R2168

REED INSTRUMENTS

Thermal Imaging Camera



WARRANTY 1 YEAR WARRANTY

Instruction Manual

REED Instruments
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Introduction

Thank you for purchasing your REED R2168 Thermal Imaging Camera. Please read the following instructions carefully before using your instrument. By following the steps outlined in this manual your meter will provide years of reliable service.

Product Quality

This product has been manufactured in an ISO9001 facility and has been calibrated during the manufacturing process to meet the stated product specifications. If a certificate of calibration is required please contact the nearest authorized REED distributor or authorized Service Center. Please note an additional fee for this service will apply.

Safety

- Never attempt to repair or modify your instrument. Dismantling your product, other than for the purpose of replacing batteries, may cause damage that will not be covered under the manufacturer's warranty. Servicing should only be provided by an authorized service center.
- Do not point the thermal imager (with or without the lens cover) at intensive energy sources as this can damage the thermal imager.
- Do not use the thermal imager in a temperature higher than 122°F (50°C).
- Always charge the battery between 32 to 122°F (0 to 50°C).
- Clean the housing with a damp cloth and a diluted soap solution.
- Do not use abrasives, isopropyl alcohol, or solvents to clean the instrument, lens or screen.
- Do not clean the infrared lens too vigorously, this can damage the anti-reflective coating.
- Store the thermal imager in cool and dry environment.
- Please use the correct emissivity to obtain accurate temperature measurements.
- To ensure accuracy, please let the instrument warm up for 10 minutes before taking a measurement if it has not been used for a long time.

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- When being charged, the internal temperature of the product will rise, which will lead to inaccurate temperature measurement, it is not recommended to take measurements during or right after charging the instrument.

Features

- 160 x 120 infrared resolution (19,200 pixels)
- 320 x 240 super resolution
- 2.8" color TFT display
- Built-in dual LED flashlight
- 7 selectable color palettes
- Intuitive on-screen measurement tools
- 4 image modes (Thermal, Visual, Picture-in-Picture, T-Mix)
- Video recording capability
- High/low temperature alarm indicators
- IP65 rated and 6.5' (2m) drop tested
- Rechargeable Li-ion battery
- Tripod mountable for continuous long-term monitoring
- Software for viewing, analyzing data, report generation, and live streaming
- Low battery indicator and auto shut-off

Included

- Thermal Imaging Camera
- USB Cable

Specifications

Imaging and Optical Specifications

Field of View (FOV):	40 x 30°
Focal Length:	0.82' (0.25m)
Spatial Resolution:	(IFOV) 4.62 mrad
Thermal Sensitivity (NETD):	<0.05°C (50mK)
Image Capture Frequency:	25Hz
Focus:	Fixed

Measurement

Temperature Range:	-4 to 1022°F (-20 to 550°C)
Accuracy:	±3.6°F (2°C) or ±2% of reading
Resolution:	0.1°F/°C/K

Detector Specifications

Detector Type:	Uncooled microbolometer, Focal plane array (UFPA)
Spectral Range:	8 to 14µm
IR Resolution:	160 x 120 (19,200 pixels)
Super Resolution:	320 x 240 (76,800 pixels)

Image Presentation and Measurement Analysis

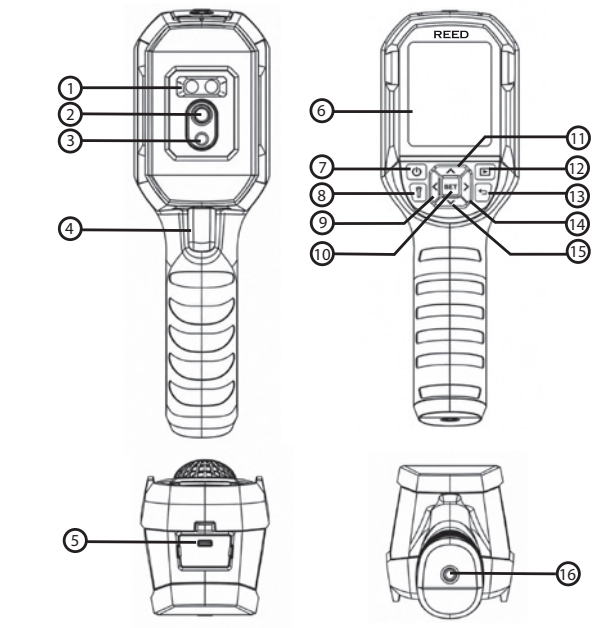
Display:	2.8" color TFT
Color Palettes:	7 (Ironbow/Rainbow/Rainbow (HC)/Lava /Red-Hot/White-Hot/Black-Hot)
Image Modes:	4 (Thermal, Visual Image, Picture-in-Picture,T-Mix)
On-Screen Temperature Markers:	3 (Center/High Temp/Low Temp)
Image Measurement Tools:	5 Points/3 Rectangles (add up to 6)
Emissivity:	Adjustable (0.01 to 0.99)
Temperature Alarm Indicators:	High/Low (user adjustable)

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General Specifications

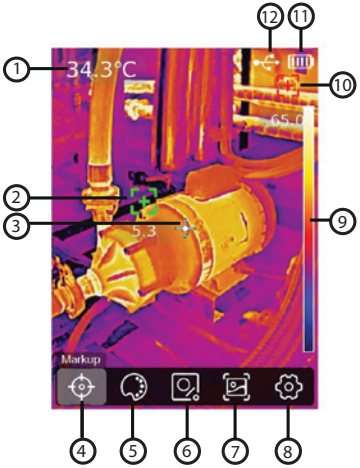
Image Capture Mode(s) :	2 (Single/Time-Lapse)
Video Capture Mode:	Yes
Display Resolution:	320 x 240 pixels
Image Format:	JPG
Video Format:	MP4
LED Flashlight:	Yes (Dual)
Memory:	Internal (32GB)
Auto Shut-off:	Yes (user adjustable 5/10/20/30/45/60/90 minutes)
Tripod Mountable:	Yes
Low Battery Indicator:	Yes
Power Supply:	3.7V/5000mAh rechargeable Li-ion battery
Battery Life:	Approximately 8 hours
Charge System:	In Camera
Charge Time:	Approximately 4 hours
PC Connectivity:	USB Cable (Type-C)
Software:	Yes (download from website)
Software Functionality:	Image Analysis/Report Generation/ Live Camera Feed
Software OS Compatibility:	Windows 7/8/10/11
Supported Languages:	English, French, German, Italian and Spanish
Product Certifications:	CE, IP65, 6.5' (2m) drop test
Operating Temperature:	32 to 122°F (0 to 50°C)
Storage Temperature:	-4 to 140°F (-20 to 60°C)
Operating/Storage Humidity Range:	10 to 95%
Maximum Operating Altitude:	6561' (2000m)
Dimensions:	9.3 x 3 x 3.4" (236 x 76 x 86mm)
Weight:	1.3lbs (600g)

Instrument Description



1. LED lights
2. Infrared camera lens
3. Visual light camera lens
4. Trigger
5. USB-C interface
6. LCD display
7. POWER button
8. FLASHLIGHT button
9. LEFT button
10. **SET** button
11. UP button
12. REPLAY button
13. BACK button
14. RIGHT button
15. DOWN button
16. Tripod mounting hole

Display Description



1. Center Spot Temperature
2. Minimum Spot Temperature
3. Center Spot
4. On-Screen Markup Settings
5. Color Palette Settings
6. On-Screen Measurement Settings
7. Image Mode Settings
8. Settings Menu
9. Temperature Bar
10. Maximum Spot Temperature
11. Battery Status Indicator
12. USB Status Indicator

Emissivity

This thermal imager measures infrared energy from the surface of the object and uses this data to calculate an estimated temperature value. Surfaces that are good at radiating energy (high emissivity), the emissivity factor is ≥0.90. Shiny surfaces or unpainted metals are not good at radiating energy (low emissivity) have an emissivity of <0.6. To more accurately measure materials with a low emissivity, an emissivity correction is necessary. Emissivity is set directly as a value or from a list of emissivity values for some common materials.

The following table gives typical emissivity of some materials:

Material	Emissivity	Material	Emissivity
Asphalt	0.95	Drywall	0.95
Concrete	0.95	Render	0.94
Hard plaster	0.90	Smoothing cement	0.90
Wood (natural)	0.93	Lacquer	0.92
Lime Stone	0.98	Latex paint	0.97
Ballast chipping	0.95	Wallpaper	0.93
Paper (every color)	0.95	Tilling	0.93
Plastics non film	0.95	Parquet floor	0.90
Tissue (fabric)	0.95	Laminate	0.90
Sand	0.90	PVC-Floor	0.92
Glass wool	0.90	Brick	0.93
Melted asphalt	0.93	Cliff	0.97
Screed/pavement	0.93	Roofing cardboard	0.93
Foamed polystyrene	0.94	Stucco	0.91

Software Installation

Visit www.REEDInstruments.com/software to download the R2168 software.

Full specifications and Operating System compatibility can be found on the product page at www.REEDInstruments.com.

If you have specific questions related to your application and/or questions related to software setup and functionality please contact the nearest authorized distributor or Customer Service at info@reedinstruments.com or 1-877-849-2127.

USB Communication and PC Analysis Software

1. Download and install the PC software from the REED Instruments website.
2. Connect the device to a computer using the USB data cable.
3. Open the PC software to view images and perform data analysis.
4. Refer to the software user manual for detailed operating instructions.
5. To disconnect the device, use the operating system's "Safely Remove Hardware" function before unplugging the USB cable.

Warning: Do not disconnect the USB cable during active data transfer. This may result in data loss or file corruption.

Operating Instructions

Power ON/OFF

1. To power on the thermal imager, press and hold the ⏻ button for approximately 3 seconds. The display will activate and the device will begin initializing.
2. To turn the device off, press and hold the ⏻ button until the shutdown prompt appears, then navigate to "OK" or "Cancel" using the 〈 or 〉 buttons.
3. Press the **SET** button to confirm the selection.

Main Menu

1. Press the **SET** button to enter the main menu.



2. Use the 〈 and 〉 buttons to scroll through the list of parameters.

	Enable/Disable Center Point, High/Low Temperature Spots or Display Numerical Values on Maximum/Minimum Spot Temperatures
	Select Color Palette
	Add/Remove/Modify On-screen temperature point(s), Rectangle(s)
	Select Image Mode (Thermal, Picture-in-Picture, Visual Images, T-Mix (thermal blending))
	Settings Menu

3. Follow the instructions below to adjust each parameter.

Enable/Disable Center Point, High/Low Temperature Spots or Region of Interest (ROI)

1. Press the **SET** button when is highlighted to access the sub-menu.
2. Use the ∧ and ∨ buttons to toggle between the options and press the **SET** button to enable/disable the following features:

	Display Center Spot Temperature (when enabled the Center Spot temperature will appear in the top left corner of the screen)
	Display Maximum Spot Temperatures
	Display Minimum Spot Temperatures
1 2 3 4	Display Numerical Values on Maximum/Minimum Spot Temperatures

Color Palette Selection

1. Press the **SET** button when is highlighted to access the sub-menu.
2. Use the ∧ and ∨ buttons to toggle between the options and press the **SET** button to confirm selection.

	Rainbow(High Contrast)
	Lava
	Rainbow
	Black-Hot
	Ironbow
	Red-Hot
	White-Hot

Image Measurement Tools

1. Press the **SET** button when  is highlighted to access the sub-menu.
2. Use the ∧ and ∨ buttons to toggle between the measurement tools.
3. Press the **SET** button to confirm selection.

Note: Up to five (5) point markers and three (3) rectangular areas can be added to the screen. A maximum of six (6) measurement tools can be active at any one time, regardless of type.
For example, the user may configure a combination such as four (4) points and two (2) rectangles, provided the total number of active tools does not exceed six (6).

	Preset (save or load a measurement tool profile)
	Clear (clear on-screen measurement tools)
	Choose (select between enabled measurement tools)
	Rectangle
	Point

Image Mode Selection

1. Press the **SET** button when  is highlighted to access the sub-menu.
2. Use the ∧ and ∨ buttons to toggle between the image modes.
3. Press the **SET** button to confirm selection.

	Thermal Image
	Digital Camera
	T-Mix (Thermal Blending)
	Picture-in-Picture (PIP): When in this mode, the PIP box cam be moved and adjusted to the desired size.

Turning the LED Flashlight ON/OFF

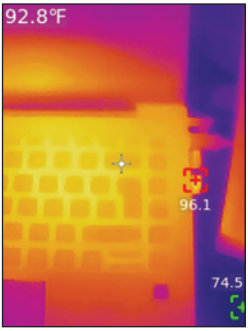
The camera is equipped with Dual LED flashlights. Press the LED Light button once to turn the flashlight ON. Press the LED Light button again to turn the flashlight OFF.

Taking Measurements

Basic Measurement Procedure

1. Press and hold the ⏻ button for approximately 3 seconds to turn on the device.
2. Allow the device to stabilize for several minutes if it has not been used recently.
3. Aim the Infrared Camera Lens at the target surface.
4. Ensure the target fills the measurement area on the display.
5. Pull the trigger to capture and display the thermal image.
6. Observe the temperature readings shown on the display:
   - Center spot temperature
   - Maximum temperature
   - Minimum temperature

The displayed values represent the surface temperature of the measured area.



Measurement Best Practices

- Ensure the target fully occupies the measurement area for improved accuracy.
- Avoid measuring reflective or polished surfaces without emissivity adjustment.
- Maintain a steady position during measurement.
- Do not take measurements immediately after charging.
- Allow the device to acclimate to ambient conditions before use.

Warning: Measurement accuracy may be affected by ambient temperature, air humidity, airborne particles such as dust or steam, and reflections from surrounding objects. Stable environmental conditions will improve measurement reliability.

Understanding Measurement Accuracy

1. Temperature accuracy depends on several factors:
    - Emissivity of the target surface
    - Distance between the device and the target
    - Ambient temperature and environmental conditions
    - Reflected temperature from surrounding objects
2. Low emissivity surfaces (such as polished metals) may produce inaccurate readings unless corrected.

Emissivity Considerations

1. High emissivity materials (≥0.90) provide more accurate readings.
2. Low emissivity materials (<0.60), such as shiny metals, may reflect infrared energy and require emissivity adjustment.
3. Refer to the Emissivity Table for typical material values.

Distance and Field of View (FOV)

1. The measurement area increases as the distance from the target increases.
2. To ensure accurate readings:
    - Position the device close enough so the target fills the measurement area.
    - Avoid measuring small objects at long distances.

Settings Menu

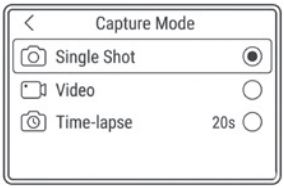
1. Press the SET button once to access the main menu.
2. Use the < or > button to to scroll to ⚙ (Settings).
3. Press the **SET** button when ⚙ is highlighted to access the sub-menu.
4. Use the ∧ and ∨ buttons to toggle between the features listed below.
5. Press the **SET** button to modify settings for each option.



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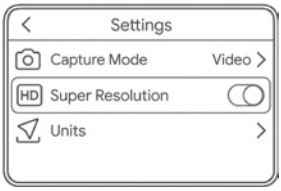
Changing Capture Mode

- Single shot – Camera takes a single image when the trigger is pulled.
- Video – Camera records video when the trigger is pulled.
- Time-Lapse – Camera automatically takes images at pre-set intervals. (between 10 and 1000 secs).



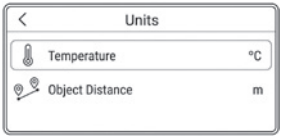
Setting HD Super Resolution

- Super Resolution – Increases the effective pixel count from 160 x 120 to 320 x 240



Setting the Units of Measure

- Temperature – Temperature unit of measure can be selected (between Celsius, Fahrenheit or Kelvin).
- Object Distance – Select between Meters and Feet.



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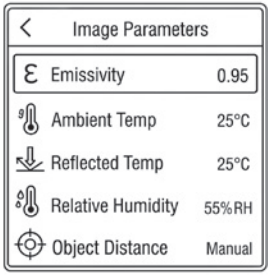
Setting Temperature Range

- Temperature Range – Select between Auto Range, -4 to 302°F (-20 to 150°C) or 212 to 1022°F (100 to 550°C)



Setting Image Parameters (Emissivity, Ambient Temp, Reflected Temp, Relative Humidity and Object Distance)

- Emissivity – Adjust the emissivity value (between 0.01 and 1.00).
- Ambient Temp – Adjust the Ambient Temperature value (between -4 to 140°F (-20 to 60°C))
- Reflective Temp - Adjust the Reflected Temperature value (between -4 to 140°F (-20 to 60°C))
- Relative Humidity – Adjust the Relative Humidity value (between 0-100%)
- Object Distance - Adjust distance to the object.



continued…

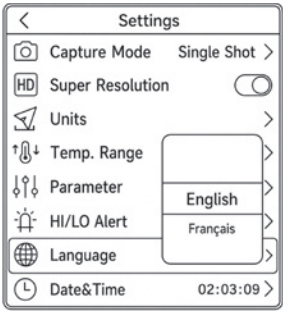
Setting High/Low Alarms

- HI – Enable the High Alarm and enter a value that will trigger the alarm. When triggered, an alarm icon in Red will appear on the display.
- LO - Enable the Low Alarm and enter a value that will trigger the alarm. When triggered, an alarm icon in Green will appear on the display.
- LED Alert - Feature will turn the Dual LED flashlight on and offrepeatedly when an alarm is triggered.



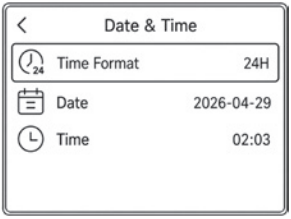
Setting the Language

- Language - Toggle between pre-loaded languages (select between English, French, German, Italian and Spanish).



Setting the Date and Date Format

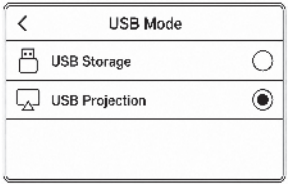
- Date & Time – Modify the time format (12 or 24hr), current time and date (YEAR/MONTH/DAY).



Changing USB Mode

- USB Storage – Select this mode to store images and videos on the camera.
- USB Projection – Select this mode to project real-time measurements to a PC.

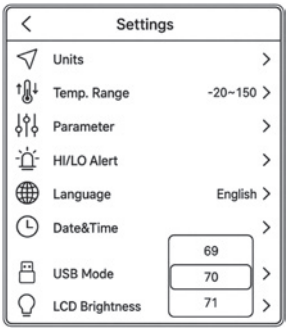
Note: Select the desired USB mode before connecting the camera to a PC.



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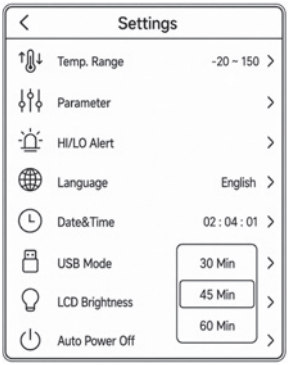
Adjusting Display Brightness

- LCD Brightness – Adjust the screen brightness level (select a value between 1 and 100).



Auto Power Off

- Auto Power Off – Adjust the time before the camera automatically turns off (select between OFF/5/10/20/30/45/60/90mins).



Factory Reset

- Factory Reset - When the **SET** button is pressed a prompt will appear asking for confirmation. If **Yes** is selected, the camera will automatically restart with all of the default firmware settings.



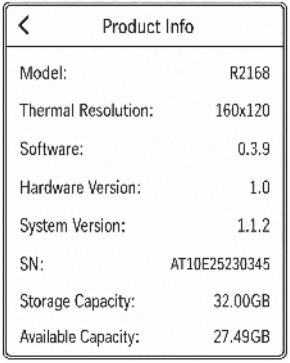
Format Internal Storage

- Format – When the **SET** button is pressed, a prompt will appear asking for confirmation to format the internal storage. If **Yes** is selected, all data stored on the device will be permanently erased. If **No** is selected, the operation will be canceled and no data will be affected.



Device Information

- About – When the **SET** button is pressed, the product info screen will display detailed product information including model number, thermal resolution, software version, hardware version, system version, serial number (SN), total storage capacity, and available storage capacity.



Saving, Viewing & Deleting Media (Images & Video)

During normal operation, images and video clips can be saved to the device's internal storage.

1. To save an image or record video, pull the trigger.
2. To view saved media, press the ▶ button to enter the gallery.
3. Press the **SET** button to view all photos and videos.
4. Use the ❮ and ❯ buttons to scroll through saved images and video clips.
5. To select a file, press the **SET** button. Once selected, you can add notes, use measurement tools, or modify and save changes.
6. To delete a file, select the image or video, then press the 🗑 button (follow on-screen prompts) to remove it from internal storage.

Charging the Battery

1. Connect the R2168 via the included cable to a USB port on your PC or into a wall outlet using a USB Power Adapter (not included) to charge the Li-ion battery.
2. Charge the meter until the battery indicator appears full and remove the charging cable when done.

Applications

- Home and building inspection
- Plant and general maintenance
- Electrical and mechanical inspection
- Predictive maintenance
- HVAC/R and plumbing
- Automotive maintenance
- Solar panel inspection
- Equine and veterinary
- PCBA inspection
- Road construction

Accessories and Replacement Parts

- **R8888** Medium Hard Carrying Case
- **R1500** Tripod

Don't see your part listed here? For a complete list of all accessories and replacement parts visit your product page on www.REEDInstruments.com.

Product Care

To keep your instrument in good working order we recommend the following:

- Store your product in a clean, dry place.
- Clean your product and accessories with biodegradable cleaner. Do not spray the cleaner directly on the instrument. Use on external parts only.

Product Warranty

REED Instruments guarantees this instrument to be free of defects in material or workmanship for a period of one (1) year from date of shipment. During the warranty period, REED Instruments will repair or replace, at no charge, products or parts of a product that proves to be defective because of improper material or workmanship, under normal use and maintenance. REED Instruments total liability is limited to repair or replacement of the product. REED Instruments shall not be liable for damages to goods, property, or persons due to improper use or through attempts to utilize the instrument under conditions which exceed the designed capabilities. In order to begin the warranty service process, please contact us by email at 1-877-849-2127 or info@reedinstruments.com to discuss the claim and determine the appropriate steps to process the warranty.

Product Disposal and Recycling



Please follow local laws and regulations when disposing or recycling your instrument. Your product contains electronic components and must be disposed of separately from standard waste products.

Product Support

If you have any questions on your product, please contact your authorized REED distributor or REED Instruments Customer Service by phone at 1-877-849-2127 or by email at info@reedinstruments.com.

Please visit **www.REEDInstruments.com** for the most up-to-date manuals, datasheets, product guides and software.

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TEST & MEASURE WITH CONFIDENCE



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