

# IRtec Rayomatic 100

Fiber Optic Two-Color  
Temperature Transmitter



## INFRARED THERMOMETERS

- ▶ Monochromatic or 2-color (Ratio) Operations
- ▶ 2-wire, 4-20 mA Transmitter
- ▶ Temperature Range from 600 to 2700°C
- ▶ High Optical Resolution
- ▶ Replaceable Fiber Optic without Recalibration
- ▶ Smart Microcontroller Technology
- ▶ Bi-directional RS232 Simultaneous
- ▶ Windows™ Software for Remote Setup and Datalogging
- ▶ Integrated Averaging, Peak-Picker and Track&Hold Programmable Alarm Output with Dual Setpoint



## Introduction

The Fiber Optic **IRtec Rayomatic 100** ratio thermometer provides maximum performance in high temperature applications, such as metal production, foundries, annealing, glass making, forging, induction heating, kilns, and refractory.

The rugged design steel coated fiber optic cable allows both confined space and high ambient temperature installations.

### ■ Principle of Operation

The instrument use the "2-color" principle, in which the temperature measurement is made simultaneously by two independent detectors with different, but adjacent, narrow band infrared filters. By ratioing the output of these two detectors, the temperature measurement became independent of a number of factors that during the measurement usually degrade the accuracy of one conventional instrument.

### ■ Exceeds the Monochromatic Application Limits

Usually you can use a standard monochromatic thermometer when the hot object being measured fill the target area and no obstruction can interfere with the cone of vision. Same time the application does not allow the Infrared thermometer to work well.

For example when the object is smaller than the nominal target; when emissivity changes for gray targets; when dust, vapour, particles are in the field of view; when you measure behind a dirty lens or window.

A ratio thermometer can usually solve these problems. If the energy reduction is lower than 95%, the ratio thermometer can measure better than a monochromatic thermometer.

### ■ E-Slope

A two-color thermometer consists of two single-color "brightness" thermometers in the same package. The signals from the two detectors are then processed as a ratio. The calibration curve is based on the ratio of the two signals, which will be very accurate, as long as the partial obstruction or attenuation affects each of the wavelengths by an equal amount.

In addition, some applications require adjustments for "non-gray" behaviour of the measured material. A good example is the measurement of molten metals where the emissivity of the material varies with wavelength. Even when a two-color thermometer is used to measure the temperature of some molten metals, the resulting temperature reading may be incorrect because the pre-programmed ratio or "slope" of the two signals is incorrect. To compensate for this type of error, the **IRtec Rayomatic 100** have a user-adjustable "E-slope" feature that allows the user to set the correct emissivity slope for the material being measured.

## Software

### IR SETUP - Configuration Software

Compatible with WIN 95/98/2000/XP, the IRSetup software package provides for:

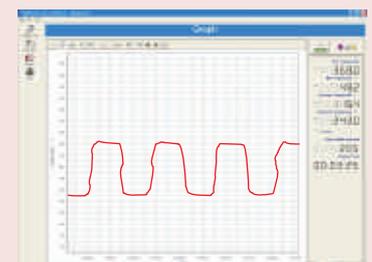
- easy sensor setup and remote controlling via USB or RS232 interface
- adjustment of signal processing functions
- programming of the 4-20mA signal



### LogMan - Datalogging Software

Compatible with WIN 98/2000/XP, the LogMan software package provides for:

- automatic data logging for analysis and documentation
- graphic display of temperature trends



**BB530207**  
RS232/USB  
adapter for PC



**BB530200**  
RS232 adapter  
for PC

## Applications

### \* Steel Production



### \* Glass



### \* Cementry



### \* Incinerators



## Optics

Target size calculated @ 95% of energy

## Specifications

The E-slope control modifies the ratio of the two signals to correct for the unequal spectral emissivities of the target. When measuring a material or alloy type for the first time, the E-slope value is determined by adjusting the E-slope control so that the instrument reading matches the temperature reading from an accurate contact type device. The E-slope value is then known and used for that particular material. Once the E-slope is set, the problems of smoke, steam, dust, and so forth are handled by the instrument.

### Innovative Design

Eurotron gets over another challenge with the ratio fiber optic **IRtec Rayomatic 100**:

- true 2-wire connection (the thermometer is powered by the signal current loop);
- no stabilization time at power-on;
- bi-directional digital communication superimposed over the 2-wire signal current loop;
- flexible, steel coated, fiber optic and small measuring head for high ambient temperature (200°C) and confined space applications.

### Signal Processing

The instrument includes signal processing features including: Emissivity, Peak-Picker, Valley-Picker, Peak Hold, Valley Hold and Averaging all of which are adjustable on the PC using the IRSetup software.

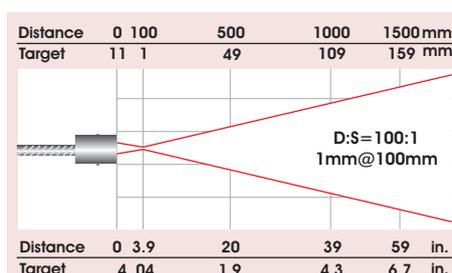
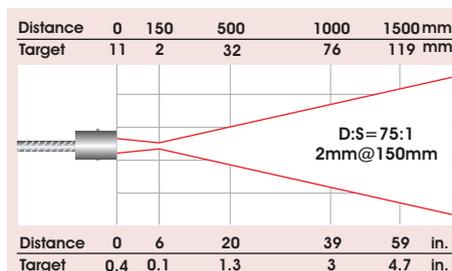
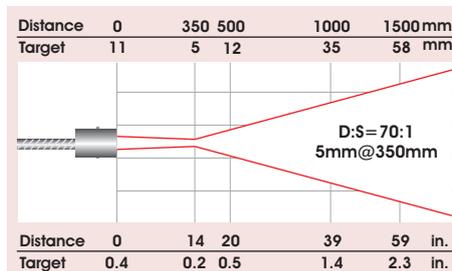
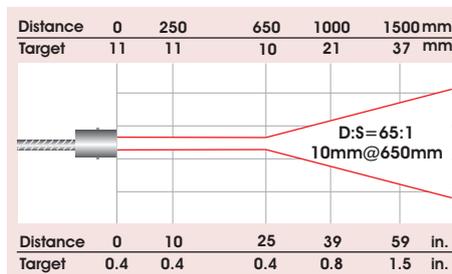
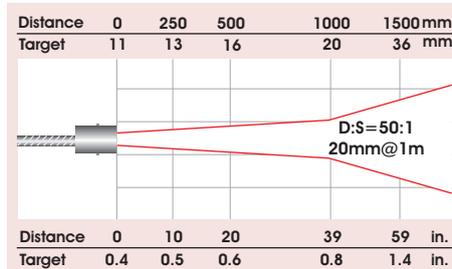
### Bell202 / RS232 Serial Adapter

**IRtec Rayomatic** temperature transmitters feature an integrated Bell202 communication module. This protocol allows to superimpose the digital serial communication over the process 2-wire current loop. The Eurotron Bell202 to RS232 adapter and software allows you to set, program and test the transmitter by using a standard Personal Computer. The adapter allows you 3 different operations:

- 24 Vdc current loop power supply
- Bell202/RS232 protocol converter
- Bell202/RS232 protocol converter + 24Vdc current loop power supply

### Report of Calibration

**IRtec Rayomatic** is delivered, with a traceable EA or NIST Report of Calibration stating the nominal, the actual values and the deviation errors.



### Accuracy:

@ 23°C ±5°C and e=1.0  
2-color: ±0.75% FS (with 95% attenuation)  
monochromatic: ±0.5% FS

### Repeatability:

2-color: ±0.25% FS  
monochromatic: ±0.25% FS

### Response time:

38ms (τ95)

### Emissivity (monochromatic):

adjustable by PC from 0.30 to 1.00 in 0.01 increments

### E-Slope (2-color):

adjustable by PC from 0.800 to 1.200 in 0.001 increments

### Temperature drift:

< ±0.05 % rdg./°C for the band exceeding +18 to +28°C

### Digital communication:

Built-in Bell202 superimposed over the 2-wire current loop  
RS232 with optional adapter

### Signal Processing:

Average, Peak, Valley, Peak-Picker, Valley-Picker, Track&Hold, Alarms

### Output signal:

4/20 mA 2-wire current loop  
max load 700 Ω

### Environmental rating:

IP65 (NEMA-4)

### Power supply:

from 12 to 32 Vdc

### Storage temperature:

from -30 to +70 °C

### Operating temperature:

optical head: 200 °C max  
fiber optic: 200 °C max  
electronic module: from -20 to +60 °C

### Dimensions:

electronic module ø45 mm x 175 mm - M4x1.5

fiber optic ø8 mm

optical head ø16 mm x 52 mm (Fast-Lock)

### Weight:

electronic module 500g





Thank you for reading this data sheet.

For pricing or for further information, please contact us at our UK Office, using the details below.



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