

## I. Warranty

The manufacturer shall warrant the Thermal Imager and all charging systems supplied with the Thermal Imager free of defects in material and workmanship, under normal use and service, for a period of one year effective upon 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 (two 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 (two 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 names and contact information from law enforcement agency 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 upon request illustrating a battery of tests that have been conducted to verify water resistance and shock/impact resistance.

## IV. Physical Configuration

The imager shall be a hand-held design, having a 2.4-inch LCD viewing screen. Total weight of the imager shall not exceed 1.5 lbs. with the battery installed. The imager shall ship in a durable, lockable hard carrying case. The imager shall include one rechargeable battery, a battery charger with AC adapters. The imager's physical dimensions shall be no more than four (4) inches tall, four (4) inches wide and seven (7) inches long.

## V. Durability

The imager shall remain operational after being submerged under 3 feet of water for 30 minutes. The imager shall withstand a 6-foot drop on concrete 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 utilize an 80x60 pixel un-cooled amorphous silicon (aSi) focal plane array, which is upgradeable to 160x120. To ensure reliability, the detector must be designed and manufactured by a company that has provided, for at least five (5) years, detectors used in law enforcement. A detector from a company without five (5) years of experience in law enforcement is not acceptable. The Noise Equivalent Temperature Difference (NETD) shall be less than 50 mK. 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.

## VII. Outer Housing

The imager shall be ergonomically designed and the outer shell or housing must be manufactured from heat resistant thermoplastic or high heat nylon material. Due to the likelihood of rigorous use, the housing 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 acceptable.

## VIII. Colors

The imager should be provided in a uniform, non-glossy, all-black housing.

## IX. Monitor/Screen

The imager shall have a 2.4" diagonal LED backlit Liquid Crystal Display (LCD) screen with a clear polycarbonate cover to protect the display screen. This cover must be field-replaceable and watertight.

## X. Lens

The imager shall have a germanium lens having a 21° horizontal x 15° vertical field of view.

## XI. 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 must have indicators to indicate white-hot, black-hot, and nocturnal modes.

## XII. Switches

The imager shall use only one switch to activate the unit. The switch must be recessed and protected to avoid accidental shut-off. The switch shall be a mechanical capture switch which allows for automatic power restoration during a hot battery swap and eliminates the need for a "push and hold" mechanism for powering off that is associated with electronic switches.

The imager shall incorporate switches that enable changing from white-hot to black-hot polarity as well as display dimming and display off modes.

## XIII. 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 user's body with the full weight of the imager, with battery, hanging unsupported from the strap.

## XIV. Power Supply

The imager shall be provided with two rechargeable batteries and battery charger. The batteries shall be a 2.4-volt nickel metal hydride (NiMH) pack, providing a minimum of 3 hours of continuous use with all standard functions and features activated. The batteries shall have a thermoplastic outer shell. The batteries must be capable of being loaded into the housing only one way and must be capable of being inserted and removed by a person wearing tactical gloves.

## XV. Operation

Once the imager is registered, the imager must be fully operational no more than six seconds after activating the power switch. The imager must not have a standby switch or mode.

## XVI. User Selectable Video Modes

The imager shall be capable of switching between standard white-hot image polarity and black-hot image polarity for optimal situational awareness in various environments as well as a special red overlay mode that enables the user's eyes to quickly adjust from viewing the display to viewing nocturnal activities.

## XVII. Display Control

The imager shall be capable of switching between a fully illuminated display, a dimmed display for extra stealth, and a full-off display without powering off the unit. This display control enables different levels of stealth for varying situations.

## XVIII. Display Shield

The manufacturer must offer a display shield that affixes to the imager to provide a high level of stealth while providing the ability for the user to continue to view the thermal imager through a monocular eyepiece. The shield must not illuminate the user when held to the eye. To provide for easy viewing of the thermal imager display, the display shield must incorporate magnification optics.



### **XIX. Battery Analysis and Conditioning**

The manufacturer must offer an analyzer / conditioner system for use with the thermal imager's batteries. The hardware unit must utilize a PC software system that enables adding, naming, and removing batteries from a user's inventory. The software must be capable of automatically providing battery analysis and conditioning of up to four separate cycles to ensure optimal battery restoration. The hardware unit must be capable of conditioning up to four separate batteries simultaneously via multiple conditioning units or banks. The software must report analysis conclusions in simple English (i.e. "good" or "bad") for intuitive user understanding. The software must also be capable of notifying the user, via mobile text messaging or email, upon the completion of battery charging and/or analysis / conditioning events. The unit must also be capable of separately charging a battery.

### **XX. Vehicle 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 an additional battery, all necessary mounting hardware, a direct charge system, and a connector that enables the use of an AC/DC power supply. The system must charge the battery in the imager at the same time it charges a spare battery utilizing separate charging systems. 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, nor are straps or other connecting devices to hold the imager to the truck mounting system. The truck mount must carry a one year warranty.

### **XXI. Customized Startup Graphics**

The imager must be equipped with the capability of providing customized factory-loadable and user-loadable startup graphics. These graphics will be shown on the imager's display during the startup sequence.

### **XXII. Registration, Service and Support**

For added user security and cataloging of equipment, the manufacturer must utilize a user registration and support interface with the imager. This interface will enable the user to activate and register the imager for initial use, maintain and organize equipment inventory, download future product updates and features, and enable other service and support functions.

### **XXIII. Security**

The imager shall also be equipped with an integral security feature which saves the registered user information to a separately accessible database in an effort to identify the rightful owner and provide for resource tracking and identification.

### **XXIV. Delivery**

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

#### **Americas:**

**Bullard**  
1898 Safety Way  
Cynthiana, KY 41031-9303 • USA  
Toll-free within USA: 877-BULLARD (285-5273)  
Tel: +1-859-234-6616  
Fax: +1-859-234-8987

#### **Europe:**

**Bullard GmbH**  
Lilienthalstrasse 12  
53424 Remagen • Germany  
Tel: +49-2642 999980  
Fax: +49-2642 9999829

#### **Asia-Pacific:**

**Bullard Asia Pacific Pte. Ltd.**  
LHK Building  
701, Sims Drive, #04-03  
Singapore 387383  
Tel: +65-6745-0556  
Fax: +65-6745-5176

