

# PyroBus

## Non-Contact Temperature Sensor with RS485 Modbus Interface



An innovative range of compact infrared  
pyrometers with built-in digital communications for  
easy systems integration

**CALEX**  
ELECTRONICS LIMITED

- Wide temperature range from -20°C to 500°C
- Built-in RS485 Modbus RTU Interface
- Configurable emissivity setting and signal processing
- Max; min; average and instantaneous readings; peak or valley hold; reflected energy compensation
- 2:1, 15:, 30:1 or close focus optics
- Fast response with high stability
- Stainless steel housing, sealed to IP65
- Quick and easy installation
- Optional air/water cooled housing, air purge collar, laser sighting tool and mounting brackets
- Optional PM240 Touch-Screen Terminal for configuring and displaying data from up to eight PyroBus sensors



The PyroBus Series is a range of high quality, low cost, compact sensors which measure the temperature of inaccessible or moving objects and materials. They measure temperatures from -20°C to 500°C, accurately and consistently, with an outstanding response time of 240 ms.

Two-way digital communications via a built-in RS485 Modbus RTU interface enables the user to adjust the emissivity setting; compensate for reflected energy; apply filtering; select maximum, minimum, average or instantaneous readings; and peak or valley hold processing. Up to thirty two sensors can be installed on a single multidrop network.

All PyroBus sensors are fitted with precision Germanium lenses for accurate optics. Model PB21 has 2:1 optics making it suitable for most applications where the sensor can be mounted close to the target. Model PB151 is designed for small or distant targets and has an optical resolution of 15:1. Model PB301 is designed for very small or distant targets and has an optical resolution of 30:1. Model PBCF is designed for targets as small as  $\varnothing 5\text{mm}$  at a distance of 100mm from the sensor.

These compact sensors are small enough to fit almost anywhere and their rugged stainless steel housings make them ideal for applications where cleanliness and hygiene are paramount.

## GENERAL SPECIFICATIONS

<b>Temperature Range</b>	-20°C to 500°C
<b>Interface</b>	RS485 Modbus RTU
<b>Accuracy</b>	$\pm 1\%$ of reading or $\pm 1^\circ\text{C}$ whichever is greater
<b>Repeatability</b>	$\pm 0.5\%$ of reading or $\pm 0.5^\circ\text{C}$ whichever is greater
<b>Emissivity</b>	0.2 to 1.0
<b>Response Time, <math>t_{90}</math></b>	240 ms (90% response)
<b>Spectral Range</b>	8 to 14 $\mu\text{m}$
<b>Supply Voltage</b>	12 V DC nominal (6 - 13 V DC)
<b>Supply Current</b>	50 mA max.
<b>Baud Rate</b>	9600 baud *
<b>Format</b>	8 data bits, no parity, 1 stop bit *

## MECHANICAL

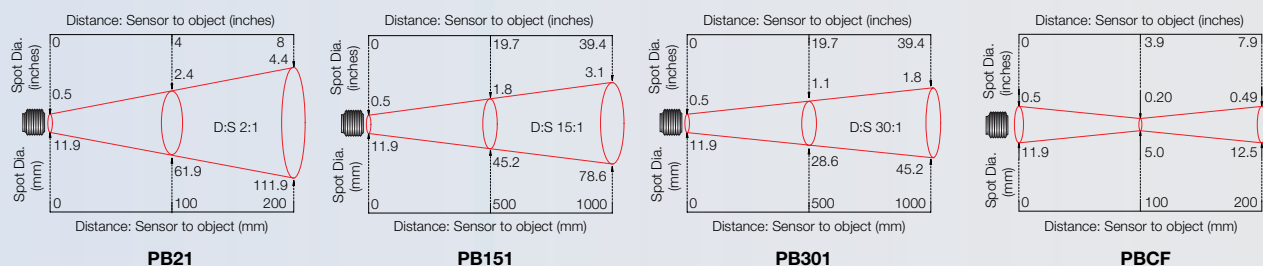
<b>Construction</b>	Stainless Steel
<b>Dimensions</b>	18 mm diameter x 103 mm long
<b>Thread Mounting</b>	M16 x 1 mm pitch
<b>Cable Length</b>	1m (longer lengths available to order)
<b>Weight with Cable</b>	95 g

## ENVIRONMENTAL

<b>Environmental Rating</b>	IP65
<b>Ambient Temperature</b>	0°C to 70°C
<b>Relative Humidity</b>	95% max. non-condensing

\* Other configurations available upon request

## DIAMETER OF TARGET SPOT MEASURED VERSUS DISTANCE FROM SENSING HEAD





The PM240 is a 320x240 pixel touch-screen terminal with a 3.5" colour TFT display. It allows the user to display data from up to eight PyroBus sensors and configure each sensor individually. The configuration parameters include emissivity setting, signal averaging, peak or valley hold processing and reflected energy compensation.

There are two versions available. Each one provides all of the features above, however, the enhanced PM240E also provides analogue transmission for up to four sensors, plus two adjustable alarm outputs per sensor for all eight sensors.

## PM240 SPECIFICATIONS

### Display

LCD type TFT 320 x 240, 3.5" touch screen  
Resistive

### Supply Voltage

12 to 24 V DC

### Power Consumption

8 W

### Ambient Temperature Range

0°C to 45°C

### Relative Humidity

35% to 95%, non-condensing

### Environmental Rating

IP54 (front), IP30 (housing)

### Dimensions

140mm wide x 100mm tall x 44mm deep (PM240)

140mm wide x 100mm tall x 65mm deep (PM240E)

### Outputs (PM240E only)

4 analogue outputs, 0 to 10 V DC,  
16 programmable alarm outputs, 12/24 V DC,  
700 mA, (3 A max. per block of 8 outputs).

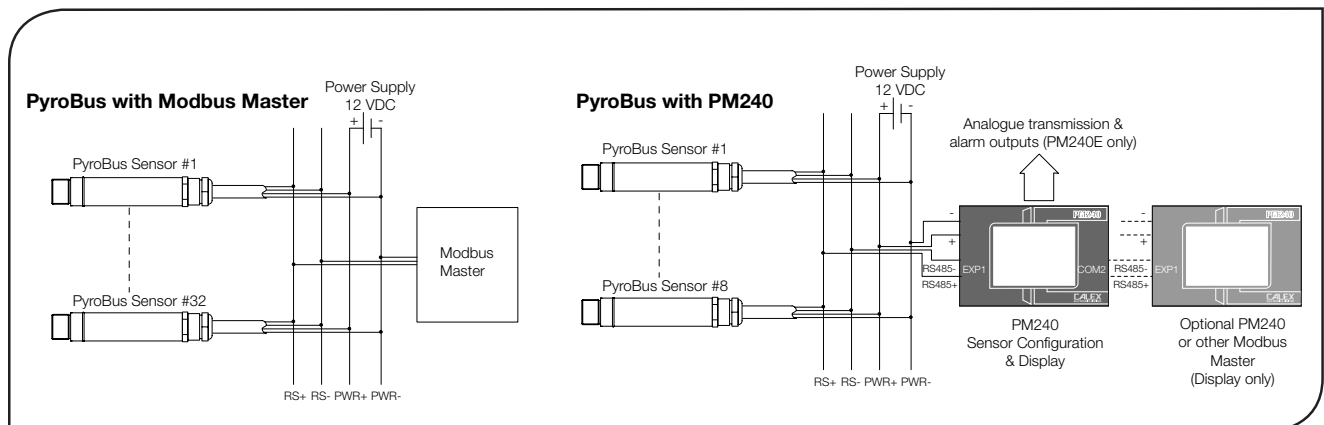
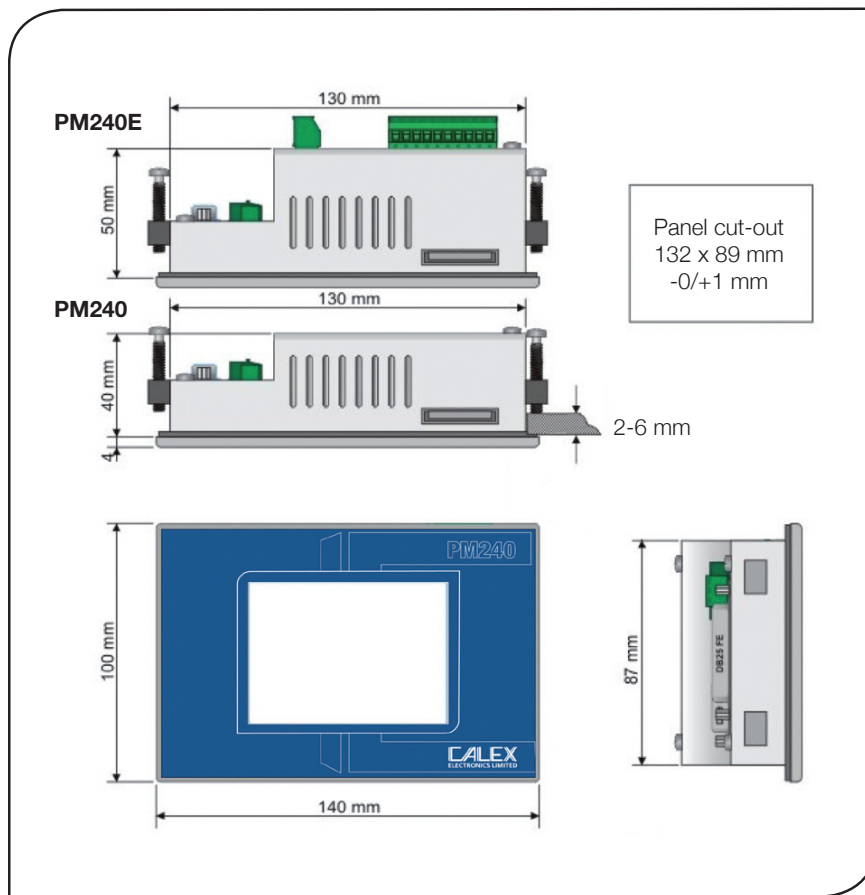
## HARDWARE AND SOFTWARE DATA

### Serial port EXP1

RS485 Modbus RTU interface for PyroBus sensors

### Serial port COM2

RS485 / RS232 interface for second display  
(read only)



All PyroBus Series Sensors are supplied with a stainless steel mounting nut and are easy to install.

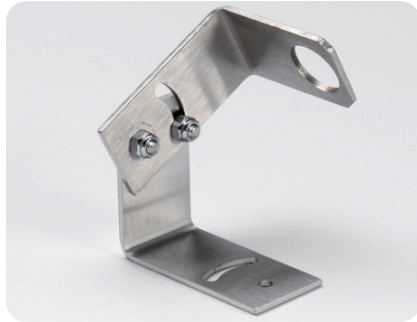
Standard sensors will operate in ambient temperatures up to 70°C. For more hostile environments or difficult mounting conditions a wide range of accessories is available.

## ACCESSORIES



### FIXED MOUNTING BRACKET

The L-shaped fixed mounting bracket offers a rigid support for the sensor and allows fine adjustment in a single plane.



### ADJUSTABLE MOUNTING BRACKET

The adjustable mounting bracket consists of a fixed mounting bracket plus another L-shaped bracket. When assembled as shown the adjustable mounting bracket offers a rigid support for the sensor and allows fine adjustment in two planes.



### AIR PURGE COLLAR

The air purge collar is used to keep dust, fumes, moisture and other contaminants away from the lens. Air flows into the fitting on the side and out of the aperture at the front.



### AIR/WATER COOLED HOUSING

The air/water cooled housing allows the sensor to withstand ambient temperatures which exceed the normal 70°C limit. Air or water (depending on the degree of cooling required) flows into one of the fittings on the side and out of the other. To prevent condensation forming on the lens, the air/water cooled housing is supplied complete with an air purge collar. Please note, the air/water cooled housing must be ordered with the sensor and cannot be fitted by the user.



### LASER SIGHTING TOOL

The Laser Sighting Tool screws onto the front of the sensor during installation and indicates precisely where the sensor is aiming. Once the sensor has been aimed at the centre of the target and locked in position the Laser Sighting Tool can be removed. The laser is activated by means of a push button on the front of the tool which has a latching mechanism.

---

## 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: [info@calex.co.uk](mailto:info@calex.co.uk) Online: <http://www.calex.co.uk>