduit entries. Window size diameter: 79 mm (3.11 in)

Table 2 -- Specifications (cont.)

Local notification indicator:	LEDs Halo Light ring. Shows instrument status. Halo is visible at 50 ft. in daylight conditions. Suitable for indoor and night applications.
	Halo flash patterns during operation:

Illustration	State	Default Pattern	Optional (settable) Pattern
	Off or de-energized	Off	Not configurable
	Normal Operation, No fire	Mostly off, flashing Green every 5 seconds	Off
	Inhibited	Solid Yellow	Not configurable
	Fault	Flashing Yellow every second	Not configurable
	Alarm	Solid Red	Flashing Red
 	Warning	Flashing Yellow and Green Alternate	Not configurable

Table 3 -- Specifications (cont.)

Product Overview

Honeywell FS20X Plus is an advanced multi-spectrum electro-optical flame detector based on the WideBand IR™ technology in combination with UV which responds quickly to radiant energy created by flaming fires. It is suitable for operation in hazardous areas.

The FS20X Plus flame detectors are factory calibrated and robust. There is no need for a field calibration. The sealed design with no moving parts allows for mounting in harsh environments. These flame detectors are available in either CF8M grade stainless steel or red painted low copper aluminum along with a choice of either two M25 or two ¾'' NPT conduit entries.

These flame detectors operate under adverse weather conditions such as rain, mist, fog and in dirty environments such as smoke. Please note that the presence of environmental inhibitors, e.g. smoke, rain, mist, and fog, can absorb IR radiation and reduce the sensitivity of the detector. The FS20X Plus is less affected than other available detection technologies.

See section 'Safety Manual ' for a detailed explanation of the safety functions that the FS20X Plus fulfils.

What's in the Box

- 1 certified flame detector with a stopping plug
- 1 standard mount (SM4) or marine mount (SM4-M)
- 1 sunshade (SH-002)
- 1 FS20X Plus performance appendix
- 1 Certificate of Conformity

Features and Benefits

UV + 3IR sensor technology

- Excellent performance in adverse weather conditions (through smoke, rain, mist and fog)
- Able to detect a diversity of fire types and at greater distances
- Approved for HazLoc, performance and SIL 2 functional safety (pending)
- Pending marine certifications
- Built-in test diagnostics
- Further enhanced false alarm avoidance
- Conformal coated PCBA

Ease of Installation

- Small and light weight
- Comes with sunshade and mount as standard
- One person mounting onto varied infrastructure
- Simple wiring with 2 conduit entries and pluggable connections

Ease of Commissioning

- Easy aiming with graduated mount
- Easy guided setup via HART, RS-485 or USB / PC application
- Simple test with test lamp

Ease of Maintenance

- Simple bump test with Honeywell long range test lamps (simply test at height)
- Built-in test diagnostics certified to IEC 61508 SIL2 (pending)
- Advanced window monitoring
- No need to calibrate
- Plug and Play design for ease of installation and maintenance

Self-Test

The FS20X Plus executes a self-test sequence every minute. All optical sensor channels and the related processing of sensor data are evaluated to ensure that analog circuits, processors, and memory are functional. Depending on the function, tests are repeated several times to confirm device status prior to declaring a fault. In the case of the optical self-test, which evaluates the optical system by flashing internal light sources and monitoring the reflection from the window, a fault is not declared until a total of 5 consecutive attempts have failed. This takes a total of five minutes to complete.

Additional self-tests are conducted on a continuing basis to ensure the continuity of relay coils.

Alarm Verification Time

The FS20X Plus has an optional alarm verification time of 5, 10, 15, or 20 seconds (default is 0 seconds = OFF). If the alarm verification time remains at 0 seconds, the fire alarm relay will be activated as well as the 4-20 mA analog output will immediately change to 20.0 mA (known as full alarm) once the alarm condition is met. If the alarm verification time is not 0 seconds, the auxiliary relay should be changed from warning to verified alarm as well as the 4-20 mA analog output will change to 20.0 mA once the alarm condition is met, and the alarm verification timer is completed. Additionally, if the alarm condition is extinguished or is below the detection threshold of the flame detector before the alarm verification timer is completed, the alarm verification timer will reset, and the auxiliary relay and a 20.0 mA will not activate. In case of an immediate new alarm condition, the flame detector treats this as a new event and the alarm verification timer is reset. Alarm verification time can be a useful option for applications with short duration friendly fires such as flare stacks which don't require notification or executive actions.

Available Spares/Accessories

- SM4 swivel mounting bracket
- SM4-M marine swivel mounting bracket
- SH-002 sunshade
- FVR-01 field of view restrictor
- TL-1055 safe area test lamp
- TL-2055 hazardous area test lamp
- FS20XP-PUCK replacement electronics module
- FS24XP-NFPA-KIT NFPA 72 connector kit

CHAPTER

2. Installation, Commissioning, and Maintenance

Read this manual before starting the installation and commissioning.

Installation

Mounting

The FS20X Plus UV/IR3 Flame detector is mounted to a structure which may be indoors or outdoors. The detector is oriented to cover the desired area. Overlapping fields of view and voting are recommended to deliver the required safety case.

Note: Must only be installed by appropriately trained and accredited personnel.

1. Mount the SM4 or SM4-M bracket.

   Note: Select a location with a low chance of mechanical damage and low vibration.

   Ensure that the detector has a line of sight to cover the threat location. Avoid obstructions. Avoid radiant infrared energy sources, which may cause false alarms.

   Refer to the sensitivity settings. Note the inverse square law to determine range to a specific fire type and size.

   Make sure that the flame detector is weather tight before leaving in position.

   Ensure only approved fittings and plugs are used to seal unused openings. Thread lock on conduit entries may be required to ensure sealing in areas with heavy rains or chance of flooding.

   Follow all local electrical codes for glands and installation.

   Ensure sufficient grease is present on the cover thread before installation. The product can be made tamper resistant by tightening the set screw.

2. Install the detector on the SM4/SM4-M bracket using the two bolts provided.

   Note: Honeywell recommends angling all detectors down at least 40 degrees from horizontal. The SM4 and SM4-M mounts have marked angle graduations.

   Note: SM4-M is more resistant to vibration for marine or high-vibration applications.

Opening the Detector

It is necessary to remove the detector electronics module from the enclosure to access the field connections.

⚠CAUTION RISK OF ELECTRIC SHOCK

Disconnect power before unscrewing the housing lid.

1. Loosen, but do not remove, the set screw on the enclosure lid as shown in Figure 1.

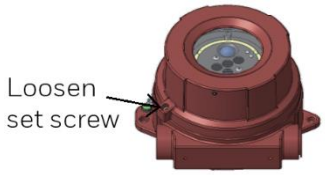


Figure 1

2. Turn counterclockwise to unscrew the enclosure lid as shown in Figure 2.

Figure 2

3. Loosen the three captive screws on the electronics module as shown in Figure 3

Figure 3

4. Slide the electronics module out of the enclosure base as shown in Figure 4.

Figure 4

Installation Summary

1. Loosen, but do not remove the set screw on the cover assembly as shown in Figure 1 in Opening the Detector section.

2. Unscrew the lid as shown in Figure 2 in Opening the Detector section.

3. Loosen the 3 Philips screws and remove the electronics module and place face up in a safe location as shown in Figures 3 and 4 in Opening the Detector section.

Note: Do not drop the electronics module.

4. Connect the armored cable gland or conduit to the detector enclosure via the M25 or ¾" NPT openings as per local electrical codes. Connect the appropriate wires to the pluggable terminal block provided as per the wiring diagram on the rear cover of the electronics module and this manual.

Note: Add thread sealant to conduit and cable entries such as Loctite® 565 or equivalent to ensure that no water or dust ingress is possible.

5. Configuration is done by USB or RS-485 with the PC application available from automation.honeywell.com. See Appendix 3: Honeywell FlameManager section of this manual. This is easiest done prior to installation.

Note: Refer to the fuel/sensitivity setting table in the performance appendix to determine the correct configuration.

6. Connect the pluggable terminal block back into the electronics module and secure the captive screws.

WARNING: Do not touch the sensor array as finger oils interfere with infrared signal transmission.

7. Install the cover and ensure the O-ring is secure. Tighten the set screw on the cover assembly. Loosen the bolts on the mounting bracket and make a rough FoV adjustment by aiming the detector at the coverage area.

8. Fit the sunshade between the flame detector and mount. Tighten bolts on mounting bracket mount when FoV adjustments are complete. Honeywell recommends aiming the detector downward 40 degrees.

Note: The ring terminal is tin-plated. If the detector is installed in harsh corrosive environments, the ring terminal should be protected with conductive grease.

Note: Detector functionality and communication to safety system should be tested to confirm correct FoV and configuration.

Note: The FS20X Plus runs an initial start-up procedure and is not able to detect flames for approximately two minutes after power is applied.

Wiring

The FS20X Plus Flame detector electronics module has pluggable terminal blocks for interfaces (Power Supply, RS-485, Relay, etc.) with retention for easy wiring and for plug-in replacement of a module in the field. The terminal block takes 14 AWG to 24 AWG cable with stranded conductors. Typically, 16 AWG or 2.5 mm2 shielded cable is recommended for all wiring.

When connecting to a fire panel, consider the NFPA 72 standard when applicable. For duplicate terminals and leads for supervised relay connections to the fire alarm system, use part number FS24XP-NFPA-KIT NFPA assembly kit includes 6-pin two-row connector as well as 9-pin two-row connector.

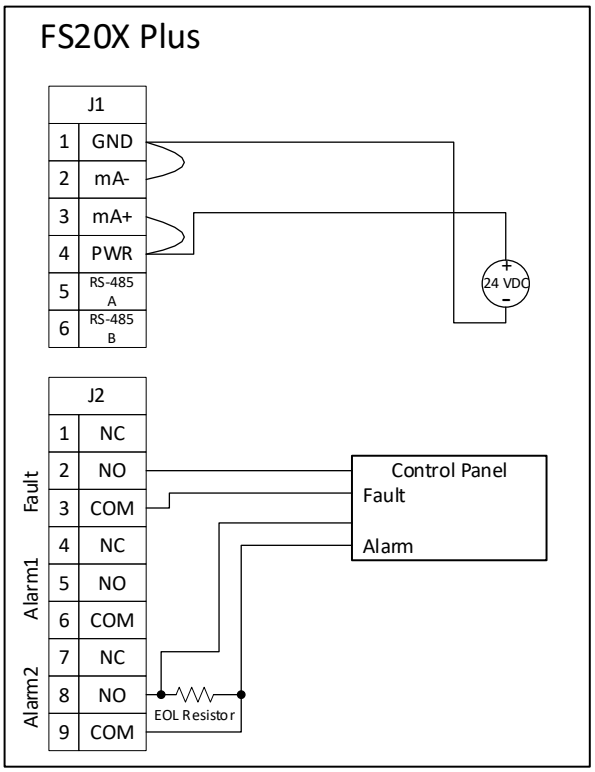


Figure 5: Independent Alarm and Fault Relay Interface Circuit

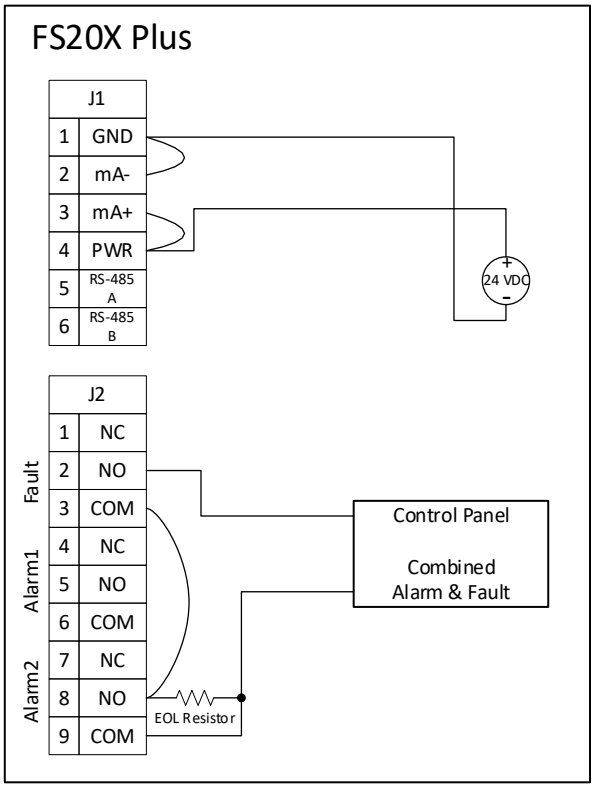


Figure 6: Combined Alarm and Fault Relay Interface Circuit

Note: On power-up, the FS20X Plus flame detector will run a start-up routine during which current levels maybe not be stable. The controller should also be set to filter milliamp transients of less than 1 millisecond.

The following diagrams show the mA wiring options:

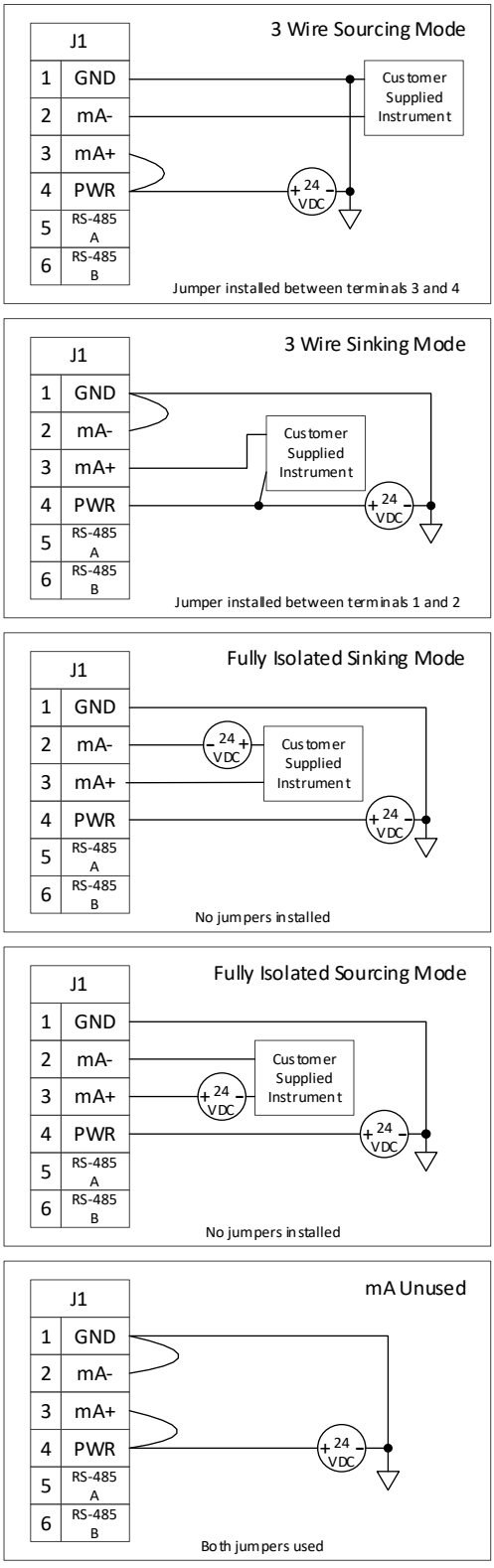


Figure 7: Loop Wiring

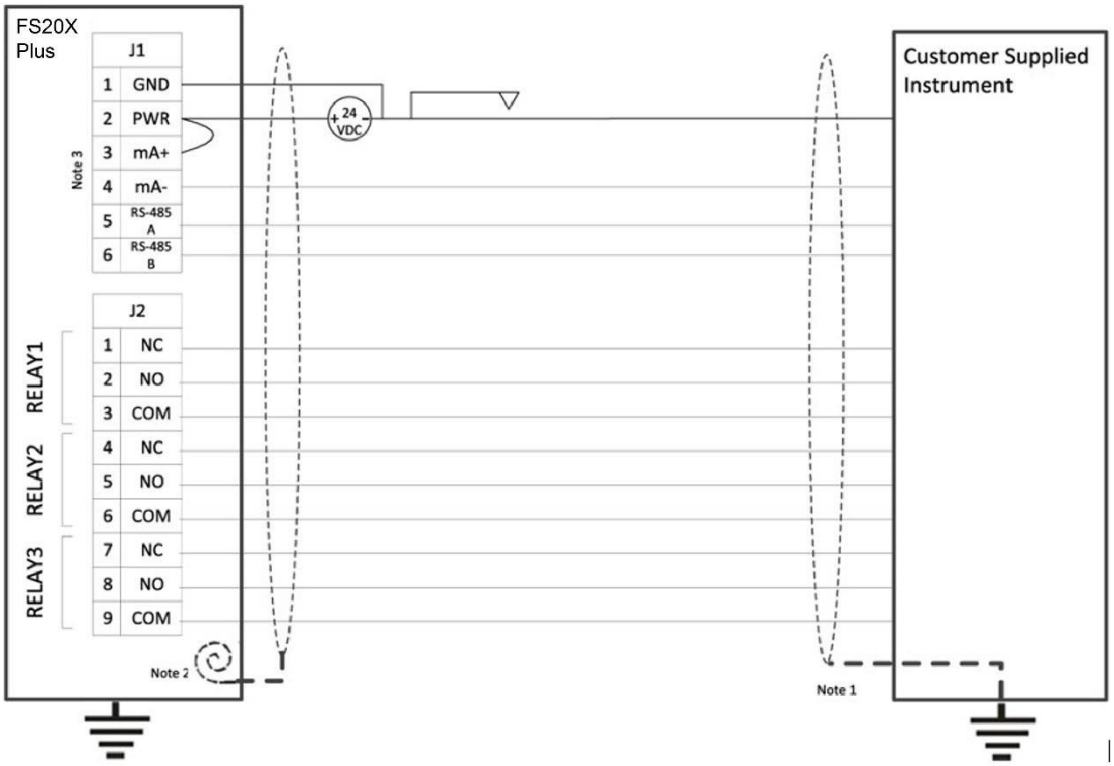


Figure 8: Cable Shield Termination

Notes for EN54-10:

1. All cable shields must be earth grounded at the customer supplied instrument like the control panel only.

2. Coil and tape the cable shields at the detector end.

3. The mA loop wiring is shown for three wire source mode. Refer to the wiring diagram for details on other modes.

General Notes on Shielding:

a. Use of shielded twisted pairs with shield coverage of more than 80% is recommended.

b. Ensure that the cable shield is an open circuit at the FS20XP enclosure .

Commissioning the Detector

Apply power to the FS20X Plus Flame detector. This can be done in a field workshop before installation.

The Halo flash pattern activates during boot-up: red, green, and blue repeatedly, for about 30 seconds followed by solid yellow for two minutes indicating inhibit state.

Note: Heaters are used during extreme cold to bring the internal electronics up to a minimum temperature. During this time, which can last up to 30 minutes, the internal microcontrollers are not running, Halo will be off, and the current loop will report less than 1.5 mA.

The Halo patterns during operation are shown in the Specifications section.

Analog Output: Flame Detected

The 4-to-20mA current loop is connected on two terminals marked "mA+ " and "mA-".

This output corresponds to the Primary Variable. HART Communication is supported on this loop.

The FS20X Plus is equipped with a 4-20 mA loop output which can operate in source, sink and isolated mode. Source, sink, and isolated modes are configured by wiring. This output is a safety-related output and is suitable for use in SIL 2 applications. Normal operation and alarm conditions are indicated between 4 to 20 mA.

Operational State	Factory Default	Configurable Range		Configuration Restrictions
		Min	Max	
Power Fault / No Power	0.0 mA	Not Configurable		Loop Current Value will be 0.0 mA in case of non-maskable fault state (safe state)
Instrument Fault State	1.0 mA	1.0 mA	3.6 mA	Not to exceed Inhibit setting - resolution of setting 0.1 mA
Inhibit State	2.0 mA	1.0 mA	3.6 mA	Greater than or equal to a fault and not to exceed Warning - resolution of setting 0.1mA
Instrument Warning State	3.0 mA	1.0 mA	4.0 mA	Greater than or equal to Inhibit - resolution of setting 0.1mA
Normal Operation State	4.0 mA	4.0 mA	4.5 mA	4.5 mA for FMM-420 Module Interface
Background IR	Disabled	8.0 mA		Not Configurable
Background UV	Disabled	12.0 mA		Not configurable
Fire Alarm State	16.0 mA	4.0 mA	20.0 mA	Configurable Values are either 4.0 mA, 16.0 mA or 20.0 mA
Verified Fire Alarm State	20.0 mA	Not Configurable		

Table 4 -- Milliamp Output Levels

Electronics Module Replacement

Note: Check the O-ring is in place on the enclosure base before replacing the electronics module.

Note: Take proper precautions to prevent damage from electro-static discharge.

Note: In the event of a fault, the detector electronics module can be replaced to enable rapid maintenance.

Note: Use a strap wrench at low temperature if the enclosure binds.

1. Loosen, but do not remove the set screw on the cover assembly. (See Figure 1)

2. Turn counterclockwise (CCW) to unscrew the enclosure lid (See Figure 2)

3. Loosen the 3 captive screws (See Figure 3) and remove the electronics module.

4. Slide the new replacement electronics module onto the standoffs in the base enclosure. (See Figure 4)

WARNING: Do not touch the sensor array as finger oils interfere with infrared signal transmission.

5. Tighten the 3 captive screws.

6. Screw the cover onto the base enclosure. Tighten the set screw.

Maintenance

To ensure the detector is operating properly at all times, it is necessary to establish a periodic cleaning schedule. In general, semi-annual inspection and testing is recommended with a Honeywell test lamp. A complete "end-to-end" test of the entire fire detection system should be performed periodically depending on the application More frequent inspection and testing should be considered for any adverse environment such as frequent temperature excursions above 40 C [104 F] or environmental contaminates. Local or regional standards such as NFPA72 may also dictate inspection or testing requirements.

Test Lamp Operation

Honeywell, in compliance with NFPA 72 codes, developed portable test lamps for periodic testing.

The function of the test lamp is to quickly and effectively ensure the flame detector's optical path is not blocked, the detector is aimed properly at the fire threat area (that the detector mounting bracket didn't move or was accidentally bumped by someone), and the detectors alarming circuitry and outputs (i.e. relays, 4-to-20 mA, etc.) all function properly.

Note: For detailed information, see Portable Test Lamps User Manual

While a built in through window test can indicate a dirty window, it cannot fully show that a flame detector can see and respond to a fire at specific positions in the field of view. For that reason, regular testing (at least quarterly) with the dedicated test lamp is recommended.

For testing, in compliance with best practice and NFPA 72 Codes for flame detectors, as manufacturers of the FSX Plus product line, tests are made using the Honeywell TL-1055 or TL-2055 test lamp with a range of 10-25 ft when fully charged.

See the Appendices for details of FS20X Plus configuration.

⚠WARNING RISK OF EXPLOSION

Use test lamp model TL-1055 in non-hazardous locations only. For hazardous locations, use model TL-2055.

⚠WARNING RISK OF UNINTENTIONAL EMERGENCY RESPONSE

Testing the flame detector will result in an alarm. Ensure all personnel and emergency responders have been appropriately notified of testing and/or disconnect/disable outputs (including RS-485, 4-20 mA, and relays) prior to testing.

3. Declarations of Conformity and Product Information

Declarations of conformity (such as EU or UK Declarations of Conformity) and Product Information are available at: automation.honeywell.com on the products “Resources” tab.

FS20X Plus Material Numbers

Product	Material	Entries	Approvals	Reserved	Reserved
FS20XP	A = Aluminum S = Stainless Steel	M = M25 N = ¾” NPT	G = Global	X = Standard D = Demo	X = Standard M = Marine
FS20XP-ANGXX	**FS20X Plus** - UV/3IR - AL - 3/4 NPT kit includes mount and sunshade				
FS20XP-AMGXX	**FS20X Plus** - UV/3IR - AL - M25 kit includes mount and sunshade				
FS20XP-SNGXX	**FS20X Plus** - UV/3IR - SS - 3/4 NPT kit includes mount and sunshade				
FS20XP-SMGXX	**FS20X Plus** - UV/3IR - SS - M25 kit includes mount and sunshade				
FS20XP-ANGXM	**FS20X Plus** - UV/3IR - AL - 3/4 NPT kit includes marine mount and sunshade				
FS20XP-AMGXM	**FS20X Plus** - UV/3IR - AL - M25 kit includes marine mount and sunshade				
FS20XP-SNGXM	**FS20X Plus** - UV/3IR - SS - 3/4 NPT kit includes marine mount and sunshade				
FS20XP-SMGXM	**FS20X Plus** - UV/3IR - SS - M25 kit includes marine mount and sunshade				

Table 5 -- Material Numbers

4. Honeywell FlameManager

Installation

FlameManager is an application program for personal computers. It facilitates configuring and interrogating the FS24X Plus and FS20X Plus Flame detector. FlameManager can communicate over either USB or RS-485 networks.

Minimum System Requirements:

- Microsoft Windows 10 or later. 32 or 64-bit version.
- Microsoft .NET framework version 4.8 or later.
- A USB or RS-485 port
- A 1024 X 768 pixels or larger screen.
- 1 GB of free disk space
- A USB-A to USB-B micro cable.
- (optional) An RS-485 interface, such as the Advantech BB-USOPTL4

Installation Steps:

1. Search on the website automation.honeywell.com for the FS24X Plus or FS20X Plus product page.
2. Under the “Resources” tab, find and download FlameManager.zip
3. Extract the contents
4. Run the resulting MSI file.
5. The FlameManager icon should appear on the desktop. It looks like this Figure 9. Run this.

Figure 9

Communication Parameters

The program first displays the communications parameters form. The default appearance of this is shown in Figure 10.

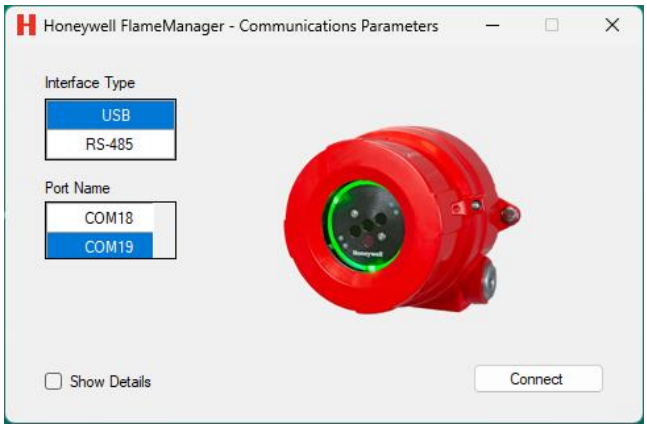


Figure 10

Complexity increases when RS-485 and "Show Details" are selected. An example is Figure 11. Baud rate, parity, and licensing information are shown. The program installation script automatically installs "HoneywellFlame.lic" in the "Documents" where the program can find it. It may be necessary to manually copy that file for different users, expiration times, or special capabilities.

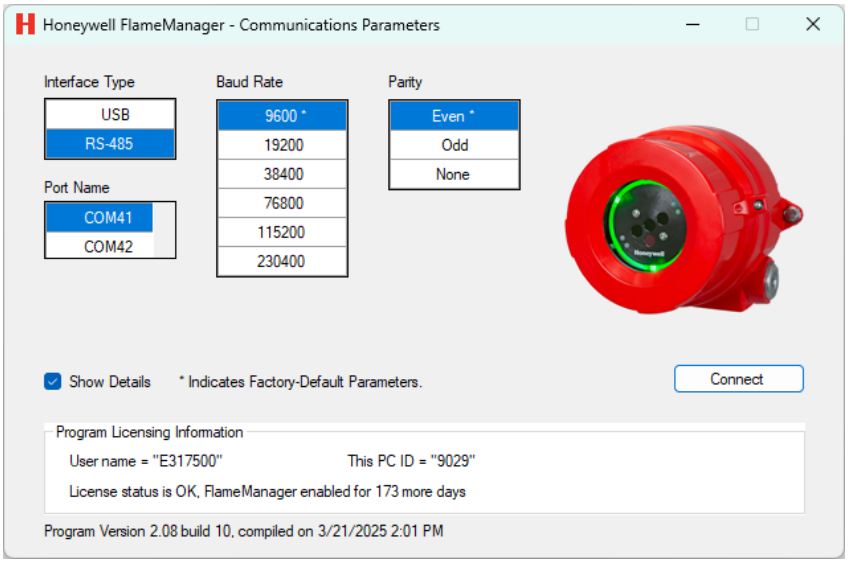


Figure 11

At minimum, two fields must be set to enable communications.

The first field is the interface type – either USB or RS-485. Either medium uses Honeywell's proprietary FP2 protocol. USB is most convenient because there is no need to configure baud rate and parity, and it provides modest speed. No special hardware is needed. USB alone is sufficient to power the detector and permit configuration. However, without 24 VDC power, the detector will continuously report a fault.

However, RS-485 is advantageous in that it can be accessed while the detector is in the enclosure, it tolerates a longer cable length of up to 1200 meters [4000 feet] and is faster if

configured for the highest baud rate. It requires an RS-485 transceiver. And it requires that the communications parameters (baud rate and parity bits) match on both ends. The default communications parameters are 9600 baud and even parity. Long or fast networks require correct 120Ω termination resistors on both ends. The live streaming feature requires either USB or RS-485 configured for 115,200 or greater baud rate.

The second field is the port name. MS-Windows assigns the name COM1, COM2 … COM99 to serial devices. On many computers, selecting the COM port number will be trivial because the flame detector will be the only port present. In complex cases, it may be necessary to observe which COM port appears and disappears from the list when the FS20X Plus is connected. The list is only refreshed when the program is closed and re-opened.

The FP2 does not support multidrop networks – installations wishing to communicate with multiple FS20X Plus Flame detector must have a unique pair of wires and RS-485 transceiver for each detector.

When all of the settings are correct in the communications parameter form, pressing [Connect] will cause the main window to appear as shown in Figure 12.

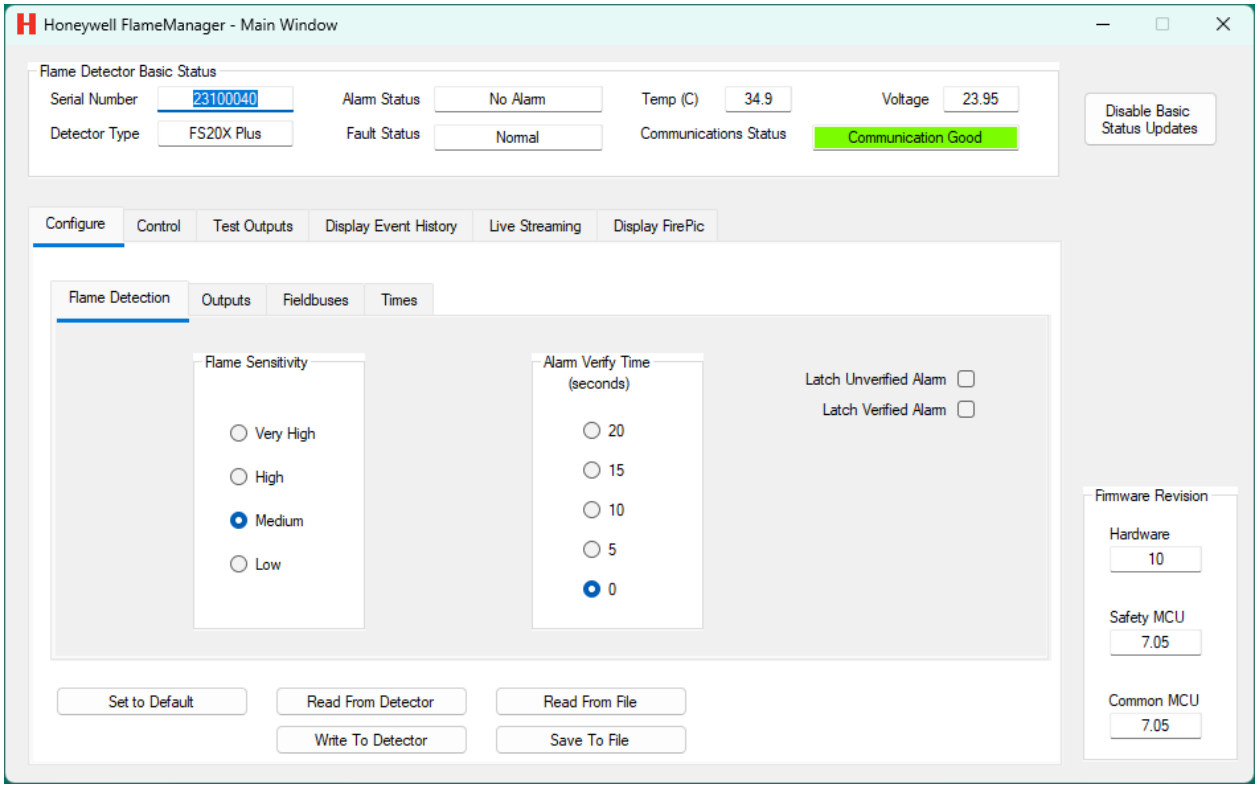


Figure 12

Most of the controls are self-explanatory. All the tabs and forms are listed below with explanations where needed.

The primary safety function of the FS20X Plus is affected by many of the controls, for example setting the flame sensitivity. Since this detector is suitable for use in systems with a safety integrity level of 2, it is essential that any change be clearly communicated. For this reason, a confirmation dialog, such Figure 12, will frequently appear. Press [OK] to accept the change or [Cancel] to reject it.

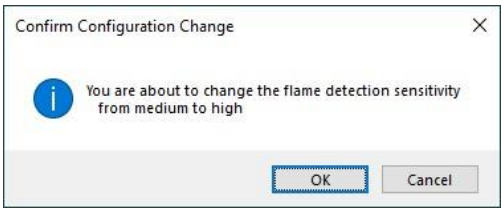


Figure 13

Configure/Outputs tab

The Configure/Outputs tab has the controls shown Figure 14. Several rules restrict the setting of mA levels. The checkbox highlighted in purple will only be present when an FS20X Plus is connected.

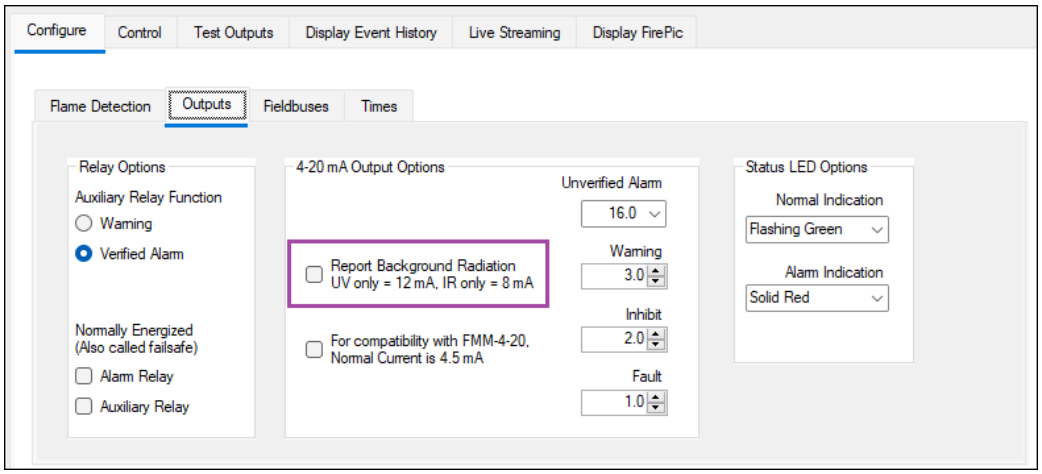


Figure 14

Configure/Fieldbuses tab

The Configure/Fieldbuses tab permits setting up the RS-485 port as shown in Figure 15. The port can communicate using standard Modbus or proprietary FP2, but not both concurrently. The Modbus register set is listed in Chapter 0

Modbus Interface on page 60. If FP2 communications on RS-485 is lost either because Modbus is enabled or because the asynchronous communications parameters are unknown, then control can be re-established using the USB port. Neither the HART Device ID nor Tag can be changed by FlameManager. The Device ID is written during manufacturing and cannot be changed in the field. The HART Tag is written by a HART configurator such as the Honeywell Versatilis. Note that the FS24X Plus with V5.05 firmware has a maximum speed of 115200 baud.

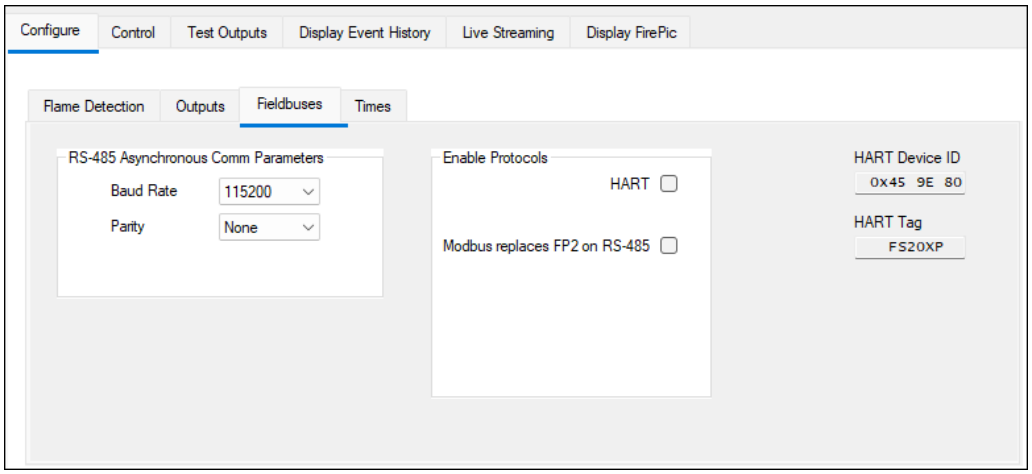


Figure 15

Configure/Times tab

The Configure/Times tab is shown in Figure 15. By default, all the timeouts are 10 minutes. This can be set up to 65000 seconds (18 hours) or even indefinitely by writing 0. These configurations should be used cautiously because they have the possibility of disabling the safety function permanently.

The real-time-clock is set to UTC in the factory. FlameManager automatically applies an appropriate offset to all timestamped data (events and FirePics) to cause them to report in the time zone of the PC. However, the HART event history report does not adjust for time zones. For installations utilizing this feature, setting the detector's clock to local time may be more convenient.

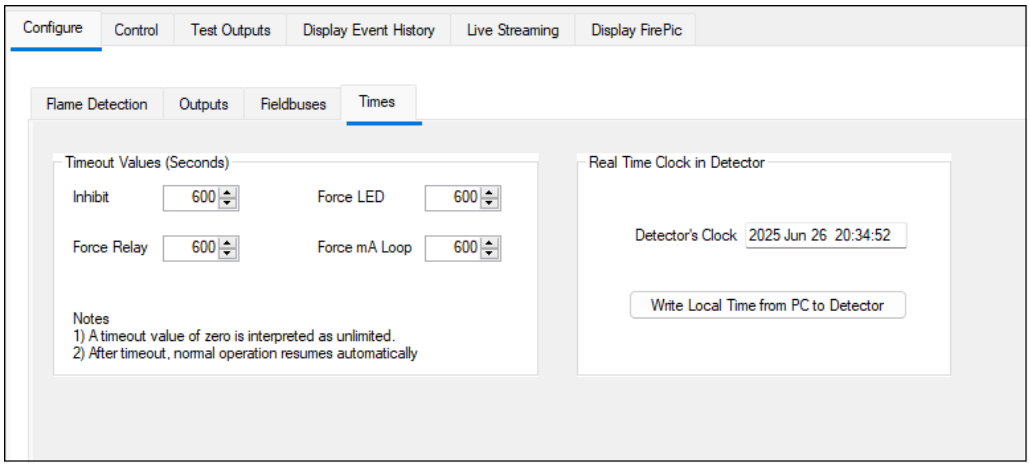


Figure 16

Control tab

The Control tab facilitates adjusting inhibit and other functions as listed in Figure 17.

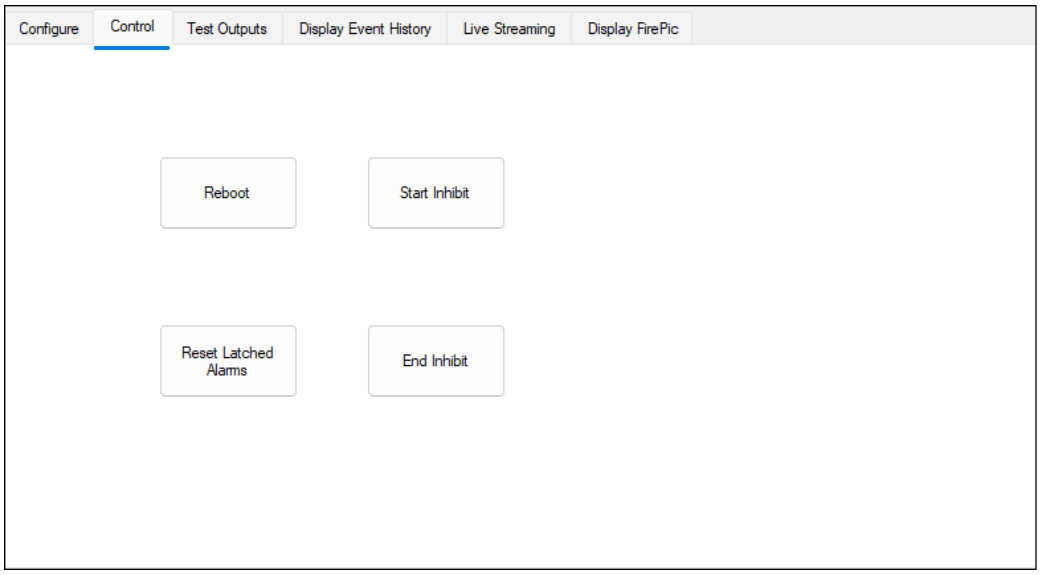


Figure 17

Test Outputs tab

The Test Output tab is shown in Figure 18. This facilitates forcing the milliamp, relay, and Halo outputs. Timeout of these is usually 10 minutes. These functions facilitate confirming that internal hardware and external automation are working correctly. As previously noted, the relays will not operate when the detector is powered by USB alone.

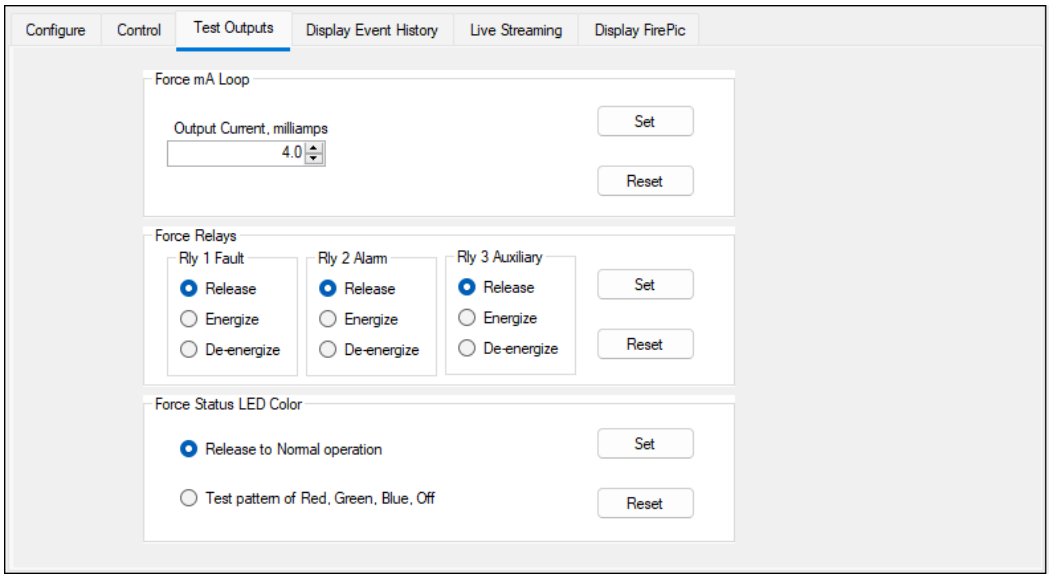


Figure 18

Display Event History tab

The Display Event History tab is shown in Figure 19. Updating this list can be slow as the detector can store thousands of events. Many events may be created if the puck is powered by USB alone.

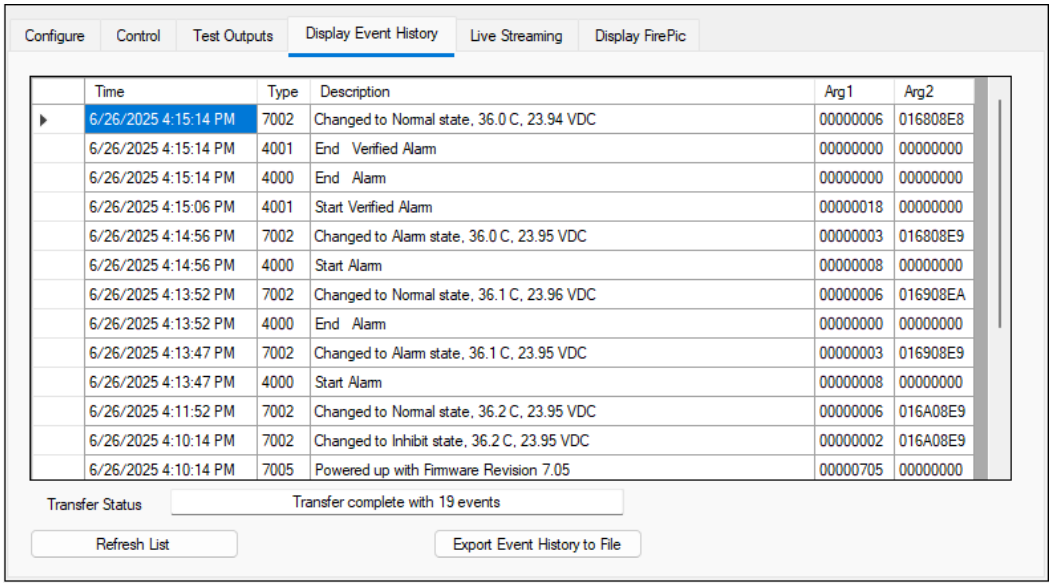


Figure 19

Live Streaming tab

The Live Streaming tab is very simple as shown in Figure 20. It may be useful to press the button [Disable Basic Status Updates] at the top right of the main form in order to conserve network bandwidth and produce more smoothly scrolling graph.

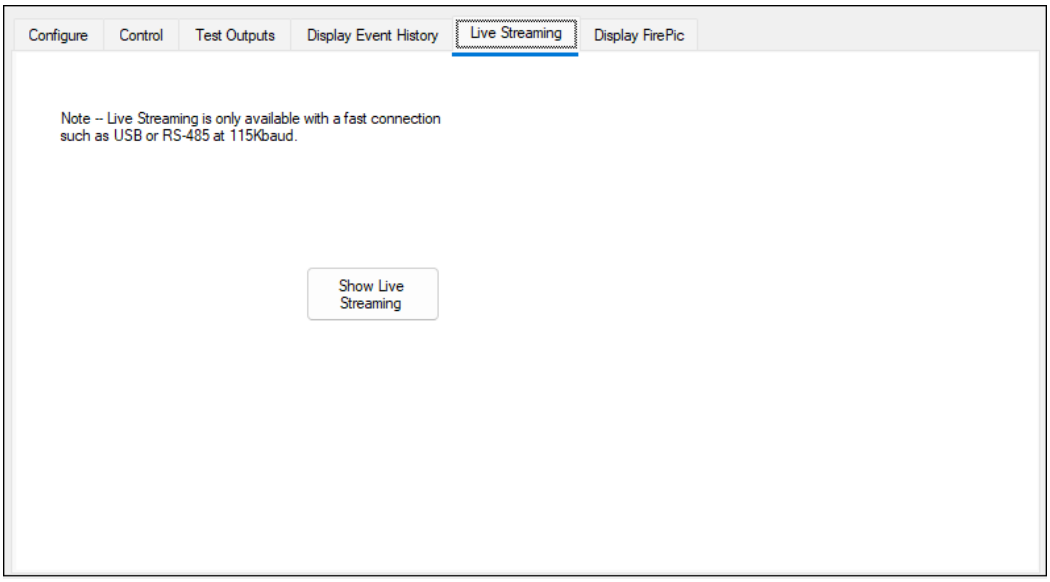


Figure 20

When the button [Show Live Streaming] shown in the previous image is pressed, a new form will open like the one shown in Figure 21. This automatically scales vertically to accommodate the huge 32- bit dynamic range of the detector. The large pulses shown are caused by the self-test subsystem. At times when the self-test pulse is not visible, the graph will zoom-in and appear noisier. The vertical bars on the side of the graph show the relative signal amplitude in a log scale. Buttons facilitate separating the DC and AC signals into different regions of the form and freezing the display.

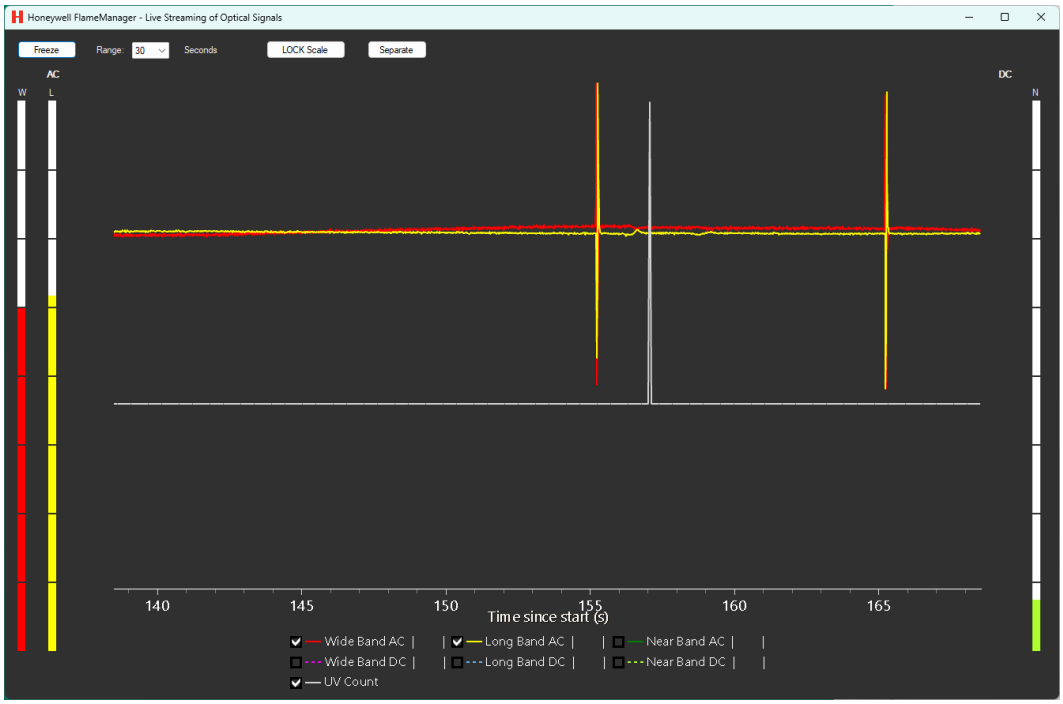


Figure 21

Display FirePic tab

The Display FirePic tab is shown in Figure 21. The 30 seconds of pre-alarm infrared signals are stored for the 10 most recent alarm events. Uploading one or all FirePics will cause a form like Figure 22 or Figure 23 to appear. The upload process takes a minute or more depending on the network used. The FirePic can be saved as a CSV file. This can be emailed to Honeywell for analysis.

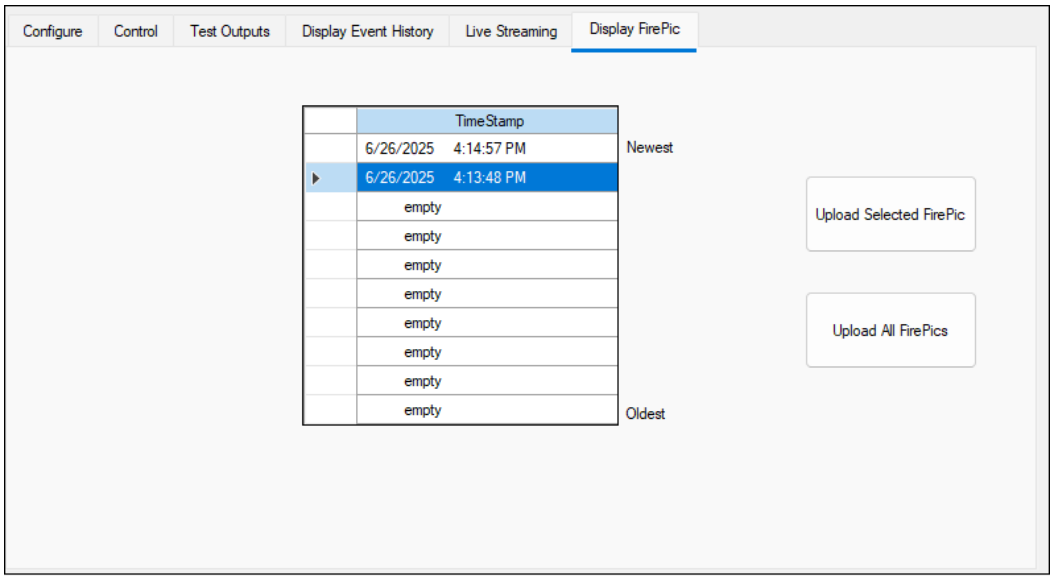


Figure 21

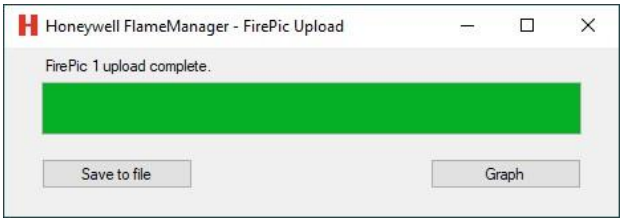


Figure 22

It is also possible to upload all FirePics to a zip file with one click.

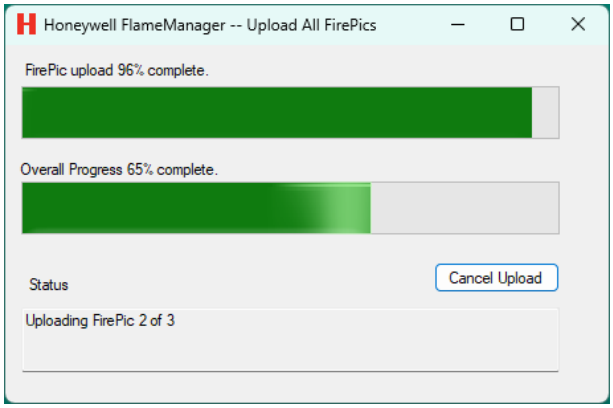


Figure 23

Pressing the [Graph] button will cause a new form much like Figure 24 to open. In this example, the large pulse at 16 seconds before the alarm is the UV self-test signals.

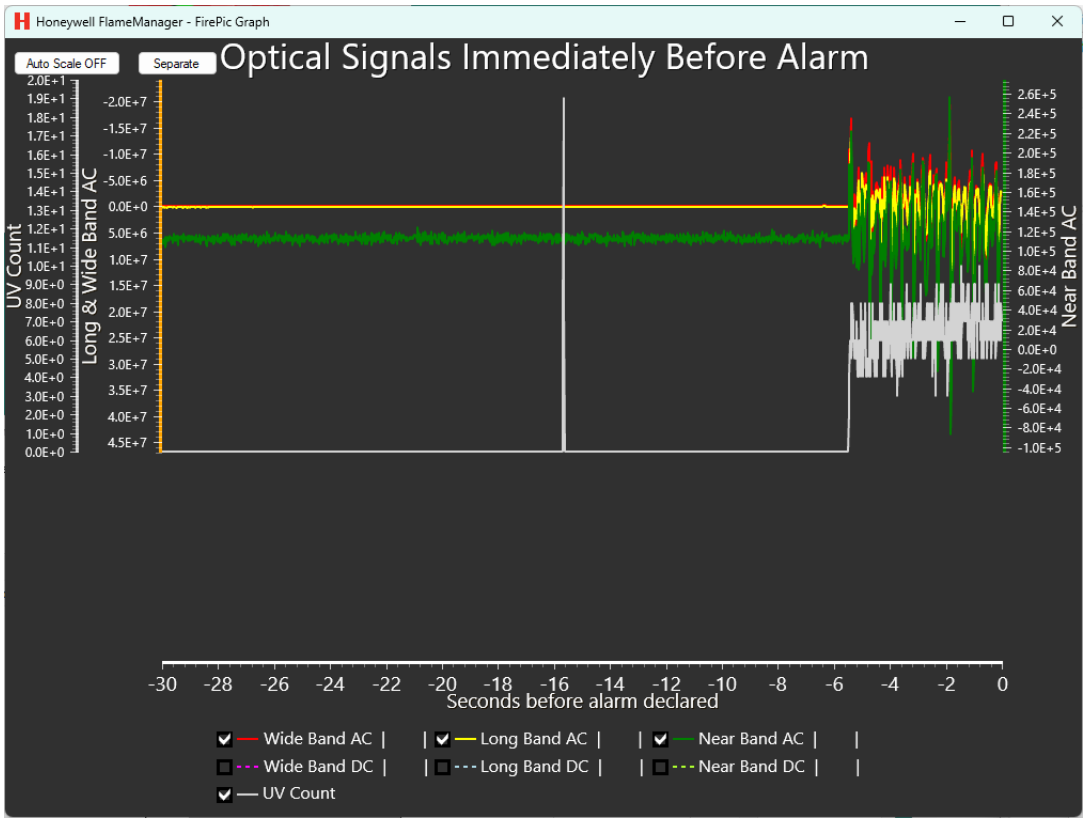


Figure 24

5. HART® User Information

EDD/DTM

The FS20X Plus can communicate using the HART protocol, which provides digital communications superimposed on the standard analogue output. More information about the HART protocol can be found at the HART Communication Foundation's website.

HART is a master-slave protocol, i.e. FS20X Plus does not continually transmit data but will respond on request.

The DD file is written using HART version 7 and is compatible with HART DD Tokenizer versions 6 and 8.

The DD file is supplied in .fm6, .fm8, .hhd and .hdd versions. It is compatible with a wide range of industry standard products.

To use the HART communications, load HART DD file into a suitable HART host (see manufacturer's instructions). The secondary master can be a handheld terminal. The detector has been tested with the handheld Emerson field communicator.

Access Levels and Password Protection

The FS20X Plus user interface recognizes three login profiles. Default profile 'Guest' offers limited access rights. The second profile 'Engineer' is available to wider engineering personnel. The third profile 'Honeywell® Engineer' is restricted to Honeywell® Field Service personnel.

The default 'Guest' profile is read-only and displays information about the current gas leak reading and detector status, including active warnings and faults.

The 'Engineer' profile access is required to test the detector, and to make changes to the default configuration.

The 'Engineer' profile access is password protected (8-digit alphanumeric, case sensitive). To avoid potential compatibility issues between different HART host devices, ensure that a full 8-digit password is used.

The password is factory set to 00000000 (eight zeroes). Instructions to change the password are given below.

Note: Some HART handheld devices will retain the previous login until switched off, even if FS20X Plus is disconnected. Ensure that 'Engineer' profile access is protected from unauthorized use by logging off when appropriate.

Menu Structure

The home screen displays current information about FS20X Plus™.

Home Screen	
1 User logged in as	Guest
2 Change login profile	1 Guest 2 Engineer 3 Honeywell Engineer
3 Device Overview	
4 Device Setup	

Selecting Device Setup leads to the further menu options, depending on the access level of the user. The menu structures are given below. '*####*' represents data values.

Device Overview Menu – Guest Access Level		
3 Device Overview	1 Dev Variant Name	####
	2 Alarm Status	####
	3 Alarm Type	####
	4 Detector Status	####
	5 Time (24-hour)	####
	6 Date	####
	7 Date Format	####
	8 Serial Number	####
	9 HART	1 PV Current Loop 2 Poll addr 3 Tag 4 Long tag 5 Descriptor 6 Message 7 Loop Current Mode 8 Configure HART 9 HART Parameters

Device Setup Menu – Guest Access Level		
4 Device Setup	1 Operations 2 Diagnostics 3 Event History	1 Detector Status 2 Clear latch
	1 Operations 2 Diagnostics 3 Event History	1 Internal Com.Flt 2 Voltage Fault 3 Test Lamp Detection
	1 Operations 2 Diagnostics 3 Event History	Latest Log

Device Setup Menu – Engineer Access Level			
4 Device Setup	1 Operations 2 Diagnostics 3 Event History 4 Settings 5 Account 6 Field Engineer Data	1 Detector Status 2 Inhibit 3 Sensitivity 4 4-20 mA Loop 5 State Latch 6 LED 7 Relays	####
4 Device Setup	1 Operations 2 Diagnostics 3 Event History 4 Settings 5 Account 6 Field Engineer Data	1 Detector Status 2 Inhibit 3 Sensitivity 4 4-20mA Loop 5 State Latch 6 LED 7 Relays	Start Inhibit End Inhibit
4 Device Setup	1 Operations 2 Diagnostics 3 Event History 4 Settings 5 Account 6 Field Engineer Data	1 Detector Status 2 Inhibit 3 Sensitivity 4 4-20mA Loop 5 State Latch 6 LED 7 Relays	Sensitivity Change Sensitivity

4 Device Setup	1 Operations 2 Diagnostics 3 Event History 4 Settings 5 Account 6 Field Engineer Data	1 Detector Status 2 Inhibit 3 Sensitivity 4 4-20mA Loop 5 State Latch 6 LED 7 Relays	1 Fault Level 2 Warning Level 3 Normal Level 4 Alarm Level 5 Verified Alarm Level 6 Inhibit Level 7 Background IR Current 8 Background UV Current 9 Configure 4-20mA Loop
4 Device Setup	1 Operations 2 Diagnostics 3 Event History 4 Settings 5 Account 6 Field Engineer Data	1 Detector Status 2 Inhibit 3 Sensitivity 4 4-20mA Loop 5 State Latch 6 LED 7 Relays	1 LED Mode for Normal 2 LED Mode for Alarm 3 LED Intensity 4 Configure LED
4 Device Setup	1 Operations 2 Diagnostics 3 Event History 4 Settings 5 Account 6 Field Engineer Data	1 Detector Status 2 Inhibit 3 Sensitivity 4 4-20mA Loop 5 State Latch 6 LED 7 Relays	1 Fault (R1) 2 Alarm (R2) 3 Verified Alarm (R3) 4 Verified Alarm (R3) I/P Sel 5 Change Relay Settings
4 Device Setup	1 Operations 2 Diagnostics 3 Event History 4 Settings 5 Account 6 Field Engineer Data	1 Change Password 2 Set Time (24-hour) 3 Set Date 4 Set Date Format	#### #### #### ####
4 Device Setup	1 Operations 2 Diagnostics 3 Event History 4 Settings 5 Account 6 Field Engineer Data	1 Field Temperature 2 Analog 24V Rail 3 Long Band PBSE DCA Value 4 Long Band PBSE DCB Value 5 Long Band PBSE AC Value 6 Wide Band PBSE DCA Value 7 Wide Band PBSE DCB Value 8 Wide Band PBSE AC Value 9 Near IR Band DC Value 10 Near IR Band AC Value 11 Visible Band DC Value 12 Visible Band AC Value 13 5V Rail 14 3V3 Rail 15 AINCOM 16 UV Sensor Reading 17 Channel Status	

Menu Navigation

Menu options can be selected by highlighting the option and pressing Enter, by pressing the number of the option, or by double clicking on the option. For more information on how to select menu options please see the instructions for the HART host device being used.

Error Reporting

FS20X Plus implements HART protocol Command 48, meaning that if any event is detected in the detector while a HART host is connected, it will be reported immediately. Therefore, warning messages may pop up during other operations.

Connection

It is best to use a dedicated HART interface point to connect a HART master (primary or secondary).

If such an interface is not available, it is possible to connect to HART signal across a load resistor in the current loop, point-to-point mode.

For example, provided there is the minimum resistance of 250Ω in the 4-20 mA loop, the HART handheld device can be connected across the terminals in the junction box.

⚠CAUTION

If using multi-drop mode, the mA output cannot be used to provide a functional safety-rated output signal.

Warning: Changes made by HART are not implemented until after the detector is rebooted or power cycled.

Appendix 5: HART® Developer Information

Note: The mA output shall have an external loop resistance between 250Ω and 600Ω with HART.

Device Identification

Manufacturer Name:	Honeywell®	Model Name(s):	**FS20X Plus**
Manufacture ID Code:	210 (D2 Hex)	Device Type Code:	135 (87 Hex)
HART Protocol Revision:	7.8	Device Revision:	1
Physical Layers Supported:	FSK		
Physical Device Category:	Transmitter, Detector		

Universal Commands

Command #3 returns PV, units, and Loop Current. The first (PV) and the last (Loop Current) variables are the same.

Command #14 contains serial number of the device (3 bytes), followed by measurement units (1 byte) and 3 floating point variables for max, min, and span loop current in mA.

Device-Specific Commands

The following device-specific commands are implemented:

Command	Description
128	Read Fire Alarm Status
130	Read Device Status
135	Read Inhibit Status
136	Simulate 4-20 mA
137	Read Internal Commination Fault Status
138	Read Voltage Fault Status
139	Read Test Lamp Detection Status
140	Read Temperature
141	Read Voltage
142	Read All Sensor Readings
144	Read Model
151	Write Background UV/IR
152	Read Background UV/IR
153	Read Device Alarm State
154	Set Detector Sensitivity**
155	Read Detector Sensitivity
158	Set Relay Default State**
159	Read Relay Default State
161	Reset Latches
162	Set Password**
164	Read Event History
165	Force Relay State
166	Force 4-20mA - Specific Loop Current
167	Force Halo State
168	Write mA Configuration**
169	Configure Alarm, Warning State - Latch / Unlatch**
172	Configure Halo Mode for Normal**
173	Read Halo Mode for Normal
174	Set Date Format**
175	Set RTC (Time and Date)**
176	Read RTC (Time and Date)
177	Configure Halo Mode for Alarm**
178	Read Halo Mode for Alarm
179	Read Alarm, Warning State - Latch / Unlatch
180	Start / End Inhibit
181	Read Inhibit Timeout
182	Configure Inhibit Timeout**
183	Read mA Configuration
187	Read Force Timeout

188	Configure Force Timeout**
190	Write Login
191	Read Date Format
192	Read Relay 3 (Aux) Input Selection
193	Set Relay 3 (Aux) Input Selection
195	Set Alarm Verification Time
196	Write LED Intensity**
197	Read LED Intensity
198	Read Serial Number

Note: **Require power cycle for the new configuration to be effective.

Additional Device Status (Command #48)

Command #48 returns nine bytes of data, with status information available in bytes #6 and #8, as indicated in the following table:

Byte	Bit	Meaning	Condition
0	0 to 7	Not used	
1	0 to 7	Not used	
2	0 to 7	Not used	
3	0 to 7	Not used	
4	0 to 7	Not used	
5	0 to 7	Not used	
6	0		Lid off or dirty, temperature or voltage out of range, or internal failure
	1	Not used	Flame detected
	2	Not used	
	3	Not used	
	4	Not used	
	5	Not used	
	6	Not used	
	7	Not used	
7	0 to 7	Not used	
8	0	Not used	
	1	Not used	
	2	Not used	
	3	Not used	
	4	Power Supply Conditions Out of Range	Voltage Fault
	5	Not used	
	6	Not used	
	7	Not used	

Not used bits are always set to 0. In each case, bit #0 is the low-order bit.

Command #128: Read Fire Alarm Status

Reads the Fire Alarm Status.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Integer	- If device is not in Alarm - If device is in Alarm

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #130: Read Device Status

Reads Current Operating State.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Integer	Operating state

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #135: Read inhibit status

Read Inhibit is On/Off.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Enum	0- If device is not in Inhibit 1- If device is in Inhibit

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #136: Simulate 4-20 mA

Forces Loop to State Selected.

Request Data Bytes

Byte	Format	Description
0	Enum	Fault/Alarm,1,2/Warning/Inhibit/Normal

Response Data Bytes

Byte	Format	Description
0	Enum	Fault/Alarm,1,2/Warning/Inhibit/Normal

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #137: Read Internal Commination fault status

Reads Internal Commination Fault Status.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Enum	- If device has no internal commination fault - If device has internal commination fault

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #138: Read Voltage Fault Status

Reads Voltage Fault Status.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Enum	- If device has no voltage fault - If device has voltage fault

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received

6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #139: Read Test Lamp Detection Status

Reads Test Lamp Detection Status.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Enum	0 - If test lamp is not detected 1 - If test lamp is detected

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #140: Read Temperature

Reads
Temperature.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0-3	Float	Temperature

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1-7		Undefined
8	Error	Access Restricted
9-15		Undefined
16	Error	Access Restricted
17-127		Undefined

Command #141: Read Voltage

Reads Voltage.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0-3	Float	Voltage

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1-7		Undefined
8	Error	Access Restricted
9-15		Undefined
16	Error	Access Restricted
17-127		Undefined

Command #142: Read All Sensor Readings

Reads All Sensor Readings.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0-59	Integer	Optical Sensor Data [0] - [15] Optical Sensor Data Representation: 0-3 Long Band PBSE DCA VALUE 4-7 Long Band PBSE DCB VALUE 8-11 Long Bande PBSE AC VALUE 12-15 Wide Band PBSE DCA VALUE 16-19 Wide Band PBSE DCB VALUE 20-23 Wide Band PBSE AC VALUE 24-27 NEAR IR Band DC VALUE 28-31 NEAR IR Band AC VALUE 32-35 Visible Band DC VALUE 36-39 Visible Band AC VALUE 40-43 5V Monitoring 44-47 3V3_Safe Monitoring 48-51 AINCOM Monitoring 52-55 UV Count 56-59 u32_channel_status

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1-7		Undefined
8	Error	Access Restricted
9-15		Undefined
16	Error	Access Restricted
17-127		Undefined

Command #144: Read Model

Read Model, it will read the short tag.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0-5	Packed ASCII	Default {25,60,180,97,8,32} Packed ASCII "FS20X Plus™"

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1-7		Undefined
8	Error	Access Restricted
9-15		Undefined
16	Error	Access Restricted
17-127		Undefined

Command #151: Write Background UV/IR

Write Background UV/IR Enable/Disable

Request Data Bytes

Byte	Format	Description
0	Enum	Background UV/IR: 0 - Disable 1 - Enable

Response Data Bytes

Byte	Format	Description
0	Enum	Background UV/IR: 0 - Disable 1 - Enable

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #152: Read Background UV/IR

Read Background UV/IR Enable/Disable.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Enum	Background UV/IR: 0 - Disable 1 - Enable

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #153: Read Device Alarm State

Reads the Device Alarm State.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Enum	[0] - Device Alarm Status - Alarm2 - Alarm1 4 - None

Command-Specific Response Codes

33-127		Undefined

Command #154: Set Detector Sensitivity

Set Detector Sensitivity

Request Data Bytes

Byte	Format	Description
0	Enum	Detector Sensitivity Level

Response Data Bytes

Byte	Format	Description
0	Enum	Detector Sensitivity Level

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #155: Read Detector Sensitivity

Reads Detector Sensitivity

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Enum	Detector Sensitivity Level

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #158: Set Relay Default State

Set Relay Default State.

Request Data Bytes

Byte	Format	Description
0	Enum	Relay Enum Index
1	Enum	State

Response Data Bytes

Byte	Format	Description
0	Enum	Relay Enum Index
1	Enum	State

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #159: Read Relay Default State

Read Relay Default State.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Enum	Relay1 default state
1	Enum	Relay2 default state
2	Enum	Relay3 latch state

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #161: Reset Latches

Reset Latches.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
None		

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #162: Set Password

Set Password.

Request Data Bytes

Byte	Format	Description
0	Enum	Login level
1-8	PASSWORD	Password

Response Data Bytes

Byte	Format	Description
0	Enum	Login level
1-8	PASSWORD	Password

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #164: Read Event History

Reads Event History Logs.

Request Data Bytes

Byte	Format	Description
0	Integer	Warning or Fault type
1	Integer	Event direction
2	Integer	Login level

Response Data Bytes

Byte	Format	Description
0	Integer	Warning or Fault Type
1	Integer	Event direction
2	Integer	Login level
3-7	Integer	Event Index
8-11	ASCII	Time
12-15	Integer	Event Arg 1
16-19	Integer	Event Arg 2

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #165: Force Relay State

Force Relay State.

Request Data Bytes

Byte	Format	Description
0	Integer	Relay selection
1	Enum	Relay state

Response Data Bytes

Byte	Format	Description
0	Integer	Relay selection
1	Enum	Relay state

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #166: Force 4-20 mA - Specific Loop Current

Force 4-20mA - Specific Loop Current

Request Data Bytes

Byte	Format	Description
0-3	Float	mA Current

Response Data Bytes

Byte	Format	Description
0-3	Float	mA Current

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #167: Force Halo State

Force Halo State.

Request Data Bytes

Byte	Format	Description
0	Integer	LED State

Response Data Bytes

Byte	Format	Description
0	Integer	LED State

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #168: Write mA Configuration

Write mA Configuration.

Request Data Bytes

Byte	Format	Description
0	Enum	State
1-4	Float	Current (mA) Level

Response Data Bytes

Byte	Format	Description
0	Enum	State
1-4	Float	Current (mA) Level

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #169: Configure Alarm, Warning State - Latch/Unlatch

Configure Alarm, Warning State - Latch/Unlatch

Request Data Bytes

Byte	Format	Description
0	Enum	State
1	Enum	Latch Enable or Disable

Response Data Bytes

Byte	Format	Description
0	Enum	- Warning - Alarm1 - Alarm2
1	Enum	Latch Enable or Disable

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #173: Read Halo Mode for Normal

Read Halo Mode for Normal.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Integer	LED Mode

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

Command #174: Set Date Format

Set Date Format.

Request Data Bytes

Byte	Format	Description
0	Enum	Format

Response Data Bytes

Byte	Format	Description
0	Enum	Format

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
1		Undefined
2	Error	Invalid Selection
3	Error	Parameter Too Large
4	Error	Parameter Too Small
5	Error	Too few data bytes received
6	Error	Transmitter Specific Command Error
7	Error	Write Protect Mode
8-15		Undefined
16	Error	Access Restricted
17-31		Undefined
32	Error	Busy
33-127		Undefined

6. Modbus Interface

Overview of Communications Channels

The FS20X Plus and FS24X Plus flame detectors communicate their status using a variety of channels including the Halo flash pattern, a 4-20 mA current loop, 3 relays, RS-485 and USB. The current loop is designed for use in systems designed for safety integrity level (SIL) 2 as defined by EN 61508. The relay outputs are designed for use in SIL 1 systems. The digital interfaces (RS-485 and USB) do not have any SIL rating but are still useful because of the abundant data they provide. The USB interface is not accessible when the enclosure is closed. And the RS-485 interface can communicate in two languages: either Honeywell's proprietary FP2 or standard Modbus. The configuration of the detector can be manipulated over USB or RS-485/FP2 but not standard Modbus. This document describes RS-485/Modbus.

Communications Capabilities.

The RS-485 port can be configured for speeds of 9600, 19200, 38400, 76800, 115200 or 230400[note1] baud with a default of 9600 baud. Each byte can have even, odd, or no parity. These parameters are set on the Configure/Fieldbuses tab of Honeywell Flame Manager. After the settings are changed, the detector must be rebooted before they take effect. The Modbus interface is implemented entirely as holding registers as listed in Table1. Writing is not permitted.

First MB Reg	Last MB Reg	Datatype	Description
40003	40004	float32	Alarm Level (0, 1, 2 or -1 for fault)
40005	40005	uint16	The most important active fault
40007	40007	uint8	Monitoring State (See Table 2.)
40008	40008	int16	Heartbeat counter
40015	40015	int16	Temperature 1 (°C * 10)
40016	40016	int16	Temperature 2 (°C * 10)
40017	40017	int16	Temperature 3 (°C * 10)
40037	40038	float32	Output Current (mA)
40039	40039	int16	External 24 VDC supply (mV)
40040	40040	int16	Internal 3.3 VDC supply 1 (mV)
40042	40042	int16	Internal 3.3 VDC supply 2 (mV)
40043	40043	int16	Internal 30 VDC supply (mV)
40044	40044	int16	Internal 320 VDC supply[note2] (Volts)
40045	40045	int16	Internal 5.0 VDC supply (mV)
40075	40081	char[14]	Detector serial number (string)
40084	40084	int16	Hardware revision number
40085	40085	int16	Software revision number
40103	40104	float32	Sensitivity configuration (0..3)
40105	40106	float32	Alarm Verification Time (seconds)
40123	40123	word16	Relay configuration (See Table 3.)
40143	40144	int32	Time (seconds since 1970)

Table 6 -- Modbus Holding Registers

Value	Meaning
1	Normal monitoring

3	Inhibited
7	In warning maintenance fault
8	In Instrument Flt
Other	For future expansion

Table 7 Register 40007 Values

Modbus holding register 40123 contains the logical OR of configuration bits as listed in Table 8

Bit Number	Bit Value	Condition
0	0x0001	reserved for future use
1	0x0002	reserved for future use
2	0x0004	reserved for future use
3	0x0008	reserved for future use
4	0x0010	Relay 2 is normally energized
5	0x0020	Relay 3 is normally energized
6	0x0040	reserved for future use
7	0x0080	reserved for future use
8	0x0100	reserved for future use
9	0x0200	reserved for future use
10	0x0400	Always on
11	0x0800	Relay 3 is warning instead of alarm2
12	0x1000	reserved for future use
13	0x2000	reserved for future use
14	0x4000	reserved for future use
15	0x8000	reserved for future use

Table 8 -- Register 40123 Bits

Notes:

1) The internal 320 VDC power supply may not be present in the FS24X Plus.

2) The maximum baud rate supported by the FS24X Plus with V5.05 firmware is 115200 baud

7. Fault Conditions

When a Fault (Trouble) condition occurs, the Halo flashes in Yellow LED.

The Detector has the following outputs with a Fault condition:

- Fault Relay activation
- 4-20 mA (Sink, source or isolated) output

  <=1 mA (Dirty Window Fault/Sensor Fault)

  <=1 mA (All Other Faults)
- RS-485 FP2 Fault Notification3
- RS-485 Modbus Fault Notification3
- HART

NOTE: 3 Only One Active Fault output from this group

Fault conditions can be caused by:

- Under Voltage Input Power (< 18 VDC).
- Over Voltage Input Power (> 32 VDC).
- Over Temperature (> 75° C or 167° F).
- Under Temperature (< -55° C or -67° F).
- One or more Microprocessor Failures.
- One or more Relay Coil Failures.
- Communication Fault.
- Electronic Self-Test Failure.
- Dirty Window Lens ⊠ Sensor failures.

8. Certifications and Approvals

Hazardous Area

US / Canada – FM Certified:

Class I, Division 1 and Division 2, Groups ABCD, T5

Class II/III, Division 1 and Division 2, Groups EFG, T135°C

Class I, Zone 1 AEx db IIC T5 Gb

Class II, Zone 1 AEx tb IIIC, T135°C Db

Enclosure rating:

Type 4X, IP66/67

International / Europe / UK / Brazil:

Ⓔx II 2 G Ex db IIC, T5 Gb

II 2 D Ex tb IIIC, T 135°C Db

IP66/67

Ta = -55°C to +85°C

ATEX - FM14ATEX0058X

IECEx - FMG14.0027X

UK - FM21UKEX0035X

Brazil - DNV18.0088X INMETRO
UAE – ECAS Ex

Others:

Marine certificates (Pending):

ABS, Lloyds, BV, DNV. MED, USCG

Functional Safety

IEC61508 SIL 2 Certified by TÜV SÜD (Pending)

Performance

cFMus (Pending)

FM 3260 (Pending)

EN54-10 (Pending): Class 1 (medium, high, and very high sensitivities).

Environmental

EMC, WEEE, and RoHS Compliant

China RoHS

设计模板 - 中国 RoHS 2 限制材料表产品：含铅焊料和含铅探测器的 pcb 产品

提交者：沙巴鲁丁.易卜拉欣提交日期：2021 年 8 月
24 日设计授权地址：林肯郡

部件名称	有害物质					
	铅（Pb）	汞（Hg）	镉（Cd）	六价铬（Cr/VI）	多溴二苯（PBB）	多溴二苯醚（PBDE）
PCB 组件	X	O	O	O	O	O
光红外探测器	X	O	O	O	O	O

此表中未列出的所有部件和组件都含有低于 **GB/T 26572** 限制要求的危险物质

此表是按照 **SJ/T 11364** 的规定编制的

O： 表明该部分所有同质材料中所含的有害物质均低于 **GB/T 26572** 的限制要求

X： 表明该部分使用的至少一**种**同质材料中所含的危险物质高于 **GB/T 26572** 的限制要求

9. WEEE Directive Disposal

 EN

EU Directive 2012/19/EU: Waste Electrical and Electronic Equipment (WEEE)

This symbol indicates that the product must not be disposed of as general industrial or domestic waste. This product should be disposed of through suitable WEEE disposal facilities. For more information about the disposal of this product, contact your local authority, distributor, or manufacturer.

 ES

DIRECTIVA 2012/19/UE: Residuos de Aparatos Eléctricos y Electrónicos (RAEE)

Este símbolo indica que el producto no puede ser desechado como residuo doméstico o industrial genérico. Este producto debe ser desechado en instalaciones de reciclado RAEE adecuadas. Para más información acerca del desecho de este producto, contacte con su autoridad local, el distribuidor o el fabricante.

 FR

DIRECTIVE 2012/19/UE: Relative aux déchets d'Equipements Électriques et Électroniques (DEEE)

Ce symbole indique que le produit ne doit pas être éliminé en tant que déchet industriel ou ménager. Ce produit doit être envoyé vers des sites de valorisation ou élimination des DEEE. Pour plus d'informations sur la mise au rebut de ce produit, contactez les autorités compétentes, votre distributeur ou le fabricant.

 NL

RICHTLIJN 2012/19/EU: Betreffende Afgedankte Elektrische en Elektronische Apparatuur (AEEA)

Dit symbool geeft aan dat het product niet als algemeen industrieel of huishoudelijk afval mag worden weggegooid. Het product dient te worden afgevoerd via geschikte afvalverwijderingsinstallaties voor AEEA.

Neem voor meer informatie over de afvoer van dit product contact op met uw lokale overheid, distributeur of de fabricant.

 IT

DIRETTIVA 2012/19/UE: Rifiuti di Apparecchiature Elettriche ed Elettroniche (RAEE)

Questo simbolo indica che il prodotto non deve essere trattato come rifiuto industriale o domestico. Questo prodotto deve essere smaltito in idonei impianti di smaltimento specifici per RAEE. Per ulteriori informazioni sullo smaltimento di questo prodotto contattare l'ente locale preposto, il distributore o il produttore.

 DE

RICHTLINIE 2012/19/EU: über Elektro- und Elektronik-Altgeräte

Dieses Symbol zeigt an, dass dieses Produkt nicht als Hausmüll oder kommunaler Müll entsorgt werden darf. Es sollte zum Recycling zu einer geeignete WEEE Entsorgungsanlagen gegeben werden. Um weitere Informationen zum Recycling dieses Produkts zu erhalten wenden Sie sich an Ihre Kommunalbehörde, Ihren Lieferanten oder den Hersteller.

Appendix 1: Hazardous Location Installation Requirements

Note – This Appendix is reproduced from the Honeywell QUICK REFERENCE GUIDE for Hazardous Location Installation Series Flame Detectors and associated Test Lamps, part 1701M5000HL

The Honeywell® Analytics Flame Detectors and Test Lamps are hazardous area products. They are factory calibrated, and the robust sealed design with no moving parts allows for mounting in any orientation even in harsh environments. These products are available in either a 316 Stainless Steel or Low Copper Aluminum.

⚠WARNING RISK OF IMPROPER FLAME DETECTION

- Install only in areas in accordance with the environmental and hazardous area ratings.
- Carefully review mounting area and position in accordance with the Performance Appendix and the User Manual to ensure optimal flame detection regarding the angle of device and unobstructed view.
- Avoid potential sources of direct or indirect radiation in the flame detector field of view.
- Do not touch the sensors on the front of the electronics module.
- Avoid direct sunlight into the flame detector window – use provided sunshade, aim flame detectors down at 40 degrees or more when possible, and use multiple detectors to cover hazardous areas from different directions.
- Avoid close proximity to rapid modulation/chopping of sunlight (creating moving dark shadows) as optical sensor performance can be reduced, e.g. close trees in the wind, rotating blades.
- Use shielded cable for all wirings and ground the shield at one end as detailed in the Wiring section.
- Keep all devices and wire runs away from mercury vapor lights, variable speed drives, radio repeaters and other sources of electromagnetic interference.
- Follow local cabling and glanding rules.
- Seal all unused conduit entries and install proper drains/traps by local codes.
- Do not try to service parts inside the electronics module, there are no field serviceable parts, just module replacement.

⚠CAUTION RISK OF PRODUCT DAMAGE

- Do not install in an area where there are incidents of high mechanical damage.
- Protect controllers and monitors from physical damage (forklifts, etc.).
- Failure to follow all warnings cautions, and instructions may void the warranty.
- To maintain IPX6 integrity, seal conduit entries with thread sealant such as Loctite 565 or approved equivalent.

⚠WARNING RISK OF EXPLOSION

- Ensure power is off and no hazardous gases nor dusts are present before installing or opening the device.
- Use only hazardous location approved plugs M25 or ¾ ” NPT as marked on product.
- Do not connect test lamps to external power sources. Test lamps are battery operated only. Do not open when explosive gases are present. Charging permitted in safe environment only.

Specific Conditions of Use

⚠WARNING ELECTROSTATIC HAZARD, DO NOT RUB WITH DRY CLOTH

- Contact the manufacturer for dimensional information on the flameproof joint specifications if repair is required.

Nameplate Tag

Representative Markings are displayed in the figure below. Additional regional marks (such as South Korea and Russia) and installation specific marks (such as ABS) may also be present. See

individual nameplates for specific approvals applicable to each product.

Note: Some products require 18 in. of conduit. (See individual nameplate for specifics).

Electrical Ratings

- Test Lamps (battery powered): 12 VDC, 600 mA
- FS10: 12 VDC; 60 mA
- FS10-R-A: Max 29 VDC, 120 mA; Relay 24 VDC, 1 A
- FS20X and FS24X Series: Max 32 VDC, 150 mA; Relay 24 VDC, 1 A
- FS20XP and FS24XP: Consumption 18 - 32 VDC, 500 mA max; Relay 24 VDC/AC, 2 A maximum

Installing the Flame Detector

All products are provided with a flameproof and explosion-proof enclosure and have been approved for use in Class 1 and Zone 1 environments as specified on the individual product nameplate tag.

Note: NFPA 72 and other local codes have specific requirements for flame detectors installations and must be consulted as necessary.

Must only be installed by appropriately trained and accredited personnel.

1. Securely mount the detector using minimum 1/4-20 or M6 sized fasteners.

   Note: We recommend angling all detectors down at least 40 degrees from horizontal.

2. Loosen, but do not remove the set screw on the cover assembly.
3. Loosen the 3 Philips screws and remove the electro-optical Detector Module and place face up in a safe location.

   Note: Do not drop the Detector Module and do not touch the sensor array.

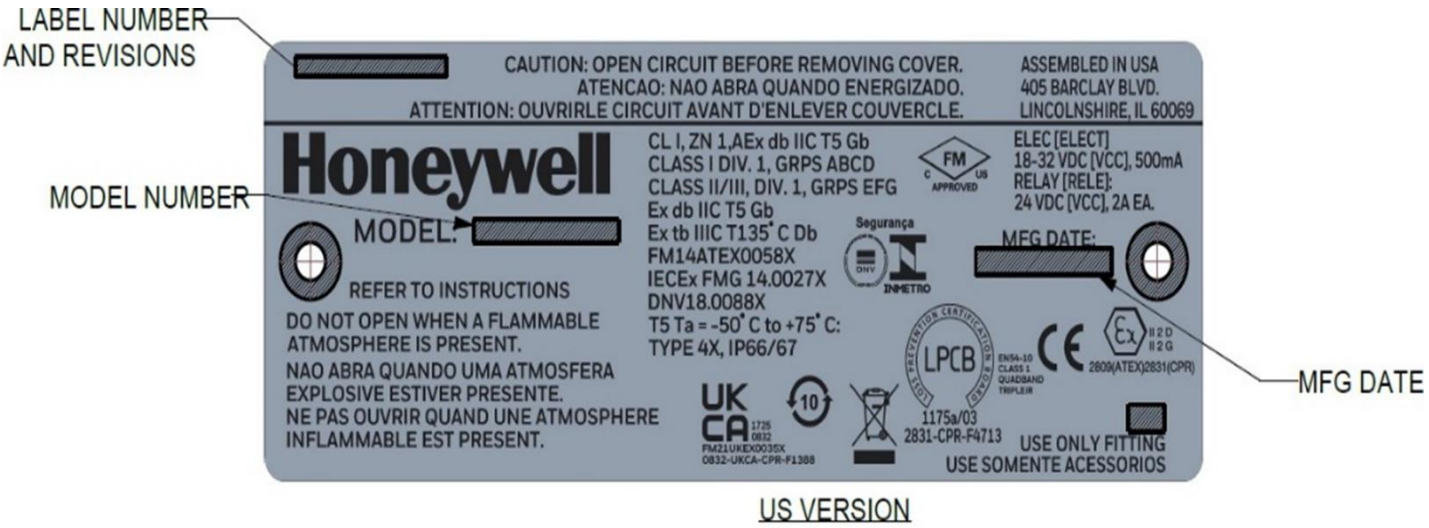
4. Connect the cable gland or conduit to the detector enclosure via the ¾ '' NPT or M25 openings, as per national electrical codes for the install location. Connect the appropriate wires rated for minimum 85ºC to the field connectors provided as per the wiring diagram on the cover of the electro-optical Detector Module.
5. Ensure the enclosure is properly grounded in accordance with all local codes.
6. Use shielded cable for all communications connections and ground one end of the shield following the product manual.
7. Configure following the product's User Manual and Performance Appendix to this guide.

   Note: Refer to the fuel and sensitivity settings table to determine the correct configuration.

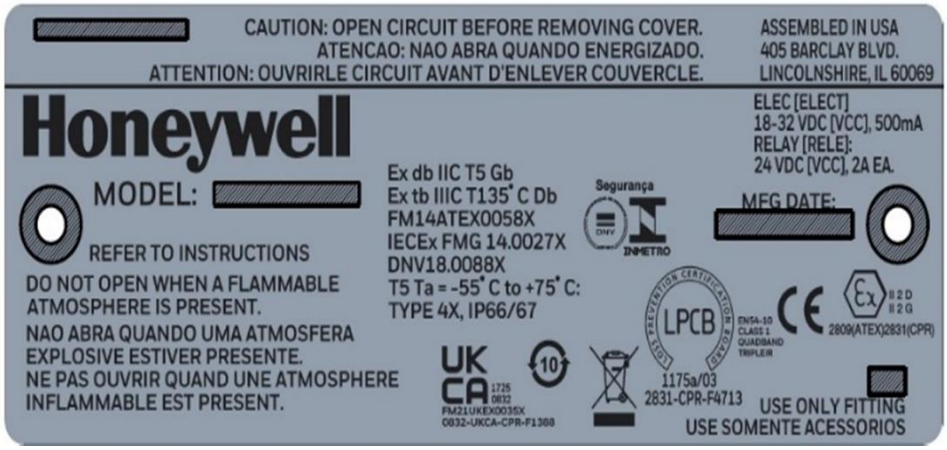
8. Connect the field connectors back onto the electro-optical Detector Module and secure the module into the enclosure with the Philips screws.
9. Install the cover and ensure the O-ring is compressed. Tighten the cap screw on the cover assembly. Make a rough Field of View (FoV) adjustment by aiming the detector at the area you want to cover.
10. Tighten all bolts when product has been fully configured and tested accordance with the product manual.

    Note: Detector functionality and communication should be tested to confirm correct FoV and configuration in the final system.

Generic Nameplate View



US VERSION



Manuals, software, and other information about this product are available at www.honeywell.com

1701M5000HL Rev E October 11, 2022

Honeywell

Appendix 2: Setup And Performance

FS20X PLUS™ FIRE AND FLAME DETECTOR

Standard Mount

FS20XP-ANGXX

FS20XP-SNGXX

FS20XP-AMGXX

FS20XP-SMGXX

Marine Mount

FS20XP-ANGXM

FS20XP-SNGXM

FS20XP-AMGXM

FS20XP-SMGXM

The Honeywell®FS20X Plus™ is a hazardous area flame detector that uses UV/3IR sensors to respond quickly to a flaming fire.

It is factory calibrated, and the robust sealed design with no moving parts allows for mounting in harsh environments. These flame detectors are available in either a CF8M stainless steel (316 equivalent) or painted low copper aluminum.

Hazardous Classifications

Class I, Zone 1, AEx db IIC T5 Gb; Class I, Div. 1, Groups A, B, C, & D; Class II/III, Div. 1, Groups E, F, & G; Ex db IIC T5 Gb; Ex tb IIIC T135°C Db; FM14ATEX0058X; IECEx FMG14.0027X; T5 Ta = -50°C to +85°C; Type 4X, IP66/67; Ⓔx II 2 D; II 2 G

This Appendix, the Quick Reference Guide and the User Manual must be used together.

⚠ WARNING RISK OF IMPROPER FLAME DETECTION

- Install only in areas in accordance with the environmental and hazardous area ratings.
- Carefully review mounting area and position in accordance with the Quick Start Guide to ensure optimal flame detection regarding the angle of device and unobstructed view.
- Avoid potential sources of direct or indirect radiation in the flame detector field of view.

- Do not touch the sensors on the front of the electronics module.
- Avoid direct sunlight into the flame detector window – use provided sunshade, aim flame detectors down at 40 degrees or more when possible, and use multiple detectors to cover hazardous areas from different directions.
- Avoid close proximity to rapid modulation/chopping of sunlight (creating moving dark shadows) as optical sensor performance can be reduced, e.g. close trees in the wind, rotating blades.
- Use shielded cable for all wirings and ground the shield at one end as detailed in the Wiring section.
- Keep all devices and wire runs away from mercury vapor lights, variable speed drives, radio repeaters and other sources of electromagnetic interference.
- Follow local cabling and glanding rules.
- Seal all unused conduit entries and install proper drains/traps according to local codes.
- Do not try to service parts inside the electronics module, there are no field serviceable parts. Replacement electronics modules are available from Honeywell.
- Inhibit detector during welding operations, especially in the presence of sunlight.
-

What's in the box?

1 flame detector

1 quick start guide

1 standard mount (SM4) or marine mount (SM4-M)

1 threaded stopping plug

1 sunshade (SH-002)

10. Available Accessories/Spares

SM4 mounting bracket

SM4-M marine mounting bracket

FVR-01 FoV restrictor

SH-002 sunshade

FS24XP-NFPA-KIT NFPA 72 connector kit

FS20X-PUCK replacement electronics module

11. Performance Specifications

Operating Temperature (ATEX/IECEx): -55°C to +75°C

Storage Temperature (ATEX/IECEx): -55°C to +85°C

Operating Temperature (North America): -50°C to +75°C

Storage Temperature (North America): -50°C to +85°C

Tested Fuels: n-heptane, methane, butane, propane, ethanol, methanol, hydrogen, acetylene, syngas, silane, diesel, kerosene, Jet A, JP-4, JP-5, JP-8, IPA, and Class A (paper/wood)

Sensitivity for Test: Low, Medium, High, and Very High Sensitivities (indoors/outdoors)

Software System & Safety: 7.07 identified on the label on electronics

Humidity: 0 to 99% relative humidity

Field of View (FoV): The detector has a oval cone of view for all standard mounts of 100° (left 50°, right 50°) horizontal and 90° (up 40°, down 50°) vertical with the highest sensitivity on the central axis.

With FoV restrictor: The detector has a FoV of left 35°, right 35°, up 35°, and down 35°

With sunshade: The detector has a FoV of left 50°, right 50°, up 30°, and down 50°

Canadian Standard FoV: The detector has a FoV of left 60°, right 60°, up 50°, and down 60°

Mean Time Before Failure: >10-year MTBF with a commonly used database (e.g. MIL-217, MIL-217D, or Siemens SN29500). Two calculations - All components and only safety critical components.

Reliability: Less than 1 failure/million hours

Operating Voltage: 24 VDC nominal (18-32 VDC) - Regulated.

Power Consumption: 1.8 watts (nominal); 2.4 watts (Alarm); 12 Watts (max) = 0.50A @ 24V with heater ON 100% duty cycle.

NOTE: When the device is first energized at temperatures below 13°F [-25°C], heaters will be activated for up to 30 minutes. During this time, the internal microcontrollers will not run, the Halo will be off, the relays will be de-energized, and the 4-20 mA loop will report less than 0.5 mA.

Inrush Current is 0.75A for a maximum duration of less than 5ms

Weight: Aluminum 3 lbs. 11 oz. (1.7 kg); Stainless Steel 7 lbs. 7 oz. (3.4 kg)

Housing material:

- Low Copper (less than 0.25%) marine grade painted cast Aluminum of ASTM A356.0 grade.
- Polished cast Stainless Steel of ASTM CF8M grade.

Enclosure: Diameter: 125 mm (4.92 in) x 115 mm (4.52 in) deep; Two M25 X 1.5P or two ¾'' NPT conduit entries.
Window size diameter: 79 mm (3.11 in)

Outputs:

- SPDT relays for Fault, Alarm and Auxiliary Max. 32 Vdc/ac, max. 2 A, min 10mA at 12 V resistive load.
- 4-20 mA Source, sink or isolated current output.
- FP2 over RS-485 and USB (USB is accessible through Detector Module electronic device only).
- Modbus over RS-485.
- HART®: The FS20X Plus™ Flame detector has HART® 7 communication; registered with FieldComm Group, EDD/DTM.
- Halo LED local notification indicator: light ring. shows instrument status, visible at 50 ft. in daylight conditions. Suitable for indoor and night applications.

Halo flash patterns during operation:

Illustration	State	Default Pattern	Optional Pattern (settable)
	Off or de- energized	Off	Not configurable
	Normal operation, no fire	Mostly off, flashing green every 5 seconds	Off
	Inhibited	Solid Yellow	Not configurable
	Fault	Flashing Yellow every second	Not configurable
	Alarm	Solid Red	Flashing Red
 	Warning	Flashing Yellow and Green Alternate	Not configurable

12. Installation

NOTE: Must only be installed by appropriately trained and accredited personnel. Read all instructions and warnings before installing.

Location - Indoor or outdoor. Select a site with a low chance of mechanical damage and low vibration. Ensure that the detector has a line of sight to the threat location. Avoid false alarm sources. Orient the detector such that the Field of View covers the desired area. It is recommended to angle all detectors down at least 40 degrees from horizontal. Use the SH-002 sunshade as needed to block direct sunlight from reaching the detector window.

13. Wiring

FS20X Plus™ must be connected with suitable cabling/conduit for the environment in terms of temperature, current and protection against damage.

NOTE: Use appropriate ESD protection when handling electronics. Do not touch sensors or lenses. Fingerprints will inhibit performance.

Cable/Wiring – Shielded cable with twisted pairs and shield coverage of more than 80% with minimum pigtail lengths outside of the shield. Specifications as follows:

14 – 24 AWG rated 85°C minimum:

One 14 – 24 AWG Cu stranded wire (16 AWG recommended); or

Two 16 – 24 AWG Cu stranded wires per terminal. Terminal block should be torqued to 5 lb in. (0.56 Nm) on each wire(s).

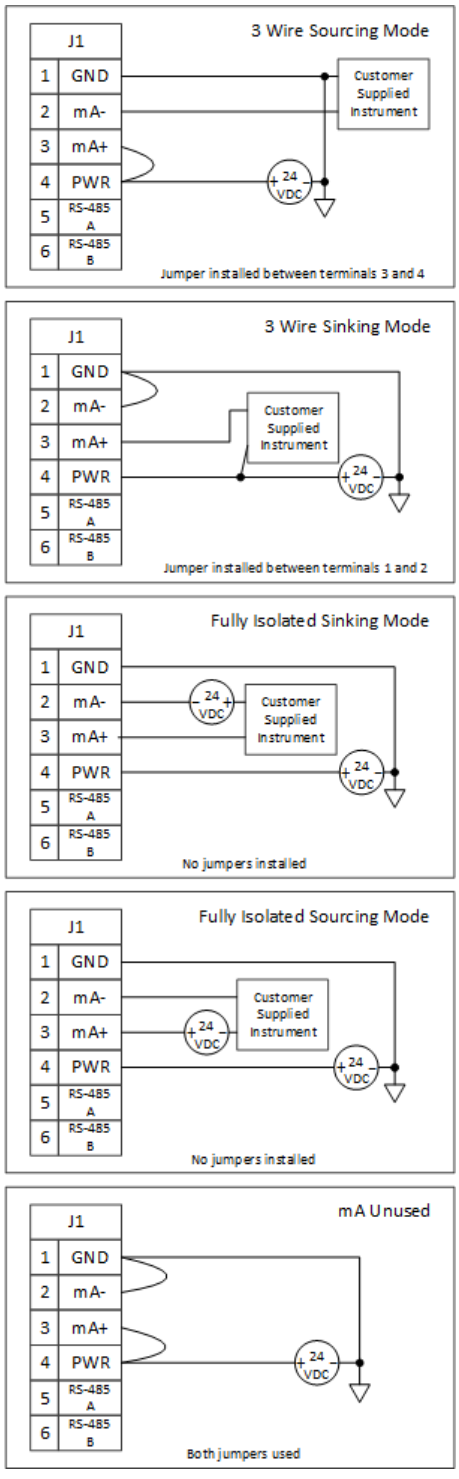
EMC - To ensure proper EMC protection, coil and tape the cable shields at the control panel or power supply. Tie the other end of the shields together and terminate inside the detector enclosure, ensuring earth ground to the cabinet.

Terminal Blocks - The flame detector electro-optical detector module has pluggable terminal blocks for interfaces (Power Supply, RS-485, Relay, etc.) with retention for easy plug-in replacement of the product in the field.

NFPA 72 Terminal Blocks - When connecting to a fire panel, compliance with NFPA 72 is obtained by using the terminal blocks in NFPA 72 connection kit part number FS24XP-NFPA-KIT. Instructions are provided with the kit and online (see QR code on the back of this appendix).

14. Wiring Configurations

There are multiple ways to configure the current loop on the detector. Consult the User Manual for specifics on each of the methods shown below.



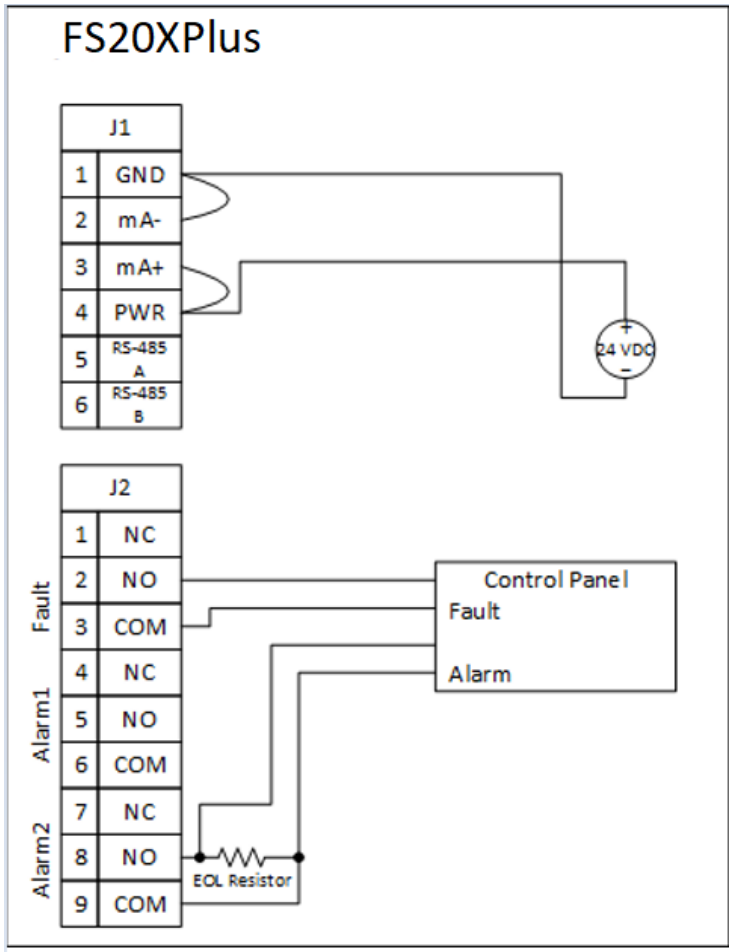
15. Communication Wiring

For Modbus and HART® details – See User Manual.

Independent Alarm and Fault Relay Wiring

- Fault relay is normally energized and wired using normally open contact. i.e., continuity of the fault circuit will break if relay de-energizes. Any fault or loss of power will result in fault relay de-energizing.
- Alarm relay is de-energized by default and typically wired using the normally open contact. i.e., the alarm circuit is shorted in the event of an alarm.
- The EOL resistor (selected following control panel specification) enables the signal circuit to be monitored by the control panel for continuity.
- Any loss of continuity in the alarm circuit, including the disconnect of either the signal conductor, or the EOL resistor, or both will be detected by the controller and signal as a fault.
- The termination of the alarm circuit conductor and the EOL resistor (or the next unit in a daisy chain of units) must be inserted into separate openings on the duplicate terminal block of the NFPA 72 connection kit to comply with NFPA 72 requirements.

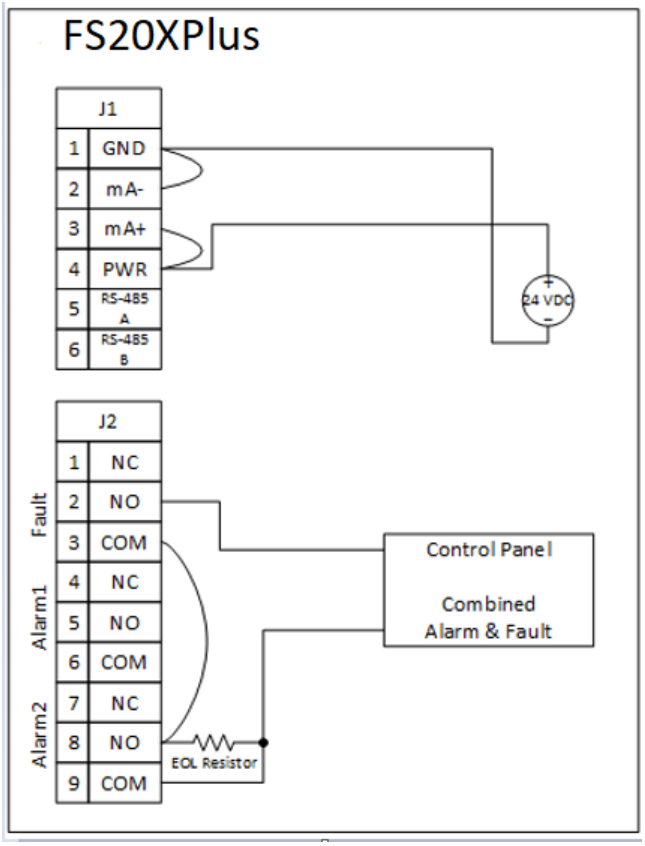
16.



17.

Combined Alarm and Fault Relay Wiring

- Fault relay is normally energized and wired using normally open contact. i.e., continuity of the fault circuit will break if relay de-energizes. Any fault or loss of power will result in fault relay de-energizing.
- Alarm relay is de-energized by default and typically wired using the normally open contact. i.e., the alarm circuit is shorted in the event of an alarm.
- The EOL resistor (selected following control panel specification) enables the signal circuit to be monitored by the control panel for continuity.
- Any loss of continuity in the alarm circuit, including the disconnect of either the signal conductor, or the EOL resistor, or both will be detected by the controller and signal as a fault.
- The termination of the alarm circuit conductor and the EOL resistor (or the next unit in a daisy chain of units) must be inserted into separate openings on the duplicate terminal block of the NFPA 72 connection kit to comply with NFPA 72 requirements.



Configure the Detector (Safe Area)

1. Connect to the detector by using either a USB cable or through a twisted pair of wires via RS-485 converter to the PC or laptop.
2. Run the Honeywell FlameManager Application.
3. In the Communication Parameters window, Select the correct port type, (either RS-485 or USB) and names.
4. Click Connect.
5. From the Main window, select the Configure tab.
6. From the Configure window, you can perform any of the following operations:

Operation	Description
Flame Sensitivity	Select from four sensitivity values from low to very high. Be sure to comply with the site required Agency approvals.
Alarm Verification Time	The time the detector should wait before sending an alarm sign after detecting a possible flame source. This waiting time is to prevent false alarms.
Read	Read the detector flame sensitivity and alarm verification time current values.
Write	Apply new values selected for the flame sensitivity and the alarm verification time.
Latch Alarms	Holds the info when the detector is alarmed. To unlatch it, turn the detector off. Be sure to comply with NFPA 72 if required.
Relay Options	1 = Fault; 2 = Alarm; 3 = Auxiliary
4-20mA Output options	Set current levels for the faults, warning, Inhibit, alarm, and verified alarm notifications.
Other Options	• Enable HART (default: Disabled) • Enable MODBUS (default: Disabled) • Enable Background UV/3IR report (default: Disabled)

Commissioning the Detector

After set-up and installation, test the flame detector with the test lamp. Confirm coverage area is correct.

States & Outputs

The FS20X Plus™ Flame detector communicates status using a variety of output methods, including the LED, 4-20 mA current loop, Relays, RS-485 Modbus, and HART® EDD over 4-20mA current loop.

Test Lamps

The Honeywell® TL-1055 and TL-2055 test lamps are compatible with the FS20X Plus™ flame detectors. Note that the test lamps will alarm the detector, so we recommend inhibiting the safety system before testing.

 WARNING Risk of Explosion

Use test lamp model TL-1055 in non-hazardous locations only. For hazardous locations, use model TL-2055.

Some of the most important functions of the remote test lamp ensure:

- The detector's optical path is not blocked.
- The detector is appropriately aimed at the fire threat area.
- The detector's alarming circuitry and outputs (i.e., relays, 4-to-20 mA, etc.) function properly.

Tests are made using the Honeywell® TL-2055 Test Lamp with a range of 10-25 ft when fully charged.

Wait a minimum of thirty (30) seconds between tests (i.e., test lamp or test fires) to allow the Detector's sensors to normalize to the spectral background conditions fully.

 WARNING: The following conditions may have a detrimental effect on detector performance or increase the chance of nuisance alarms and therefore should be avoided:

1. Locations where the detector is aimed directly at the sun.
2. Situations where the detector is continuously subjected to modulated sunlight.

Maintenance

After the FS20X Plus™ Flame detector is installed and commissioned, the detector's window must be kept clean. To ensure the detector is operating properly at all times, it may be necessary to establish a periodic cleaning schedule. Inspect at least quarterly in dirty environments. Semi-annual or quarterly testing should be performed using the appropriate Honeywell® test lamp to ensure the integrity of the detector. A complete "end-to-end" test of the entire fire detection system should be performed periodically depending on the application.

Flame Response Sensitivity Test

The following tables provides FS20X Plus™ response times and distance to various fuels with the verify alarm time set to zero.

Fuel	Flame Response Sensitivity				Target Sensitivity[6]	Alarm Response Time (sec)	
	Fire Size		Fire Distance[5]				
	Indoor	Outdoor	Indoor	Outdoor		Typ.	Max.
N-Heptane	6 in x 6 in (0.15m x 0.15m)	12 in x 12 in (0.3m x 0.3m)	160 ft (49 m)	220 ft (67 m)	Very High[4]	5	10
			120 ft (37 m)	165 ft (50 m)	High		
			80 ft (24 m)	110 ft (34 m)	Medium		
			40 ft (12 m)	55 ft (17 m)	Low		
Methane	3/8 in (9.5mm) Dia. Orifice, 15 in (0.38m) Plume	3/8 in (9.5mm) Dia. Orifice, 32 in (0.81m) Plume	60 ft (18 m)	100 ft (30 m)	Very High		
Butane	N/A	3/8 in (9.5mm) Dia. Orifice, 32 in (0.81m) Plume	N/A	190 ft (58 m)	Very High		
Propane	N/A	3/8 in (9.5mm) Dia. Orifice, 32 in (0.81m) Plume	N/A	190 ft (58 m)	Very High		
Ethanol	N/A	12 in x 12 in (0.3m x 0.3m)	N/A	160 ft (49 m)	Very High		
Methanol	N/A	12 in x 12 in (0.3m x 0.3m)	N/A	105 ft (32m)	Very High		
Hydrogen	N/A	3/8 in (9.5mm) Dia. Orifice, 32 in (0.81m) Plume	N/A	90 ft (27 m)	Very High		
Acetylene	3/8 in (9.5mm) Dia. Orifice, 12 in (0.3 m) Plume	3/8 in (9.5mm) Dia. Orifice, 12 in (0.3 m) Plume	100 ft (30 m)	110 ft (34 m)	Very High		
Syngas	N/A	3/8 in (9.5mm) Dia. Orifice, 28 in (0.71 m) Plume	N/A	90 ft (27 m)	Very High		
Diesel	N/A	12 in x 12 in (0.3m x 0.3m)	N/A	170 ft (52 m)	Very High		
Kerosene	N/A	12 in x 12 in (0.3m x 0.3m)	N/A	160 ft (49 m)	Very High		
Jet A	N/A	12 in x 12 in (0.3m x 0.3m)	N/A	175 ft (53 m)	Very High		
JP-4	N/A	12 in x 12 in (0.3m x 0.3m)	N/A	175 ft (53 m)	Very High		
JP 5/8	N/A	12 in x 12 in (0.3m x 0.3m	N/A	190 ft (58 m)	Very High		
IPA	6 in x 6 in (0.15m x 0.15m)	12 in x 12 in (0.3m x 0.3m)	110 ft (34 m)	200 ft (61 m)	Very High		
Class A (paper and wood	N/A	Shredded paper loosely packed 12 in X 12 in x 12 in (0.3m X 0.3m X 0.3m)	N/A	110 ft (34 m)	Very High		
Silane	9/64 in (3.5mm) Dia. Orifice, 12 in (0.3 m) Plume	9/64 in (3.5mm) Dia. Orifice, 12 in (0.3 m) Plume	40 ft (12 m)	60 ft (18 m)	Very High	6	10

Flame Response [C386-15 Canada]

Sensitivity: Very High @ 8ft height from ground

Fuel	Fire Size	Distance	Fuel Volume	Alarm Response Time (sec)	
				Typ.	Max
N-Heptane + water	2ft x 2ft x 1ft (0.6 X 0.6 X 0.3m)	300ft (91m)	500 ml	5	10

False Stimuli Response Test

False Alarm Source	FS20X Plus™ UV/3IR					Product Sensitivity	Alarm Response Time (sec)
	False Alarm Source Immunity Distance[2]	False Alarm Stimuli Performance					
		False Alarm Source Distance	Fire Size and Fuel	Fire Distance	Equivalent Fire Distance for 12 X 12 in (0.3m X 0.3m)		
Direct Sunlight (Modulated)	No Alarm	N/A	12 in X 12 in (0.3 m X 0.3 m) N-Heptane	150 ft (46 m)	150 ft (46 m)	Very High	5 (typ.) 10 (max)
Direct Sunlight (Un-Modulated)	No Alarm	N/A		180 ft (55 m)	180 ft (55 m)		
Reflected Sunlight (Modulated)	>=10ft (3.1 m)[7]	>=10ft (3.1 m)[7]	12 in X 12 in (0.3 m X 0.3 m) N-Heptane	150 ft (46 m)	150 ft (46 m)		
Reflected Sunlight (Un- Modulated)	>=10ft (3.1 m)[7]	>=10ft (3.1 m)[7]		180 ft (55 m)	180 ft (55 m)		
Arc welding 1/8" rod type 7014 to ½" plate @ 200A (Modulated)[1, 3]	>= 15 ft (4.6m)	>= 15 ft (4.6 m)	12 in X 12 in (0.3 m X 0.3 m) N-Heptane	30 ft (9 m)	30 ft (9 m)		
Arc welding 1/8" rod type 7014 to ½" plate @ 200A (Un-Modulated)[1]							
NiCr Electric Heater, 1500W (Modulated)	>= 5 ft (1.6m)	>= 5 ft (1.6 m)	3 in X 3 in (76 mm X 76 mm) N- Heptane	20 ft (6 m)	80 ft (24 m)		
NiCr Electric Heater, 1500W (Un-Modulated)	>= 8 ft (2.5m)	>= 8 ft (2.5 m)					
Fluorescent lamps, two 34W (Modulated)	>= 5 ft (1.6m)	>= 5 ft (1.6 m)	3 in X 3 in (76 mm X 76 mm) N- Heptane	20 ft (6 m)	80 ft (24 m)		
Fluorescent lamps, two 34W (Un-Modulated)							
Halogen lamp, Quartz (un-shielded), 500W (Modulated)	>= 5 ft (1.6m)	>= 5 ft (1.6 m)	3 in X 3 in (76 mm X 76 mm) N-Heptane	20 ft (6 m)	80 ft (24 m)		
Halogen lamp, Quartz (un-shielded, 500W (Un-Modulated)							
Halogen lamp, Quartz (shielded), 500W (Modulated)	>= 5 ft (1.6m)	>= 5 ft (1.6 m)	3 in X 3 in (76 mm X 76 mm) N-Heptane	20 ft (6 m)	80 ft (24 m)		
Halogen lamp, Quartz (shielded), 500W (Un-Modulated)							
Incandescent Lamp, 300W (Modulated)	>= 5 ft (1.6m)	>= 5 ft (1.6 m)	3 in X 3 in (76 mm X 76 mm) N-Heptane	20 ft (6 m)	80 ft (24 m)		
Incandescent Lamp, 300W (Un-Modulated)							
Sodium Vapor Lamp, 70W (Modulated)	>= 5 ft (1.6m)	>= 5 ft (1.6 m)	3 in X 3 in (76 mm X 76 mm) N-Heptane	20 ft (6 m)	80 ft (24 m)		
Sodium Vapor Lamp, 70W (Un-Modulated)							
LED (Modulated)	>= 5 ft (1.6m)	>= 5 ft (1.6 m)	3 in X 3 in (76 mm X 76 mm) N-Heptane	20 ft (6 m)	80 ft (24 m)		
LED (Un-Modulated)							
Ceramic Heater 1500 W (Modulated)	>= 5 ft (1.6m)	>= 5 ft (1.6 m)	3 in X 3 in (76 mm X 76 mm) N-Heptane	20 ft (6 m)	80 ft (24 m)		
Ceramic Heater 1500 W (Un-Modulated)							

Notes:

1) Electric arc welding generates intense ultraviolet (UV) radiation. This UV radiation can easily scatter and travel significant distances, even in the presence of direct obstructions. For instance, any open door or window can permit nuisance UV radiation from arc welding to enter an enclosed area, potentially triggering a response from the flame detector. It is recommended to inhibit the flame detector during electric arc welding operations when a false alarm cannot be tolerated. Additionally for gas welding, the gas torch is a real flame, and the flame detector should be inhibited during welding operations.

2) All false alarms tests are conducted indoors excluding sunlight tests

3) Modulated Arc Welding was conducted at 1 Hz Modulation

4) Outdoor n-Heptane 12" X 12" can be detected at up to 265 ft (81 m) with a detection time of ~15 seconds.

5) For a given fuel and sensitivity setting, flame detection distance varies approximately as the square root of the area of the fire base. This is the inverse square law.

6) When the sensitivity is set to "High", the detection distance is approximately 75% of the distance for Very High. When set to Medium, it is approximately 50%, When set to Low, detection distance is about 25% of the value for Very High.

7) Distance from flame detector to reflective surface.

Contact Us

Americas Honeywell® Analytics 405 Barclay Boulevard Lincolnshire, Illinois 60069 Tel: +1 847 955 8200 Toll free: +1 800 538 0363 detectgas@honeywell.com	Europe, Middle East, and Africa Honeywell® International Sarl Z.A. La Piece 16 1180 Rolle Switzerland Main Phone: +41 21 695 30 10 reception.rolle@honeywell.com
Asia Pacific Honeywell® Industrial Safety 7F SangAm IT Tower 434, Worldcup Buk-ro, Mapo-gu, Seoul 03922 South Korea Tel: +82 (0) 2 6909 0300 analytics.ap@honeywell.com	 1701M5005 Revision C August 22, 2025

Contact Us

Americas

Honeywell® Analytics
405 Barclay Boulevard
Lincolnshire, Illinois 60069
Tel: +1 847 955 8200
Toll free: +1 800 538 0363
Fax: +1 847 955 8210 detectgas@honeywell.com

Europe, Middle East, and Africa

Honeywell® International Sarl
Z.A. La Piece 16
1180 Rolle
Switzerland
Main Phone: +41 21 695 30 00
reception.rolle@honeywell.com

Asia Pacific

Honeywell® Industrial Safety
7F SangAm IT Tower
434, Worldcup Buk-ro, Mapo-gu
Seoul 03922
South Korea
Tel: +82 (0) 2 6909 0300 Fax: +82 (0) 2025 0329
analytics.ap@honeywell.com

Technical Services

ha.global.service@honeywell.com

1701M5006

Manuals, software, and other information about this product are available at Publication www.honeywell.com

Channel Partner: sales@norrscope.com

Revision C
Date: August 22, 2025