

## Welcome to the IRI1020

The IRISYS IRI1020 Imaging Radiometer has 256 sensing elements and is sensitive to infrared radiation in the 8 to 14  $\mu\text{m}$  band. Invisible to the naked eye, infrared (IR) radiation can be felt as heat when one walks past a hot object.

### Radiometry

All objects give off an IR signal which depends on the temperature of the object. For objects which are not reflective (or shiny), the amount of IR can be used to estimate the object temperature - even at a distance. The temperatures of the objects whose images fill the small green cursors are shown in the chosen temperature units at the top of the screen. **CAUTION The temperature of objects smaller than these boxes may be hotter than the reported value.**

### Emissivity and Reflected Background

Emissivity has a maximum of 1 and minimum of 0 and is the opposite of reflectivity, an emissivity of 1 means that the object is not at all shiny and an emissivity of close to 0 means that it is very shiny indeed. The IRI1020 can compensate for the emissivity of a viewed object if the emissivity is entered into the camera. If the emissivity is less than 1, the object is partly shiny and therefore some of the IR picture will have come from the surrounding background. The average background temperature must therefore also be entered into the camera. Measurement accuracy falls at low emissivities and so the value entered into the camera is limited to be no less than 0.2. **CAUTION Objects with low emissivity may be considerably hotter than the reading given by the IRI1020.** The power-on value of emissivity is 1.0 and the background temperature is not then taken into account. The current emissivity and background temperature values are displayed at the top of the screen in the single cursor mode.

### Integration

The output of the radiometer is subject to noise in the electronics and in the infrared detector. The noise can be reduced by increasing the integration setting. This averages several pictures together to reduce the noise but at the expense of slower response when the camera or the viewed object is moved.

### Level and Span

In order to get a visible picture, the IRI1020 focuses on a certain temperature range. This is automatically determined and the temperature range is shown on the right hand side of the screen. The LEVEL is the value at the centre of the scale and the SPAN is the difference between the top value and the bottom value. Only objects in the centre third of the picture are taken into account by the IRI1020 in arriving at the automatic level and span.

If the manual mode is entered, the level and span will be locked at their current values but can be adjusted by the arrow keys. This can be useful if comparative pictures of two different objects are required or if small variations in a hot or cold object are to be measured.

Entering automatic mode at any time will restore a usable picture. Powering the unit off and on again will restore all factory settings.

Over and under range values are indicated by red or blue coloured numbers, these readings exceed the range of the instrument and should not be relied upon.

## Getting Started

Remove cover.



Insert battery.



Close cover.



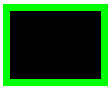
Power button.



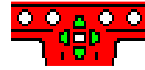
Laser button.



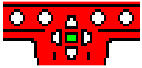
**Warning: Class 2 laser product**  
**Conforms to USA 21 CFR 1040.10 and 1040.11**  
**except for deviations pursuant to laser notice**  
**No.50 dated July 26<sup>th</sup> 2001**  
**Complies with IEC/EN 60825-1 (2001)**



The green border around an icon shows that it is selected. Use the arrow keys to adjust the values as required.



Use the centre button to freeze the image.



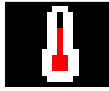
Use Hotkey 1 to select and cycle through measurement options:



Emissivity.  
0.20 → 1.00.



Reflected Background -20  
°C → +200°C.



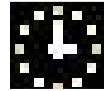
°C  
°F  
K



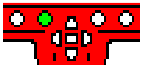
Integration  
1 → 9 frames.



Red - Blue,  
Green - Blue,  
Greyscale.



Time & Date  
(Centre button)



Use Hotkey 2 to select these functions:

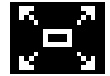
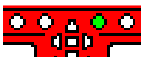


Image Size. In this mode, pressing any of the Arrow keys toggles between standard and large.



In these modes, use the centre button to select 1 or 2 measurement cursors. Use the Arrow keys to move the measurement cursor selected.



Use Hotkey 3 to control the saving and loading of snapshots to and from the SD card.



Save.



Load.

In save mode, press the centre button once to freeze an image and a second time to save the image.

In load mode, use up and down arrows to cycle through stored snapshots. Use left and right arrows to cycle through 10 snapshots at a time.



No SD card to save to.



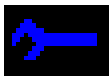
No files to load.



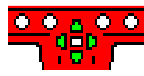
Use Hotkey 4 to toggle between automatic and manual level and span control.



Automatic



Manual



In manual mode, use the Arrow keys to change values; icons will appear on the screen as below:

Manual Level control.



Increase.



Decrease.



Maximum.



Minimum.

Manual Span control.



Increase.



Decrease.



Maximum.



Minimum.



IRI1020  
Thermal  
Imaging  
Radiometer.

## IRI 1020 Quick Reference Guide



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