Honeywell

Technical Note

Recommendation for reducing Flame Detector False and Nuisance Alarms

All Electro-Optical Flame Detectors are vulnerable to alarming to non-fire sources and reflected non-fire and real fire sources. Installations where there are flares (ground flares or flare stacks) ensure that the flares are not within the Flame Detector's Field of View (FoV). Flares are real fires, often referred to as friendly fires, and strong reflections from these flares can also be detected by an optical flame detector. Aim the Flame Detector, so that a flare is not within the field of view and try to avoid reflections of a flare within the FoV. Additionally, we recommend these steps be taken (in any order) to help mitigate or reduce their occurrence(s).

1. Lower the sensitivity – A higher sensitivity setting has a higher risk or vulnerability of alarming to non-fire and friendly fire sources. Reduce the sensitivity of all flame detectors with reflective surfaces within their FoVs. The factory default setting for the FS20X (UV/Dual IR plus Visible) and FS24X (Triple IR plus Visible) Detectors is Medium sensitivity, or 100 ft. sensitivity to a 1 sq. ft. pan fire. Due to the proximity of the flame detectors with the reflective surfaces and/or flare stacks, we recommend a sensitivity setting of Low. The energy from a flare stack may be reflecting off one or more surfaces. This reflected energy is coming from a real fire and is considered a nuisance alarm and not a false alarm.

2. Reduce the FoV – Focus the detector's FoV on the primary threat area and avoid false and nuisance sources outside the primary threat area. In some cases, a Sun Shade accessory (SH-001) will be adequate for this purpose. In other, more extreme cases, it may be necessary to utilize a Field of View Restrictor accessory (FVR-01) to focus the Flame Detector on the area to be protected. These two accessories are available from Honeywell Analytics.

3. Vote Detectors - Typically, this is the recommendation for most outdoor installations where an alarm from the flame detectors will initiate a suppression release. A spurious trip by single detector should not activate a suppression release system. It is unlikely that two or more spurious conditions will happen simultaneously, therefore, require two or more detectors to alarm to a fire before initiating suppression. The best approach is to vote two detectors that cover the same threat area from opposing perspectives, so that a single detector covering the threat area that alarms to a source outside or beyond the threat area will not initiate suppression by itself.

4. Set a Fire Verification Time (affects the Auxiliary Relay) - All FS20X and FS24X Detectors have a user selectable verification time that can be set via a DIP switch setting on the back of the detector module. Setting a verification time of five, ten, or twenty seconds means that the secondary alarm (Auxiliary Relay) will not activate unless the fire continues to burn during the entire verification time. When that verification time expires and the fire is still burning, the Auxiliary Relay will activate. If the time expires and the fire is not burning, the Auxiliary Relay will not activate. Many non-fire sources are brief or have short time durations, and Verification is a setting that can be employed that may dramatically reduce the occurrence of False and Nuisance Alarms. Fire Verification does not affect the 4-20mA output of the standard version of the FS24X Detector, therefore, any source that causes the first stage Alarm to activate will also generate a 20mA signal level on the 4-20mA output. This is not the case with the FS20X Detector: on Fire Alarm the 4 to 20mA output will rise to 16mA and on Fire Verification the 4 to 20mA output will rise to 20mA.

All the above recommendations will help reduce or mitigate false and nuisance alarms from occurring, but they may not be enough by themselves. Honeywell Analytics has developed a Triple IR Flame Detector that is suitable for use in applications where flares are present, referred to as the dash 5 (-5) version. The -5 version is a replacement for the standard version dash 1 (-1) of the FS24X, however, a detector module purchased before July 19, 2018 and swapped in the field must be accompanied by the addition of a reflector ring onto the FS24X enclosure lid.

It is important to note the -5 version is only available on the 90° FoV FS24X and not the 110° FoV FS24X nor the FS20X. Also, we recommend 90° Field of View Flame Detectors in any high background flare or IR energy applications rather than the wider 110° Field of View units.

The main difference between the -1 and -5 firmware is the ability of the -5 to retreat from alarm within 6 seconds with elevated levels of background IR present. The -5 firmware was developed and validated using:

1. a low sensitivity setting and
2. a ten (10) second verification setting

The -5 FS24X will alarm to the same test fires, at the same distances, with the same response times as the -1 FS24X. In other words, the primary detection algorithms were not altered.

NOTE: *The firmware changes made to the dash 5 version of the FS24X will <u>not</u> prevent the Detector from alarming to Flares within the Detector's Field of View.*

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