

# 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	-

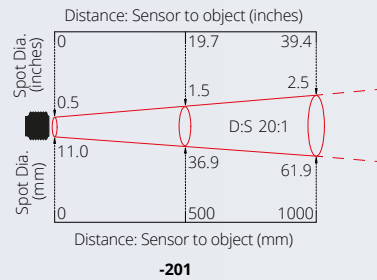
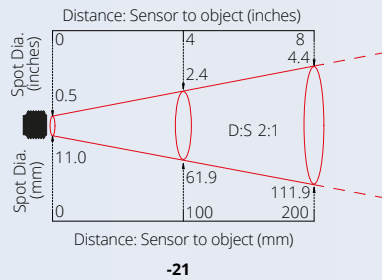
#### HAZARDOUS AREA CLASSIFICATION

	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

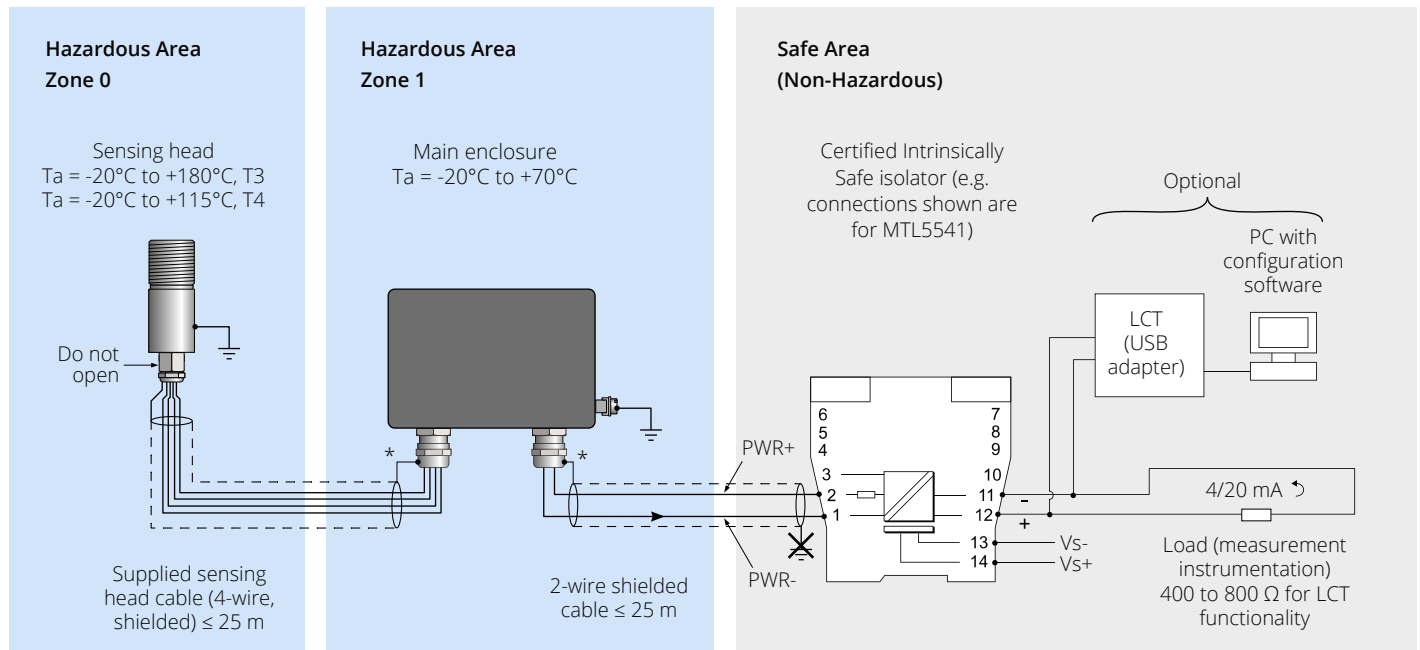
## OPTICS

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

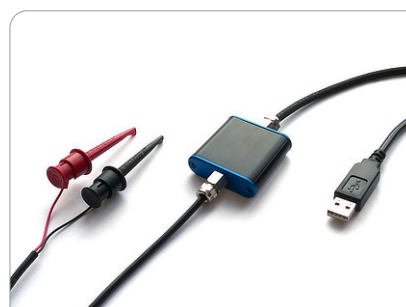
## CONFIGURATION

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

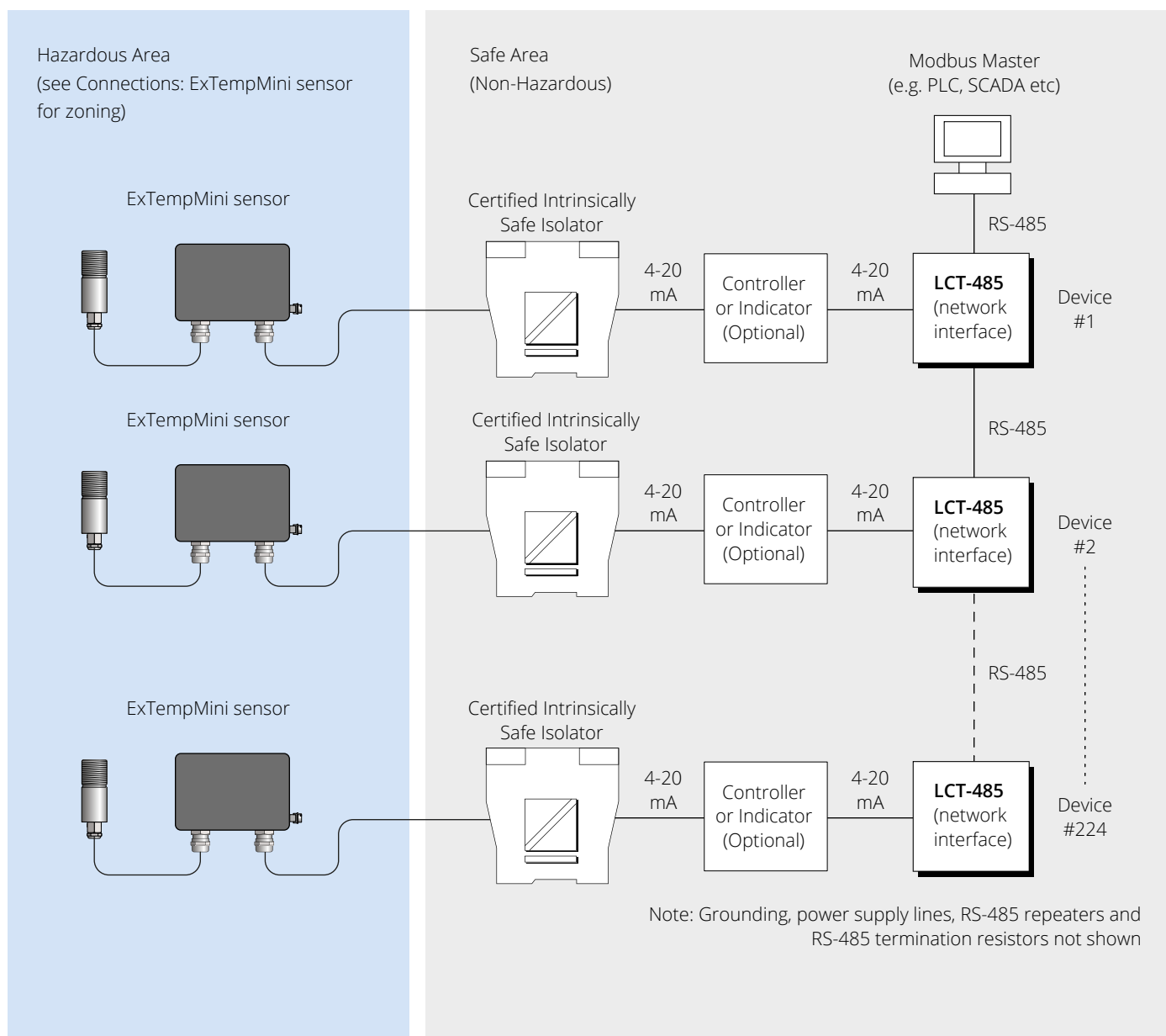
### SPECIFICATIONS

<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

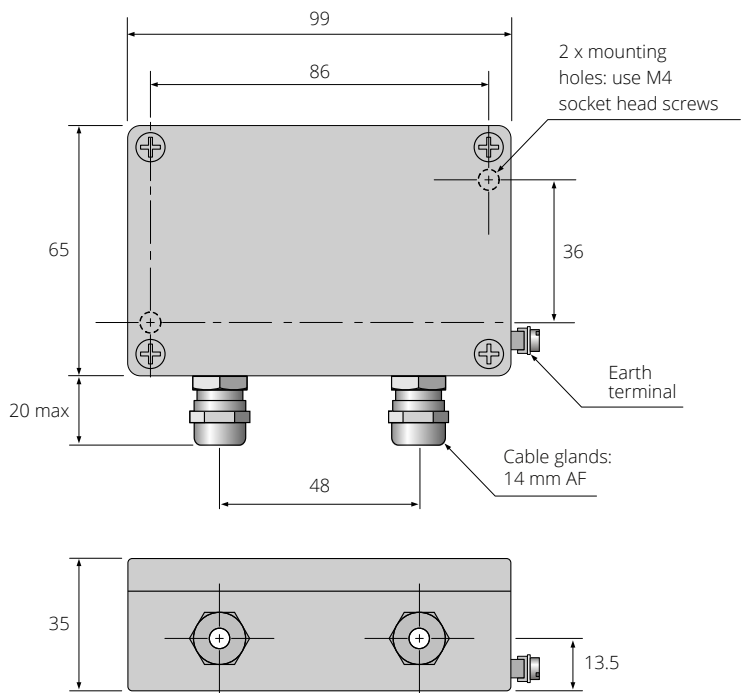


### NETWORK LAYOUT: LCT-485 INTERFACE

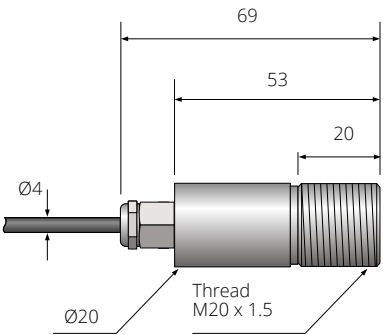


DIMENSIONS (mm)

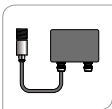
Main enclosure



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)
- APMW Air purge collar (for 2:1 optics)
- 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