

### OVERVIEW

The NFPA (National Fire Protection Association)\*, has recently released *NFPA 1801: Standard on Thermal Imagers for the Fire Service, 2018 Edition*. This new standard provides performance standards for thermal imaging cameras (TICs) used by firefighters on firegrounds and within other hazardous environments. The standard provides requirements for minimum image quality, standard operation, durability, and nonincendive safety. This paper discusses each category and how these requirements impact firefighters.

To meet the new standard, TIC manufacturers must be registered as ISO 9001-compliant. Testing laboratories for TIC NFPA certification must be accredited in accordance with ISO 17025A requirements.

#### MINIMUM IMAGE QUALITY

NFPA 1801 requires thermal imaging cameras to meet minimum image quality standards to help ensure that compliant TICs provide information of sufficient quality for fireground use. TIC imaging performance tests conducted include those for image contrast, image spatial resolution and thermal sensitivity.

#### STANDARD OPERATING REQUIREMENTS

NFPA 1801 requires that all TICs provide the same interface, enabling firefighters to use any NFPA-compliant TIC with minimal additional training. Requirements include a **green power button** and an **NFPA Basic Mode**. Basic Mode limits the camera display to heat-indicating color with color reference scale. Any additional camera features must be accessed by taking a **special action** that switches the camera from Basic Mode to **Plus Mode**. The green power button **cannot** be used to take this special action, as this distinction is meant to avoid incidence of firefighters potentially accessing features for which they have not been trained.

In addition, powered-on TICs must continuously detect and display images that occur within electromagnetic spectrum range of 8.0 – 14.0 micron. NFPA-compliant TICs must be tested for electromagnetic emission and immunity.

#### POWER AND SERVICE LIFE REQUIREMENTS

NFPA-compliant TICs, once powered on, must operate continuously for a minimum of 120 minutes in Basic Mode without battery charging or change-out. Operational selection devices such as buttons, keys and switches must be able to be activated using a single gloved hand, and be rated for a 50,000-cycle service life.

#### DURABILITY REQUIREMENTS

NFPA 1801 has durability requirements to help ensure that TICs are fit for fireground duty. Many of these requirements are similar to those found in NFPA standards for SCBA (self-contained breathing apparatus) and other PPE (personal protective equipment). TIC tests conducted include those for ingress protection, heat/flame resistance, impact acceleration and vibration resistance, and corrosion.

#### NONINCENDIVE SAFETY AND ELECTROMAGNETIC REQUIREMENTS

Firefighters sometimes operate within potentially explosive environments; NFPA 1801's intrinsic safety requirement addresses this operational concern. NFPA-compliant TICs must meet ANSI/UL 121201 Class 1 Division 2 requirements, meaning that TICs are suitable for use within conditions where potentially explosive quantities of dust or vapor may be present.

#### SUMMARY

NFPA 1801 standardizes TIC operation, helping to ensure minimum image quality, adds nonincendive safety and provides minimum durability requirements for compliant TICs.

*\*NFPA, an international non-profit organization established in 1896, provides consensus codes, standards, research, training, and education concerning fire prevention and minimizing the effects of fire. NFPA 1801 was established to provide minimum design, manufacturing, testing, performance, and certification requirements for fire service thermal imaging cameras. Since its 2010 inception, MSA and other TIC manufacturers have been actively involved in developing the 2021 edition.*

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