PyroMini

Miniature Infrared Temperature Sensors with Optional Touch Screen Interface

thermo-electra
temperature sensor solutions

PyroMini with touch screen

FEATURES

- Two-part sensor with 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
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	
Field of View	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)
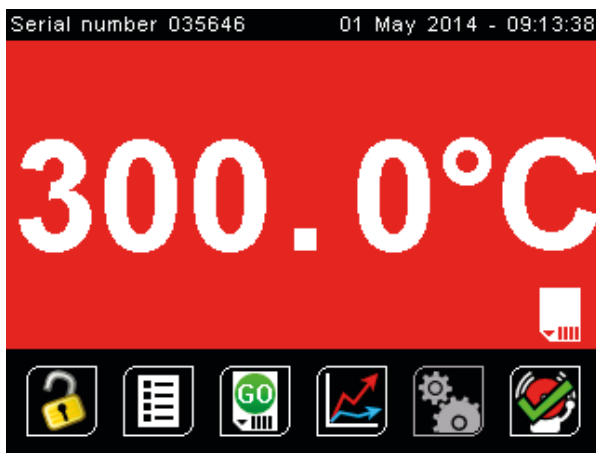PyroMini 2.2: 0°C to 70°C

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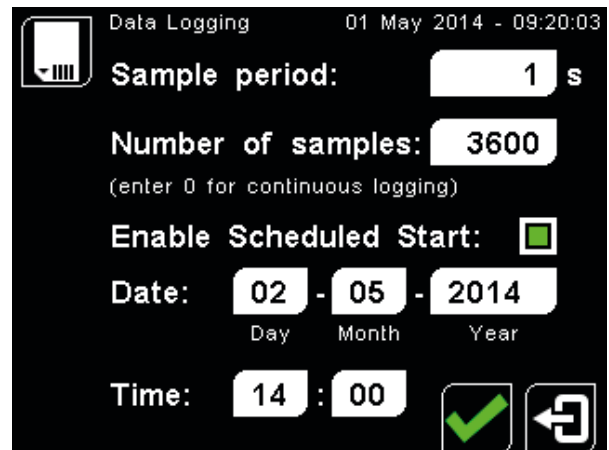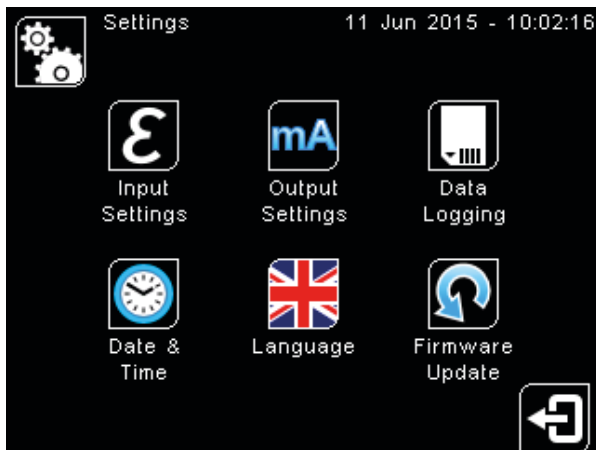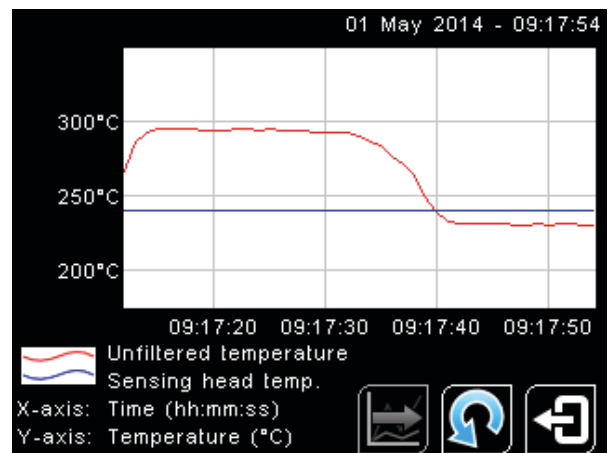
In alarm conditions, the display changes colour to provide an immediate and obvious alarm indication. Alarm modes and levels can be configured via the touch screen.

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

Screen shown with red background to indicate alarm condition

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.

Data Logging Specifications	
Data Logging Interval	1 to 86,400 seconds (1 day)
MicroSD Card	Max. capacity: 32 GB (not included)
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

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	PT	CB CRT BB BRT
		251 751 CF	MT HT	

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.
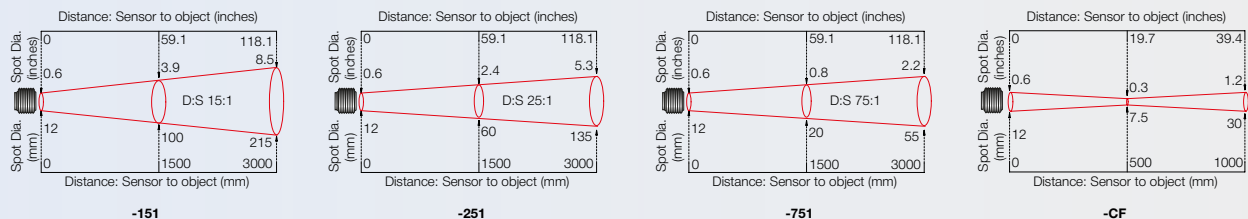

PyroMini without screen

FIELD OF VIEW (PyroMini - General Purpose)

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

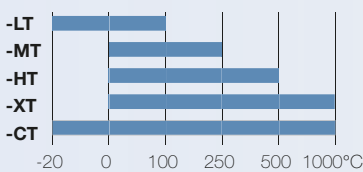**-21**   D:S 2:1
-151 D:S 15:1
-201 D:S 20:1
-301 D:S 30:1
-CF
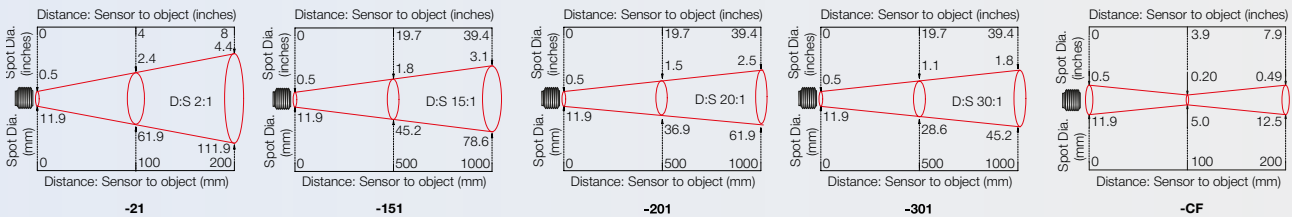
FIELD OF VIEW (PyroMini 2.2 - High Temperature)

-151 D:S 15:1
-251 D:S 25:1
-751 D:S 75:1
-CF

MEASUREMENT TEMPERATURE RANGE (°C)

PyroMini (General Purpose)

-LT
-MT
-HT
-XT
-CT

-20   0   100   250   500   1000°C

PyroMini 2.2 (High Temperature)

-PT
-MT
-HT

100   250   400   450   1000   2000°C
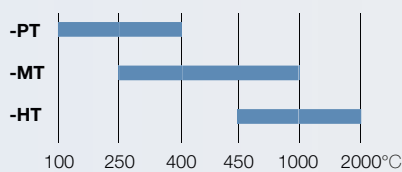
-CB models: Fixed 4 to 20 mA output scale (e.g. -XT: 0°C @ 4 mA, 1000°C @ 20 mA)
-CRT models: 4 to 20 mA output is configurable within this range
-BRT and -BB models: Digital output, full temperature range

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

| TP+ | TP- | TH+ | GND | | OP+ | OP- | PWR- | PWR+ |

Emissivity switches on -CB models only

x 0.10   x 0.01

24 V DC
100 mA

4 to 20 mA
Ⓐ

-BB and -BRT models

| TP+ | TP- | TH+ | GND | | OP+ | OP- | PWR- | PWR+ |

24 V DC
100 mA

GND
RS-
RS+

Modbus Master
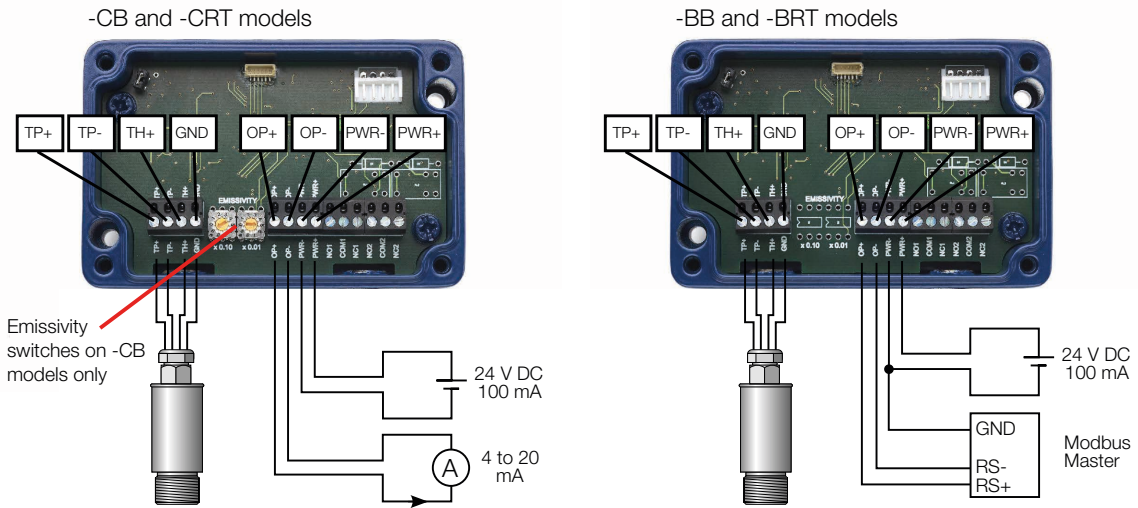
DIMENSIONS AND ACCESSORIES

Electronics Module

98
86
64
36
20

Mounting holes: use M4 CSK screws (supplied)

Touch screen (optional) 72 mm (2.83")

Cable glands: 14 mm AF

48

36
18

Sensing Head

Ø 18.6   Ø 18   Thread M16 x 1 mm

Standard length: 1000   13   45   12

Mounting Nut (included)
4
18

Air Purge Collar

1/8" BSP air fitting

Removable spigot fitted to type APSN for use with all models except -21. Not fitted to type APSW for -21 models.

18
Ø 40   Ø 29
25
50

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**
- Protective plastic or silicon window in stainless steel holder (General Purpose models only) **PWS / SIWS**
- Panel Mounting Kit **PMK**

Laser Sighting Tool

PM180

Adjustable Mounting Bracket

Dual Laser Sighting Bracket

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