

Bullard T4 Thermal Imager

Bid Specifications

I. Warranty

The manufacturer shall warrant the thermal imager free of defects in material and workmanship, under normal use and service, for a period of one year from delivery. In addition, the imager's outer shell or 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. Upon request, the manufacturer must provide the names and contact information for three (3) fire departments that can serve as references, verifying that the manufacturer complies with this requirement.

III. 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 illustrating that a battery of tests that have been conducted to verify water resistance, heat resistance and shock/impact resistance.

IV. Physical Configuration:

The imager shall be a hand-held design, having a 4.3-inch LCD display screen and two side straps (one on each side of the imager). A combination wrist/gear strap shall accompany the imager. Total weight of the imager shall not exceed 4 lbs. with the standard battery installed. The imager shall ship in a padded, re-usable delivery case. The imager shall ship standard with two rechargeable batteries, a battery charger with AC and DC adapters, and an interactive multimedia orientation/training CD-ROM. The imager's physical dimensions shall be no more than eight (8) inches tall, six (6) inches wide and six (5.5) inches long. The imager must contain an integral threaded connector to mount on a standard tripod.

V. Durability:

The imager shall remain operational after being submerged under 3 feet of water for 30 minutes. The Thermal Imager shall withstand a 6-foot drop in any orientation and sustain no operational damage. 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 technology shall be 320 x 240 pixel un-cooled amorphous silicon microbolometer detector. To ensure reliability, the detector must be designed and manufactured by a company that has provided, for at least three (3) years, detectors used in the fire service. A detector from a company without three (3) years experience in the fire service is not equivalent. The Noise Equivalent Temperature Difference (NETD) shall be less than 50 mK. The imager shall exhibit an ability to evade whiteout when pointed directly at flames or the sun. The detector shall operate across core temperature ranges of -20°C to 85°C. The dynamic range of the detector and associated electronics shall be 600°C (± 25°C). The imager shall provide surface temperature measurement taken directly from the detector. To ensure safety, temperatures shall be displayed in a graphical form rather than numerically. Preference will be given to bar graph-type graphics on the right side of the display screen. The temperature display must indicate temperatures as high as 1200°F. The imager shall have a colorization mode, active only in its low gain setting that colors items in three colors based on their temperatures. The system shall activate at 500°F with yellow colorization. The colorization shall use orange for items at least 250°F hotter than the activation temperature. The system shall use red colorization shall for objects above 1000°F. Colorization must occur in gradations, meaning that each color appears in multiple shades based on the actual temperature of the object.

VII. 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 Ultem must be molded with color pigment throughout to mask small surface scratches. Outer shells or housings that are painted or otherwise lack consistent color through their entire thickness are not equivalent. The interior surfaces of the outer shell or housing shall be coated with a conductive electromagnetic interference (EMI) shielding material.

VIII. Colors:

The imager should be available in no less than seven scratch resistant colors to allow for color-coding as needed by the department. Colors shall include, at a minimum: Red, Yellow, Black, White, Orange, Blue, and Lime-Yellow.

IX. Monitor/Screen:

The imager shall have a 4.3" diagonal LED backlit Liquid Crystal Display (LCD) screen. It shall have a minimum pixel range of 130,560 and a dot format of 480 x 272 dots for high quality resolution. The screen must be visible in thick smoke to both the operator and nearby firefighters from a variety of distances from the face, including arms length. In addition, the display screen must be protected by a clear polycarbonate cover. This cover must be field replaceable and watertight.

X. Lens:

The imager shall possess an f/1.0 lens fabricated of germanium. The lens shall be

protected with a watertight, sealed 2 mm thick germanium cover window.

XI. Visual Indicators:

The imager shall have only one LED-indicator system to promote maximum ease-of-use. This indicator shall display battery life via five LEDs: three green, one yellow and one red.

XII. Switches:

The imager shall use one switch to activate the unit. The switch must be recessed and protected to avoid accidental shut-off. The imager shall also be equipped with a pair of switches that activates a special colorization mode, which helps the user identify the hottest objects in a scene. This colorization mode must be manually adjustable by the user and colorize the hottest objects in a scene with a color that is unique to this mode. This system provides extreme value during overhaul and investigations, therefore imagers that do not have a manual mode will not be considered equal. To ensure firefighter safety and avoid confusion, thermal imagers that use yellow, orange or red to identify hot objects (other than required in Section VI) will not be considered equal. The imager shall be equipped with a switch to activate a 2x and 4x digital zoom. The switch shall be recessed and protected to avoid accidental activation.

XIII. Strap Systems:

The strap system must be field replaceable and shall be constructed with the following:

- A. The side straps, one on each side of the imager, shall be made primarily of Kevlar. The side straps must be adjustable and must include a metal D-ring. To improve safety, the side straps must have reflective trim.
- B. The combination wrist and gear strap shall be made primarily of Kevlar. This strap shall include two metal carabineers and a quick-release buckle that frees the imager from the strap. An optional self-retracting strap must also be available for the imager. The self-retracting strap must retract fully with the full weight of the imager (with battery) hanging unsupported from the strap.

XIV. Power Supply:

A minimum of two (2) rechargeable batteries shall accompany each imager. Each battery shall be a 10-volt nickel metal hydride (NiMH) cell, providing a minimum of three hours of continuous use with all standard functions and features. Each battery must be capable of a minimum of 1,000 charges. The battery shall have an Ultem outer shell. The battery shall eject from the imager only when two opposing battery release buttons are pressed simultaneously. The battery must be capable of being loaded into the housing only one way and must be easily inserted and removed by a person wearing standard firefighting gloves. A lithium ion battery is an unacceptable substitute for NiMH due to lithium's higher risk of explosion when exposed to high heat. An optional AA alkaline battery case must also be available for the imager. The

case must load and secure into the imager in the same manner as the standard NiMH battery. It must also be constructed from Ultem.

XV. 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.

XVI. Wireless Transmission:

The manufacturer shall offer an optional wireless remote transmitter compliant with FCC part 90 while operating at a frequency range of 2.4 GHz. The wireless transmitter must come as a two (2) or four (4) channel unit at the department's option. The transmitter and a dipole antenna shall be housed inside an attachable handle, protecting the transmitter and antenna from possible damage while giving the department the option to disengage the transmitter. Attaching the transmitter handle must not increase the width of the imager by more than one (1) inch. Each wireless unit must have a receiver and antenna able to receive a signal from at least 300 feet through common Type V construction. To ensure mobility at an emergency incident, the manufacturer must offer an optional receiver system that operates on the same batteries as the imager. This optional receiver must also weigh less than 2.5 lbs. and be a self-contained unit, including receiver, antenna, channel switch, video display and power supply.

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 charging system shall come standard with all necessary mounting hardware, a direct charge system, and power cords that enable the use of a DC power supply. The system must charge the battery in the imager at the same time it charges a spare battery. The battery in the imager must be charged through contacts on the imager. No cables or wires connecting the imager to the charging system are acceptable. The system must be compliant to NFPA 1901 when properly mounted in a vehicle or fire apparatus. The charger must include a separate storage compartment large enough to hold a spare battery or AA alkaline battery

XVIII. Training:

A product familiarization class will be available through the manufacturer's authorized distributor. To ensure the highest quality training materials, the manufacturer must have at least two full-time employees dedicated to developing and delivering thermal imaging training. To qualify, the employee must have at least ten years of active firefighting experience and must be certified as a thermal imaging instructor by an internationally recognized organization that specializes in thermal imaging for public safety organizations. The employee must also spend at least 75% of his/her time on thermal imaging training programs.

XIV. Delivery:

The manufacturer shall deliver the thermal imager and all ordered accessories in 30 days or less after receiving the purchase order.
