

# ExTempMini

## Miniature Intrinsically Safe Infrared Temperature Sensor for High Ambient Temperatures

ATEX  
IECEX  
JapanEx  
UKCA



- Suitable for gas hazardous areas, Zone 0, 1 and 2 (sensing head) with a suitable Intrinsically Safe isolator
- Miniature sensing head for use in high ambient temperatures up to 180°C
- Temperature range: -20°C to 1000°C
- Two wire, 4-20 mA output
- Rescalable output and adjustable emissivity setting via optional USB and RS-485 adapters
- Fast response time and high stability
- Stainless steel 316 housing on sensing head - ideal for offshore applications
- IP65 sealed
- Supplied with up to 25 m sensing head cable

### SPECIFICATIONS

#### GENERAL

|                               |  |
|-------------------------------|--|
| Measurement Temperature Range | -20°C to 1000°C (see table of Model Numbers)         |
| Output                        | Two-wire 4 to 20 mA (loop powered)                   |
| Minimum Temperature Span      | 100°C  |
| Maximum Temperature Span      | 1000°C   |
| Field of View                 | See table of Model Numbers                           |
| Accuracy                      | ± 1°C or 1% of reading, whichever is greater         |
| Repeatability                 | ± 0.5°C or 0.5%, whichever is greater                |
| Emissivity Setting Range      | 0.20 to 1.00 (pre-set to 0.95)                       |
| Emissivity Setting Method     | User configurable via optional USB / RS-485 adapters |
| Response Time, $t_{90}$       | 240 ms (90% response)                                |
| Spectral Range                | 8 to 14 $\mu$ m                                      |
| Supply Voltage                | 12 to 24 V DC $\pm$ 5%                               |
| Minimum Sensor Voltage        | 11.4 V DC  |
| Maximum Current Draw          | 25 mA  |

#### ENVIRONMENTAL

|                                       | Main Enclosure                        | Sensing Head                          |
|---------------------------------------|---------------------------------------|---------------------------------------|
| Environmental Rating                  | IP65 (NEMA 4)                         | IP65 (NEMA 4)                         |
| Ambient (Operating) Temperature Range | 0°C to 70°C                           | 0°C to 180°C                          |
| Ambient Pressure Range                | 80 kPa (0.8 bar) to 110 kPa (1.1 bar) | 80 kPa (0.8 bar) to 110 kPa (1.1 bar) |
| Relative Humidity                     | Max. 95% non-condensing               | Max. 95% non-condensing               |
| CE Marked                             | Yes                                   | Yes                                   |
| RoHS Compliant                        | Yes                                   | Yes                                   |

#### MECHANICAL

|                             | Main Enclosure  | Sensing Head   |
|-----------------------------|---|--|
| Construction                | Painted aluminium   | Stainless Steel 316  |
| Major Dimensions            | 99 x 65 x 35 mm   | Ø 20 x length 69 mm including cable gland (see Dimensions)                                       |
| Mounting                    | 2 x mounting holes, use M4 socket head screws   | M20 x 1.5 mm thread, length 20 mm, supplied with two mounting nuts                               |
| Cable Length (Sensing Head) | -   | Choice of 5 m, 10 m or 25 m factory-fitted. Contact Calex for information about extending cable. |
| Weight with 5 m Cable       | TBD   | TBD  |
| Cable Connections           | Removable screw terminal blocks (see Connections). Conductor size 22 AWG to 14 AWG (0.326 mm <sup>2</sup> to 2.08 mm <sup>2</sup> ) | -  |
| Output Cable Gland          | Suitable for cable diameters 3.5 to 7.0 mm  | -  |

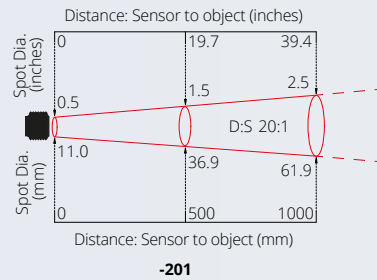
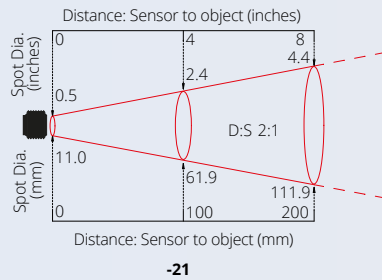
#### HAZARDOUS AREA CLASSIFICATION

|                            | Main Enclosure              | Sensing Head                 |                              |
|----------------------------|-----------------------------|------------------------------|------------------------------|
| Ambient Temperature Rating | -20°C $\leq$ Ta $\leq$ 70°C | -20°C $\leq$ Ta $\leq$ 115°C | -20°C $\leq$ Ta $\leq$ 180°C |
| ATEX Classification        | Ex II 2 G                   | Ex II 1 G                    | Ex II 1 G                    |
| IECEX Classification (Gas) | Ex ia [ia Ga] IIC T4 Gb     | Ex ia IIC T4 Ga              | Ex ia IIC T3 Ga              |

|                              |                    |
|------------------------------|--------------------|
| Maximum DC Input Voltage     | Ui = 28 V          |
| Maximum Input Current        | Ii = 93 mA         |
| Maximum Input Power          | Pi = 0.651 W       |
| Maximum Internal Capacitance | Ci = 5.17 nF       |
| Maximum Internal Inductance  | Li = 1.99 $\mu$ H  |
| ATEX Certificate Number      | CML 22ATEX2007X    |
| IECEX Certificate Number     | IECEX CML 22.0001X |
| JapanEx Certificate Number   | CML 22JPN2009X     |
| UKCA Certificate Number      | CML 22UKEX2008X    |

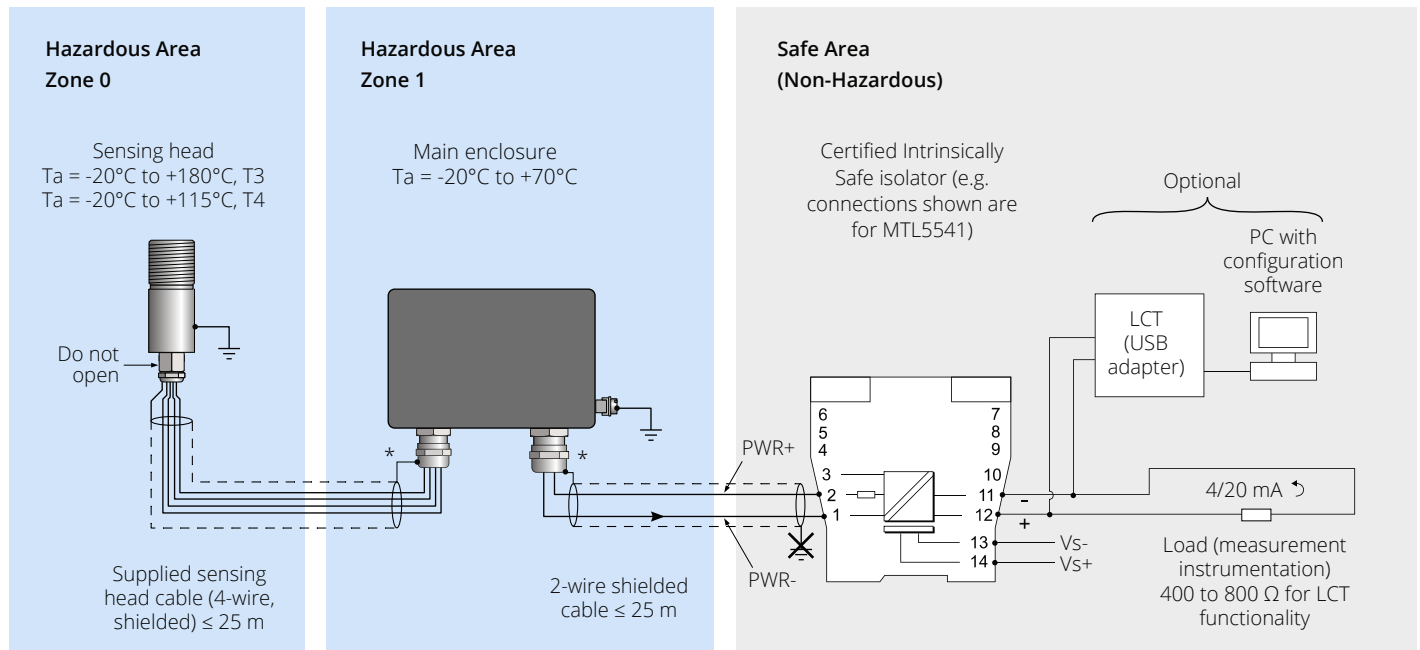
## OPTICS

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



Note: The sensor will measure at longer distances than shown, with a larger measured spot diameter. Contact Calex for more information.

## CONNECTIONS: EXTEMPMINI SENSOR



\* Cable shield is terminated in main enclosure gland - see OUTPUT CABLE INSTALLATION in Operator's Guide

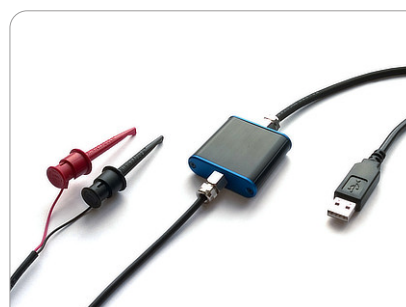
## CONFIGURATION

A choice of optional adapters is available to allow configuration of the ExTempMini sensor.

**Both adapters must be connected on the safe side of an Intrinsically Safe isolator.**

The isolator must be capable of digital communications over 4-20 mA, and correct loop polarity must be observed.

Configurable settings include the emissivity setting, 4-20 mA temperature range, averaging, peak and valley hold processing and reflected energy compensation.



**LCT**  
 USB adapter  
 For sensor configuration



**LCT-485**  
 RS-485 network interface  
 allows configuration and continuous measurement from multiple sensors via a network)



### LCT

The Loop Configuration Tool (LCT) allows the ExTemp or ExTempMini sensor to be connected to a PC via USB.

CalexConfig software makes it easy to configure the sensor.

For more information on the software, please see [www.calex.co.uk/software](http://www.calex.co.uk/software) and the Software data sheet.

## LCT-485 NETWORK INTERFACE

This DIN rail-mounted unit provides RS-485 Modbus RTU Slave communications for one ExTemp or ExTempMini sensor. It allows up to 224 sensors to be connected together in a network.

### FEATURES

- Fault-tolerant RS-485 interface with up to 60 V over-voltage protection
- Isolated RS-485 interface for easy connection to separately powered buses
- Built-in 270 ohm loop resistor for simplified wiring

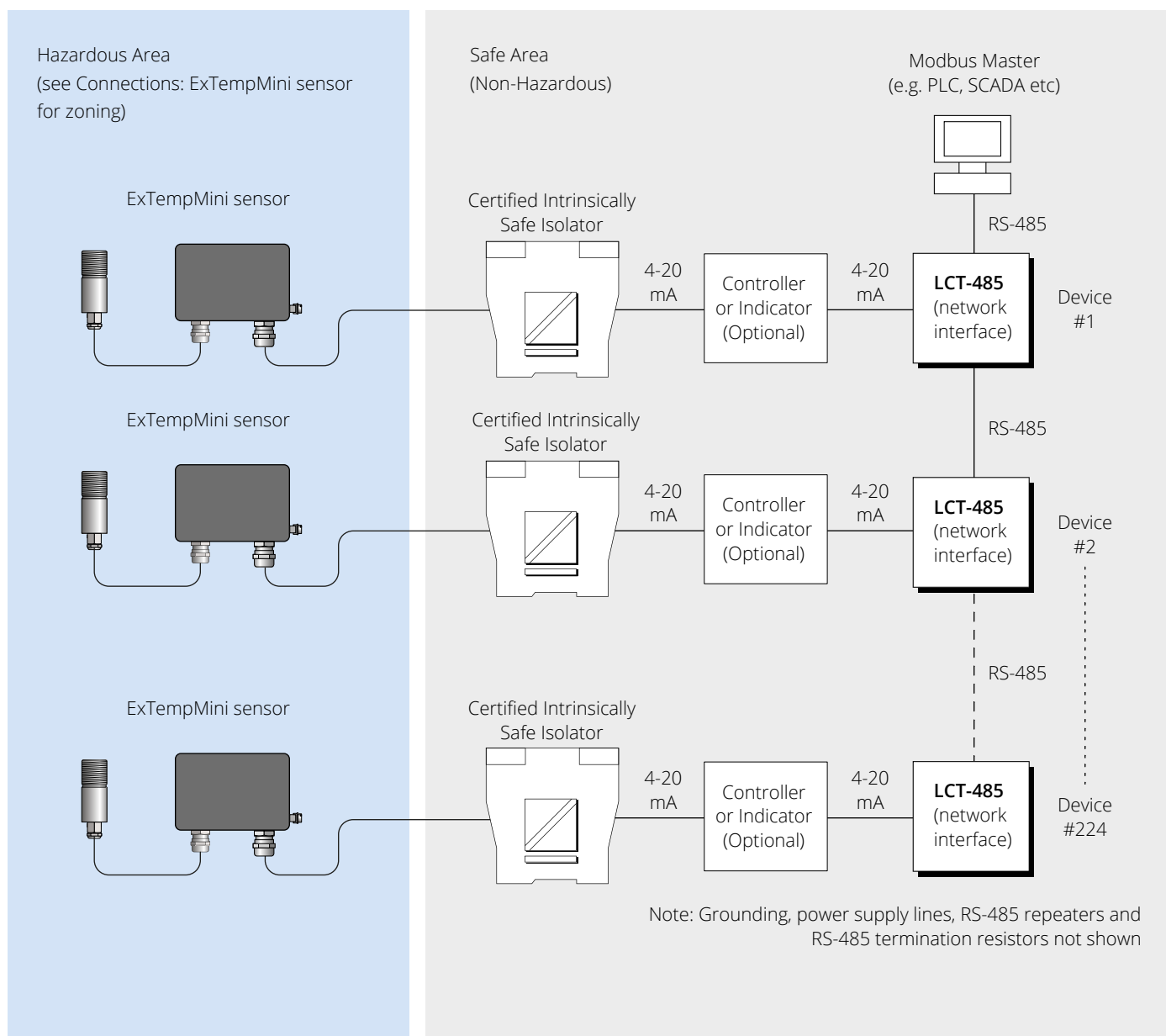
### SPECIFICATIONS

|                            |   |
|----------------------------|---|
| <b>Mounting</b>            | DIN rail (35 mm)                                    |
| <b>Dimensions</b>          | 114(d) x 18(w) x 107(h) mm approx                   |
| <b>Connections</b>         | Screw terminals for RS-485, power, and sensor loop  |
| <b>Supply voltage</b>      | 6 to 28 V DC  |
| <b>Max current draw</b>    | 50 mA   |
| <b>Protocol</b>            | Modbus RTU Slave                                    |
| <b>Baud rate</b>           | 1200-57600 bps, detected automatically              |
| <b>Ambient temperature</b> | -20°C to 70°C                                       |
| <b>EMC Conformity</b>      | BS EN 61326-1:2013 & EN 61326-2-3:2013*             |
| <b>Max. No. of Devices</b> | Up to 224 x LCT-485 Slave devices per Modbus Master |

\* for lines  $\leq 30$  m within buildings, for RS-485 & loop terminals

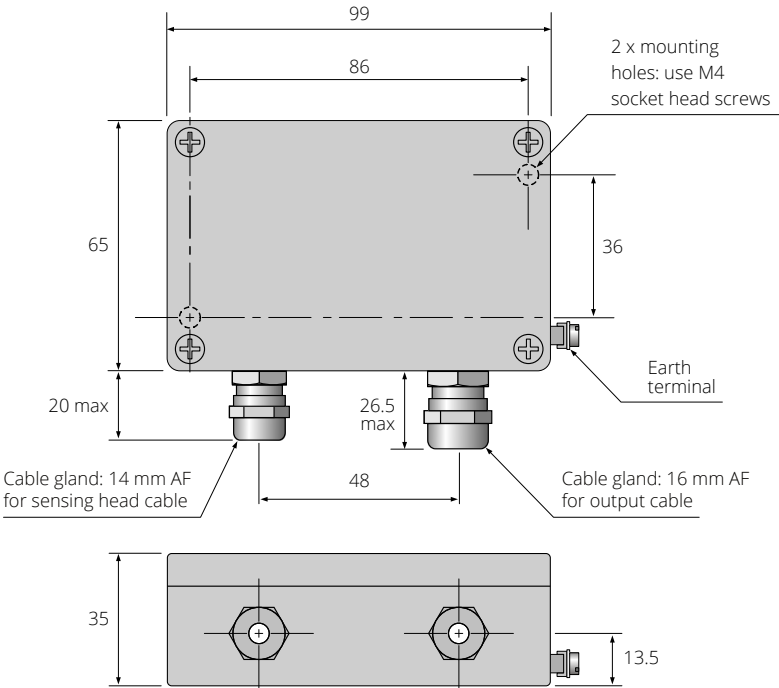


### NETWORK LAYOUT: LCT-485 INTERFACE

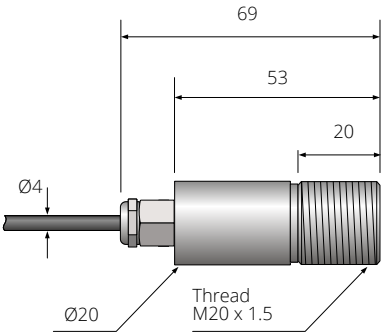


DIMENSIONS (mm)

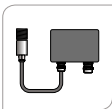
Main enclosure



Sensing head



MODEL NUMBERS



ExTempMini infrared temperature sensor with miniature sensing head and separate electronics module. Supplied with 2 x mounting nuts and operator's guide

EXM8 - 201 - LT - 25

Sensing Head Cable Length (m)

e.g.  
5 = 5 m  
10 = 10 m  
25 = 25 m (maximum length)

The sensing head and electronics module are calibrated together as a pair. The sensing head cable length may not be modified by the user. Contact Calex for more information.

Measurement Temperature Range

LT = -20°C to 100°C  
MT = 0°C to 250°C  
HT = 0°C to 500°C  
XT = 0°C to 1000°C  
ST = Special temperature range

Temperature range may be rescaled between limits -20°C and 1000°C via optional adapters and software

Field of view (see OPTICS)

21 = 2:1 divergent optics  
201 = 20:1 divergent optics

Series EXM8

= ExTempMini infrared temperature sensor with miniature sensing head and separate electronics module. Supplied with 2 x mounting nuts and operator's guide. General-purpose, 8-14 µm spectral response, for non-reflective non-metal surfaces and painted metals.

Ambient temperature range (sensing head) 0°C to 180°C

ACCESSORIES

- FBL Fixed mounting bracket (1-axis rotation)
- ABL Adjustable mounting bracket (2-axis rotation)
- APM Air purge collar for 20:1 optics (Not for use in Zone 0)
- APMW Air purge collar for 2:1 optics (Not for use in Zone 0)
- CALCERTA Calibration certificate, 3 temperature points, UKAS traceable
- LCT USB configuration adapter (CalexConfig software available as a free download)
- LCT-485 RS-485 Modbus network interface