

Product Specification for the Evolution[®] 5800 TIC



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Purpose

To establish minimum standards for MSA's Evolution 5800 Thermal Imaging Camera (TIC) and Evolution 5000 Series Universal Truck Mounted Charging System. The Evolution 5800 TICs are designed to be a tool for firefighters and first response emergency personnel and used for search and rescue, fire scene size-up, overhaul, location of victims, and advanced firefighting and first response applications.

Type

The thermal imaging camera covered by this specification shall be of the type incorporating a 320x240 vanadium oxide microbolometer focal plane array sensor. The Evolution 5800 series TIC displays black and white representations of the scene on a 3.5 inch diagonal LCD display. Its design is optimized for firefighters in its ergonomic design and ease of incorporation with firefighting gear. It features a dual handle design for easy handoff and handling and a high impact, heat resistant housing that ensures that the TIC will withstand the rigors of the firefighting environment. It is further protected by a rubber bumper system that provides additional protection from extremely harsh environments. The TIC shall be tested and comply with the following standards:

| | |
|------------------------------|---|
| Water/Dust Ingress | International Standard CEI, IEC 529, IP 67 Classification |
| Direct Flame/Heat Exposure | Simulated NFPA 1981-2002 Ed., NFPA 1982-1998 Ed. |
| Vibration | MIL-STD-810E Category 1 Loose Cargo Transport |
| Radio Frequency Interference | CE/EN 50081-2:1992, EN 50082-2: 1992, FCC Part 15 |
| Rollover (Truck Charger) | Simulated NFPA 1901-12, 1.7 |

Component Parts

The product shall consist of the following component parts. TICs, kits and accessories can be purchased individually.

1. Evolution 5800 series Thermal Imaging Camera
2. Direct temperature measurement
3. Heat Seeker PLUS Indicator
4. 2X Digital Zoom.
5. Five user selectable pallets
6. Video out connector
7. Operating manual

Components below sold in kit format and/or individually:

8. Lithium Ion battery packs
9. Stand alone battery charger with wall plug and cigarette lighter adapter
10. Vehicle mounted charging system
11. Attachments - carabiner, wrist strap, shoulder strap, and retractable lanyard
12. Carrying Case



| Specific Requirements | | | | | | | | | | | | | |
|--|--|---------------------|-----------------------|--------------|--------------|---------------|--------------|---------------|-------------|---------------|--------------|--------------|--------------|
| Sensor | | | | | | | | | | | | | |
| Type | Uncooled Vanadium Oxide Microbolometer Focal Plane Array Detector | | | | | | | | | | | | |
| Array Size | 320 x 240 | | | | | | | | | | | | |
| Spectral Response | 8-14 microns | | | | | | | | | | | | |
| NETD | ≤65mK (in High Sensitivity), ≤240mK (in Low Sensitivity) | | | | | | | | | | | | |
| Dynamic Range | -40° to 320°F (-40° to 160°C) in High Sensitivity, -40°F to 1040°F (-40°C to 560°C) in Low Sensitivity | | | | | | | | | | | | |
| Video Standard | 16 bit real time analog | | | | | | | | | | | | |
| Frame rate | 30 Hz | | | | | | | | | | | | |
| Video output | NTSC | | | | | | | | | | | | |
| Optics | | | | | | | | | | | | | |
| Lens | 19mm, F1.4 | | | | | | | | | | | | |
| Field of View | 36° horizontal, 27° vertical | | | | | | | | | | | | |
| Focus | Optimal 3' to ∞ (1m to ∞) | | | | | | | | | | | | |
| Digital Zoom | 2X | | | | | | | | | | | | |
| Mechanical | | | | | | | | | | | | | |
| Dimensions | 10.8" x 8.1" x 4.4" (275mm x 205mm x 112mm) | | | | | | | | | | | | |
| Base Weight | 45 oz. (2.8 Lbs) | | | | | | | | | | | | |
| Materials | Outer case and bumper materials pass simulated NFPA 1981:2002 edition direct flame and heat exposure tests | | | | | | | | | | | | |
| Outer Housing | Bayer PCPET Makroblend | | | | | | | | | | | | |
| Rubber Bumpers | FR Neoprene | | | | | | | | | | | | |
| Display Cover | Heat and scratch resistant polycarbonate | | | | | | | | | | | | |
| Electrical | | | | | | | | | | | | | |
| Power Supply | Supplied by an integral battery pack | | | | | | | | | | | | |
| Power Consumption | <6 W nominal | | | | | | | | | | | | |
| Video Output | RS-170 a standard SMA connector is included under the display for direct connection to a remote video source. An SMA to BNC adapter is included | | | | | | | | | | | | |
| Display | 3.5 inch LCD backlit display | | | | | | | | | | | | |
| Environmental | | | | | | | | | | | | | |
| The Evolution 5800 TIC is designed to have the following temperature tolerances: | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th><u>Ambient Temp</u></th> <th><u>Operating Time</u></th> </tr> </thead> <tbody> <tr> <td>80°C, 176° F</td> <td>> 30 minutes</td> </tr> <tr> <td>120°C, 248° F</td> <td>> 20 minutes</td> </tr> <tr> <td>260°C, 500° F</td> <td>> 8 minutes</td> </tr> <tr> <td>-30°C, -22° F</td> <td>> 40 minutes</td> </tr> <tr> <td>-40°C, -40°F</td> <td>> 25 minutes</td> </tr> </tbody> </table> | <u>Ambient Temp</u> | <u>Operating Time</u> | 80°C, 176° F | > 30 minutes | 120°C, 248° F | > 20 minutes | 260°C, 500° F | > 8 minutes | -30°C, -22° F | > 40 minutes | -40°C, -40°F | > 25 minutes |
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| -40°C, -40°F | > 25 minutes | | | | | | | | | | | | |
| Water/Dust Ingress: | The TIC shall resist the ingress of dust and water and must conform to International Standard CEI IEC 529; Degrees of Protection Provided by Enclosures (IP Code); IP-67 classification | | | | | | | | | | | | |
| Impact/Drop | Will survive a 6' drop at any angle with no operational defaults or physical compromise of the outer housing | | | | | | | | | | | | |
| Vibration | The TIC and components housed in the carrying case shall be resistant to vibration and must conform to MIL-STD-810E, Category 3, loose cargo transport | | | | | | | | | | | | |
| RFI/EMC | The TIC should not interfere with standard firefighter frequency bands at power levels found in hand-held (3-5W) and vehicle mounted systems (~100W). Communication/electronic devices cannot affect the TIC to the point where navigation with the TIC is compromised when the TIC is subjected to RF interference of 80 MHz to 1 GHz at 30V/m. The TIC must meet RFI emissions and susceptibility of CE/EN | | | | | | | | | | | | |
| Warnings/Indicators: There will be one green LED to indicate the TIC status | | | | | | | | | | | | | |
| Green | TIC in normal mode and functioning correctly | | | | | | | | | | | | |
| Flashing Green | TIC in standby mode and functioning correctly | | | | | | | | | | | | |

| | | |
|--|--|-------------------------------|
| Battery Status: Total battery capacity will be indicated in the viewing area with a row of 3 LEDs | | |
| Green | Full battery capacity | |
| Yellow | Marginal battery capacity | |
| Red | Battery Warning – Lit for 15 min. before shutdown | |
| Flashing Red | Battery Shutdown – Flashes 60 sec. before shutdown | |
| Shutter Indicator | On-screen indicator which appears as a small block in the upper left corner of the display when the camera shutters, indicating that a re-scan of the area is necessary | |
| Low Sensitivity Indicator | On-screen indicator which appears as the letter “L” in the lower left portion of the screen. This indicates activities when the TIC is in Low Sensitivity | |
| Over Temperature Warning: There will be one red LED to indicate the TIC’s over-temperature status | | |
| Not Lit | TIC is within operational thermal limits | |
| Flashing Red | TIC has exceeded recommended operational thermal limits | |
| Rechargeable Lithium ion Battery Pack | | |
| Battery Type | Rechargeable Lithium Ion battery pack | |
| Battery Location | Inside the handle | |
| Battery Weight | 3.2 oz | |
| Operating Time | 2 hours | |
| Stand-Alone Battery Charger | | |
| Battery Charge Time | 2 hours nominal | |
| Power Supply | 110 VAC (220VAC optional), 12 VDC Cigarette adapter included | |
| Evolution 5000-Series Universal Truck Mounted Charger | | |
| Functionality | The optional truck mounted charger will charge the TIC and one spare battery while properly installed in the vehicle. Each truck charger will come with a mounting kit for installation on the vehicle. The charger will draw less than 1.5 amps of power. | |
| Battery Charge Time | 3 hours nominal, trickle maintenance charge. | |
| Power Supply | 12-24 VDC | |
| Vibration | The truck mounted charger must safely charge the TIC while in a moving vehicle – reference MIL-STD-810E — vibration resistance | |
| Rollover | The truck mounted charger must meet the rollover requirements identified in NFPA 1901-12-1.7 | |
| LED Indicators | The truck mounted charger user interface will consist of 3 LEDs: 1 LED for each battery (inside the TIC and one spare) and 1 LED for the system status. They will operate as follows | |
| Battery Status | Not Lit | Battery not present |
| | Flashing Green-Slow | Charge pending |
| | Flashing Green-Fast | Charge in process |
| | Green | Battery fully charged |
| | Red | Fault, Lost signal to battery |
| System Status | Not Lit | System fault |
| | Green | Power On, system operational |
| Dimensions | 10 3/8” L, 5 3/4”W, 6”H | |
| Attachments and Carrying Options | | |
| Caribiner | Each TIC shall come equipped with a caribiner attachment for securing the TIC to a tool belt or other gear. | |
| Wrist Strap/Bunker Clip | An optional Wrist strap/Bunker clip attachment is available. This will be made of fire- and heat-resistant materials. | |
| Shoulder Strap | An optional flame- and heat-resistant shoulder strap is available. It will include an emergency release clip. | |
| Retractable Lanyard | An optional retractable lanyard for use with the TIC/caribiner assembly is available. Retraction line is to be made of a Kevlar core material. Housing to be heat resistant. | |

| Video Connector | |
|---|--|
| All TICs shall come standard with an SMA video out connector. | |
| Tripod Mounting | |
| A tripod mounting attachment shall be available as an option. | |
| Carrying Case | |
| Contents | Case will hold, as a minimum, the TIC, two lithium ion battery packs, manual, carrying attachments, stand-alone battery charger assembly, tripod mount, and SMA to BNC adapter cable. |
| Water/Dust Ingress | The case shall resist the ingress of dust and water and must conform to International Standard CEI IEC 529; Degrees of Protection Provided by Enclosures (IP Code); IP-54 classification. |
| Impact/Drop | Will survive a 3' drop (1m) at any angle with no operational defaults or physical compromise of the case or contents |
| Operation and Instruction Manual | |
| Manual | Manual will be included with the camera |
| Direct Temperature Measurement | |
| Installation | Integrated inside of the TIC without any add-on devices |
| Device | Measurement taken from FPA |
| Range | 32°F to 300°F (0° to 150°) in High Sensitivity, 32°F to 1000° (0° to 500°C) in Low Sensitivity |
| Tick Marks | 100°F and 200°F (50°C and 100°C) in High Sensitivity; 250°F, 500°F, 750°F in Low Sensitivity |
| Accuracy | ± 27°F (15°C) or ±10% which ever is greater. For temperatures greater than 435°F (225°C) ± 20% |
| Readout | Thermometer style bar indicator in Fahrenheit or Celsius available. Digital temperature feature displays the approximate number value of the temperature of objects located in the spotter |
| Heat Seeker PLUS Indicator | |
| Installation | Integrated inside of the TIC without any add-on devices. |
| Device | Measurement taken from FPA |
| Readout | Graduated color (yellow to orange to red) of portions of a scheme that are above 275°F (135°C) - yellow, 297°F (147°C) - red, in High Sensitivity, or 842°F (450°C) - yellow, 914°F (490°C) - red, in Low Sensitivity mode |
| User Selectable Palettes | |
| Installation | Integrated inside of the TIC without any add-on devices |
| Device | User selectable palette that offers five options. White hot, Black hot and three color options, Fusion, Fire and Ice, Rainbow |
| Readout | Single button operation provides 3 second indication of the user selected palette displayed on the TIC's display |