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*English*

# X380

## Operating Manual



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# 1.0 Introduction

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## 1.1 About Your Product

Thank you for purchasing your brand new, high-specification thermal imaging product from ISG InfrasyS. Your product has been designed and manufactured in our technical facility, where it has been tested to meet the requirements of the ISO 9001 quality standards.

All information provided in this and any other documentation enclosed with your product is correct at time of going to print and is subject to change without notification. For the purposes of these documents, Infrared Systems Group is sometimes referred to as 'ISG INFRASYS'. ISG InfrasyS is a trading name of Infrared Systems Group.

The images used in this Operating Manual may represent a different product to the one you have purchased, however it's functionality is exactly the same unless otherwise stated.

We strongly recommend that you read through the Regulatory Information in the next section of this Operating Manual prior to using your thermal imaging product for the first time.

## 1.2 More Information

Should you have any questions with regard to this or any other ISG INFRASYS thermal imaging product, please contact our Customer Services team:

### *North & South America*



Infrared Systems Group LLC  
305 Petty Road  
Lawrenceville  
Georgia  
30043  
USA



+1 678 442 1234



info@isgfire.com



www.isgfire.com

### *Europe & ROW*



Infrared Systems Group Ltd.  
Unit 14 Repton Court  
Basildon  
Essex  
SS13 1LN  
United Kingdom



+44 1268 52 77 00



info@isgfire.co.uk



www.isgfire.co.uk

## 2.0 Regulatory Information

### 2.1 Declaration of Conformity

The EC Declaration of Conformity for your model of ISG INFRASYS thermal imager is supplied as a separate document on your Product Documents CD-ROM.

### 2.2 Safe Disposal



This symbol indicates the requirement for a separate waste collection for electronic equipment, batteries and accumulators. All ISG INFRASYS products displaying this symbol must be disposed of or recycled in accordance with EU Directives 2002/96/EC (WEEE) and 2006/66/EC (batteries).

This procedure is described as follows:

Upon reaching the end of its useful life, the thermal imager must be returned to Infrared Systems Group for suitable disposal under the WEEE directives. ISG INFRASYS will arrange collection at our expense, when notified that the item is no longer required.

Accessory items requiring safe disposal, including battery packs, can be disposed of locally under the regulatory directives of your local authority.

### 2.3 Export Obligations

This infrared camera is considered dual-use military equipment and is export controlled under DOC CCL 6a003. It is a criminal act to export this camera and any of its components thereof outside the United States without obtaining an approved export license.

If you wish to export these items, please notify ISG / INFRASYS for assistance in obtaining the proper export documentation.

### 2.4 Safety Warnings and Exclusions

All users of ISG INFRASYS thermal imagers must read the following safety warnings and exclusions carefully.

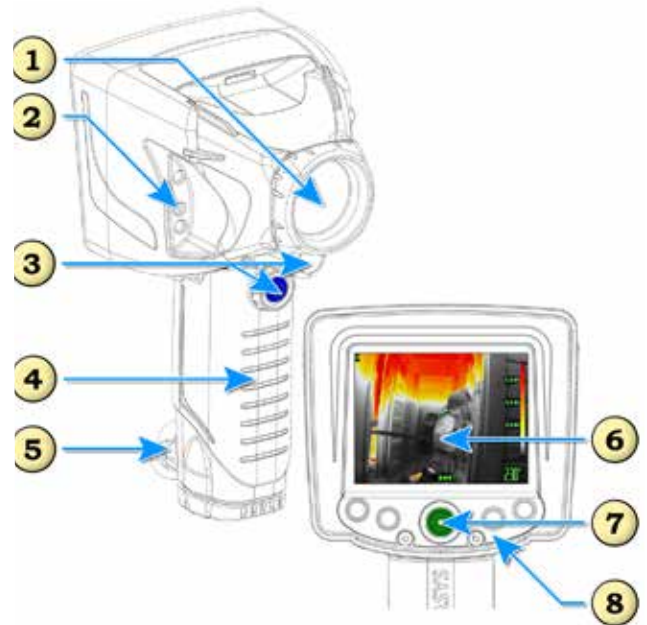
- 1) ISG INFRASYS thermal imagers must only be used by personnel familiar with the usage and limitations of a thermal imaging device, including a general understanding of thermal images and how they are interpreted. It is recommended that the user has gained experience with its usage in simulated emergency conditions, such as a controlled live burn situation. Usage of the ISG INFRASYS thermal imager by unauthorized, unfamiliar or untrained users in a hazardous atmosphere may result in injury or death.
- 2) The ISG INFRASYS thermal imager is not life support equipment and should not be used as such.
- 3) The ISG INFRASYS thermal imager provides a thermal image in normal vision-impairing conditions and is designed to augment any of your existing Standard Operating Procedures. Failure to follow Standard Operating Procedures in a hazardous atmosphere may result in disorientation, injury or death, in the unlikely event that the equipment should fail.
- 4) Always perform a visual check on the equipment prior to use to validate that it has not been damaged or degraded.
- 5) Never use the ISG INFRASYS thermal imager as the sole source of navigation. If system failure occurs, you may become disoriented or lost in a hostile environment, which could result in injury or death.
- 6) The ISG INFRASYS thermal imager is a complex, electro-optical piece of equipment and, just like any other piece of machinery or electronic system, is subject to potential failures. Should a failure occur, the user will no longer have access to the thermal images provided by the thermal imager. Tactical usage of this equipment must not deviate from Standard Operating Procedures used by personnel who do not have the benefit of the equipment.

- 7) While every effort has been made to ensure that your ISG INFRASYS thermal imager is both tough and reliable, the thermal imager is a sophisticated electro-optical system that will fail if it is abused or exposed to environments beyond its design envelope.
- 8) Repeated exposure to high temperature environments without adequate periods for the unit to self-cool may result in degradation or loss of the thermal image, or damage to the internal components. Be sure to allow adequate cool-down periods between high temperature exposures.
- 9) The ISG INFRASYS thermal imager will not provide images through glass, water, or shiny objects. These surfaces act like reflective mirrors to the system.
- 10) The ISG INFRASYS thermal imager will not provide thermal images underwater.
- 11) Batteries supplied with the ISG INFRASYS thermal imager have been selected for specific performance values. Replacement batteries must be obtained ONLY from an authorized ISG INFRASYS service center. In addition:
  - Never try to dispose of the battery pack by burning or through exposure to a heating device such as a microwave oven – it could explode and cause injury.
  - Never try to disassemble, repair or otherwise tamper with a battery pack.
  - Never short-circuit the battery pack by contacting the terminals with a metal object.
  - Never puncture the battery pack with a sharp object or strike with a hammer or other object.
- 12) Users should be conscious of the battery life. Only enter a hazardous environment when a full battery charge is indicated on the battery charge indicator.
- 13) Failure to exit a hostile environment immediately on observation of the low battery warning may result in system failure in a hostile environment, which could result in injury or death.
- 14) The ISG INFRASYS thermal imager must be serviced only by authorized personnel. The thermal imager contains high voltage components and therefore, the user should never remove the cover due to risk of shock.

## 3.0 Getting Started

### 3.1 Parts and Controls

- 1) Lens window
- 2) Charging contacts
- 3) Laser Assist
- 4) Battery compartment
- 5) Lanyard 'D' ring
- 6) LCD Display
- 7) Power button & LED
- 8) Button panel



### 3.2 Charging the Battery

#### Information

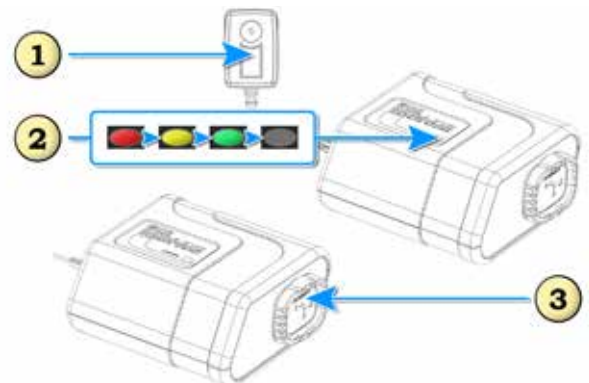
All Batteries require a 14-hour charge cycle before the product's first use. Upon inserting the battery into the charger, a short delay may occur prior to the initiation of the charging sequence.

#### WARNING

Do not expose the battery charger unit and/or power adapter to rain or moisture.  
Do not attempt to use a charging device to charge a non-ISG INFRASYS approved battery.  
To install your Truck Charger, please refer to the installation guide enclosed.  
Always check the charging device is in good working order before each use.

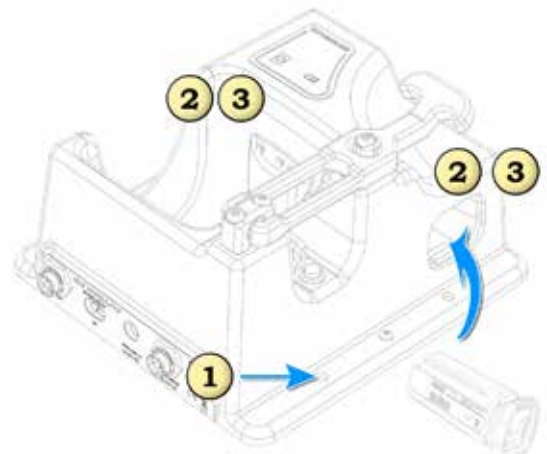
#### Using a Desktop Charger

- 1) Connect mains adapter to charger, then connect to mains power outlet and switch on power.
- 2) Wait for the charger to start up.
- 3) Insert the battery into the charger.



#### Using a Truck Charger

- 1) Install device (see installation guide).
- 2) Insert thermal imager and/or spare battery into charger.
- 3) Release thermal imager and/or spare battery from charger.



### **LED Indicators**

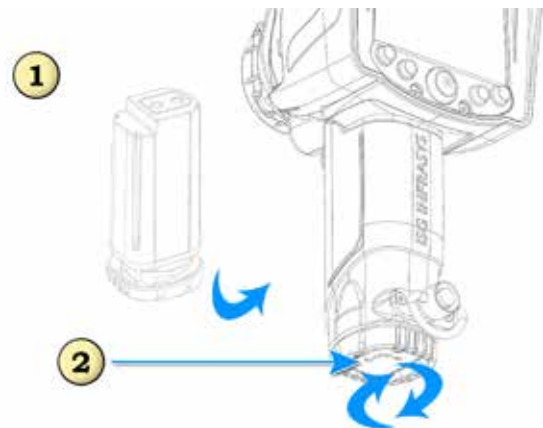
- 1) Power on
- 2) Battery charging
- 3) Battery charged
- 4) Battery failure



## **3.3 Inserting and Removing the Battery**

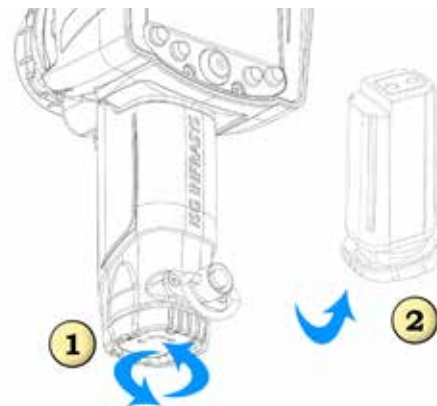
### **Inserting the Battery**

- 1) Insert the battery into the battery compartment.
- 2) Twist clockwise to lock.



### **Removing the Battery**

- 1) Twist counter-clockwise to lock.
- 2) Slide the battery out of the compartment.



## 4.0 General Operation

### 4.1 Power On and Off

#### WARNING

Always fit a fully charged battery prior to use in an emergency operation. Never disconnect the battery without undertaking the turn off procedure.

#### Power On

- 1) Press the Power button. LED lights continuously.
- 2) Start-up screen is displayed, signifying that the start-up sequence has been initiated.
- 3) Live thermal image is displayed with a DTM readout given in the bottom right corner to signify the thermal imager is operating in Normal Imaging Mode.

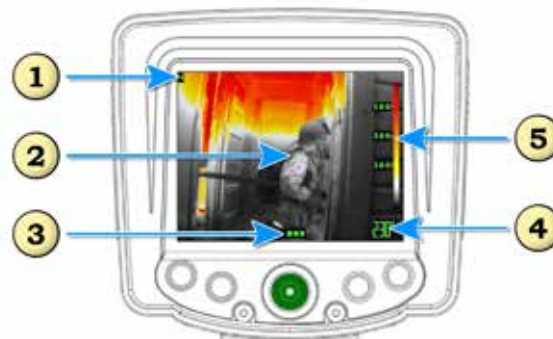


#### Power Off

- 1) Press and hold the Power button.
- 2) Release when the thermal imager powers down or when the timer next to the Power Off icon (🔌) reaches 0. The power off sequence will be aborted if the Power button is released prior to the thermal imager powering off.

### 4.2 On-screen Display

- 1) Mode
- 2) DTM Crosshair
- 3) Battery Status Bar
- 4) DTM readout
- 5) Color Reference Bar



### 4.3 Annotations and Meanings

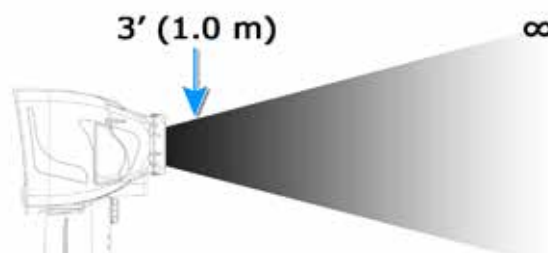
- |                           |  |                             |  |
|---------------------------|--|-----------------------------|--|
| 1) DTM Crosshair          |  | 7) Over-Temperature Warning |  |
| 2) Battery 100%           |  | 8) High Sensitivity Mode    |  |
| 3) Battery 75%            |  | 9) Mid Sensitivity Mode     |  |
| 4) Battery 50%            |  | 10) Low Sensitivity Mode    |  |
| 5) Battery 25%            |  | 11) Power Off               |  |
| 6) Battery <5% (flashing) |  |                             |  |



## 4.4 Focus Range

This product has an approximate focus range of 3 ft. (1.0 metre) to infinity ( $\infty$ ).

This means that objects that are imaged from less than 3 ft. away may appear slightly blurred on the display.



## 4.5 Over-Temperature Warning

This indicator (🚨) signifies that the thermal imager's internal electronics have reached temperatures outside normal operating range, and therefore the thermal imager will shut down to preserve its life.

The thermal imager's Over-Temperature Warning indicator will be displayed 30-seconds before the shutdown sequence is initiated.

## 4.6 About Intelligent Focus

The Intelligent Focus feature enhances the thermal imager's usability by enabling the user to optimise its imaging performance based on the surrounding environment.

A trained and experienced user can enhance his vision by forcing the camera to operate in what he feels is the most appropriate Sensitivity Mode setting for a specific environment, at a specific time.

The thermal imager will automatically select what it believes to be the most appropriate Sensitivity Mode, unless the user chooses to override this setting. The user selects an alternative Sensitivity Mode by simply pointing the thermal imager's crosshair at the desired object.

## 4.7 Intelligent Focus Sensitivity Modes

### High Sense Mode

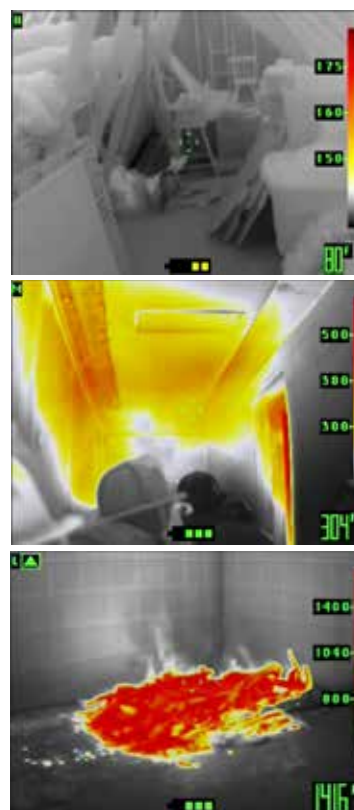
This mode is automatically activated when objects in its field of view are at room temperature or cooler. For example, when you activate your thermal imager and look around the fire station, it will most likely be operating in High Sensitivity Mode. Likewise, High Sensitivity Mode is automatically selected when you are searching or navigating in a cold smoke-filled basement.

### Mid Sense Mode

This mode is automatically activated when the temperature of objects in its field of view is elevated. This mode is automatically activated when there are objects in the field of view that are generally greater than 150°F or 65°C.

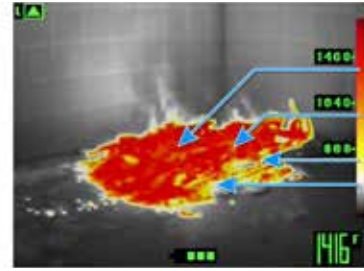
### 1000+ Plus Mode

This mode is automatically selected when the entire field of view exceeds 475°F or 240°C, or when the crosshair in the center of the viewing screen is directed to objects that are generally greater than 475°F or 240°C. While operating in this mode, the thermal imager is capable of imaging objects that are in excess of 2000°F or 1000°C.



## 4.8 Color Reference Bar

The Color Reference Bar provides a visual indication of the range of scene temperatures detected. It is displayed on the right-hand edge of the screen and provides a point of reference for the user to quickly identify the different temperature ranges in the scene.



## 4.9 Direct Temperature Measurement

The Direct Temperature Measurement (DTM) feature gives a temperature readout of a fixed point on the screen. The DTM feature is accurate to  $\pm 5^\circ$  for  $32^\circ\text{F} - 200^\circ\text{F}$  ( $0^\circ\text{C} - 100^\circ\text{C}$ ), and  $\pm 10\%$  for  $201^\circ\text{F} - 2000^\circ\text{F}$  ( $100^\circ\text{C} - 1000^\circ\text{C}$ ).

### Information

The measured temperature is based on an assumed target emissivity of 0.95.

The measurement indicated is not a measure of air temperature.

Unless otherwise specified at the time of order, the unit of measurement (i.e Celsius or Fahrenheit) is preset at the factory to the normal standard for the designated country.

## 5.0 Advanced Operation

### 5.1 Laser Assist

The Laser Assist enables the user to highlight the location of hot spots, extension or other hazards to team members, helping to improve communication.

#### **WARNING**

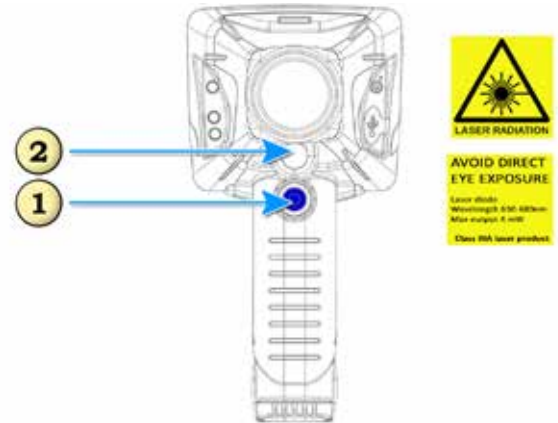
Never aim the Laser Assist into a person's face or eyes as this may cause permanent damage.

#### **Laser Assist On**

- 1) Press and hold the Blue Button.
- 2) The laser beam is enabled.

#### **Laser Assist Off**

- 1) Release the Blue button.



### 5.2 Video Capture (optional)

Video Capture enables the user to record and save videos and still images, for review at a later date.

#### **To Capture a Still Image**

- 1) Press the Video Capture button.
- 2) The LED lights red momentarily.

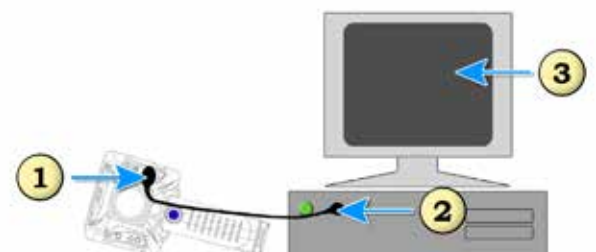
#### **To Record a Video**

- 1) Press and hold the Video Capture button for 3 seconds (approx.).
- 2) The LED flashes red and green alternately.
- 3) Press the Video Capture button to Stop.



#### **To Download Saved Files**

- 1) Insert the Mini-USB lead into the connector on the camera.
- 2) Insert the USB lead into the port on your PC.
- 3) Follow the on-screen prompts to view saved files or select mass storage device via My Computer.



### 5.3 Zoom (optional)

The Zoom feature enables the user to magnify the on-screen image to enhance imaging performance from a distance.

#### **Zoom On**

- 1) From Normal Imaging Mode, press the Zoom button.
- 2) The live image is magnified by a factor of 2.
- 3) To operate with X4 Zoom, press the Zoom button again.
- 4) The live image is magnified by a factor of 4.



#### **Zoom Off**

- 1) Press the Zoom button to exit.

### 5.4 Spot Tracker (optional)

The Spot Tracker enables the user to track the hottest or the coldest object in the scene, and measures its temperature.

#### **Information**

The DTM temperature readout shall be removed whilst the Spot Tracker is in use.

#### **Spot Tracker On**

- 1) From Normal Imaging Mode, press the Spot Tracker button.
- 2) The Spot Tracker crosshair tracks the hottest pixel in the scene and displays its temperature on-screen.
- 3) To operate with Cold Spot Tracker, press the Spot Tracker button again.
- 4) The Spot Tracker crosshair tracks the coldest pixel in the scene and displays its temperature on-screen.



#### **Spot Tracker Off**

- 1) Press the Spot Tracker button to exit.

### 5.5 Freeze Frame (optional)

The Freeze Frame function enables you to capture a snapshot image of the scene for quick review.

#### **Information**

The Freeze Frame function will temporarily disable all other features of the thermal imager whilst in use.

#### **Freeze Frame On**

- 1) From Normal Imaging Mode, press the Freeze Frame button.
- 2) The image is temporarily suspended.

#### **Freeze Frame Off**

- 1) Press the Freeze Frame button to exit.



## 6.0 Technical Specifications

### Characteristics

#### 6.1 Engine Characteristics

Detector Type:	Uncooled Microbolometer
Sensor Material:	Amorphous Silicon
Resolution:	384 x 288
Spectral Response:	8 $\mu\text{m}$ to 14 $\mu\text{m}$
Sensitivity (nominal):	<50 mK
Scene Update Rate:	50 Hz
Dynamic Range:	>2000°F / >1000°C
Thermoelectric Cooler:	None required

#### 6.2 Performance Characteristics

Modes of Operation:	Three
Operating Duration:	20 mins @ 250°F (120°C), 8 mins @ 500°F (260°C)
Operating Temperature:	-30°F (-35°C) to ~850°F (~450°C) (limited exposure)
Storage Temperature:	-15°F (-25°C) to 55°C (130°F) when in carry case
DTM Range:	-40°F (-40°C) to 2000°F (1000°C)
Spot Measurement Ratio:	480:1

#### 6.3 Physical Characteristics

Dimensions (L x W x H):	5" x 4.5" x 9" / 130 mm x 115 mm x 225 mm
Weight (excluding battery):	2.1 lbs / 0.95 kg
Shell Material:	Radel
Shell Color:	Black
Hand-strap Material:	Kevlar
IR Protection Window Material:	Germanium
Water Resistant:	IP67, submerged at 3 ft (1.0 m) for 30 mins
Drop Tested:	6' 6" / 2.0 metres
Intrinsic Safety Compliance:	ANSI/ISA-12.12.01-2007 (pending)

#### 6.4 Display & Optical Characteristics

Display Technology:	LCD
Display Size (diagonal):	3.5" / 90 mm
Luminance:	250 cd / m <sup>2</sup>
Focus Range:	1.0 m to $\infty$
Field of View (diagonal):	54°

#### 6.5 Power Characteristics

Battery Technology:	Li-Ion
Battery Weight:	7 oz / 0.2 kg
Operating Time:	4 hours (nominal)

Recharge Time (nominal):	<2.5 hours
Recharge Cycles:	1000+

## 6.6 Operational Characteristics

Pushbutton Controls:	1, 3 or 5 button configurations
Start-up Time:	< 10 seconds
Image Optimization:	Automatic
Colorization:	Dual-transparent color
Laser Pointer:	Yes
Zoom:	X2 and x4

## 6.7 Desktop Charger

Dimensions (L x W x H):	6" x 6" x 6.5" / 155 mm x 155 mm x 165 mm
Weight:	9 oz / 0.26 kg
Operating Temperature:	32°F (0°C) to 85°F (30°C)
Storage Temperature:	-5°F (-20°C) to 130°F (55°C)
PSU Supply Voltage:	12 V
Operating Voltage:	8 V nominal
Sealing:	IP20

## 6.8 Truck Charger

Dimensions (L x W x H):	9" x 8" x 5" / 225 mm x 205 mm x 125 mm
Weight:	2.1 lbs / 0.95 kg
Operating Temperature:	32°F (0°C) to 85°F (30°C)
Storage Temperature:	-5°F (-20°C) to 130°F (55°C)
PSU Supply Voltage:	12 - 24 V
Operating Voltage:	8 V nominal
Sealing:	IP20

## 7.0 Additional Information

### 7.1 Maintenance Information

Following use, the thermal imager should always be cleaned and inspected for damage. In the event of damage being detected (for example, cracked or broken window or housing), the thermal imager should be withdrawn from service immediately and returned to an authorized service center for repair.

The thermal imager should be cleaned using warm soapy water and non-abrasive cleaners. Allow the thermal imager to dry before replacing it into the carry case.

Ensure all battery contacts of the thermal imager and the batteries are clean and free from debris as this may prevent electrical connection.

It is recommended that the IR window and display be treated with anti-fog solutions as used on SCBA/BA facemasks.

To ensure long service life, it is recommended that the thermal imager and its accessories are stored in a temperate environment (15°C to 25°C, moderate humidity) at all times.

The batteries should always be removed from the thermal imager before storage for extended periods.

### 7.2 Service/Repair Procedure

In the event your product requires a service or repair, we encourage you to contact your nearest Service Center as soon as possible either via our website, email or phone, and provide the following information:

- Company name
- Contact name
- Contact email address
- Return address
- Product model
- Serial number (located in the battery compartment)
- Fault report (if applicable)

On receipt of this information, we will then issue a Returned Material Authorization (RMA) number which will need to be displayed prominently on the package containing the product. Under no circumstances should an item be shipped back to us without an RMA number as this makes it impossible to track and may result in your item being lost in transit.

Please ship the item(s) to your nearest ISG Infrasy's Authorized Repair Center:

#### ***North & South America***

ISG Infrasy's USA  
305 Petty Road, Ste. B  
Lawrenceville  
Georgia  
30043  
USA  
ATTN: RMA# \_\_\_\_\_

#### ***Europe & ROW***

ISG Infrasy's UK  
Unit 14 Repton Court  
Basildon  
Essex  
SS13 1LN  
United Kingdom  
ATTN: RMA# \_\_\_\_\_

### **Information**

Prior to returning the thermal imager, the device should be fully decontaminated. ISG INFRASYS reserves the right to return the unit to the user for decontamination.

When shipping a product back to ISG INFRASYS, if possible, place the item inside its original shipping container and ensure it is appropriately sealed. For any camera repair or service, it is recommended that all accessory items (e.g. batteries, charger etc.) are also returned for inspection. ISG INFRASYS shall not be responsible for damage/loss incurred in transit.

## 7.3 Warranty Agreement

ISG /INFRASYS warrants the X380 thermal imager to the original owner to be free of defects in material and workmanship under intended use and service for one year from the date of purchase. ISG / INFRASYS' obligation under this warranty is limited to the replacement or repair, at ISG / INFRASYS' option, of articles if returned to ISG / INFRASYS in Georgia, or an authorized distributor, with shipping charges prepaid by the owner, and which, upon inspection by ISG / INFRASYS, shall prove to have been defective in normal, "intended use" and service. Maintenance and field replaceable items (batteries, battery chargers, AC/DC adaptors, straps, display covers and all accessories), if defective, are covered under warranty for a ninety (90) day period.

This warranty does not apply to equipment malfunction or damage resulting from accident, alteration, misuse, or non-intended abuse of the equipment including, but not limited to, power surges, over exposure to heat, defective power supply, abnormal wear and tear or other perils outside the design tolerances of the system. In addition, this warranty does not apply to elastomeric or rubber components since they can be adversely affected by undue exposure to heat, sun, water, ozone, or other deteriorative elements. The decision as to what constitutes normal use shall be made solely by ISG / INFRASYS.

To maintain this warranty, the purchaser must perform maintenance and inspections as prescribed in the operation and maintenance manual which shall include prompt replacement or repair of defective parts.

This warranty is expressed in lieu of all other warranties, expressed or implied, and all other obligations and liabilities on ISG / INFRASYS' part. ISG / INFRASYS neither assumes nor authorizes any other firm or person to assume on ISG / INFRASYS' behalf any liability in any way connected to the sale of ISG / INFRASYS Products.

### ***Warranty Disclaimer***

This warranty shall be null and void if ISG INFRASYS determines that the thermal imager or its accessories have been damaged by neglect, misuse, accident, abuse, power surges, over-exposure to heat, abnormal wear and tear, or other perils outside the design tolerances of the thermal imager.

The following additional conditions shall void all warranties:

- Unauthorized repair, modification or alteration of the thermal imager and/or its accessories
- Damage caused by failure to use and/or maintain the thermal imager and/or its accessories in accordance with the manufacturer's written instructions
- Damage in shipping
- Damage caused by use of a non-approved battery or battery charger
- Non-service related damage
- Damage caused by improper storage or transportation

### **Information**

THE USE OF NON-FACTORY AUTHORISED PARTS OR COMPONENTS, OR FAILURE TO MAINTAIN AND USE THE SYSTEM AS DIRECTED IN THE OPERATING MANUAL, VOIDS ALL WARRANTIES.

### ***Responsibilities of ISG INFRASYS Under The Warranty***

Provided the end user/distributor detects and reports (in writing) defects to ISG INFRASYS within the warranty period, ISG INFRASYS shall either repair or replace either the components or the System, at its sole option, once its responsibility has been determined under the warranty. This repair/replacement shall be the user's sole and exclusive remedy.

ISG INFRASYS shall determine responsibility under the warranty and advise the end user/distributor of warranty coverage or any charges associated with repair/replacement of components or the system outside warranty-covered repair/replacement.

Following a warranty repair by ISG INFRASYS, all carriage costs associated with the shipment of the material back to the end user/distributor, shall be borne by ISG INFRASYS.

Any such repair, whether under warranty or otherwise, shall not be construed as an extension of the warranty period.



### ***Responsibilities of the End User and/or Distributor Under the Warranty***

To maximise speed of return and repair, ISG INFRASYS operates the Service Direct facility, available to all customers – please contact ISG INFRASYS for full details and to obtain an RMA code (see below). In all other cases, the end user shall return the unit to the authorised ISG INFRASYS distributor from whom the thermal imager was purchased. Thereafter it is the responsibility of the distributor to return the unit in accordance with the instructions herein.

The end user/distributor shall obtain a Returned Material Authorisation (RMA) code prior to returning the thermal imager or accessory. The end user/distributor shall ship the returned materials to ISG INFRASYS with the RMA code prominently displayed on the outside of the packaging and a headed letter with the return address and a brief description of the fault placed inside the package.

### ***Non-Warranty Repairs***

In the event that ISG INFRASYS determines that the repair is not covered by the warranty, ISG INFRASYS shall inform the end user/distributor and provide an estimated cost of repair. Upon receipt of a purchase order from the end user/distributor, ISG INFRASYS shall undertake the repair and return the thermal imager. All carriage, insurance and freight costs shall be borne by the end user/distributor. Any such repair, whether under warranty or otherwise, shall not be construed as an extension of the warranty period.

### ***Transfer of the Warranty***

ISG INFRASYS's obligations under this warranty are limited to the original end user unless prior written consent has been issued by ISG INFRASYS to transfer the Product to another location, end user or application.

## 8.0 Trouble Shooting

If you are experiencing problems with your product, please refer to this checklist. If the problem persists, please contact ISG INFRASYS Customer Services or your local distributor.

### 8.1 Power and Charging

<i>Issues</i>	<i>Solutions</i>
Thermal imager will not turn on	Ensure battery is inserted correctly and is fully charged
LED will not light	Ensure battery is inserted correctly
Thermal imager switches off by itself	Replace/charge the battery
Battery will not charge	Clean battery charging contacts

### 8.2 Performance and Imaging

<i>Issues</i>	<i>Solutions</i>
Power is on but screen is black	Ensure no water or glass items are impeding the view
Image is a reflection of the user	Ensure no obstacles are impeding the view
Image appears blurred	Ensure the lens window is clean
Thermal imager will not focus	Ensure the lens window is clean



