

IRtec P800 & P1000

IRtec P1300

IRtec P1600 & P2000

Portable Infrared Thermometers

Bulletin 03-08.4 E



ISO 9001
registered by
GAS TEC



- Twin laser, telescope or red point target pinpointing
- No focusing required
- Actual temperature average, min, max, and ΔT
- Programmable alarms
- Auxiliary thermocouples type K and S input for automatic emissivity setting
- Powered by alkaline or rechargeable battery
- Bidirectional digital interface and analog output
- Data memory grouped by Tag (500 records)
- Report of Calibration





Non-contact Temperature measurement

General

Each body, at temperatures above the absolute zero (-273°C or 0K), emits energy as electromagnetic radiation. When temperature rises, the intensity of this infrared energy increases.

The temperature of the body surface can therefore be determined by measuring the intensity of this energy in a small spectral band: the infrared region.

The instruments used to measure this energy and to calculate the related temperature are called infrared thermometers or non-contact thermometers.

Applications

Temperature measurements of a liquid or gaseous compound have been successfully made with thermoelectric or expansion thermometers, thanks to the good thermal exchange of the sensor with the fluid.

With solid bodies, a good thermal exchange is difficult to be obtained and an additional measuring error should be considered.

When the target is moving or is electrically hazardous, a contact temperature measurement can't be made.

Non-contact IR temperature measurement could be the only solution to the above application problems.

Typical application of **IRtec** portable thermometers is to control temperature where an increase of its value means a possible machine wearing, aging, faulting, etc.



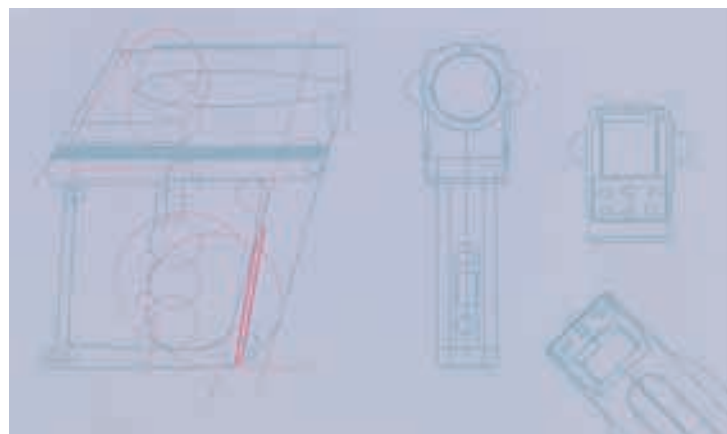
Red point and telescope auxiliary pinpointing systems



Display and keyboard

Periodical temperature checks are Important for:

- ▶ Oxidized Metals
- ▶ Glass and Ceramics
- ▶ Thin film plastics
- ▶ Ovens
- ▶ Plant maintenance
- ▶ Electrical
- ▶ General purpose
- ▶ Food safety
- ▶ Life sciences





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Lens

Laser pinpointing system

Analog output
Thermocouple input
Digital interface
Battery charger

Trigger

Tripod thread

Wrist strap mount

Battery cover



A professional tool for maintenance and surveillance

Instrument highlights

Optical system

The optical system consists of a high quality lens which brings the infrared energy to the detector; a filter and a field stop which defines the visual cone and the minimum target dimensions.

The detector is placed at the focal point of the optical system. No focusing operations are required.

A secondary, but extremely important feature, is the correct pinpointing of the target.

Target pinpointing

A correct aiming of the target is an important feature in a non-contact thermometer.

Immediate evaluation of the smallest measurable target area is also an important factor in many applications.

With a laser pinpointing the operation of the instrument is extremely simplified. You simply aim the target and read the temperature while keeping a safe body position.

Following types of pinpointing are available:

- Twin laser pointers to define, at distance, the measurable target dimensions
- Combination of twin laser and direct telescope viewing for universal applications, mainly required for target where distance is longer than 5 meters.
- Combination of twin laser and red point pinpointing for universal applications mainly required for high temperature target where laser spots are not visible.

Emissivity

Infrared energy emitted by a surface differs according to its composition and physical conditions.

The parameter used to characterize object surface is called emissivity.

To obtain these temperature readings, it is necessary to set the right emissivity values of the surface to be measured.

IRtec P is equipped with an emissivity adjustment from 0.10 to 1.00 directly through keyboard.

Calculated measurements

Measuring unstable input signals could be made by programming the digital filter.

In addition the operator can select minimum, maximum, Tmax -Tmin operations to identify hot spots, fast scanning, etc.



Twin laser target pinpointing system



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Display & Keyboard

Thermocouple Input

To extend the operative capability the instrument is equipped with an auxiliary input for thermocouples type K and S.

This feature, when used with a calibrated thermocouple, can be used for automatic emissivity adjustment.

The thermocouple can be used also to compensate temperature readings to reflected radiations from hot crowns (e.g. reheating furnaces) or to measure objects internal temperature.



Analog Output

An analog output is available to drive an external analog input device (e.g. a potentiometric or hybrid recorder) for long term trend profiling and tests.

In this case the instrument can be powered directly from mains using the external power supply module.

Data memory

The instrument can be equipped with an internal memory to store up to 500 input data records complete with date & time acquisition.

Two types of data acquisition can be selected by the user:

Continuous acquisition

The operator can select the interval time between each acquisition and store progressively the input data in the "Tag 0" file.

Acquisition by dedicated Tags

Operator can assign one tag file for each apparatus or operating area and store, by pressing one key only, one or more temperature measurements.

Software

Standard Agencies and Quality Auditors require the collection, organization and availability of traceability documents.

LogMan supporting software is available to transfer a selection of plant inspections from a PC to the internal memory of the instrument in order to simplify field check and select the appropriate tag number.

Dedicated input data are memory stored and downloaded to a PC to document the inspection activity.

Data can be saved on disks, viewed and printed in a numeric or graphic mode. The name of every Tag is also programmable.

Alarms

High and low alarms can be programmed and used to identify hot spots; fast scanning; long term temperature monitoring. The internal buzzer and the custom LCD gives an acoustic and visible alarm to alert the operator.

Digital interface

A full bidirectional digital port is available for communication with computer systems.

An optional TTL/RS 232 adapter is available for PC connection.

The high contrast custom LCD display indicates the actual temperature value and shows the operative mode selected. The display backlight is automatically switched on to allow easy reading in poor light conditions.



<MEM> DataLogger programming - Data Hold

<ENTER> General parameters programming mode - Enable /disable averaging

<SEL> Select the parameter / menu option - Memory recalling

<▲><▼> Increase / decrease value

<*> Enable / disable laser

- 1 Operative mode
- 2 Operative mode
- 3 Selected parameter (min, med, max, alarm, memory, etc.)
- 4 Emissivity value
- 5 Technical unit (°C, °F, K)
- 6 measured value with 1°C or 0.1°C resolution
- 7 Low and High alarm indication
- 8 Setting value for the selected parameter



Technical Specifications

	IRtec P800	IRtec P1000	IRtec P1300	IRtec P1600	IRtec P2000
Temperature measuring range	-30 to 930°C -20 to 1710°F	-30 to 1000°C -20 to 1830°F	300 to 1300°C 570 to 2370°F	600 to 1600°C 1100 to 2900°F	600 to 2000°C 1100 to 3630°F
Spectral response	8-14 μm	8-14 μm	1.6 μm	0.9 μm	0.9 μm
Target spot size @ distance <i>Nominal target @ 95% of energy</i>	10mm@600mm 0.39in@24in	10mm@1m 0.39 in@39.4in	6mm@1m 0.236in@39.4in	5mm@1m 0.20in@39.4in	5mm@1m 0.20in@39.4in
D:S target sighting ratio	60:1	100:1	167:1	200:1	200:1
Accuracy IR	±(1% of rdg+1°C)	±(1% of rdg+1°C)	±(0.5% of rdg+1°C)	±(0.5% of rdg+1°C)	±(0.5% of rdg+1°C)
Repeatability IR	±0.5% of rdg	±0.5% of rdg	±0.25% of rdg	±0.25% of rdg	±0.25% of rdg
Temperature stability IR	±0.01% f.s./°C (for the band exceeding +18°C to +28°C)				
Measurement sampling time	<300 ms				
Emissivity	Adjustable from 0.10 to 1.00				
Thermocouple measuring ranges					
<i>type K</i>	from -100°C to +1370°C - 0.1°C resolution				
<i>type S</i>	from 0°C to +1760°C - 0.1°C resolution				
Thermocouple accuracy					
<i>type K</i>	±(0.05% of reading + 0.4°C)				
<i>type S</i>	±(0.05% of reading + 2.5°C)				
Display	High contrast custom LCD with backlight device				
Display resolution	1°C / °F / K (0.1°C / 0.1°F in AVG mode up to 200°C)				
Laser	twin crossed or parallel (suggested for target distance over 5m)				
Laser indicator	asterisk on display				
Analog output	1 mV/ °C/ °F/ K				
<i>Accuracy</i>	±1 mV				
<i>Impedance</i>	<0.5 Ω with max. output current 0.5 mA				
Digital interface	full bi-directional (RS232 standard isolated available as option)				
Calculated functions	average, max, min, diff.				
Data memory	500 input data structured by Tag (max. 20 Tag)				
Power supply	alkaline or rechargeable (optional) type AA battery				
Battery life	16 h (backlight off)				
Battery low level of charge	symbol on the LCD display				
Line operation	100, 115, 230V ±10% 50/60 Hz using the external charger				
Charger transformer insulation	2500 V _{bc}				
Battery recharging time	8 h at 90% (instrument switched off)				
Operating temperature range	from -10°C to +60°C				
Storage temperature range	from -10°C to +60°C		from -30°C to +60°C		
Case	Injection moulded ABS+ polycarbonate				
Dimensions	200 x 180 x 80 mm				
Weights	net 0.8 kg		gross 1.5 kg		



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EMC COMPATIBILITY

All IRtec thermometers are designed and fully tested for conformity with the Directive No. 89/336/CEE Electromagnetic Compatibility.

Report of calibration

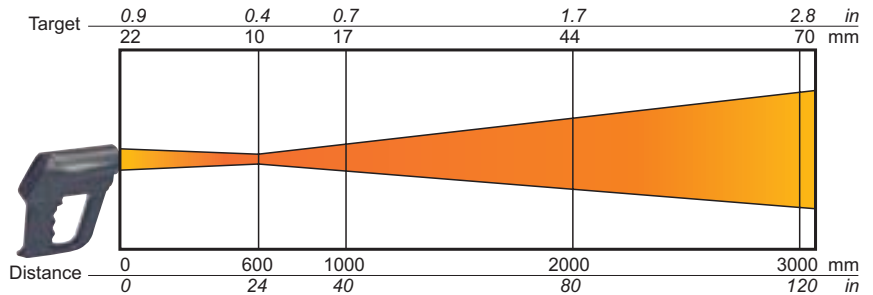
Each IRtec portable IR thermometer is factory calibrated and certified in according to Eurotron Standards, that are periodically certified by an International recognized Laboratory to grant traceability, and supplied with a Report of Calibration stating the nominal and actual values and the deviation errors.

Quality System

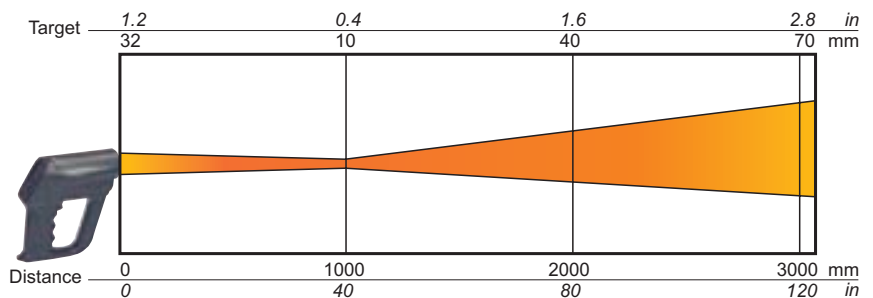
Research, development, production, inspection and certification activities are defined by methods and procedures of Eurotron Quality System. Eurotron Quality System has been inspected in compliance with ISO 9001 by Gastec.

Target sighting and spot sizes *

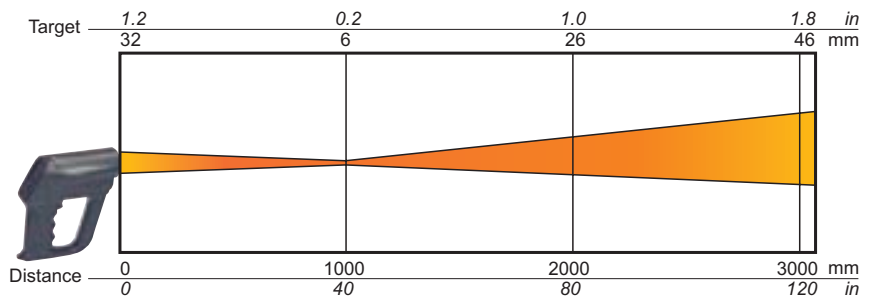
IRtec P800



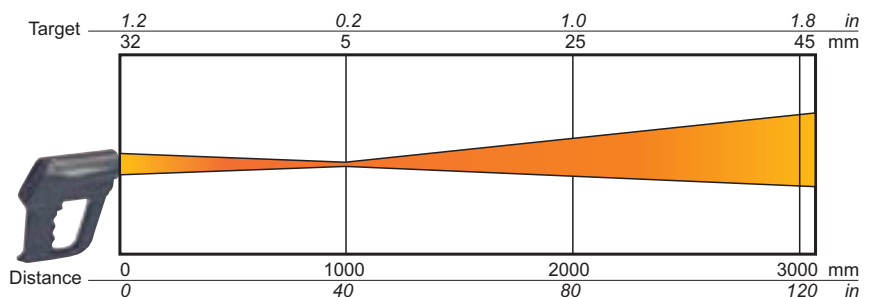
IRtec P1000



IRtec P1300



IRtec P1600 and P2000



*Nominal target diameter at 95% of energy.



Ordering Code



LogMan application software packages for PC



Aluminium case



2x telescope and 1x "Red point" adaptors (suggested for T>1100°C (2000°F) and D> 5m)

Vinyl case

IRtec P

A - B - C - D - E

Table	A	Model/Range
	1192	P800 from -30°C to +930°C (-20°F to +1710°F)
	1194	P1000 from -30°C to +1000°C (-20°F to +1830°F)
	1195	P1300 from +300°C to +1300°C (+570°F to +2370°F)
	1196	P1600 from +600°C to +1600°C (+1100°F to +2900°F)
	1198	P2000 from +600°C to +2000°C (+1100°F to +3630°F)
Table	B	Battery/charger
	0	alkaline battery/none
	1	Ni-MH/120 V USA plug
	2	Ni-MH/230 V Schuko plug
	3	Ni-MH/240 V UK plug
	4	Ni-MH/230 V European plug
	5	Ni-MH/100 V Japan plug
Table	C	Pinpointing system
	2	twin crossed laser
	3	twin parallel laser (suggested for target distance over than 5m)
Table	D	Accessories
	1	Vinyl case (instrument only)
	2	Aluminium case (IRtec +accessories) (standard on A =1194 and A =1198)
	3	Internal data memory +TTL/RS232 adapter + LogMan software (standard for A =1194 and A=1198)
	4	External printer
	5	Software CalpMan data manager for PC (D=3 required)
	6	Sighting telescope pinpointing system
	7	Red point system
	8	Acoustic & visible alarm (standard on A =1194 and A =1198)
	9	Analog output (standard on A =1194 and A =1198)
	A	Tc K/S auxiliary input (standard on A =1194 or A=1198)
Table	E	Report of Calibration
	1	Eurotron Report

Specifications may change without notice.



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