NXT Thermal Imager
Bid Specifications

I. Warranty
The manufacturer shall make standard a warranty for the thermal imager, all features and accessories installed in the thermal imager to be free of defects in material and workmanship, under normal use and service, for a period of five years. As part of this warranty, the manufacturer must provide free inbound and outbound shipping for transport within the continental United States for all repair service. The manufacturer must provide a warranty which covers all required battery replacements for a period of five years. In addition, the imager's housing shall carry a limited lifetime warranty.

II. Service
The manufacturer must be located in the U.S.A. and provide a full-service repair center in the U.S.A. to ensure timely and efficient processing of any service related issues concerning the imager. Warranty repairs must carry a guaranteed 48-hour turnaround (2 full business days from the time of receipt at the service center to the time that the manufacturer ships the imager). Non-warranty repairs must carry a guaranteed 48-hour (2 full business days) turnaround from the time the manufacturer receives purchase order authorization to complete the repairs to the time the manufacturer ships the imager.

III. Standards / Quality
The manufacturer must ensure quality design and manufacturing methods through third party certification to ISO 9001, or its equivalent. To ensure that the product is of the highest quality, documentation must be presented upon request illustrating a battery of tests that have been conducted to verify water resistance, heat resistance, and shock/impact resistance.

The imager must be compliant to NFPA 1801, Standard on Thermal Imagers for the Fire Service, 2021 Edition at the time of delivery. The imager must be suitable for use in ISA STD 12.12.01 CLASS I DIV 2, GROUP A, B, C, D, T6 CLASS II DIV 2, GROUP F & G hazardous locations.

IV. Physical Configuration
The imager shall be a hand-held design with a total weight not exceeding 2.4 pounds (1.1 kg) with all standard features installed. The imager's physical dimensions shall not exceed 5.4 (137 mm) tall, 4.6 (117 mm) wide, and 8.2 (208 mm) long. The imager shall ship in a reusable delivery case.

V. Durability
The imager shall remain operational after being submerged under 3 feet of water for 30 minutes. The imager shall withstand a 2-meter drop in any orientation and sustain no operational damage. The imager shall be able to withstand an environment temperature of 350º F (177º C) for 15 minutes without operational impact or damage to the unit. The manufacturer must perform these tests in front of designated department representatives at a mutually determined time and location. Failure to perform these tests in front of designated department representatives shall constitute non-compliance with this portion of the specification.

VI. Technology
The imaging array shall utilize a 320x240 pixel uncooled vanadium oxide (VOx) focal plane array.The Noise Equivalent Temperature Difference (NETD) shall be less than 30 mK. The imager shall exhibit an ability to evade whiteout when pointed directly at flames. The detector shall operate with core temperature ranges of -40°F to 175°F (-40°C to 79°C). The dynamic range of the detector and associated electronics shall be nominally 1100°F (592°C). The detector spectral response shall be 7 to 14 microns. Mid-wave or short-wave infrared products that operate below this portion of the infrared spectrum (below 7.5 microns) are not acceptable due to unreliable performance in smoky conditions. The frame rate of the infrared engine shall be no less than 60 Hertz.

VII. Image Colorization
In order to provide a greater degree of safety, the imager shall utilize a tri-color automatic colorization mode. This colorization mode shall utilize a yellow/orange/red color scheme. The display will show yellow colorization at temperatures of 500°F (260°C) to 799°F (426°C), orange colorization at temperatures of 800°F (427°C) to 999°F (537°C), and red colorization at temperatures of 1000 °F (538°C) or hotter. Such colorization shall be graduated in nature so as to be able to discern scene details such as visible thermal flows though the color. The imager shall employ one single colorization scheme of yellow/orange/red which does not vary with ambient thermal energy. Color palettes which colorize objects that are below 500º F are not acceptable. This requirement does not apply to the Manual Colorization Mode (see Switches).

VIII. Outer Housing
The imager shall be ergonomically designed and the outer shell or housing must be manufactured from heat-resistant Ultem® thermoplastic. Due to the likelihood of rigorous use, the thermoplastic must be molded with color pigment throughout to mask small surface scratches. Outer shells or housings which are painted or otherwise lacking consistent color through their entire thickness are not acceptable.

IX. Colors
The imager shall be available in no fewer than eight scratch-resistant colors to allow for color-coding as needed by the department. All lower housings shall be presented in black, with the upper housing to include options for the following colors at minimum: Red (default configuration), Metallic Blue, Yellow, Black, White, Orange, Blue, and Lime-Yellow.

X. Monitor/Screen
The imager shall have a 3.5" (89 mm) diagonal LED backlit Liquid Crystal Display (LCD) screen. The display shall consist of no less than 76,800 pixels for high quality resolution. The screen must be visible in thick smoke to the operator while using it at arms-length. In addition, a clear polycarbonate cover must protect the display screen. This cover must be field-replaceable and watertight.

XI. Lens
The imager shall possess an f/1.3 lens fabricated of germanium and have no less than a 31° (V) x 40° (H) field of view. The lens shall be protected with a watertight, sealed 2 mm thick germanium cover window.

XII. Visual Indicators
The imager shall have a battery status indicator on the viewing display to reduce imager size. Battery indicators that are not located on the display, such as separate LED based indicators, are unacceptable as they increase imager size. The imager is capable of providing surface temperature measurement of objects presented on the display screen in both bar graph and numeric indication simultaneously when operating in Basic Plus Mode while adhering to the NFPA 1801, 2021 edition regarding Basic Mode operations. The imager shall provide on-screen indication when manual colorization mode is engaged and when the DVR is recording (if so equipped).

XIII. Switches, Features, and Modes of Operation
The imager shall use only one switch to activate the unit. The switch shall employ an electronic press-and-hold protection mechanism which prevents accidental shut-off. The imager must employ a secondary switch which enters TI BASIC PLUS mode allowing access to advanced features. During operation, a single press of the main power switch must always return the imager to TI BASIC mode regardless of current operational state or mode. Additionally, the imager must utilize a pair of switches which enable the activation and adjustment of a manual colorization mode, an internally installed Digital Video Recorder (DVR), and/or digital zoom, as applicable to the imager's installed configuration.

XIII. Switches, Features, and Modes of Operation (cont.)

As an option or upgrade, the imager must be available with a manual colorization mode which helps the user identify the hottest objects in a scene irrespective of absolute heat levels. This colorization mode must be manually adjustable by the user and colorize the hottest objects in a scene with blue, using gradients of blue so as to discern scene details though the color. Thermal imagers which employ yellow, orange, or red to identify hot objects for a manual colorization mode are not acceptable as they can easily be confused with the automatic colorization modes which typically use such colors to designate fire and high heat conditions.

As an option or upgrade, the imager must be available with a digital zoom feature for better view of scene details. The zoom feature should offer 2X and 4X magnification options.

As an option or upgrade, the imager must be available with an internally housed Digital Video Recorder (DVR) which enables the recording of thermal imaging video to the internal memory of the thermal imager. The DVR must be manually operable by the user enabling activation and deactivation with a button press. The DVR must be capable of recording 5.5 hours of video in 720 x 480 resolution. Stored digital video shall download to the user's computer via USB connection. A time and date stamp shall be displayed at the beginning of recorded video for documentation purposes. Attachable DVRs are not acceptable as they increase total size and weight.

XIV. Strap Systems

To reduce bulk, the imager must not have an integral strap system; however, the imager shall accommodate an available self-retracting strap. This retractable strap shall be attachable to a D-ring at the base of the thermal imager, under the display, and must be capable of holding the unit to the firefighter's body with the full weight of the imager, with battery, hanging unsupported from the strap. All straps must be field replaceable.

XV. Power Supply

When fully charged, the imager shall provide a minimum of 6 hours of continuous use with the DVR recording. The imager shall have an internal battery that can be charged wirelessly such that contacts that can corrode over time are absent.

XVI. Operation

The imager must be fully operational no more than four seconds after activating the power switch. The imager must not have a standby switch or mode.

XVII. Truck Mount

The manufacturer must offer a truck mounted charging system to mount the imager and internal charging system in a vehicle or fire apparatus or on the wall of a fire station. The system must be compliant to NFPA 1901 when properly mounted in a vehicle or fire apparatus. The truck mount must carry a one-year warranty.

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