PyroMini

Miniature Infrared Temperature Sensors with Optional Touch Screen Interface



PyroMini with touch screen

FEATURES

- Two-part sensor with miniature sensing head and configurable electronics module
- Touch screen (optional) for temperature display 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 models - Spectral response 8-14 µm

- 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
Short wavelength models - Spectral response 2.2 µm

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

MECHANICAL

	Sensing Head	Electronics Module
Construction	Stainless Steel 316	Cast aluminium
Dimensions	ø 18 x 45 mm (see diagram)	98(w) x 64(h) x 36(d) mm
Mounting	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)
Environmental Rating	IP65 (NEMA 4)	IP65 (NEMA 4)	-
Ambient Temperature Range	See below *	0°C to 60°C	0°C to 60°C
Relative Humidity	Maximum 95% non-condensing	Maximum 95% non-condensing	Maximum 95% non-condensing
RoHS Compliant	Yes	Yes	Yes

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

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

PyroMini 2.2: 0°C to 70°C

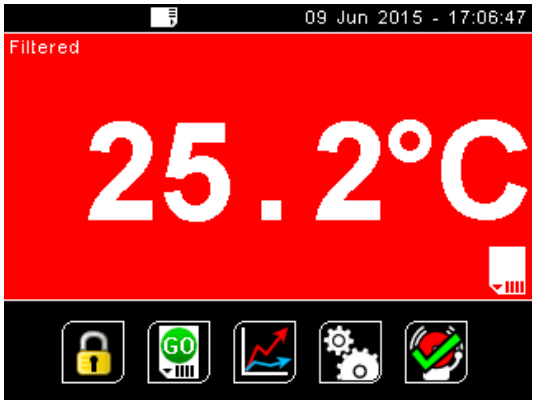
TOUCH SCREEN (-CRT AND -BRT MODELS)

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.

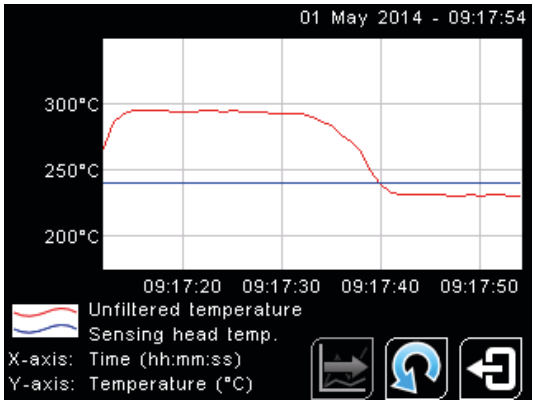
In alarm conditions, the display changes colour to provide an immediate and obvious alarm indication. Alarm modes and levels can be configured via the touch screen.

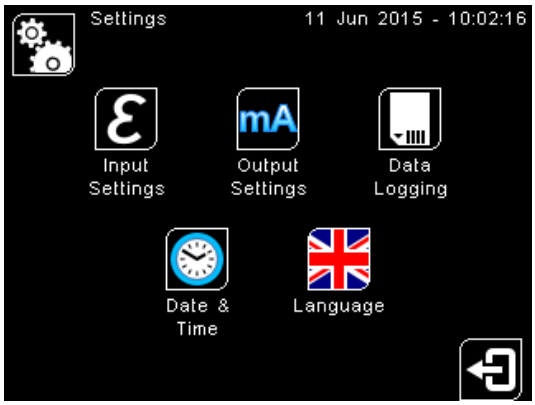
Touch Screen Specifications	
Touch Screen Display Format	2.83" (72 mm) resistive touch TFT, 320 x 240 pixels, backlit
Configurable Parameters	Temperature range, temperature units, emissivity setting, reflected energy compensation, alarms, signal processing, Modbus address (-BRT models), date and time,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

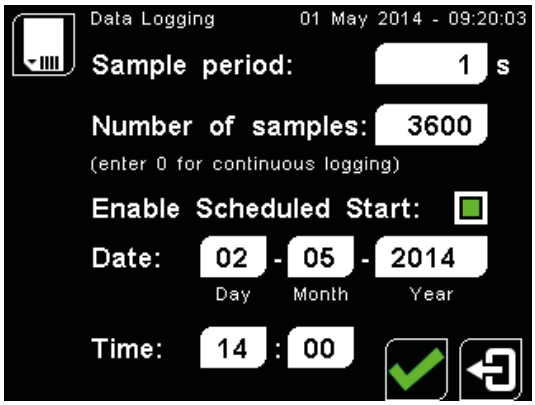
EXAMPLE SCREENSHOTS



Red background on temperature display indicates alarm condition







Data Logging Specifications	
Data Logging Interval	1 to 86,400 seconds (1 day)
MicroSD Card	Max. capacity: 32 GB (available separately)
Internal Clock Battery	1 x BR 1225 3V (not included)
Variables Logged	Target temperature, sensing head temperature, electronics module temperature, max, min, average, emissivity setting, reflected energy compensation temperature, alarm events
File Format	.csv
Configurable Parameters	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 -CRT and -BRT models 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.

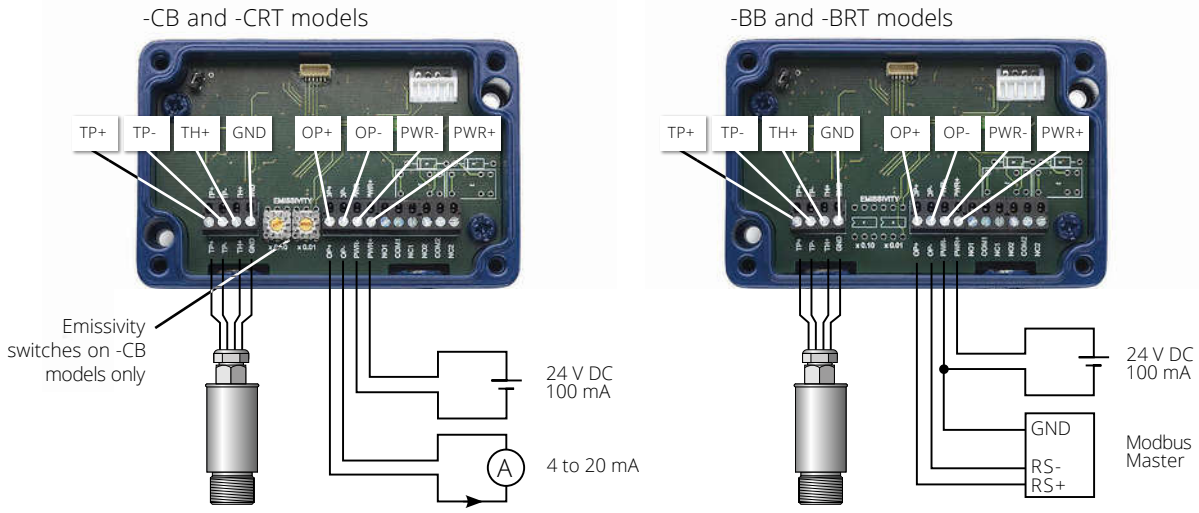
With a 2 GB card, the user can store 28.4 million readings, which provides almost 1 year's worth of data at the fastest possible sample rate of 1 per second.

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.

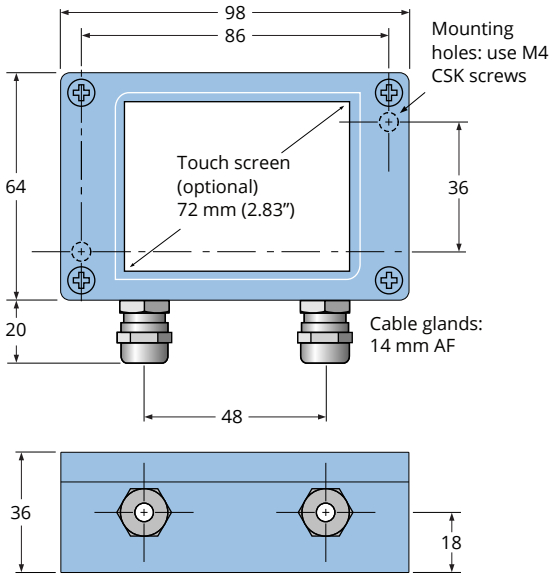
The MicroSD card slot and battery holder are located on the touch screen circuit board in the lid of the PyroMini. Readings are time and date stamped using the sensor's internal clock. The clock is reset when the power is disconnected, or it will continue if the optional battery is fitted.

CONNECTIONS

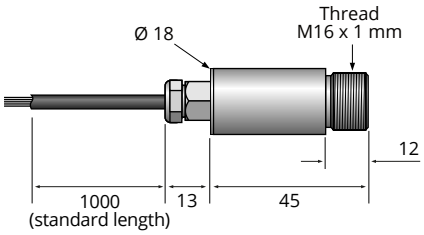


DIMENSIONS AND ACCESSORIES

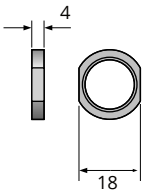
Electronics Module



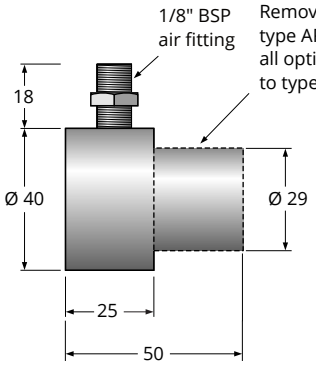
Sensing Head



Mounting Nut (included)



Air Purge Collar



ACCESSORIES ALSO AVAILABLE

- **ABS / FBS** Adjustable / fixed mounting bracket
- **CALCERTA** Calibration certificate
- **MSD** MicroSD Card with SD Card adapter: stores logged data (-CRT and -BRT models)
- **LSTS** Laser sighting tool
- **DLSBAS / DLSBFS** Adjustable / Fixed Dual Laser Sighting Bracket
- **PM180** 6-channel Modbus temperature indicator with data logging, for -BB and -BRT models
- **PWS / SIWS** Plastic/Silicon protective window in stainless steel holder (General Purpose models only)
- **PMK** Panel mounting kit, for -CRT and -BRT models


Laser Sighting Tool


PM180


Adjustable Mounting Bracket


Dual Laser Sighting Bracket

PyroMini
Model Numbers - General Purpose models

Series	Sensing Head Operating Temperature Range	Optics	Measurement Temperature Range	Output & Interface	Sensing Head Cable Length
PM General Purpose (8-14 µm)	**MA** (0-60°C)	**21** (2:1) **151** (15:1) **301** (30:1) **CF** (close focus)	**LT** (-20 - 100°C) **MT** (0 - 250°C) **HT** (0 - 500°C) **XT** (0 - 1000°C)	**CB**	**(blank)** Standard length 1 metre **2M** 2 metres ... **30M** 30 metres
			CT (-20 - 1000°C)	**CRT** **BB** **BRT**	
	HA (0-180°C) **JA** (0-120°C)	**201** (20:1) **HCF** (close focus)	**LT** (-20 - 100°C) **MT** (0 - 250°C) **HT** (0 - 500°C) **XT** (0 - 1000°C)	**CB**	
			CT (-20 - 1000°C)	**CRT** **BB** **BRT**	

SENSING HEAD OPERATING TEMPERATURE RANGE

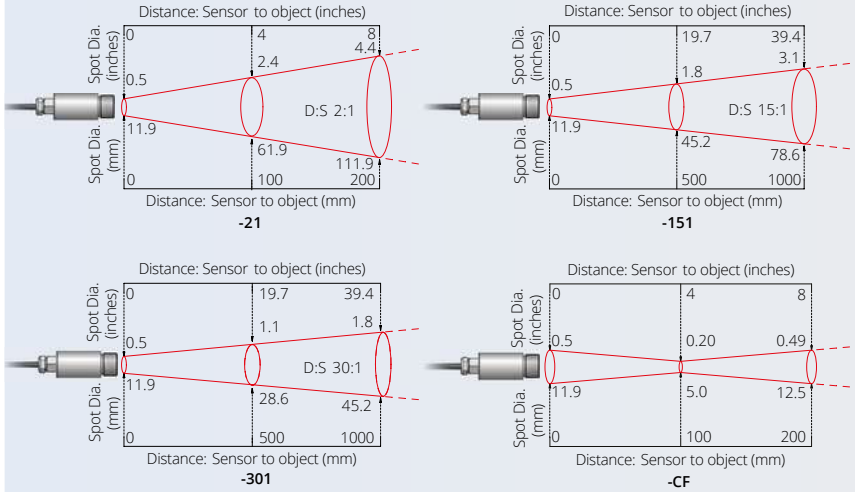
-MA 0°C to 60°C
-JA 0°C to 120°C
-HA 0°C to 180°C

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

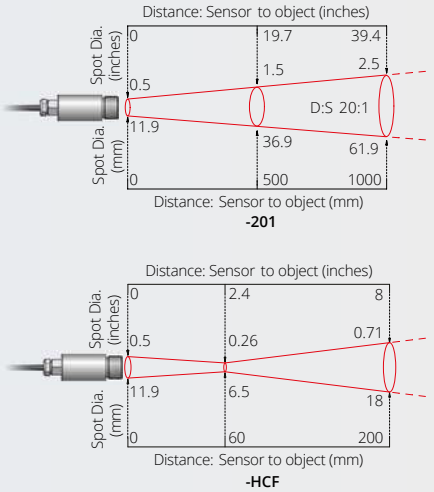
OPTICS

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

PM-MA models



PM-HA and PM-JA models



All sensors can measure at longer distances than shown above, with a larger measured spot.

MEASUREMENT TEMPERATURE RANGE (°C)

-LT	-20°C	to	100°C
-MT	0°C	to	250°C
-HT	0°C	to	500°C
-XT	0°C	to	1,000°C

-CB models:

Fixed 4 to 20 mA output scale
(e.g. -XT: 0°C @ 4 mA, 1000°C @ 20 mA)

-CT	-20°C	to	1,000°C

-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, without display

-BB RS-485 Modbus output, without display



-CRT 4 to 20 mA output and two alarm relay outputs, with touch screen

-BRT RS-485 Modbus communications and two alarm relay outputs, with touch screen

OUTPUT CABLE LENGTH

-2M to **-30M**

Specify the length of the sensing head cable. The maximum length is 30 m. If no length is specified, the sensor will be supplied with a 1-metre sensing head cable. The length of the PyroMini sensing head cable cannot be modified by the user. Please be sure to order the length of cable you require.

EXAMPLE: **PM-MA-151-CT-CRT-5M**

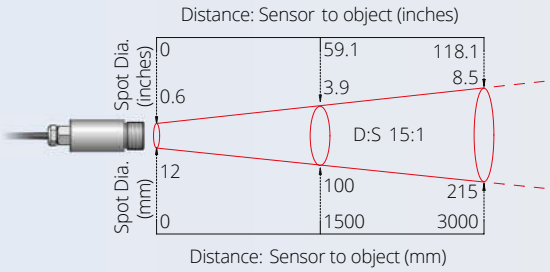
Series	Sensing Head Operating Temperature	Optics	Measurement Temperature Range	Output and Interface	Sensing Head Cable Length
PM PyroMini	**-MA** 0°C to 60°C	**-151** 15:1 divergent	**-CT** Configurable -20 to 1000 °C	**-CRT** 4-20 mA output and two alarm alarm relay outputs, with touch screen	**-5M** 5 metres

PyroMini 2.2
Model Numbers - Short Wavelength models

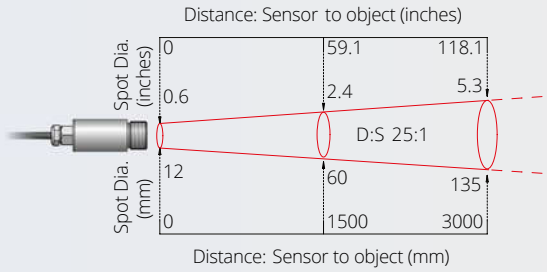
Series	Optics	Measurement Temperature Range	Output & Interface	Sensing Head Cable Length
PM2.2 High Temperature (2.2 µm)	**151** (15:1)	**PT** (100 - 400°C)	**CB** **CRT** **BB** **BRT**	**(blank)** Standard length 1 metre **2M** 2 metres ... **30M** 30 metres
	251 (25:1) **751** (75:1) **CF** (close focus)	**MT** (250 - 1000°C) **HT** (450 - 2000°C)		

OPTICS

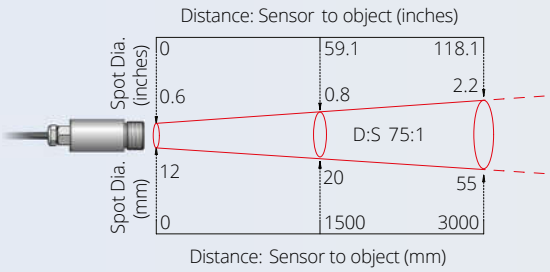
Diameter of target spot measured versus distance from sensing head - 90% energy



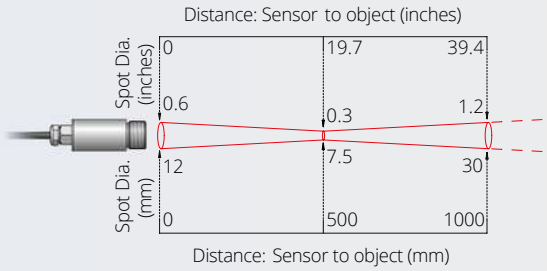
-151



-251



-751



-CF

All sensors can measure at longer distances than shown above, with a larger measured spot.

MEASUREMENT TEMPERATURE RANGE (°C)

-PT	100°C to	400°C
-MT	250°C to	1000°C
-HT	450°C to	2000°C

-CB models:

Fixed 4 to 20 mA output scale (e.g. -MT: 250°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, without display

-BB RS-485 Modbus output, without display



-CRT 4 to 20 mA output and two alarm relay outputs, with touch screen

-BRT RS-485 Modbus communications and two alarm relay outputs, with touch screen

OUTPUT CABLE LENGTH

-2M to **-30M**

Specify the length of the sensing head cable. The maximum length is 30 m. If no length is specified, the sensor will be supplied with a 1-metre sensing head cable. The length of the PyroMini sensing head cable cannot be modified by the user. Please be sure to order the length of cable you require.

EXAMPLE: **PM2.2-751-MT-BRT-3M**

Series	Optics	Measurement Temperature Range	Output & Interface	Sensing Head Cable Length
PM2.2 PyroMini 2.2 series short-wavelength infrared temperature sensor	**751** 75:1 divergent optics	**MT** 250°C to 1000°C	**BRT** RS-485 Modbus communications, 2 x alarm relay outputs, touch screen interface	**3M** 3 metres

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