Evolution® 6000 Basic TIC Bid Specification

Specification Purpose

This specification establishes minimum standards for thermal imaging cameras and associated battery charging systems. Thermal imaging cameras are tools for firefighters and first response emergency personnel that are used for search and rescue, fire scene size-up, overhaul, location of victims, and advanced firefighting and first response applications.

Specification Type

Thermal imaging cameras covered by this specification shall be of the type incorporating 320X240 vanadium oxide microbolometer focal plane array sensor.
TIC displays black and white scene representations on 3.5" diagonal LCD display.
Design is optimized for firefighters in ergonomic design and ease of incorporation with firefighting gear. TIC features dual-handle design for one-handed operation, easy handoff and handling and high-impact, heat-resistant housing to ensure that TIC withstands rigors of firefighting environments. TIC is further enhanced by rubber bumper system to provide additional protection from extremely harsh environments. TIC shall be tested to and comply with the following standards:

NFPA compliance	NFPA 1801-2013 Edition
Water/dust ingress	International Standard CEI, IEC 529, IP67 Classification
Direct flame/heat exposure	NFPA 1801-2013 Edition
Radio frequency interference	IEC 61000-6-3, IEC 61000-6-2, FCC Part 15
Rollover (truck charger)	Simulated NFPA 1901-12, 1.7
Non-explosive rating	ANSI/UL 12.12.01 (Class I, Div. 2, Groups C and D)

TIC Components

TIC, kits and accessories can be purchased individually. TIC shall consist of component parts direct temperature measurement, Heat Seeker PLUS Indicator, flashlight, and laser pointer. Components are sold in kit format and/or individually, consisting of lithium-ion battery packs; desktop/vehicle cup holder; dual battery charger with wall plug and cigarette lighter adapter; truck-mounted charging system and attachments consisting of: carabiner, wrist strap, shoulder strap, retractable lanyard, and carrying case.

Sensor Technology

Sensor shall be uncooled vanadium oxide microbolometer focal plane array detector, with array size of 320X240, spectral response of 7.0-14.0 microns, Netd ≤78mK max. ≤40mK typ. (in High Sensitivity), ≤234mK (in Low Sensitivity), dynamic range of -40°t o 320℉ (-40℃ to 160℃) in High Sensitivity, -40℉ to 1112℉, (-40℃ to 600℃) in L ow Sensitivity.

Mechanical Requirements

Dimensions shall be 7.3" x 4.8" x 11.6" (185 mm x 122 mm x 295 mm) with base weight of 42.4 oz. (2.65 lbs/1.2 kg).
Outer case and bumper materials pass NFPA 1801:2013 edition direct flame and heat exposure tests.
Outer housing is of polyphenylsulfone with flame-retardant silicone rubber bumpers.
Display cover is constructed of UV-stabilized polycarbonate with NFPA anti-scratch coating.
Camera floats in water.

Electrical Requirements

Power is supplied by integral battery pack; power consumption is <6 w nominal.
USB ports comprise 1 configuration.
Display is 3.5" backlit LCD.

Configuration Requirements

Camera will be configurable on PC application.

Environmental Requirements

Ambient temperature operating times are:

80º C, 176º F	> 30 minutes
120º C, 248º F	> 20 minutes
260º C, 500º F	> 6 minutes
-30º C, - 22º F	> 40 minutes
-40º C, - 40º F	> 25 minutes

Water/Dust Ingress

TIC shall resist dust and water and must conform to International Standard CEI IEC 529; Degrees of Protection Provided by Enclosures (IP Code); IP67 classification.

Impact/Drop

TIC will survive 6-ft drop at any angle with no operational defaults or outer housing physical compromise.

RFI/EMC

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 TIC to the point where navigation is compromised when TIC is subjected to RF interference of 80 MHz to 1 GHz at 30V/m.
TIC must meet RFI emissions and IEC susceptibility.

Optical Requirements

Lens shall be 9mm and F1.25, field of view of 48° horizontal and 37° vertical.
Focus shall be optimal 3 ft to ∞ (1m to ∞).

Battery Status Indicators

Total battery capacity shall be indicated in viewing area with row of 4 LEDs, functioning as follows:

- 4 green LEDs indicate 75% to 100% capacity
- 3 green LEDs indicate 50% to 75% capacity
- 2 yellow LEDs indicate 25% to 50% capacity
- 1 red LED indicates less than 25% capacity
- 1 red (flashing) LED indicates less then 5 minutes remaining.

On-screen shutter indicator appears as small block in upper left display corner when camera shutters indicate that area re-scan is necessary.
On-screen low sensitivity indicator appears as green triangle in upper left screen portion, indicating activities when TIC is in Low Sensitivity.

Over-Temperature Warning

Warning shall be indicated via on-screen red triangle in display's upper center.
When not lit, TIC is within operational thermal limits.
Flashing red TIC has exceeded recommended operational thermal limits.

Rechargeable Lithium-Ion Battery Pack

Battery type shall be rechargeable lithium-ion battery pack, with pack located inside of handle; pack weight of 3.2 oz.
Operating time shall be 3.5 hours nominal, 4 hours maximum.

Battery Charger

Stand-alone battery charger will charge two batteries simultaneously.
Charger design allows for desktop or vehicle cup holder use.
Battery charge time is 4 hours nominal, power supply is 110/240 VAC 50/60HZ with included 12 VDC cigarette adapter.

Vehicle-Mounted Charger

Optional vehicle-mounted charger will charge TIC and 1 spare battery when properly installed.
Each vehicle charger includes installation/mounting kit.
Charger will draw less than 1.5 amps of power.
Battery charge time is 4 hours nominal, trickle maintenance charge; power supply is 12-24 VDC.
Vehicle-mounted charger must safely charge TIC while in a moving vehicle.
Vehicle-mounted charger must meet rollover requirements identified in NFPA 1901-12-1.7.
Dimensions are 10 3/8" L, 5 3/4"W, 6"H.
Vehicle-mounted charger LED indicators are comprised of camera charging indicator on camera front panel with LEDS as follows: red: charging, green: complete.
Spare battery charging indicator located on charger indicates status as follows: red: charging, green: complete.

Attachments and Carrying Options

TIC shall come equipped with 3 carabiner attachment points.
Battery charger kits shall come with carabiner for securing TIC to tool belt or other gear and retractable lanyard for use with TIC /carabiner assembly is available.
Retraction line is to be made of Kevlar core material; housing is to be heat-resistant.
Optional wrist strap/bunker clip attachment is available, constructed of fire-and heat-resistant materials.
Optional flame-and heat-resistant shoulder strap is offered, including emergency release clip.

Carrying Case

Carrying case will hold as minimum: TIC, 2 lithium-ion battery packs, manual, carrying attachments, and stand-alone battery charger assembly.
Case shall resist dust and water ingress and must conform to international standard CEI IEC 529; degrees of protection provided by enclosures (IP code); IP54 classification.
Case impact/drop testing: dropped 3 consecutive times onto concrete from 3 ft (1m) at any angle with no operational defaults or physical compromise of case or contents.

Operation and Instruction Manual

Comprehensive manual includes all aspects of use, care and camera maintenance.
Quick-start guide easy reference card covers basic camera operation.
Online video training includes camera use, care and maintenance with available certification.

Direct Temperature Measurement

Tool is integrated within TIC without add-on devices, with measurement taken from FPA.
Temperature range shall be:
-40°to 320℉ (-40℃ to 160℃) in High Sensitivity
-40℉ to 1112℉ (-40℃ to 600℃) in Low Sensitivity
Tick marks occur at:
75℉, 150℉ and 225℉ (24℃, 65℃ and107℃) in High Sensitivity
250℉, 500℉ and 750℉ (120℃, 260℃ and 399℃) in Low Sensitivity
Accuracy will be ± 18℉ (10℃) or ±10%, whichever i s greater.
Intended for temperatures greater than 435℉ (225℃) ± 20%.

Thermometer-style readout bar indicator in Fahrenheit or Celsius is available.
Digital temperature feature displays approximate number value of object temperatures located in spotter.

Heat Seeker PLUS Indicator

Tool is integrated within TIC without add-on devices, with measurement taken from FPA.
Readout is of graduated color (yellow to orange to red) of portions of scheme that are above 275℉, (135℃)-yellow, 297℉ (147℃)-red, in High Sensitiv ity, or 842℉ (450℃)-yellow, 914℉, (490℃)-red, in Low Sensitivity mode.

Laser Pointer

Laser pointer is integrated inside TIC without add-on devices.

Flashlight

Tool is integrated inside TIC without add-on devices.