PyroMiniBus

Infrared Temperature Sensors with RS-485 Modbus for Multi-Channel Installations



- Miniature non-contact industrial pyrometers
- Sensors have RS-485 Modbus communications and can be connected directly to third-party Modbus hardware
- Optional 6-channel local display with configuration, alarms and data logging
- Low-cost standalone 6-channel system
- Optional analogue and relay output modules
- Conforms to industrial EMC standards
- Ideal for continuous temperature monitoring at multiple locations e.g. busbar surface temperature in switchgear cabinets

PyroMiniBus sensors are designed to measure the surface temperature of non-reflective materials in industrial applications, from -20°C to 1000°C.

Sensors can be connected directly to a third-party Modbus Master, such as a PLC or SCADA system. They have direct RS-485 Modbus communications and there is no need for additional interface hardware.

They can measure painted surfaces, food, paper, thick plastics, asphalt, paint, bulk materials and organic materials, as well as most dirty, rusty or oily surfaces.

NETWORKABLE

With sensors connected directly to the Master, or in sub-networks using repeaters or local displays, it is possible to measure the temperature of hundreds of locations on one network.

ROBUST

PyroMiniBus sensors are sealed to IP65, built from 316 stainless steel, and fully tested to industrial EMC standards. They have an operating temperature rating of up to 120°C with no need for cooling.

COMPACT

The sensors measure just 45 mm long (plus cable gland), so they can fit into the smallest of spaces.

LOCAL DISPLAY

Up to 6 sensors can be connected to the optional PM180 touch screen interface module, which provides temperature display, configuration, and high-capacity data logging to a MicroSD Card. They can also be configured remotely via Modbus.

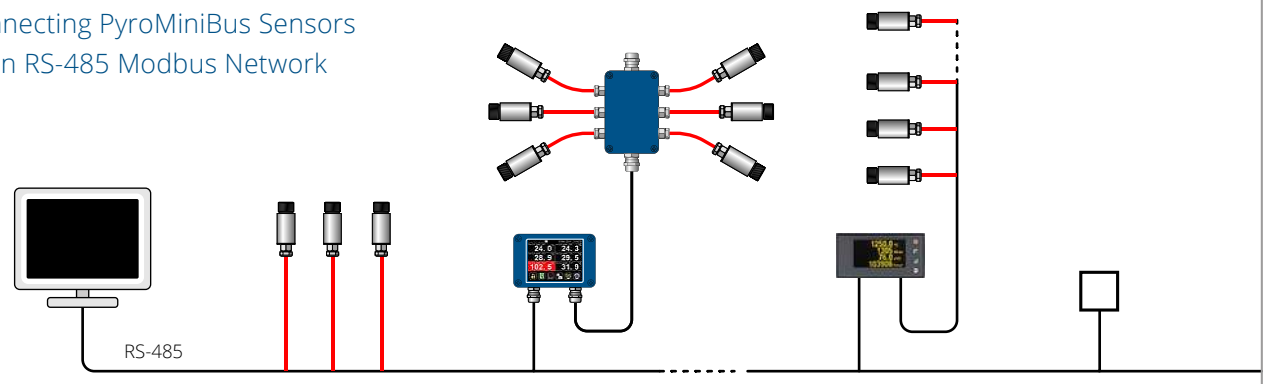
Analogue and relay outputs are available via separate DIN rail mounted modules.

Alternatively, the panel-mounted STR571 provides display of 8 Modbus variables.

LOW COST

With up to 8 sensors connected to one display, the PyroMiniBus is an ideal low-cost, non-contact, general-purpose temperature measurement system.

Connecting PyroMiniBus Sensors to an RS-485 Modbus Network



Third-party RS-485 Modbus Master e.g. PLC or SCADA

PyroMiniBus sensors connected directly to Modbus Master

Up to 6 sensors connected to optional PM180 display & configuration unit

Up to 8 sensors connected to optional STR571 8-variable display

Other Modbus devices

Multiple sub-networks may be connected to the Master

CALEX ELECTRONICS LIMITED

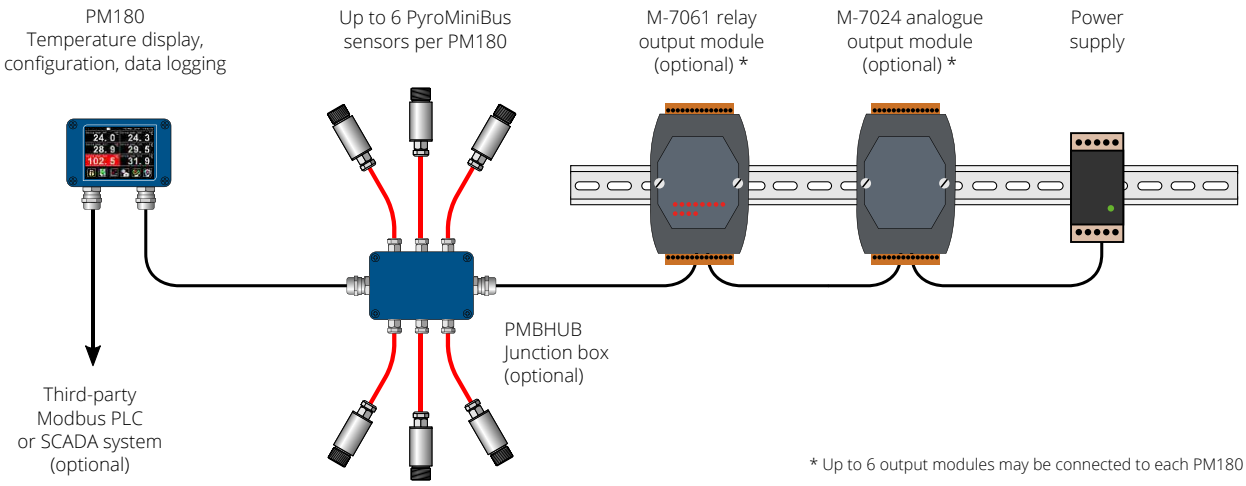


PM180

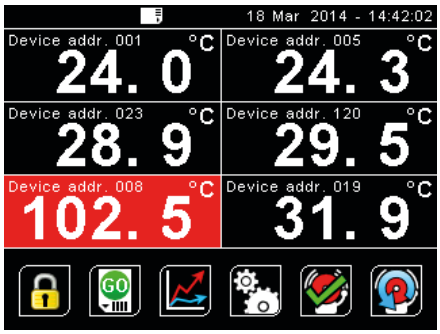
Optional 6-Channel Touch Screen Terminal

- Display temperatures, configure sensors, log data and alarm events
- Connect up to 6 sensors per PM180
- Operates as Modbus Master and Slave
- High capacity data logging to MicroSD Card
- Bright touch screen display with backlight
- Analogue and relay outputs via optional ICP-DAS modules M-7061 and M-7024
- 2-channel scrolling temperature chart
- Selectable language: English, Chinese, Japanese

Standalone 1-6 Channel System

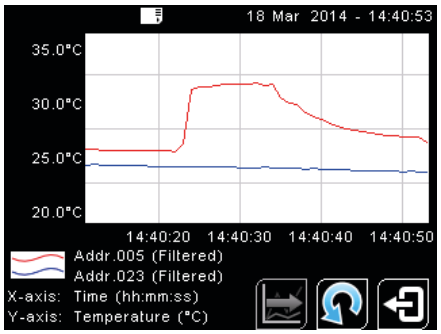


* Up to 6 output modules may be connected to each PM180



Intuitive touch screen interface

Display and configure all 6 channels individually or simultaneously. The display for each channel turns red in an alarm condition



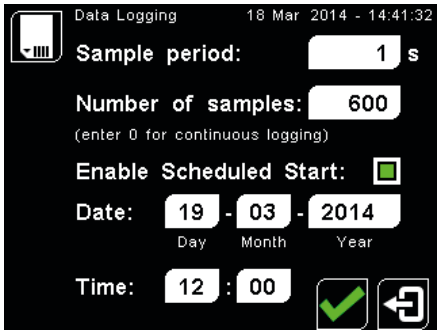
Temperature chart

Display temperature data from two channels in a scrolling graph



Password-protected settings

Configure options for each sensor, and the PM180 itself



Data logging

Schedule a start time, or start/stop logging with one touch. Log temperature data and alarm events to a MicroSD Card (not supplied)

SPECIFICATIONS



PYROMINIBUS SENSOR

General	
Temperature Range	-20°C to 1000°C
Interface	RS-485 Modbus RTU
Accuracy	±1% of reading or ±1°C whichever is greater
Repeatability	± 0.5% of reading or ± 0.5°C whichever is greater
Emissivity Setting	0.2 to 1.0
Response Time	125 ms (90% response)
Spectral Range	8 to 14 µm
Supply Voltage	24 V DC (min. 6 V DC / max. 28 V DC)
Supply Current	50 mA max.
Baud Rate	9600 baud *
Format	8 data bits, no parity, 1 stop bit *

* Other configurations available on request

Configuration	
Configuration Method	Via PM180 touch screen, or directly via RS-485 Modbus
Configurable Parameters	Emissivity Setting, Averaging, Reflected Energy Compensation

Mechanical	
Construction	Stainless Steel
Dimensions	18 mm diameter x 45 mm long
Thread Mounting	M16 x 1 mm pitch
Cable Length	1m (can be extended or ordered with longer length)
Weight with Cable	85 g

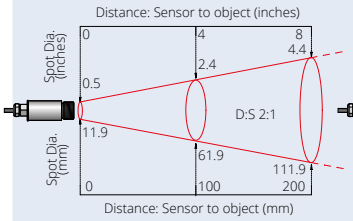
Environmental	
Environmental Rating	IP65
Ambient Temperature	0°C to 120°C
Relative Humidity	95% max. non-condensing

Conformity
See PM180 Specification (right)

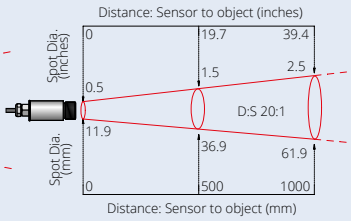
Network Size	
Max. No. of Devices	224 sensors per Modbus Master

OPTICS

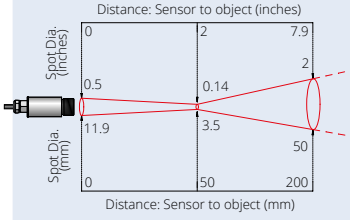
Diameter of target spot measured versus distance from sensing head (90% energy)



PMB21



PMB201



PMBXCF

All models can measure at longer distances than shown, with a larger spot size.

Accuracy is not affected by measurement distance in clean air.



PM180

General	
Compatible Sensor Types	All models of PyroMiniBus and PyroBus sensors; -BB and -BRT models of PyroMini and FibreMini sensors. Up to 6 sensors per PM180.
Display	2.83" (72 mm) resistive touch TFT, 320 x 240 pixels, backlit
Supply Voltage	24 V DC (min. 10 V DC / max. 30 V DC)
Max. Current Draw	100 mA
Configurable Parameters (global)	Temperature units, date and time, data logging, graph channels, alarm logging
Configurable Parameters (per channel)	Signal processing, emissivity setting, reflected energy compensation, alarms, Modbus address
Alarm Configuration	12 alarms (2 per sensor) with adjustable level, individually configurable as HI or LO.
Temperature Units	°C or °F selectable
Temperature Resolution	0.1°
Signal Processing	Averaging with configurable period
Display Sample Period	120 ms per sensor (720 ms in total for 6 sensors)

Data Logging	
Logging Interval	1 to 86,400 seconds (1 day)
MicroSD Card	Max. capacity: 32 GB (not included - stores years of logged data)
Internal Clock Battery	1 x BR 1225 3V (not included)
Variables Logged	Target temperature, sensing head temperature, alarm events
File Format	.csv (can be imported to Excel)
Configurable Parameters	Sample period, number of samples, scheduled start date and time

Mechanical	
Construction	Die Cast Aluminium
Electrical Connections	Removable screw terminals, 28 AWG to 18 AWG
Dimensions	98 (w) x 64 (h) x 36 (d) mm excluding cable glands
Weight	280 g

Environmental	
Environmental Rating	IP65
Ambient Temperature	0°C to 60°C
Relative Humidity	Maximum 95%, non-condensing

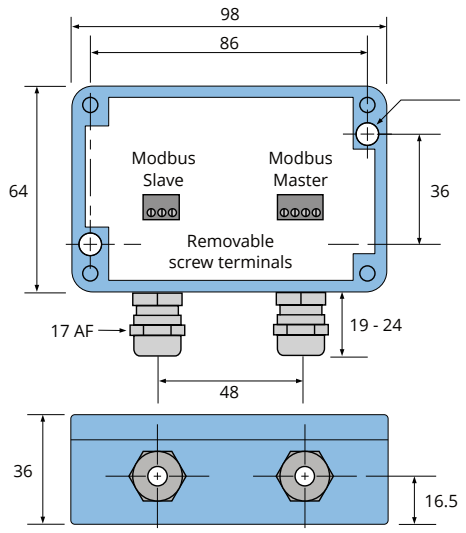
Conformity	
RoHS Compliant	Yes
Electromagnetic Compatibility	EN61326-1, EN61326-2-3 (Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements - **Industrial**)

Language	
Languages	Selectable: English, Chinese (Simplified) or Japanese

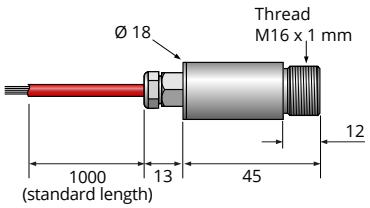
Network Size	
Max. No. of Devices	6 sensors per PM180 128 PM180 units per Modbus Master

MAJOR DIMENSIONS

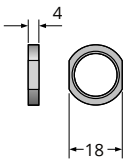
PM180



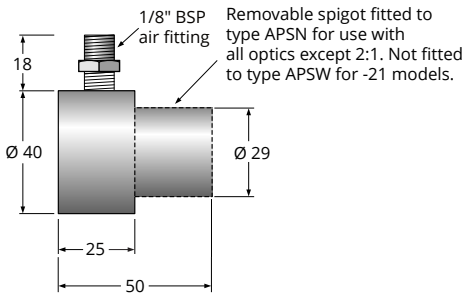
PyroMiniBus Sensor



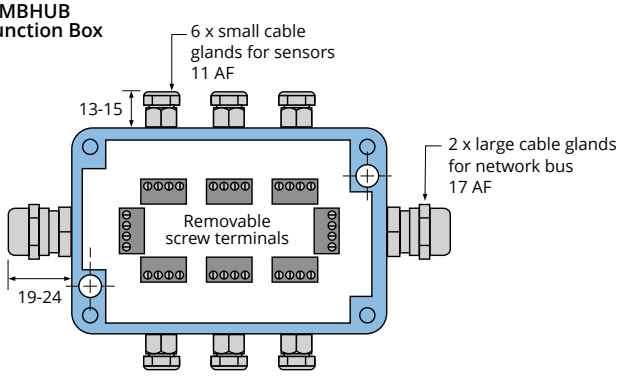
Mounting Nut (included)



Air Purge Collar



PMBHUB Junction Box



All dimensions in mm

PMBHUB SPECIFICATIONS

Construction	Die Cast Aluminium
Electrical Connections	Removable screw terminals, 28 AWG to 18 AWG
Weight	250 g
Environmental Rating	IP65
Enclosure Dimensions	Same as PM180
Max. Ambient Temperature	80°C

SENSOR MODEL NUMBERS



Optional

PMB | **201** | - | 3M

Cable length
(blank) 1 metre
nM *n* metres
Maximum factory fitted length: 30 m
Can be extended using RS-485 cable

Field of view
21 2:1 wide-angle divergent optics
201 20:1 general-purpose divergent optics
XCF Close Focus optics (3.5 mm spot diameter at 50 mm distance)

Series
PMB PyroMiniBus sensor

SENSOR ACCESSORIES

PMBHUB	IP65 junction box for 6 sensors
FBS / ABS	Fixed or Adjustable mounting bracket
LSTS	Removable laser sighting tool
PMBSC-*n*M	RS-485 network cable (connects PM180 to PMBHUB), length *n* metres
CALCERTA	Calibration certificate
PWS / SIWS	Protective plastic/silicon window in stainless steel holder

PM180 ACCESSORIES

MSD	MicroSD Card for PM180 data logging
M-7061	12-channel ICP DAS Modbus relay output module
M-7024	4-channel ICP DAS Modbus voltage or current analogue output module


Laser sighting tool **LSTS**


Air purge collar **APSN**


Adjustable bracket **ABS**


Fixed bracket **FBS**


Touch screen interface **PM180**


8-variable RS-485 Modbus indicator **STR571**

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Specifications subject to change without notice