

# PyroMini

## Miniature Infrared Temperature Sensors with Optional Touch Screen Interface



### FEATURES (ALL MODELS)

- Miniature sensing head and configurable electronics module
- Touch screen (optional) for temperature indication and configuration
- Screen turns bright red in alarm condition for maximum visibility
- Adjustable emissivity setting on all models
- Data logging to MicroSD Card (optional) on touch screen models
- 4 to 20 mA or RS485 Modbus outputs
- Alarm relay outputs rated 24 V DC (optional) - no need for separate trip amplifier
- Maximum, minimum, average and instantaneous readings, peak or valley hold, reflected energy compensation

### PYROMINI GENERAL PURPOSE

- High-ambient sensing heads (optional) withstand up to 120°C or 180°C without cooling
- Suitable for a wide range of target materials such as paper, plastics, food, painted surfaces, coated metal and many more
- Resistant to interference from movement of sensing head cable (-JA, -HA models) - ideal for mounting on robot arms
- Temperature ranges from -20°C to 1000°C

### PYROMINI 2.2 HIGH TEMPERATURE

- Short-wavelength measurement for improved accuracy on reflective targets such as steel rollers and many other metal surfaces
- Temperature ranges from 100°C to 2000°C
- Choice of optics, including narrow options for long-distance measurements of very hot objects

### GENERAL SPECIFICATIONS

	PyroMini General Purpose	PyroMini 2.2 High Temperature
<b>Temperature Range</b>	Choice of ranges from -20°C to 2000°C (see Model Numbers on page 3)	
<b>Output</b>	4 to 20 mA or RS485 Modbus (up to 247 sensors may be installed on each Modbus network)	
<b>Alarm Relays (-CRT and -BRT models)</b>	2 x Single Pole Changeover alarm relays rated 24 V DC, 1 A, isolated 500 V DC	
<b>Accuracy</b>	± 1°C or 1% of reading, whichever is greater	± 2°C or 1% of reading, whichever is greater
<b>Repeatability</b>	± 0.5°C or 0.5%, whichever is greater	
<b>Field of View</b>	Choice of optics (see Model Numbers on page 3)	
<b>Emissivity Setting Range</b>	0.20 to 1.00	0.10 to 1.00
<b>Emissivity Setting Method</b>	-CRT and -BRT models: via touch screen -BB and -BRT models: via RS485 -CB models: via two rotary switches in electronics box	
<b>Response Time, t90</b>	≥240 ms (90% response)	
<b>Spectral Range</b>	8 to 14 μm	2.0 to 2.6 μm
<b>Supply Voltage</b>	24 V DC ± 5%	
<b>Maximum Current Draw</b>	100 mA	
<b>Maximum Loop Impedance</b>	CB and -CRT models: 900 Ω (4 to 20 mA output)	
<b>Max Temp Span (-CRT models)</b>	Full temperature range	
<b>Min Temp Span (-CRT models)</b>	100°C	

### MECHANICAL

	Sensing Head	Electronics Module
<b>Construction</b>	Stainless Steel 316	Cast aluminium
<b>Dimensions</b>	Ø 18 x 45 mm (see diagram)	98(w) x 64(h) x 36(d) mm
<b>Mounting</b>	M16 x 1 mm thread	Two M4 screw holes for wall mounting (see diagram)

### Cable Length (sensing head to electronics module)

1 m (standard), up to 30 m (optional)

### Weight with 1 m Cable

390 g (approx)

### Cable Connections

Removable screw terminal blocks (see Connections) Conductor size: 28 AWG to 18 AWG

### Output Cable Gland

Suitable for cable diameters 3.0 to 6.5 mm

### ENVIRONMENTAL

	Sensing Head	Electronics Module (without screen)	Electronics Module (with touch screen)
<b>Environmental Rating</b>	IP65 (NEMA 4)	IP65 (NEMA 4)	-
<b>Ambient Temperature Range</b>	See below *	0°C to 60°C	0°C to 60°C
<b>Relative Humidity</b>	Maximum 95% non-condensing	Maximum 95% non-condensing	Maximum 95% non-condensing
<b>RoHS Compliant</b>	Yes	Yes	Yes

### \*Ambient Temperature Range (Sensing Head)

PyroMini: Ranges from 0°C to 180°C, depending on model (see Model Numbers on page 3)

PyroMini 2.2: 0°C to 70°C

### ELECTROMAGNETIC COMPATIBILITY STANDARDS

Conforms to EMC Directive EN61326-1:2006 (Electrical equipment for measurement, control and laboratory use – Industrial) as well as industrial standards for electromagnetic immunity and emissions.

## TOUCH SCREEN (-CRT AND -BRT MODELS)

The optional backlit touch screen interface mounted in the lid of the electronics module provides a large, bright display of the measured temperature, as well as controls allowing full configuration of the sensor. The graph view shows the history of the measured temperature.

In alarm conditions, the display changes colour to provide an immediate and obvious alarm indication. Alarm modes and levels can be configured via the touch screen.

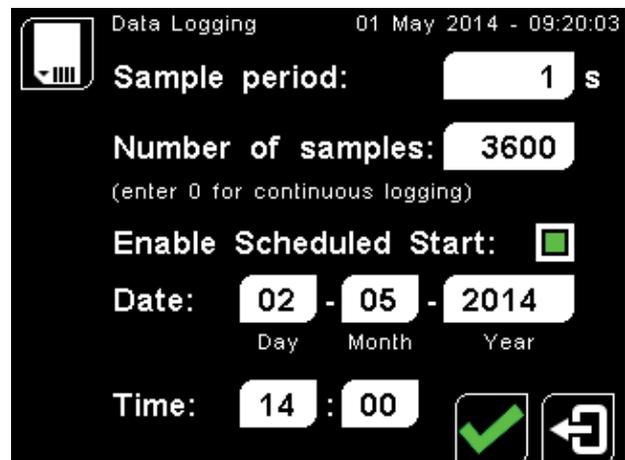
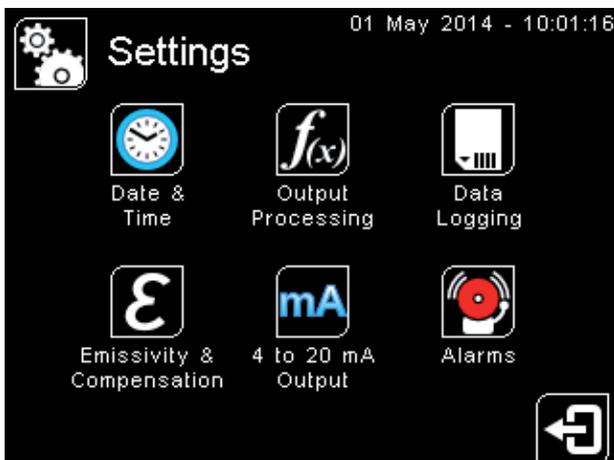
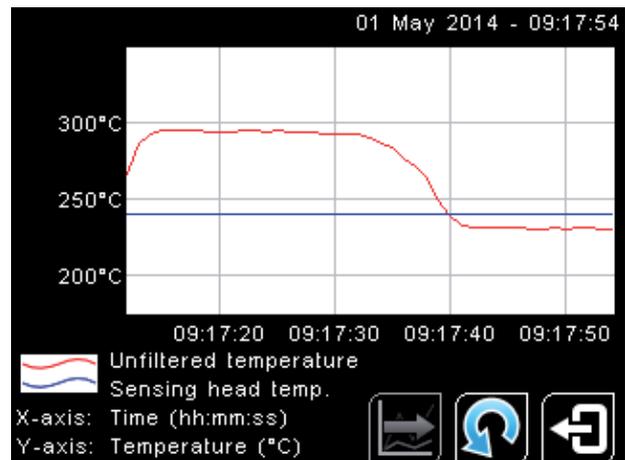
## TOUCH SCREEN SPECIFICATIONS

<b>Touch Screen Display Format</b>	2.83" (72 mm) resistive touch TFT, 320 x 240 pixels, backlit
<b>Configurable Parameters</b>	Temperature range, temperature units, emissivity setting, reflected energy compensation, alarms, signal processing, Modbus address (-BRT models), date and time, data logging
<b>Temperature Units</b>	°C or °F configurable
<b>Temperature Resolution</b>	0.1°
<b>Alarm Configuration</b>	Two alarms with adjustable level, individually configurable as HI or LO. Alarm 2 can be set to target temperature or sensing head internal temperature
<b>Signal Processing</b>	Average, peak hold, valley hold, minimum, maximum

## EXAMPLE SCREENSHOTS



Screen shown with red background to indicate alarm condition



## DATA LOGGING SPECIFICATIONS

<b>Data Logging Interval</b>	1 to 86,400 seconds (1 day)
<b>MicroSD Card</b>	Max. capacity: 32 GB (not included)
<b>Internal Clock Battery</b>	1 x BR 1225 3V (not included)
<b>Variables Logged</b>	Target temperature, sensing head temperature, electronics module temperature, max, min, average, emissivity setting, reflected energy compensation temperature, alarm events
<b>File format</b>	.csv
<b>Configurable Parameters</b>	Sample period, number of samples, scheduled start date and time

## DATA LOGGING (-CRT AND -BRT MODELS)

The PyroMini can be used as a standalone data logger.

PyroMini models -CRT and -BRT include a MicroSD card slot for data logging, which can be configured via the touch screen interface. The user can select the sample rate and the number of samples to be taken and schedule the data logging to start at a certain time.

With a 2 GB card, the user can store 28.4 million readings, which provides almost 1 year's worth of data at the fastest possible sample rate of 1 per second.

Data is stored on the MicroSD card in .csv format and can be viewed and edited easily using spreadsheet software. Alarm events can also be logged to the MicroSD Card.

A MicroSD card with SD card adapter is available as an optional accessory.

The MicroSD card slot and battery holder are located on the touch screen circuit board in the lid of the PyroMini. Readings are time and date stamped using the sensor's internal clock. The clock is reset when the power is disconnected, or it will continue if the optional battery is fitted.

## MODEL NUMBERS

Series	Sensing Head Operating Temperature Range (General Purpose only)	Field of View	Measurement Temperature Range	Output and Interface
PM (PyroMini - General Purpose)	MA	21 151 301 CF	LT MT HT XT	CB
			CT	CRT BB BRT
	HA JA	201	HT XT	CB
			CT	CRT BB BRT
PM2.2 (PyroMini 2.2 - High Temperature)	-	151 251 751 CF	PT MT HT	CB CRT BB BRT

## SENSING HEAD OPERATING TEMPERATURE RANGE (General Purpose models only)

- MA** 0°C to 60°C
- JA** 0°C to 120°C
- HA** 0°C to 180°C

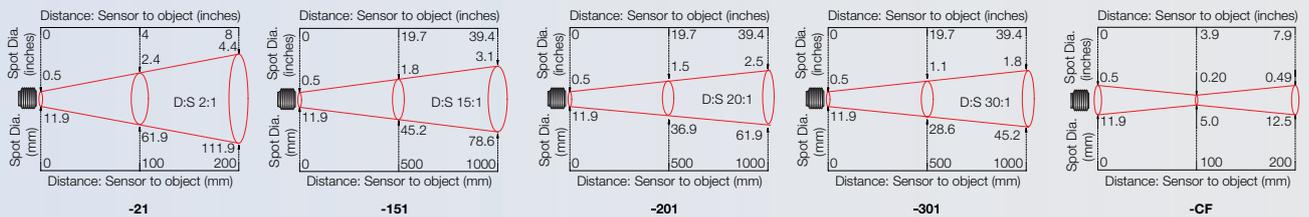
The sensing head on -JA and -HA models is able to withstand ambient temperatures of up to 120°C (-JA) and 180°C (-HA) without cooling. Both models are available with 20:1 optics.

There is no need to supply cooling air or water, and the miniature sensing head is much smaller than bulky, cooled sensors.

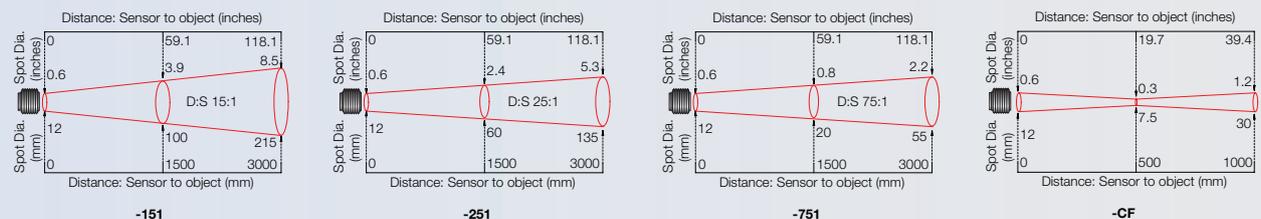


### FIELD OF VIEW (PyroMini - General Purpose)

Diameter of target spot measured versus distance from sensing head - 90% energy

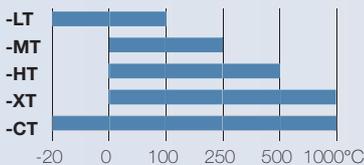


### FIELD OF VIEW (PyroMini 2.2 - Short Wavelength)

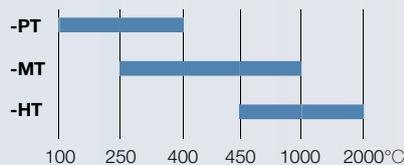


## MEASUREMENT TEMPERATURE RANGE (°C)

### PyroMini (General Purpose)



### PyroMini 2.2 (High Temperature)



- CB models: Fixed 4 to 20 mA output scale (e.g. -XT: 0°C @ 4 mA, 1000°C @ 20 mA)
- CRT models: 4 to 20 mA output is configurable within this range
- BRT and -BB models: Digital output, full temperature range

## OUTPUT AND INTERFACE

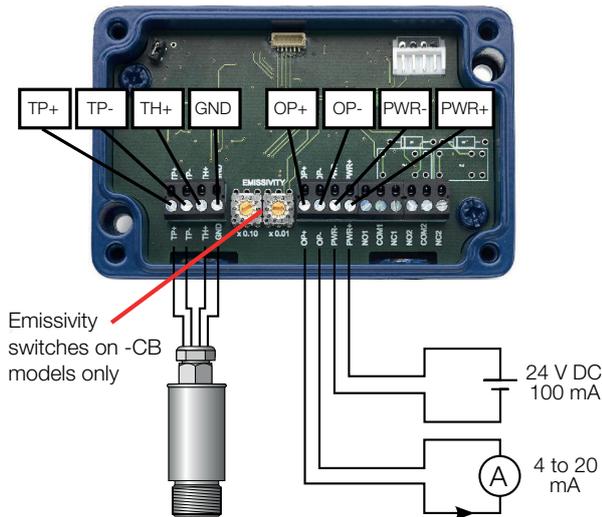
- CB** 4 to 20 mA output, no screen
- CRT** 4 to 20 mA output and two alarm relay outputs, with touch screen
- BB** RS485 Modbus output, no screen
- BRT** RS485 Modbus output and two alarm relay outputs, with touch screen

## EXAMPLE: PM-MA-301-CT-BRT

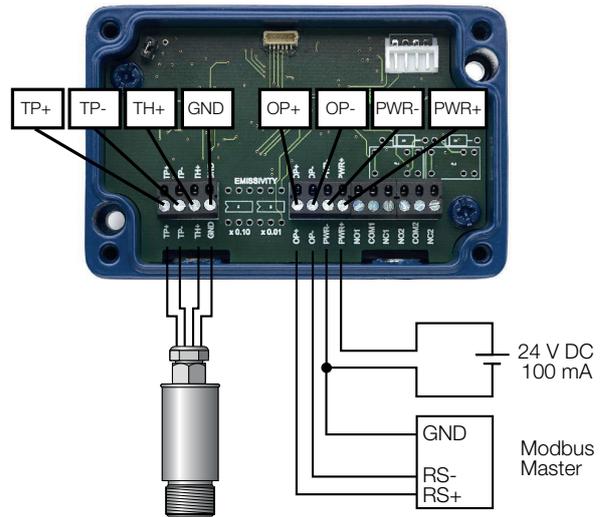
Series	Sensing Head Operating Temperature	Optics	Temperature Range	Output and Interface
PM PyroMini	-MA 0°C to 60°C	-301 30:1 divergent	-CT Digital output, -20 to 1000 °C	-BRT RS485 Modbus output and two alarm relay outputs, with touch screen

## CONNECTIONS

-CB and -CRT models

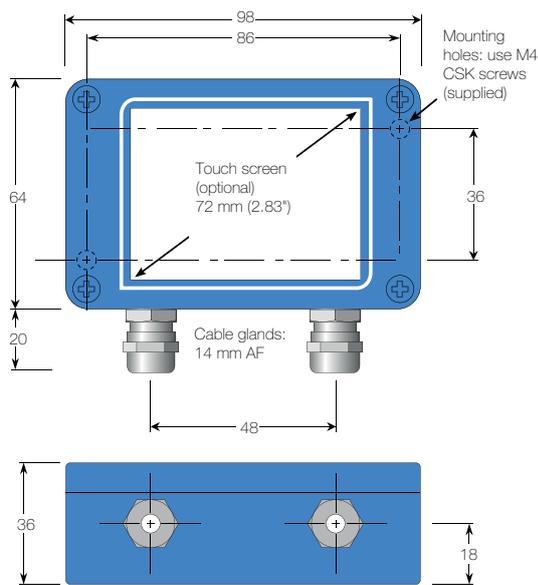


-BB and -BRT models

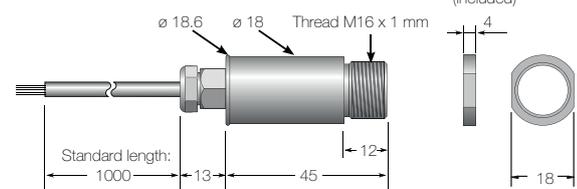


## DIMENSIONS AND ACCESSORIES

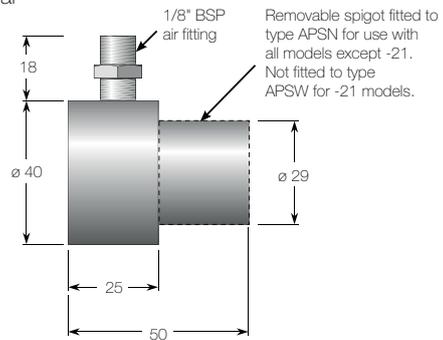
Electronics Module



Sensing Head



Air Purge Collar



All dimensions in mm

## ACCESSORIES ALSO AVAILABLE

- MicroSD Card with SD Card adapter: stores logged data (-CRT and -BRT models) **MSD**
- Extended cable between sensing head and electronics module (PyroMini -MA models) **PMCE**, (PyroMini -HA and -JA models) **PMCEHT**, (PyroMini 2.2 models) **PM2.2CE**
- Calibration certificate **CALCERTA**
- Laser sighting tool **LSTS**
- Mounting bracket, Adjustable **ABS**, Fixed **FBS**
- Dual Laser Sighting Bracket, Adjustable **DLSBAS**, Fixed **DLSBFS**
- 6-channel Modbus temperature indicator with data logging **PM180**



## Calex Electronics Limited

PO Box 2, Leighton Buzzard, Bedfordshire, England LU7 4AZ  
 Tel: +44 (0)1525 373178/853800 Fax: +44 (0)1525 851319 Lo-call Tel: 0845 3108053  
 E-mail: mail@calex.co.uk Online: <http://www.calex.co.uk>

Issue A - Sept 15  
 Specifications subject to change without notice