User manual

OLCT 80

Gas Transmitter

Part Number: NPO80GB
Revision: E.1

OLDHAM

The Fixed Gas Detection Experts

All information provided in this document is accurate to the best of our knowledge.

As a result of continuous research and development, the specifications of this product may be changed without prior notice.

Oldham S.A.S
Rue Orfila
Z.I. Est – CS 20417
F – 62027 ARRAS Cedex
Tel: +33 (0)3 21 60 80 80
Fax: +33 (0)3 21 60 80 00

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Chapter 1 Overview

Thank you for choosing this OLDHAM instrument.

All necessary actions have been taken to ensure your complete satisfaction with this equipment.

It is important that you read this entire manual carefully and thoroughly.

Limitation of Liability

- OLDHAM shall not be held responsible for any damage to the equipment or for any physical injury or death resulting in whole or in part from the inappropriate use or installation of the equipment, non-compliance with any and all instructions, warnings, standards and/or regulations in force.
- No business, person or legal entity may assume responsibility on behalf of OLDHAM, even though they may be involved in the sale of OLDHAM products.
- OLDHAM shall not be responsible for any direct or indirect damage, or any direct or indirect consequence, resulting from the sale and use of any of its products **UNLESS SUCH PRODUCTS HAVE BEEN SELECTED BY OLDHAM ACCORDING TO THE APPLICATION.**

Ownership clauses

- The drawings, specifications, and information herein contain confidential information that is the property of OLDHAM.
- This information shall not, either in whole or in part, by physical, electronic, or any other means whatsoever, be reproduced, copied, divulged, translated, or used as the basis for the manufacture or sale of OLDHAM equipment, or for any other reason **without the prior written consent of OLDHAM**.

Warnings

- This is not a contractual document. **OLDHAM** reserves the right to alter the technical features of its equipment at any time and for any reason without prior notice.
- **READ THESE INSTRUCTIONS CAREFULLY BEFORE USING FOR THE FIRST TIME:** these instructions should be read by all persons who have or will have responsibility for the use, maintenance, or repair of the instrument.
- This instrument shall only be deemed to be in conformance with the published performance if used, maintained, and repaired in accordance with the instructions of OLDHAM, by OLDHAM personnel, or by personnel authorized by OLDHAM.

Warranty

Under normal conditions of use and on return to the factory, parts and workmanship are guaranteed for 2 years, excluding consumables such as sensors, filters, etc.

Important Information

The modification of the material and the use of parts of an unspecified origin shall entail the cancellation of any form of warranty.

The use of the unit has been projected for the applications specified in the technical characteristics. Exceeding the indicated values cannot in any case be authorized.

Catalytic sensors are susceptible to poisoning by traces of several substances. This leads to an inhibition which can be permanent or temporary depending on the contaminant, the concentration of the contaminant, the duration of exposure to the contaminant.

Poisoning may result from exposure to substances as:

- silicones (e.g. waterproofing, adhesives, release agents, special oils and greases, certain medical products, commercial cleaning agents)
- tetraethyl lead (e.g. leaded petrol, particularly aviation petrol 'Avgas')
- sulfur compounds (sulfur dioxide, hydrogen sulfide)
- halogenated compounds (R134a, HFO, etc.)
- organo-phosphorus compounds (e.g. herbicides, insecticides, and phosphate esters in fireproof hydraulic fluids)

Oldham recommends regular testing of fixed gas detection installations (read Chapter 8).

Destruction of equipment

European Union only. This symbol indicates that, in conformity with directive DEEE (2002/96/CE) and in accordance with local regulations, this product must not be discarded with household waste.

It must be disposed of in a collection area that is designated for this purpose, for example at a site that is officially designated for recycling of electrical and electronic equipment (EEE) or a point of exchange for authorized products in the event of the acquisition of a new product of the same type.

The OLCT80 transmitter contains a lithium ion battery intended to supply power to certain parts of the electronic circuit. The battery will be removed prior to the destruction of the transmitter and deposited in a collection center for used batteries.

Symbols used

Icon	Signification
	This symbol indicates: useful additional information.
	This symbol indicates: This equipment must be connected to ground.
	This symbol denotes: Protective earth terminal. A cable of the adequate diameter must be connected to ground and to the terminal having this symbol
	This symbol denotes: **Attention! In the present mode of use, failure to adhere to the instructions preceded by this symbol can result in a risk of electric shock and/or death.**
	This symbol indicates: You must refer to the instructions.

Chapter 2 | Transmitter Overview

Purpose

Gas detector *OLCT 80* is a digital and analog transmitter designed to measure combustible and toxic gases, as well as oxygen levels, in ATEX zones. The *OLCT 80* has 2 auxiliary inputs, ANA1 and ANA2, with a 4-20 mA signal, to monitor up to 3 parameters simultaneously.

The transmitter also includes a digital LCD display, two alarm relays with programmable thresholds and a fault relay.

The device is programmed using an intrinsically-safe infrared remote control that can be used in ATEX zones.

Versions

Explosion-proof, intrinsically-safe versions

The following types of transmitters are available:

- Explosion-proof: the enclosure and sensor pack assembly is explosion-proof. The explosion-proof certified version is designated *OLCT 80d*.
- Explosion-proof + intrinsically-safe: the transmitter's enclosure is explosion-proof and the sensor pack is intrinsically-safe. Only the versions using an electrochemical sensor are available in this style. The explosion-proof, intrinsically-safe certified version is designated *OLCT 80id*.

The table below lists the versions available.

	OLCT 80d	OLCT 80id
Catalytic sensor	☑	
Electrochemical sensor	☑	☑
XPIR infrared sensor	☑	

Table 1: comparison of OLCT 80 detectors.

Local and remote sensor versions

There are two different options for the *OLCT 80:*

- *OLCT 80*, which uses a local sensor. It consists of an explosion-proof transmitter with an integrated intrinsically-safe detection module (B) or explosion-proof detection module (A).
- *OLCT 80D*, which uses a remote sensor. It consists of an explosion-proof transmitter with a remote intrinsically-safe detection module (D) or explosion-proof detection module (C).

Figure 1: OLCT 80 types

External components

Overview

Item	Description
1.	Cable glands (4 x M20 and 2 x M25) or threaded caps.
2.	Digital display and indicator lights. See Figure 4 for further detail.
3.	Grounding terminal (not visible in figure).
4.	Cover locking screw.
5.	Integrated or remote sensor pack (main sensor). See page 6 for further detail.
6.	Additional detectors; maximum of two per *OLCT 80*. See page 6 for further detail.

Figure 2: external view of the components of an OLCT 80 transmitter.

Differentiating explosion-proof and intrinsically-safe sensors

In addition to different ATEX markings, explosion-proof and intrinsically-safe sensors can also be distinguished by the color of their sensor pack:

- Explosion-proof sensor: unpainted stainless steel sensor equipped with a sintered metal piece (2 and 4).
- Intrinsically-safe sensor: blue stainless steel sensor equipped with a protective Teflon membrane (1 and 3).

Figure 3: intrinsically-safe and explosion-proof sensors.

Displays and indicator lights

Item	Description
1.	Green power indicator light.
2.	Orange fault indicator light.
3.	Red level 1 alarm indicator light.
4.	Red level 2 alarm indicator light.
5.	LCD digital display, backlit.
6.	Infrared receptor for the signal coming from the *IR20* remote control. See *Infrared remote control* on page 11.
7.	Level 1 and level 2 alarm icons. The icons blink in the event of an alarm, but changes to a solid icon once the alarm is acknowledged using the *IR20* remote control.
8.	Maintenance/fault icon (sensor, electronic, connection fault etc.).
9.	Text field (type of gas, unit, configuration-related text).

Figure 4: front view.

Internal components

The main items accessible to the user are the connectors located on the motherboard. See page 57 for the connections.

Item	Description
1.	24 VDC power supply and RS485 connection.
2.	4-20 mA analog output and *ANA1/ANA2* analog inputs.
3.	Relays (default, Rel1 and Rel2).
4.	Fault relay dry contact output.
5.	Rel2 relay dry contact output.
6.	Rel1 relay dry contact output.
7.	24 VDC power output and RS485 connection.

Figure 5: internal components of the transmitter.

Device markings

Name plate

This area on the cover lists all necessary information regarding the detector's characteristics:

Item	Description
1.	ATEX marking. Product type.
2.	Warning in French.
3.	Manufacturer name.
4.	CE and ATEX markings (excluding metrological performance).
5.	Maximum rated temperature.
6.	Warning in English.

Figure 6: name plate

Side label

This label, located on the housing, includes the following information:

Item	Description
1.	Thread diameter and pitch of the cable entries (here 2x M20 and 1x M25)
2.	P/N of transmitter (here OLCT80 d variant) without the sensor cell
3.	S/N of transmitter : first two digits (here 17) correspond to the year of construction (here 2017).
4.	Recycling symbol

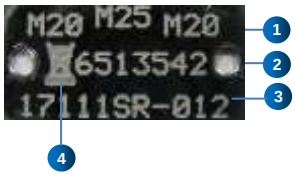

Figure 7: side label

Indicators

At start-up

The following sequence of indicators/text is displayed:

- All LCD segments are displayed to ensure that they are working properly. The ϟ and DEF🔧 indicators turn on as solid lights.

- The result of the RAM memory check. The ϟ and DEF🔧 indicators remain on as solid lights.

- The result of the flash memory check. The ϟ and DEF🔧 indicators remain on as solid lights.

- The result of the EEprom memory check. The ϟ and DEF🔧 indicators remain on as solid lights.

- The stabilization time is then displayed. The ϟ indicator light blinks, while the DEF🔧 indicator light is a solid light.

- The post-stabilization gas concentration and sensor test are displayed. The ϟ indicator light blinks. The DEF🔧 indicator light is off.

Figure 8: display sequence at start-up.

During normal operation

- *Single sensor*: the display indicates the concentration measured and also alternates between the type of gas and the unit. The ⚡ indicator light blinks. The DEF🔧 indicator light is off.
- *At least 2 sensors connected*: the display can be configured in one of two ways:
  - To display the readings in succession (normal mode).
  - To display a single reading (see page **Erreur ! Signet non défini.**).

Figure 9: display under normal operating conditions. The green ⚡ indicator light blinks.

If a fault or error is detected

The display indicates an error or fault message (see list of faults on page 111). The orange DEF🔧 indicator light comes on and the 🔧 icon is displayed at the same time.

Press ⬆ to list any other faults that may be present, until you come to the word "FIN."

Figure 10: in the event of an alarm or fault, the type of fault is displayed. The orange DEF🔧 fault indicator light remains on as a solid light.

Understanding the indicator lights

Light	Off	Blinking	Solid
⚡	No power to detector.	Detector powered.	
DEF🔧	Not applicable.	No detector fault.	Detector fault or detector in maintenance mode.
AL1🔔	Level 1 alarm not triggered.	Level 1 alarm triggered and not acknowledged.	Level 1 alarm triggered and acknowledged (remote control).
AL2🔔	Level 2 alarm not triggered.	Level 1 alarm triggered and not acknowledged.	Level 2 alarm triggered and acknowledged (remote control).

-

Infrared remote control

Description

The *IR20* infrared remote control is a stand-alone device that can be used to configure and control the *OLCT 80* remotely without opening its housing. Certified intrinsically safe, it can be used in IIC-type explosive atmospheres in surface industries. The maximum range of this remote control is approximately 5 meters under normal daylight conditions. The remote control's rear battery slot holds two AA 1.5-V batteries.

The leather case must be used in ATEX zones.

Item	Description
1.	Infrared transmitter.
2.	Soft-touch buttons.
3.	Operating light.
4.	The remote control in its leather case.
5.	Two AA 1.5 V batteries.
6.	Battery slot cover (removable after removing screw).

Figure 11: IR20 infrared remote control.

Using the remote control

To control the gas detector, point the front of the remote control (Figure 11, 1) toward the detector. Refer to Chapter 3, page 13, for instructions on how to access the menus and perform the various maintenance tasks.

Using the remote control's buttons

Button	Related action
	Decrease a value or navigate between sub-menus at the same level.
	Increase a value, modify a setting or navigate between sub-menus at the same level.
	Access and leave menus.
	Confirm.

Chapter 3 | Menus

Purpose of the menus

The menus allow the user to perform various operations in relation to the *OLCT 80*'s settings (configure the *ANA1/ANA2* sensors, alarm thresholds and relays, RS485 connection, date and time, etc.).

These menus can be accessed using the infrared remote control, without opening the cover of the *OLCT 80*. It is important to take the necessary safety precautions before opening the cover if the device is installed in an ATEX zone. These precautions include:

- Obtaining a hot-work permit from the relevant department.
- Using a portable for detection of combustible gases at all times.
- Using an intrinsically-safe multimeter, where applicable.
- Performing the operation as quickly as possible.

This pertains to all *OLCT 80* versions, whether equipped with an explosion-proof or intrinsically-safe sensor pack.

Accessing the menus

Follow the steps below:

- Point the infrared remote control toward the *OLCT 80*.

Figure 12: the remote control pointed toward the OLCT 80.

- Push the *Menu* button on the remote control.
- The *AFF MES* menu will appear on the display of the *OLCT 8*0.

Figure 13: the start menu.

Tree structure of the main menus

The menus are shown below. Each of these menus is described under *Complete tree structure of the menus* below.

Figure 14: main menus of the *OLCT 80*.

Complete tree structure of the menus

See Figure 15 and Figure 16.

Menu	Sub-menu		Description	Page
AFF MES			Display values for the selected channel.	21
DATE TIME			Set the date and time.	22
PROGR.			Configure the transmitter. Access code required to access this menu.	23
	PG SENSOR		Access the channel configuration sub-menus.	25
		PG SENSOR	Configure the main channel (local sensor).	26
		PG CH1	Configure the *ANA1* sensor.	27
		PG CH2	Configure the *ANA2* sensor.	30
	PG AL/REL		Access the configuration sub-menus for the alarm thresholds and relays.	31
		AL SENSOR	Configure the alarm thresholds for the main sensor.	31
		AL CH1	Configure the alarm thresholds for the *ANA1* sensor.	31
		AL CH2	Configure the alarm thresholds for the *ANA2* sensor.	32
		RELAIS 1	Configure the conditions that trigger the 1st alarm relay.	35
		RELAIS 2	Configure the conditions that trigger the 2nd alarm relay.	37
		RELAIS D	Configure the conditions that trigger the fault relay.	37
	PG SERIE		Configure the serial connection and the backlighting of the LCD display.	38

Menu	Sub-menu	Description	Page
	PG PASSW.	Define the code to access the configuration menus.	41
MAINT		Display maintenance-related settings.	42
CALIBRA		Display the 3 calibration sub-menus for the main sensor, the *ANA1* sensor and the *ANA2* sensor. Access code required to access this menu.	44
	Cal sensor	Calibrate the main sensor.	45
	Chgt sens.	Reset the stored wear rate to zero after replacing the main sensor.	47
	Cal CH1	Calibrate the *ANA1* sensor.	48
	Cal CH2	Calibrate the *ANA2* sensor.	48
4-20 mA		Override the 4-20 mA output.	49
INFOS		Display the serial number, software version, etc.	50
TEST		Perform gas test without triggering relays.	51

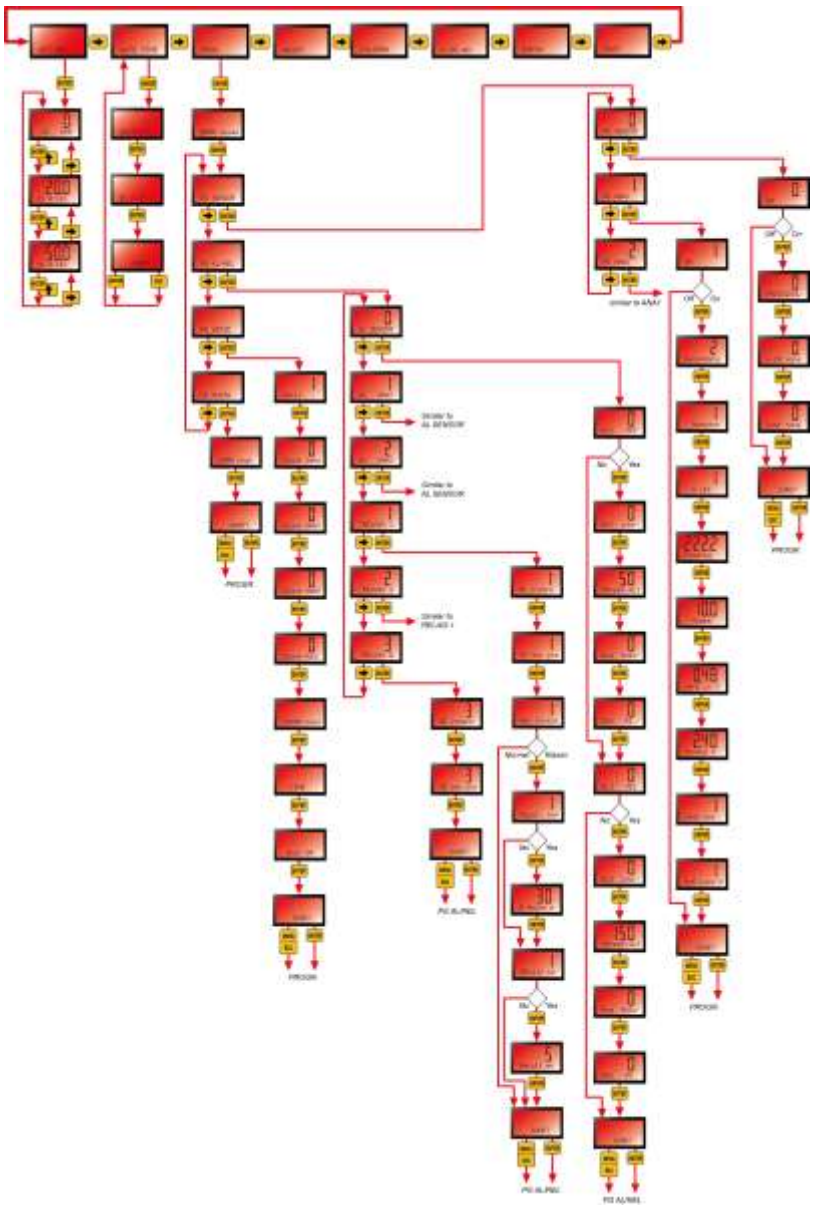

Figure 15: the *OLCT 80*'s sub-menus under *AFF MES*, *DATE TIME* and *PROG*.

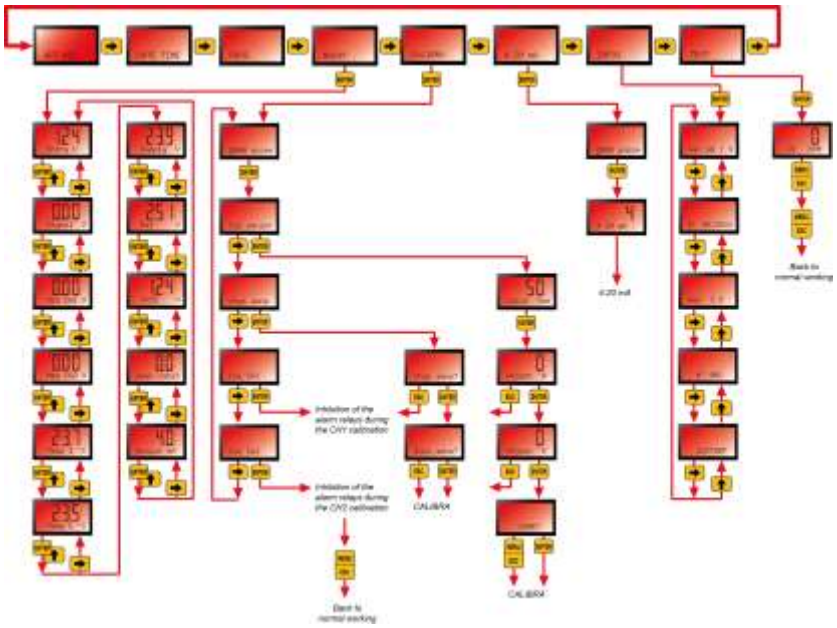

Figure 16: the *OLCT 80's* sub-menus under *MAINT*, *CALIBRA*, *4-20mA*, *INFOS* and *TEST*.

Index of menu settings

This section lists the programmable settings and the corresponding pages in this manual.

Setting	Menu	See page
4-20 mA		
4-20 mA – control the output current for testing purposes	4-20 mA	49
4-20 mA – manage the analog output signal of the *OLCT 80*	PROG. > PG SENSOR > PG SENSOR > Normal / Synth / CAPEX	26
Display		
Display readings	AFF.MES	21
24 VDC power supply		
Display current voltage	MAINT > Entry V	42
Sensor – main sensor		
Sensor – verify	PROG. > PG SENSOR > PG SENSOR > OvR Lock Y	26
Sensor – display	PROG. > PG SENSOR > PG SENSOR > Display / Principal / Secondary	26
Sensor – calibration	CALIBRA >	44
Sensor – on/off	PROG. > PG SENSOR > PG SENSOR > ON/OFF	26
Sensor – adjust sensitivity	CALIBRA > Cal sensor > Adjust. ‘S’	45
Sensor – zeroing	CALIBRA > Cal sensor. > Adjust. ‘0’	45
Sensor – wear rate (display)	MAINT > User rate%	42
Sensor – replace sensor	CALIBRA > Chgt sens.	47
Sensor – reading integration time	PROG. > PG SENSOR > PG SENSOR > coef none	25
Sensor – 4-20 mA output type	PROG. > PG SENSOR > PG SENSOR > Normal / Synth / CAPEX	25
Sensor – input signal value	MAINT > Signal V	42
Sensor – input voltage value	MAINT > Entry V	42
Main sensor – slave number	PROG. > PG SERIE > Slave Sens	38
Date		
Date	DATE TIME	22
ANA1 sensor		
ANA1 sensor – input voltage value	MAINT > Meas CH1 V	42
ANA1 sensor – acknowledge reading or function	PROG. > PG SENSOR > PG ANA1 > Measure/Acquit	27
ANA1 sensor – display	PROG. > PG SENSOR > PG ANA1 > Display / Principal / Secondary	27
ANA1 sensor – range minimum	PROG. > PG SENSOR > PG ANA1 > Zero in V	27
ANA 1 sensor – measurement range	PROG. > PG SENSOR > PG ANA1 > Gamme	27

Setting	Menu	See page
ANA1 sensor – range maximum	PROG. > PG SENSOR > PG ANA1 > Zero in V	27
ANA1 sensor – verify	PROG. > PG SENSOR > PG ANA1 > Gamme	27
ANA1 sensor – on/off	PROG. > PG SENSOR > PG ANA1 > Zero in V	27
ANA1 sensor – slave number	PROG. > PG SENSOR > PG ANA1 > Gamme	38
ANA1 sensor – decimal places in display	PROG. > PG SENSOR > PG ANA1 > Zero in V	27
ANA1 sensor – reading integration time	PROG. > PG SENSOR > PG ANA1 > Gamme	27
ANA1 sensor – units	PROG. > PG SENSOR > PG ANA1 > Zero in V	27
ANA2 sensor		
Refer to the section above on the *ANA1 sensor* as the information is similar.		
Calibration gas		
Calibration gas – define the value	CALIBRA > Cal sens. > Calib. Gas	45
Time		
Time	DATE TIME	22
LCD		
LCD backlighting	PG SERIE > Back On/Off	38
Current reading (value, reading type, unit)	AFF.MES	21
Password		
Password – change	PROG > PG PASSW > chgt	41
Serial number, etc.		
Transmitter serial number	INFO > N°	50
Software version number	INFO > Ver GB	50
Alarm #1 - main sensor		
Alarm #1 – activate	PROG. > PG AL/REL > AL SENSOR > AL1 YES/NO	31
Alarm #1 – acknowledge	PROG. > PG AL/REL > AL SENSOR > Acq auto/manu	31
Alarm #1 – assign to a relay	PROG. > PG AL/REL > AL SENSOR > Rel R1/R2/NONE	31
Alarm #1 – increasing/decreasing	PROG. > PG AL/REL > AL SENSOR > AL1 incre /decre	31
Alarm #2 - main sensor		
Alarm #2 – activate	PROG. > PG AL/REL > AL SENSOR > AL2 YES/NO	31
Alarm #2 – acknowledge	PROG. > PG AL/REL > AL SENSOR > Acq auto/manu	31
Alarm #2 – assign to a relay	PROG. > PG AL/REL > AL SENSOR > Rel R1/R2/NONE	31

Setting	Menu	See page
Alarm #2 – increasing/decreasing	PROG. > PG AL/REL > AL SENSOR > AL2 incre /decre	31

Alarms #1 and #2 - ANA1 and ANA2 sensors		
Refer to the *Alarm #1 and Alarm #2* settings for the main sensor, since the information is similar.		
Alarm relay #1		
Relay #1 – internal/external	PROG. > PG AL/REL > REL 1 > R1 intern/extern	35
Relay #1 – horn-duration	PROG. > PG AL/REL > REL 1 > D. Maint s	35
Relay #1 – horn-deactivation	PROG. > PG AL/REL > REL 1 > Maint YES/NO	35
Relay #1 – horn-normal	PROG. > PG AL/REL > REL 1 > Rel normal/klaxon	35
Relay #1 – horn-reminder	PROG. > PG AL/REL > REL 1 > Recalll YES/NO	35
Relay #1 – horn-reminder length	PROG. > PG AL/REL > REL 1 > Recalll mn	35
Relay #1 – energized or de-energized during alarm	PROG. > PG AL/REL > REL 1 > R1 sec pos/sec neg	35
Alarm relay #2		
Procedural similar to alarm relay #1.		
Fault relay		
Fault relay – internal/external	PROG. > PG AL/REL > RELAIS D. > RD intern/extern	37
Fault relay – horn-normal	PROG. > PG AL/REL > RELAIS D > Rel normal/klaxon	37
Fault relay – energized or de-energized during alarm	PROG. > PG AL/REL > RELAIS D>RD sec pos/sec neg	37
LCD backlighting		
LCD backlighting	PG SERIE > Back On/Off	38
RS485		
RS485 – all settings	PG SERIE >	38
Wear rate		
Sensor wear rate (display)	MAINT > User rate%	42
Sensor wear rate (reset to zero)	CALIBRA > Chgt. Sens.	47

AFF MES

Purpose

Display values for the main sensor, *ANA1* sensor or *ANA2* sensor on the screen, as selected using the *IR20* remote control. The menu serves mainly to display a particular item temporarily.

How to access

Press MENU.

Tree structure

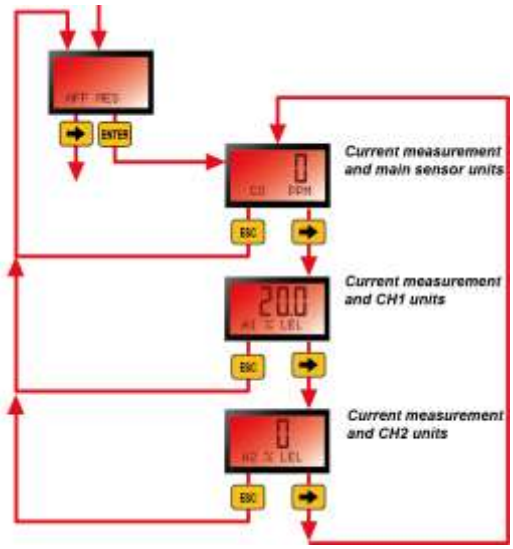

Figure 17: the *Reading Display* menu.

Use

Use the buttons on the remote control to navigate the menu's tree structure as shown in figure 17.

As long as the *OLCT 80* is on this menu, the system will continue to operate normally and monitor gas levels.
To leave this menu and return to normal operating mode, push the ESC button on the remote control two times.

DATE TIME

Purpose

Define the internal *Date* and *Time* settings of the *OLCT 80* transmitter.

How to access

Press MENU, then →, then ENTER. See Figure 14.

Tree structure

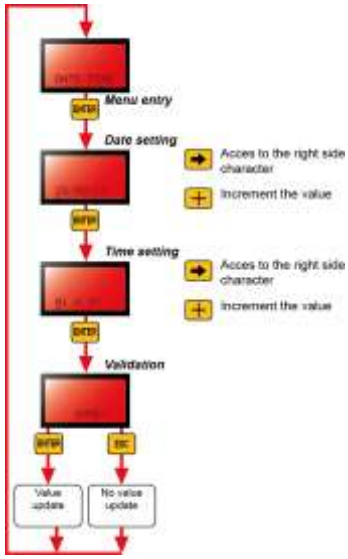

Figure 18: the *Date and Time* menu.

Use

Use the buttons on the remote control to change the date and time values as indicated in Figure 18.

The date is in DD/MM/YY format and the time is in HH/MM format (24-hour clock).

Press *ESC* to return to the reading display.

PROGR

Purpose

Access the following sub-menus:

- *PG SENSOR* (configure the settings of the main sensor and the *ANA1* and *ANA2* sensors).
- *PG AL/REL* (configure the alarms and the 3 internal relays).
- PG SERIE (configure the settings of the serial connection and the backlighting of the LCD display).
- *PG PASSW* (configure the access code).

How to access

Follow the steps below (see Figure 14):

1. Press MENU, then → twice and then ENTER.
2. Enter the access code (1000 by default).
   Use the ↑ button to increase or decrease the value indicated by the cursor.
   Use the → button to move to the next character. Confirm by pressing ENTER.

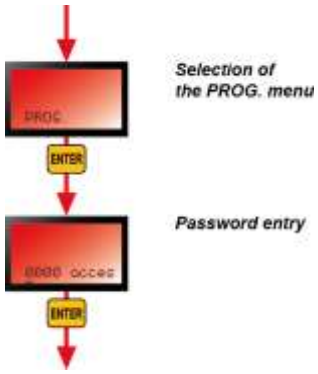

Figure 19: password required (default password: "1000") to access the *PROG* sub-menus. Press *ESC* repeatedly to return to the reading display.

Tree structure

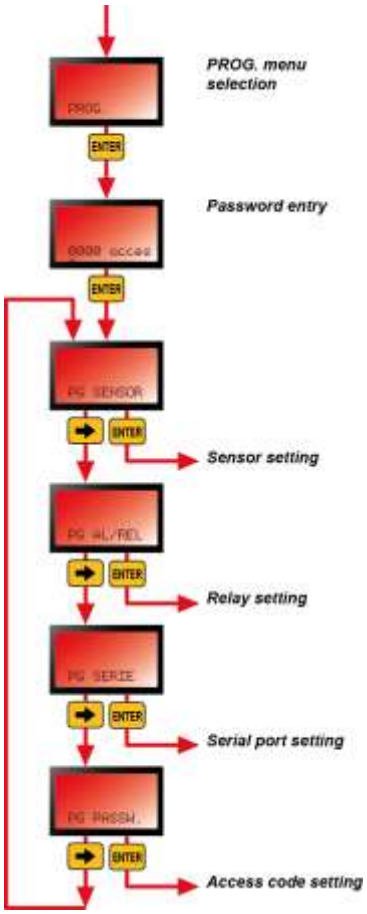

Figure 20: the *Configuration* menu leads to 4 different sub-menus. Press *ESC* repeatedly to return to the reading display.

Menu	Description	See page
PG SENSOR	Configure the main channel (local sensor), the *ANA1* channel and the *ANA2* channel.	23
PG AL/REL	Configure the alarms and relays.	31
PG SERIE	Configure the serial connection and the backlighting of the LCD display.	38
PG PASSW	Manage the access code.	41

PG SENSOR

Purpose

This menu leads to the following sub-menus:

- *PG SENSOR* (configure the settings of the local sensor).
- *PG CH1* (configure the settings of the *ANA1* sensor).
- PG *CH2* (configure the settings of the *ANA2* sensor).

Tree structure

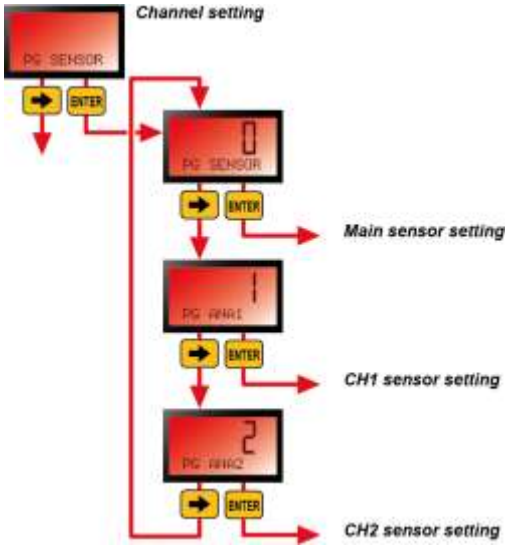

Figure 21: the *Channel Configuration* menu.

PG SENSOR

Purpose

Configure the main sensor.

How to access

See Figure 21.

Tree structure

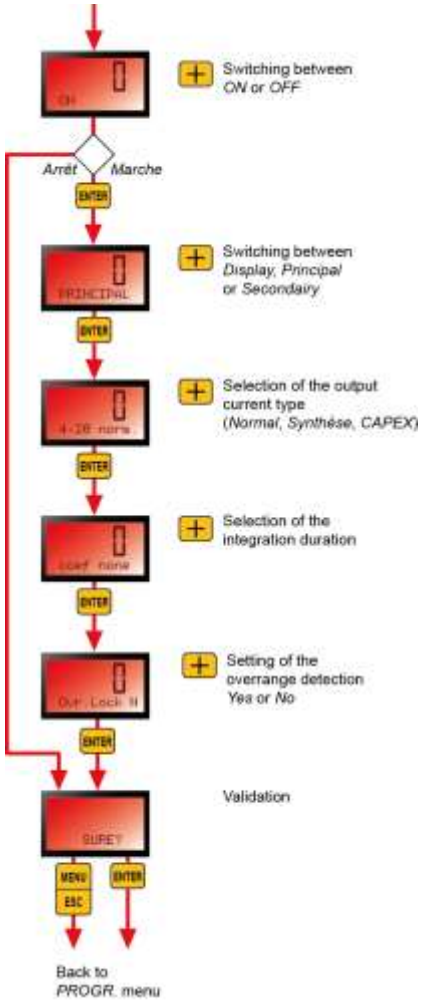

Figure 22: the *Sensor Configuration* menu. Press *ESC* repeatedly to return to the reading display.

The settings of the main sensor (range, type of gas, etc.) are factory-set and cannot be changed.

Menu	Description
ON	Turn the main sensor on or off.
PRINCIPAL	■ *Display*: display the reading from the main sensor. ■ *Primary*: display the reading from the main sensor and go to the 4-20 mA menu (see step below). ■ *Secondary*: the reading is not displayed. Note: if multiple sensors (main sensor, ANA1 sensor or ANA2 sensor) are configured as the *Primary*, the -4-20 mA output will use the current corresponding to the *Main sensor*.
4-20 mA	Define the output current type (see the *Note on the 4-20 mA current type* on page 27). ■ *Normal*: standard 4-20 mA signal. ■ *Combined*: signal uses predefined values representing the alarm statuses of the 3 sensors. This option is automatically selected if the *Secondary* option was defined in the previous step. ■ *CAPEX*: all-or-nothing signal indicating normal operation or a fault condition.
Coef none	Defines the reading integration time (none, 5 seconds, 30 seconds, 1 minute, 2, 5, 10 or 15 minutes). The reading will be averaged over the given period.
Ovr Lock	■ *Yes*: verification is activated. If the device detects a gas concentration above 100% LEL, it will display the word "*Sup*." The reading is blocked and the output signal is fixed at 23.2 mA. The verification request is acknowledged using the infrared remote control. See the section on *Verification* on page 71. ■ *No*: verification is not activated.
Sure ??	■ *ENTER*: confirm the changes made. ■ *ESC*: cancel the changes made and return to the *PROG* menu.

Note on the 4-20 mA current type

Normal mode

0 mA signal: no power.
1 mA signal: fault code.
2 mA signal: in calibration.
Signal from 4-20 mA: reading from the main channel (*Menu* > *PROG*).
Signal greater than 20 mA: line fault, out-of-range, verification.

Combined mode

1 mA : 1 faulty sensor.
2 mA : in stabilization or calibration.
4 mA : no fault and no alarm
8 mA : 1 sensor out of 3 in alarm #1
12 mA : 2 sensors out of 3 in alarm #1
16 mA : 3 sensors in alarm #1.
19 mA : 1 sensor out of 3 in alarm #2
22 mA : 1 sensor out-of-range or to be verified.

Note: an alarm always takes priority over a fault, unless the alarm is generated by the faulty channel.

CAPEX function

Comprises 2 statuses: *Good* or *Bad*.

0.1 mA : in fault, alarm, calibration or stabilization.

20 mA : no fault and no alarm

PG CH1

Purpose

Configure the *ANA1* sensor.

How to access

See Figure 21.

Tree structure

See Figure 23.

Menu	Description
ON	Turn the *ANA1* sensor on or off.
PRINCIPAL	■ *Display*: display the reading from the *ANA1* sensor. ■ *Primary*: display the reading from the *ANA1* sensor and go to the 4-20 mA menu (see step below). ■ *Secondary*: the reading is not displayed. Note: if multiple sensors (main sensor, ANA1 sensor or ANA2 sensor) are configured as the *Primary*, the -4-20 mA output will use the current corresponding to the *Main sensor*.
4-20 mA	Define the output current type (see the *Note on the 4-20 mA current type* on page 27). ■ *Normal*: standard 4-20 mA signal. ■ *Combined*: signal uses predefined values representing the alarm statuses of the 3 sensors. This option is automatically selected if the *Secondary* option was defined in the previous step. ■ *CAPEX*: all-or-nothing signal indicating normal operation or a fault condition.
Measure	■ *Reading*: the channel will be used to input an analog reading (4-20 mA current only). ■ *Acknowledge*: the channel will be assigned to a dry contact for remote acknowledgment (function used only in the absence of the IR20 remote control). The contact will be wired between the *S* and *E* terminals of the 4-20 mA input, labeled *IN1.* See Figure 5, 2 .
% LEL	Defines the unit of measure displayed on the LCD (%LEL, %O2, %, ppm H2S, ppm NH3, ppm HCL, ppm CO2, ppm NO, ppm ETO, ppm H2, ppm HCN, ppm HF, ppm O3, ppm CLO2, ppm, ppb, °C, V, hPa, [blank]).
Display	Define the position of the decimal point, e.g., 22.22.
Gamme	Define the reading range on the LCD (001-100 in increments of one, 100-1000 in increments of ten or 1000-9900 in increments of one hundred).
Zero in V	Define the bottom of the range in volts. 0.48 V corresponds to 4 mA through a 120 ohm resistor.
Scale in V	Define the top of the range in volts. 2.40 V corresponds to 20 mA through a 120 ohm resistor.
Coef	Defines the reading integration time (none, 5 seconds, 30 seconds, 1 minute, 2, 5, 10 or 15 minutes). The reading will be averaged over the given period.

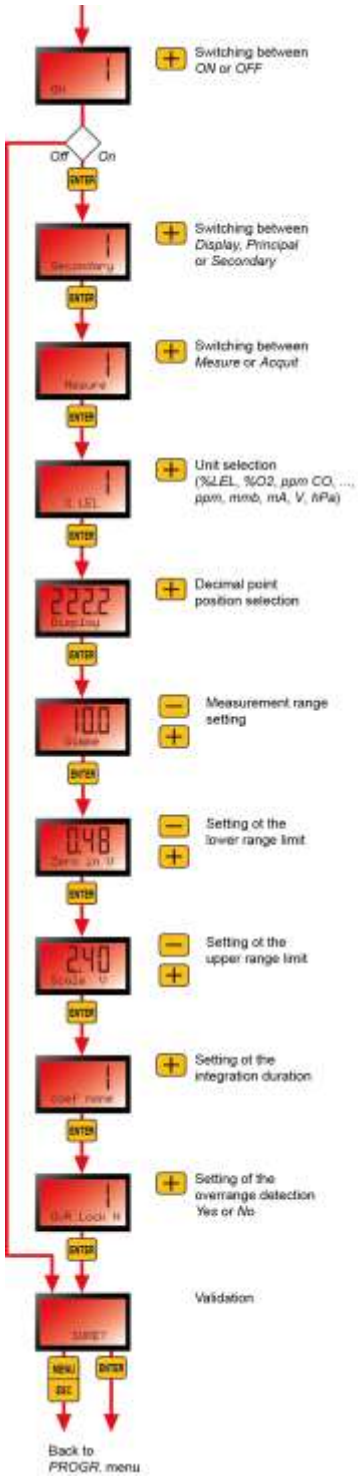

Figure 23: the *ANA1 Configuration* menu. Press *ESC* repeatedly to return to the reading display.

Menu	Description
OvR Lock	■ *Yes*: verification is activated. If the device detects a gas concentration above 100% LEL, it will display the word "*Sup*." The reading is blocked and the output signal is fixed at 23.2 mA. The verification request is acknowledged using the infrared remote control. See the section on *Verification* on page 71. ■ *No*: verification is not activated.
Sure ??	■ *ENTER*: confirm the changes made. ■ *ESC*: cancel the changes made and return to the *PROG* menu.

PG CH2

Purpose

Configure the *ANA2* sensor.

How to access

See Figure 21.

Tree structure

Same as for the *ANA1* sensor. See Figure 23.

PG AL/REL

Purpose

Configure the alarms of the local sensor and the alarm relays.

How to access

See Figure 20.

Tree structure

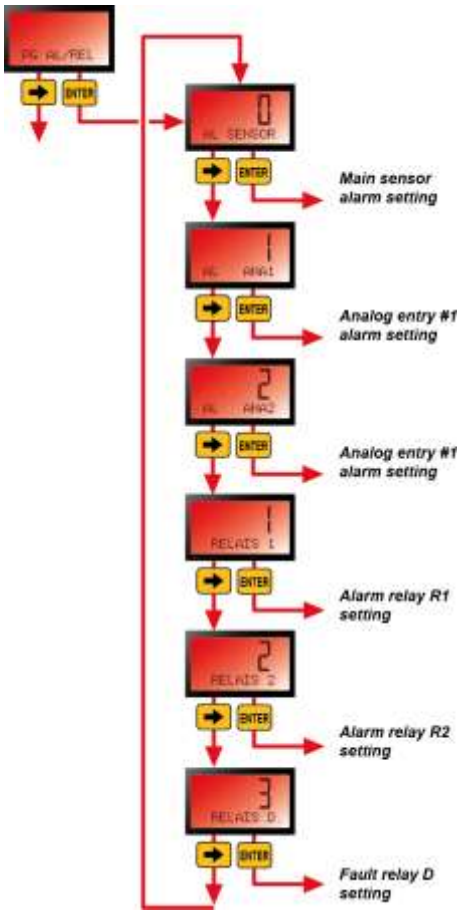

Figure 24: the *Alarm/Relay Configuration* menu. Press *ESC* repeatedly to return to the reading display.

Menu	Description	See page
AL SENSOR	Configure the alarms of the local sensor.	31
AL ANA1	Configure the alarms of the *ANA1* sensor.	34
AL ANA2	Configure the alarms of the *ANA2* sensor.	34
RELAIS 1	Configure the level-1 alarm relays.	35
RELAIS 2	Configure the level-2 alarm relays.	37
RELAIS D	Configure the fault relay.	37

AL SENSOR

Configure the alarm thresholds of the main sensor and assign relays.

How to access

See Figure 24.

Tree structure

Menu	Description
AL1	■ *Yes*: the level-1 alarm is used. The following menus are used to define the settings for this alarm. ■ *No*: the level-1 alarm is not used.
AL1	■ *Increasing*: increasing alarm (e.g., for combustible or toxic gases, etc.). A reading above the threshold will trigger the alarm. ■ *Decreasing*: decreasing alarm (e.g., for oxygen levels). A reading below the threshold will trigger the alarm.
Thresh AL1	Define the threshold value to trigger the alarm (from 0-9900, in increments that depend on the value).
Acq	■ *Auto*: the alarm (relay and indicator light) will be acknowledged automatically once the measured value is less than (increasing threshold) or greater than (decreasing threshold) the defined threshold (*AL1 threshold*). ■ *Manual*: the alarm (relay and indicator light) must be acknowledged manually once the measured value is less than (increasing threshold) or greater than (decreasing threshold) the defined threshold (*AL1 threshold*). The alarm will be acknowledged using the remote control of via remote acknowledgment (see *Reading* under *ANA1 configuration* on page 28).
Rel	Define the relay(s) to be activated if a certain threshold is exceeded (*AL1 threshold*): ■ *None*: no relay activated. ■ *R1*: relay *R1* activated. ■ *R2*: relay *R2* activated. ■ *R1 & R21*: relays *R1* and R2 activated.
AL2 *AL2 incre.* *Thresh AL2* *Acq auto* *RELAIS 2*	The following options pertain to the level-2 alarm threshold. The settings are identical to those for the alarm-1 threshold.
Sure ??	■ *ENTER*: confirm the changes made and return to the *Alarm/Relay Configuration* menu. ■ *ESC*: cancel the changes made and return to the *PROG* menu.

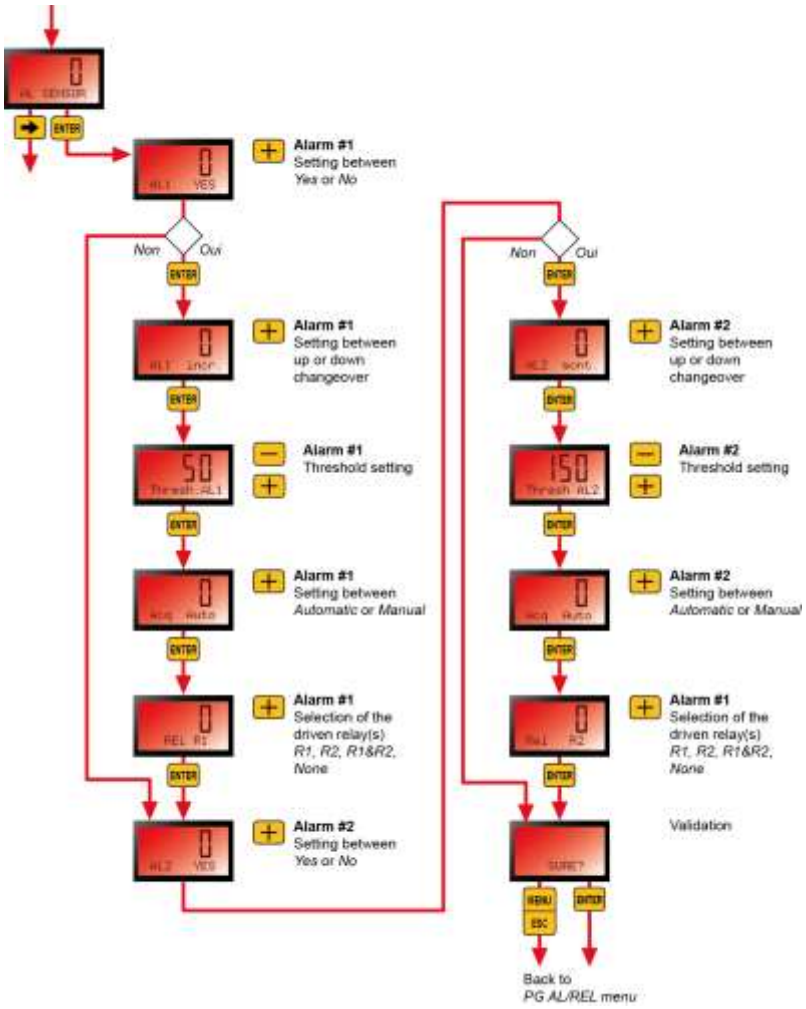

Figure 25: the *Alarm/Relay Configuration* menu. Press *ESC* repeatedly to return to the reading display.

AL CH1

Configure the thresholds of the *ANA1* sensor and assign relays.

How to access

See Figure 24.

Tree structure

See Figure 25. The steps are identical to those described for the main sensor.

AL CH2

Configure the thresholds of the *ANA2* sensor and assign relays.

How to access

See Figure 24.

Tree structure

See Figure 25. The steps are identical to those described for the main sensor.

RELAIS 1

Configure relay *R1*.

How to access

See Figure 24.

Tree structure

Menu	Description
R1 intern	■ *Internal*: the relay is triggered by the internal electronics of the transmitter. ■ *External*: the relay is triggered by the *MX 62* central measuring controller or an API via the RS485 (Modbus) connection.
R1 sec. pos.	■ *Positive security*: the relay will be powered as long as there is no alarm (positive security). It will be deactivated in the event of an alarm. This option is recommended. ■ *Negative security*: the relay will be de-energized as long as there is no alarm. It will be activated in the event of an alarm.
Rel normal	■ *Normal* : the relay does not trigger an audible warning. ■ *klaxon*: the relay triggers a warning horn. Two complementary settings will need to be defined in this case (whether and how long the audible warning will continue to sound).
Maint.	This setting is only displayed if *Horn* was selected under *Normal Relay*. It is used to define how the alarm is stored. ■ *Yes*: the relay will remain in alarm position once an alarm condition is detected. The audible warning will be activated for a duration to be defined in the next step. ■ *No*: the audible warning will be deactivated once the alarm condition is eliminated.
D. maint. s	This setting is only displayed if *Horn* was selected under *Normal Relay*. It is used to set the duration of the audible warning. This duration can be set to any value up to 900 seconds in 5-second increments. In the event of an alarm, the audible warning will sound for the defined amount of time, at a minimum.
Recall	This setting is displayed only if *Horn* was selected under *Normal Relay*: ■ *Yes*: the relay will be reactivated after the number of minutes defined in the next step if the corresponding alarm condition persists. ■ *No*: the relay will not be reactivated in this case.
Recall mn	This setting is displayed only if *Yes* was selected in the previous step. Enter the time in minutes (5-minute increments from 5 to 900 minutes) after which the relay will be reactivated if the alarm is still present.
Sûre ??	■ *ENTER*: confirm the changes made and return to the *Alarm/Relay Configuration* menu. ■ *ESC*: cancel the changes made and return to the *Alarm/Relay Configuration* menu.

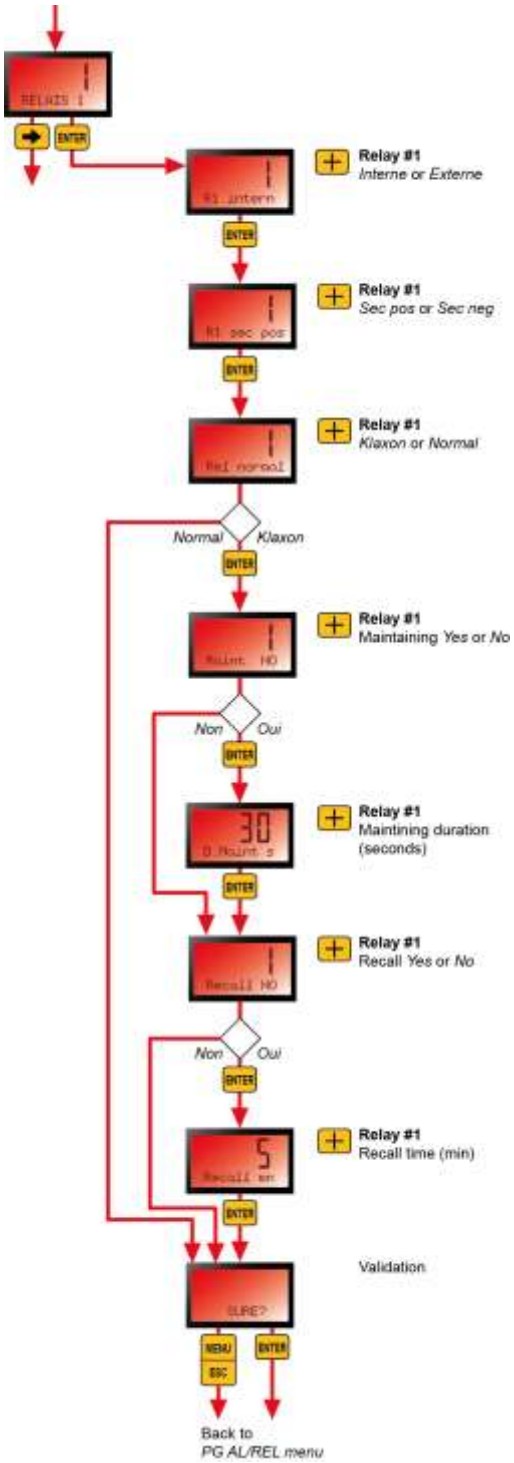

Figure 26: *RELAY 1* menu. Press *ESC* repeatedly to return to the reading display.

RELAIS 2

Configure relay *R2*.

How to access

See Figure 24.

Tree structure

See Figure 26. The steps are identical to those described for *Relay 1*.

RELAIS D

Configure the fault relay.

How to access

See Figure 24.

Tree structure

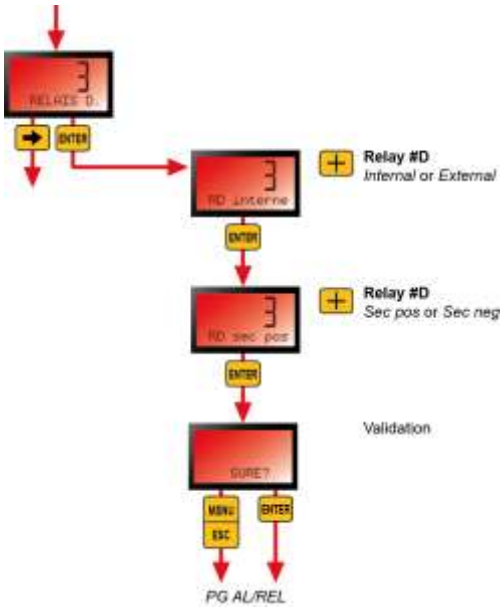

Figure 27: the *Fault Relay* menu. Press *ESC* repeatedly to return to the reading display.

Menu	Description
RD intern	■ *Internal*: the relay is triggered by the internal electronics of the transmitter. ■ *External*: the relay is triggered by the *MX 62* central measuring controller or an API via the RS485 (Modbus) connection.
RD sec. pos.	■ *Positive security*: the relay will be powered as long as there is no alarm (positive security). It will be deactivated in the event of a fault. This option is recommended. ■ *Negative security*: the relay will be de-energized as long as there is no fault. The relay will be activated in the event of a fault.
Sûre ??	■ *ENTER*: confirm the changes made and return to the *Alarm/Relay Configuration* menu. ■ *ESC*: cancel the changes made and return to the *Alarm/Relay Configuration* menu.

PG SERIE

Purpose

Configure the serial connection and the backlighting of the LCD display.

How to access

See Figure 20.

Tree structure

Menu	Description
Ascii	Define the data transmission format: ■ *Ascii*: data are transmitted in 7-bit format; a byte thus contains the code for 2 characters. Threads are coded in hexadecimal format. ■ *Binary*: data are transmitted in 8-bit format; a byte thus contains the code for 1 character.
Slave Sens	Define the slave number of the main sensor (value between 1 and 255). The number 0 indicates that all of the slaves are affected; therefore, it is best to avoid using this value.
Slave ANA1	Define the slave number of the *ANA1* sensor (value between 1 and 255).
Slave ANA2	Define the slave number of the *ANA2* sensor (value between 1 and 255).
Slave Rel.	Define the slave number of each of the 3 alarm relays (value between 1 and 255).
38400 Baud	Define the data transmission speed. The pre-defined speeds are 1200, 2400, 4800, 9600, 19200 and 38400 bauds.
LINE	■ *Line*: used if the *OLCT 80* is connected to the line of an *MX 43*. ■ *Loop*: used if the *OLCT 80* is connected to the loop of an *MX 62* or an API, for example.
Back ON	■ *Yes*: the display is always backlit. ■ *No*: the display illuminates once a button is pressed on the IR 20 remote control.
Sûre ??	■ *ENTER*: confirm the changes made and return to the *PROG* menu. ■ *ESC*: cancel the changes made and return to the *PROG* menu.

Communication with an MX 43 central controller: configure binary mode at 9600 bauds.
Communication with an MX62 central controller: configure ASCII mode at 38400 bauds.

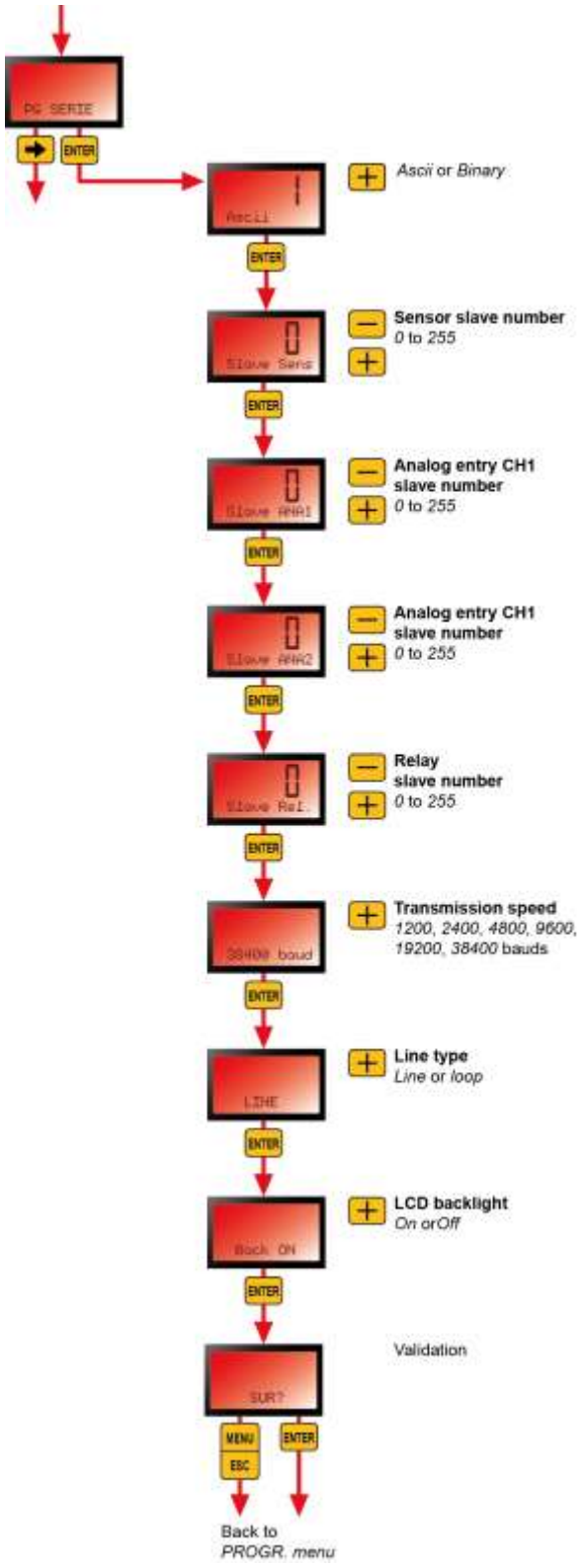

Figure 28: the *Alarm/Relay Configuration* menu. Press *ESC* repeatedly to return to the reading display.

-

PG PASSW

Purpose

Configure (modify) the access code for the *OLCT 80*. The default code is 1000.

Important: if multiple *OLCT 80*s are in range of the remote control, assign them different access codes

How to access

See Figure 20.

Tree structure

Menu	Description
1000 chgt	View the current access code. To change this code, use the + and ➞ buttons. Characters that may be used include 0…9 and A…F.
Sûre ??	■ *ENTER*: confirm the changes made and return to the *PROG* menu. ■ *ESC*: cancel the changes made and return to the *PROG* menu.

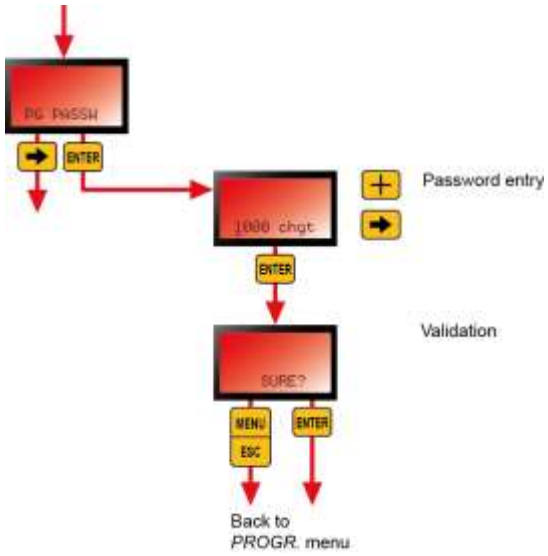

Figure 29: the *Access Configuration* menu. Press *ESC* repeatedly to return to the reading display.

MAINT

This menu displays certain settings related to maintenance

How to access

See Figure 14.

Tree structure

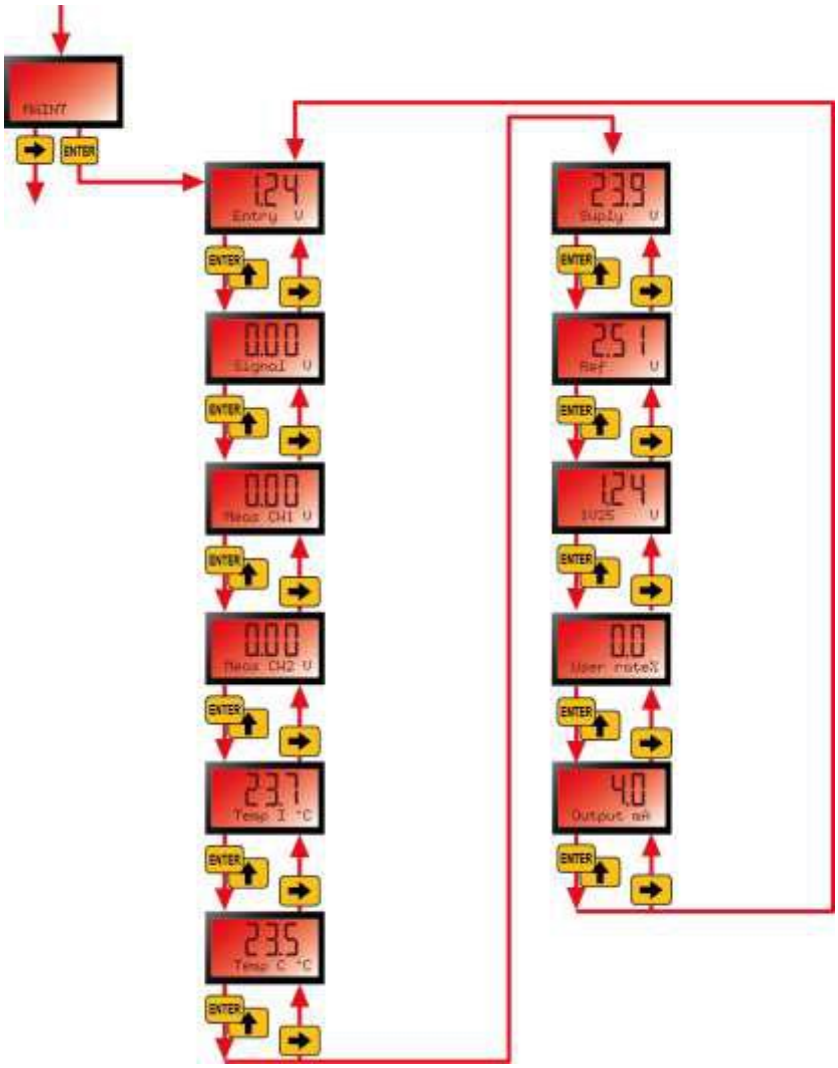

Figure 30: the *Maintenance* menu. Press *ESC* repeatedly to return to the reading display.

Menu	Value displayed
Entry V	Internal value of the main sensor's signal.
Signal V	Main signal in volts.
Meas CH1 V	Signal from the *ANA1* sensor in volts.
Meas CH2 V	Signal from the *ANA2* sensor in volts.
Temp I °C	Internal temperature within the housing.
Temp C °C	Temperature of the main sensor.
Supply V	Supply voltage to the terminals of the *OLCT 80*.
Ref V	Internal reference voltage (normally 2.5 V).
1V25 V	Internal reference voltage (normally 1.25 V).
User rate %	Wear rate of the main sensor. A value of 50% represents a 50% loss of sensitivity. The sensor must be replaced once a 75% wear rate is reached. This value is recalculated after each calibration.
Output mA	Output current value at the OUT pin (see Figure 5, 2).

CALIBRA

Display the 3 calibration sub-menus for the main sensor, the *ANA1* sensor and the *ANA2* sensor.

How to access

See Figure 14.

Tree structure

Menu	Description	See page
0000 acces	Enter the access code (1000 by default).	-
Cal sensor	Calibrate the main sensor.	45
Chgt capt	Reset the wear rate value of the sensor to zero after replacing the main sensor.	47
Cal CH1	Calibrate the *ANA1* sensor.	48
Cal CH2	Calibrate the *ANA2* sensor.	48

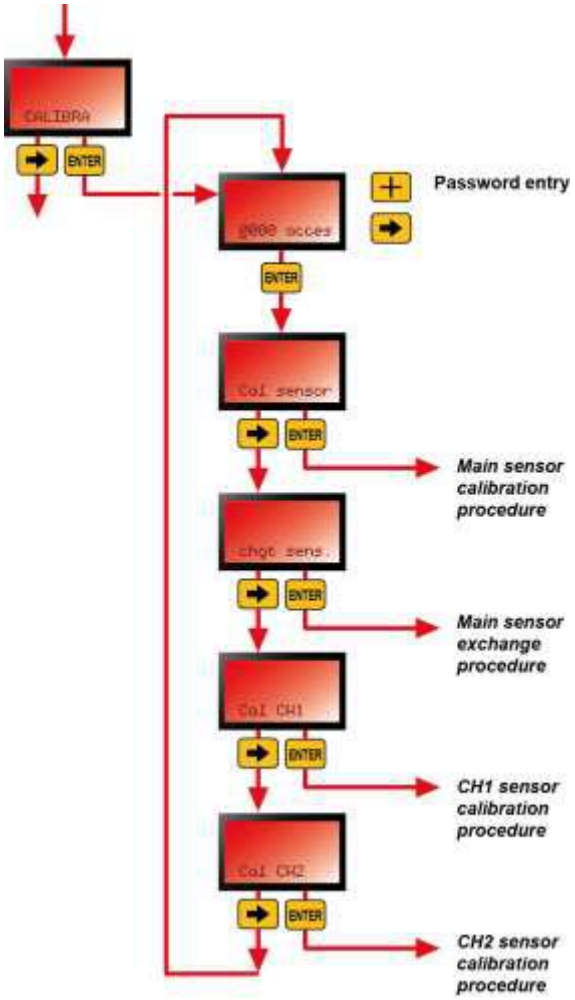

Figure 31: the *Calibration* menu. Press *ESC* repeatedly to return to the reading display.

Cal sensor

Calibrate the main sensor (adjust zero and sensitivity).

How to access

See Figure 31.

Tree structure

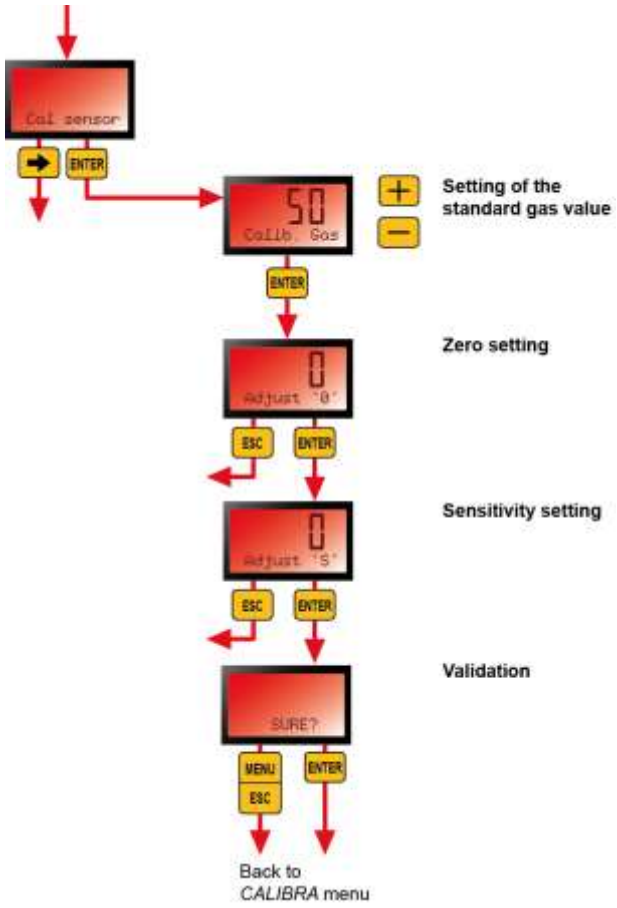

Figure 32: the *Calibration* menu. Press *ESC* repeatedly to return to the reading display.

Menu	Description
Calib. Gas	Configure the value of the calibration gas to be used.
Adjust.'0"	■ Place the injection hood over the device and inject clean air from the bottle (flow rate of 30-60 l/h). ■ Wait for the reading to stabilize (at least 2 minutes). ■ Press *Enter* to confirm the zero.
	Note: a CO2 sensor pack must always be zeroed using reconstituted air or nitrogen. Never use ambient air as the zero since it naturally contains 300-500 ppm of CO_2.
Adjust. 'S"	Place the calibration hood over the detector head and open the valve on the bottle of calibration gas (flow rate of 30-60 l/h).
	The reading displayed will fluctuate until it reaches the stabilization point. Wait for the reading to stabilize (at least 2 minutes).
	Press *Enter* to confirm the reading.

Menu	Description
Sûre ??	■ *ENTER*: confirm the changes made and return to the *CALIBRA* menu. ■ *ESC*: cancel the changes made and return to the *CALIBRA* menu.
	Close the valve on the bottle of calibration gas and remove the injection hood.
	Once the countdown is over, the detector will resume operation in measurement mode.
	Restore the transmission of alarms within the central system.

- Each step under the *Calibration* menu is limited to 5 minutes.
- The detector will resume operation in measurement mode and disregard the previous changes after a 1-minute countdown, as long as no commands are detected.
- If "8888" appears on the display followed by a code, the sensor is not working. Check the fault code (see page 103) and take the appropriate corrective action. See also the section on *Possible transmitter errors* on page 80.
- Before calibrating, block the transmission of alarms within the system to avoid accidentally triggering an alarm during the operation. Restore the alarms once the procedure is completed.

Chgt sens

This procedure must be carried out after the main sensor is replaced. This menu resets the wear rate value for the main sensor, which is displayed under the *Maintenance* menu (see *T. usure %* on page *42*). The zeroing and sensitivity adjustment procedure must be carried out for the new sensor (see *Sensor calibration* on page 45).

How to access

See Figure 31.

Tree structure

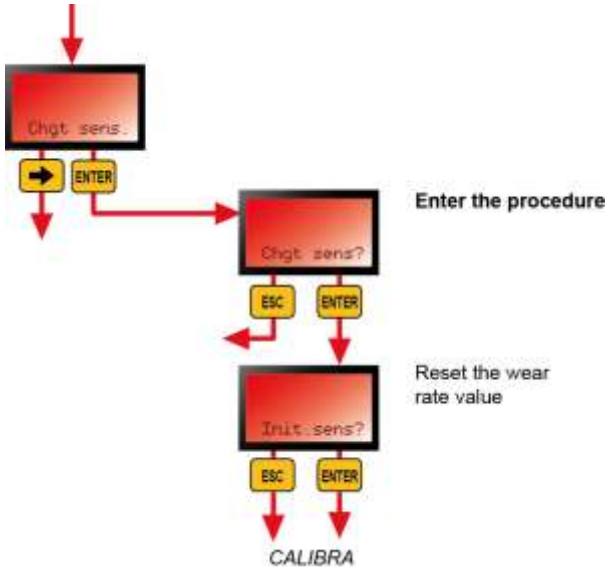

Figure 33: the *Sensor Replacement* menu. Press *ESC* repeatedly to return to the reading display.

Menu	Description
Chgt sens.?	Confirm that you want to begin the wear rate reset procedure for the main sensor.
Init sens ?	■ *ENTER*: reset the wear rate value for the main sensor and return to the *CALIBRA* menu. ■ *ESC*: cancel the reset of the wear rate value for the main sensor and return to the *CALIBRA* menu.

Cal CH1

Calibrate the sensor connected to the *ANA1* inlet (see the documentation for this sensor) with the relays blocked for 5 minutes. The two indicators lights (⚡ and DEF🔧) will blink.

The AL1 and AL2 alarm indicator lights will be activated if the threshold is exceeded. They will turn off automatically once the value falls below the setpoint.

How to access

See Figure 31.

Cal CH2

Calibrate the sensor connected to the *ANA2* inlet (see the documentation for this sensor) with the relays blocked for 5 minutes. The two indicators lights (⚡ and DEF🔧) will blink.

The AL1 and AL2 alarm indicator lights will be activated if the threshold is exceeded. They will turn off automatically once the value falls below the setpoint.

How to access

See Figure 31.

4-20 mA

Define the output current value available from the OUT terminal (Figure 5, 2) from 1 to 25 mA for servo control purposes.

How to access

See Figure 14.

Tree structure

Menu	Description
0000 passw	Enter the access code (1000 by default).
4 20 mA	Define the output current value available from the OUT terminal (Figure 5, 2), from 1 to 25 mA. The analog output will then be controlled by the *OLCT 80*.

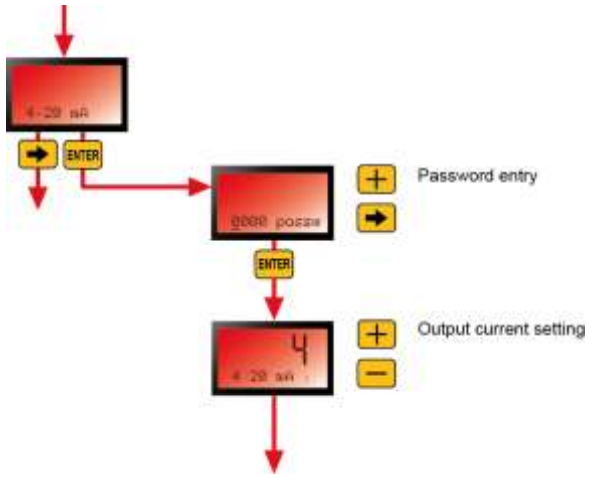

Figure 34: the *4-20 mA* menu. Press *ESC* repeatedly to return to the reading display.

INFOS

Display the version number of the application and other reference numbers.

How to access

See Figure 14.

Tree structure

Menu	Description
Ver GB 1.9	Version number of the application
R 65135xx	Part number of the *OLCT 80* without sensor (housing only).
eep 2.0	Version number of the EEPROM software.
N° 001	Serial number of the *OLCT 80*.
1303000	Manufacturer batch number.

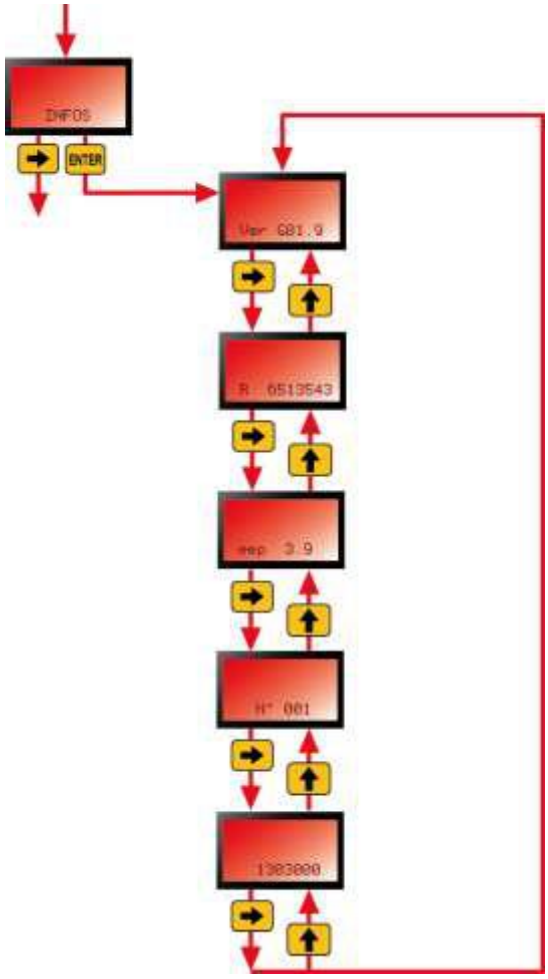

Figure 35: the *Info* menu. Press *ESC* repeatedly to return to the reading display.

TEST

This menu blocks the #1 alarm, #2 alarm and fault relays so that gas tests can be performed.

If Rel1 or Rel2 is activated before accessing this menu, this relay will remain activated until the user leaves the menu.

How to access

See Figure 14.

Tree structure

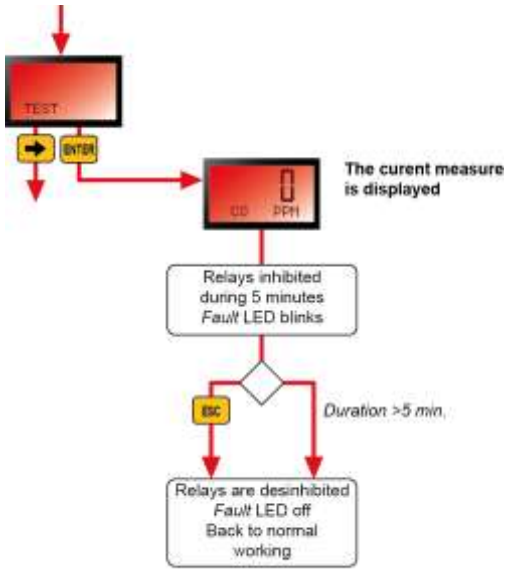

Figure 36: the *Test* menu. Press *ESC* repeatedly to return to the reading display.

After 5 minutes the *OLCT 80* will automatically switch back into normal operating mode.

Chapter 4 | Installation

It is recommended that you read the relevant guides for installing, operating and maintaining flammable gas and oxygen detectors (EN 60079-29-2) and toxic detectors (EN 45544-4).

Regulations and operating conditions

- Installation must comply with current edition of EN 60079-14 for systems installed in explosive atmospheres and eventually with any local or national additional requirements that may apply in the country of installation.

In general, the ambient temperature, the power supply voltage and power mentioned in this document pertain to safety precautions against explosion. These temperatures are not the detector's operating temperatures.

- The equipment is authorized for use in zones 1, 2, 21 and 22 for ambient temperatures ranging between -20°C to +60°C.
- For the *OLCT 80D id* version, the sensor pack may be used in zones 0, 1, 2, 20, 21 and 22 if it is operated remotely with respect to the transmitter. The transmitter is not authorized for use in zone 0 or 20.
- The detection sensor must always be in contact with the ambient air. Therefore:
  - Do not cover the detection module.
  - Do not apply paint on the detection module.
  - Keep dust from building up.

Pre-installation Hardware Configuration

If one or two of the 4-20 mA inputs (*ANA1/ANA2* sensor inputs) is going to be used, see Chapter 7 on page 73.

Equipment required

- Complete detector.
- Connection cable.
- Tools for mounting the device.
- Mounting materials.

Positioning the detector

The detector should be positioned at ground level, on the ceiling, at the height of the respiratory tract or near air extraction ducts, depending on the application or the density of the gas to be detected. Heavy gases should be detected at ground level, while light gases should be detected at ceiling height.

Mounting the detector

All versions with local sensor

The detector must be installed with the detection sensor pointing downwards. For combustible gas detectors, tilting the device more than 45° past vertical can lead to imprecise readings.

The housing should be mounted using 4 M6 screws and appropriate anchors for the mounting surface.

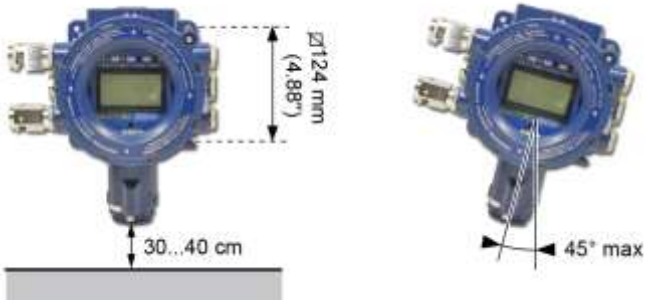

Figure 37: sensor pointing downward (left); maximum angle for an combustible gas detector (right).

All versions with remote sensor

For combustible gas detectors, tilting the sensor more than 45° past vertical can lead to imprecise readings.

The housing should be mounted using 4 M6 screws and appropriate anchors for the mounting surface. The sensor pack should be mounted using 2 M4 screws and appropriate anchors for the mounting surface.

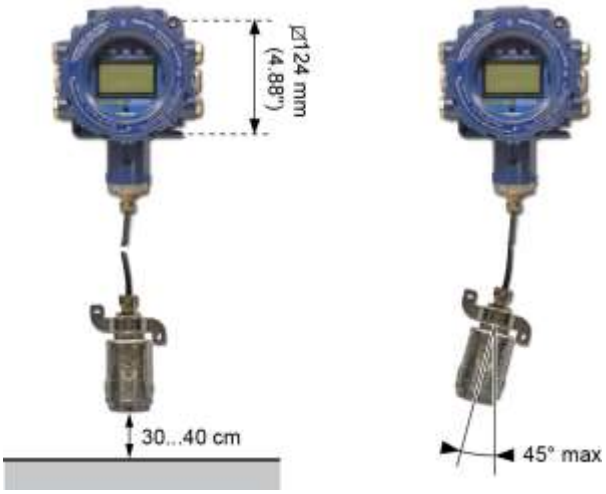

Figure 38: sensor pointing downward (left); maximum angle for an combustible gas detector (right).

Power supply

Current in the power line

The power consumption listed in the table below corresponds to an *OLCT 80* equipped with a main sensor. It does not include the power consumption of an *ANA1*/*ANA2* sensors used.

Detector type	Sensor type	Power supply (VDC)	Max. current (mA)	Power consumption (W)
Combustible	Catalytic	16 to 28	170	2.72
Combustible	XPIR infrared	16 to 28	130	1.84
Freon	Semiconductor	16 to 28	170	2.72
Oxygen	Electrochemical	12 to 30	100	1.2
Toxic	Electrochemical	12 to 30	100	1.44

Length of the power line

The detector must be connected to a dedicated power supply or a central power source (central measuring controller, PLC) using a shielded, armored (where necessary) cable. The cable should be selected based on distance, the detector type and any requirements specific to the facility.

Detector type	Sensor type	Maximum length (km) depending on the cable gauge (cross sectional area)		
		0.5 mm^2	0.9mm^2	1.5 mm^2
Combustible	Catalytic	0.75	1.31	2.33
Combustible	XPIR infrared	1.11	1.95	3.44
Freon	Semiconductor	0.75	1.31	2.33
Oxygen	Electrochemical	1.92	3.36	5.95
Toxic	Electrochemical	1.6	2.8	4.95

Preparing the connection cables

Preparing the cable

The cable will be brought to the detection point. Professional standards for running wires and maintaining and protecting cables must be followed.

Disconnecting power

If the central system to which the transmitter will be connected is already activated:

1. Block the system's alarms during the operation to avoid accidentally triggering them.
2. Disconnect power to the detector or the corresponding line.

Opening the detector

Remove the 4-mm hexagonal cover locking screw before unscrewing the detector's cover (Figure 2, 4).

Running the cable

Follow all instructions provided by the manufacturer of the cable gland and be sure to properly connect the braided shield.

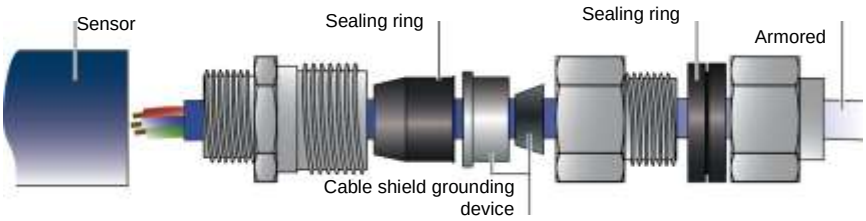

Figure 39: example of a double-compression cable gland to secure armored cable.

Wiring

Power must be disconnected during the wiring process. The site must be grounded.

Stand-alone OLCT 80

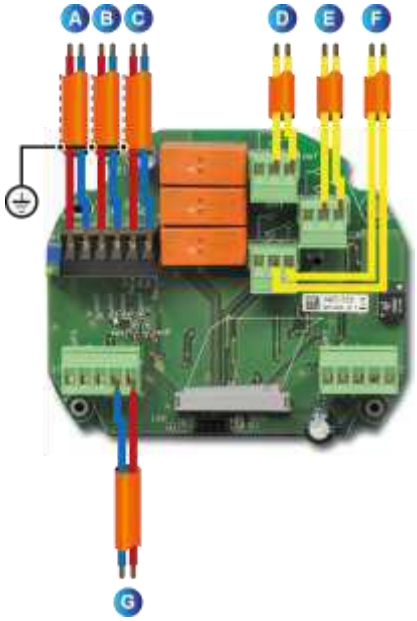

Figure 40: wiring for a stand-alone OLCT 80.

Item	Description
A.	Analog output (4-20 mA).
B.	Auxiliary input #1, 4-20 mA, 24 VDC.
C.	Auxiliary input #2, 4-20 mA, 24 VDC.
D.	Fault relay output. Dry contact. Interrupting capacity: 30 VDC - 250 VAC – 2A.
E.	Rel2 relay output. Dry contact. Interrupting capacity: 30 VDC - 250 VAC – 2A.
F.	Rel1 relay output. Dry contact. Interrupting capacity: 30 VDC - 250 VAC – 2A.
G.	24 VDC power supply.

OLCT 80 linked to a *central controller or PLC* – analog mode

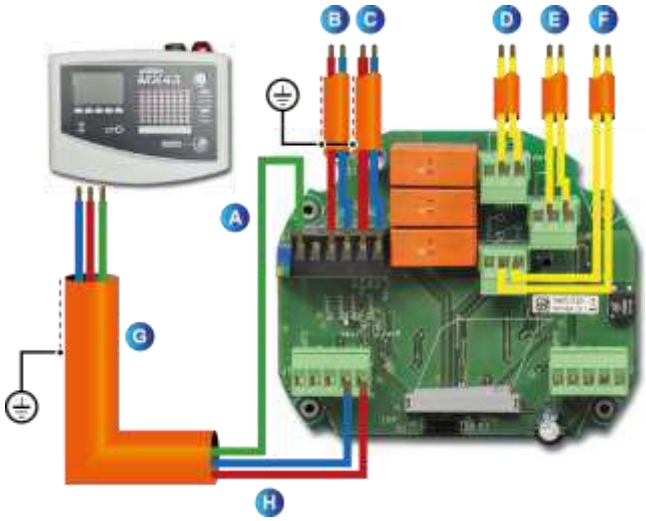

Figure 41: wiring to a central detection controller (analog mode).

Item	Description
A.	Analog output (4-20 mA).
B.	Auxiliary input #1, 4-20 mA, 24 VDC.
C.	Auxiliary input #2, 4-20 mA, 24 VDC.
D.	Fault relay output. Dry contact. Interrupting capacity: 30 VDC - 250 VAC – 2A.
E.	Rel2 relay output. Dry contact. Interrupting capacity: 30 VDC - 250 VAC – 2A.
F.	Rel1 relay output. Dry contact. Interrupting capacity: 30 VDC - 250 VAC – 2A.
G.	Instrumentation-type shielded cable with 3 wires
H.	24 VDC power supply.

Note on 4-20 mA connection cable

The cable must be equipped with a braided shield to reduce the impact of electrical noise and radiofrequencies. Examples of compatible cable types:

- Non-ATEX zone: CNOMO FRN05 VC4V5-F.
- ATEX zone: GEVELYON (U 1000RHC1).
- ATEX zone: GVCSTV RH (U 1000).
- ATEX zone: xx-xx-09/15- EG-SF or EG-FA or EG-PF (M87202-compatible U 300).

OLCT 80 in RS485 network topology (Modbus)

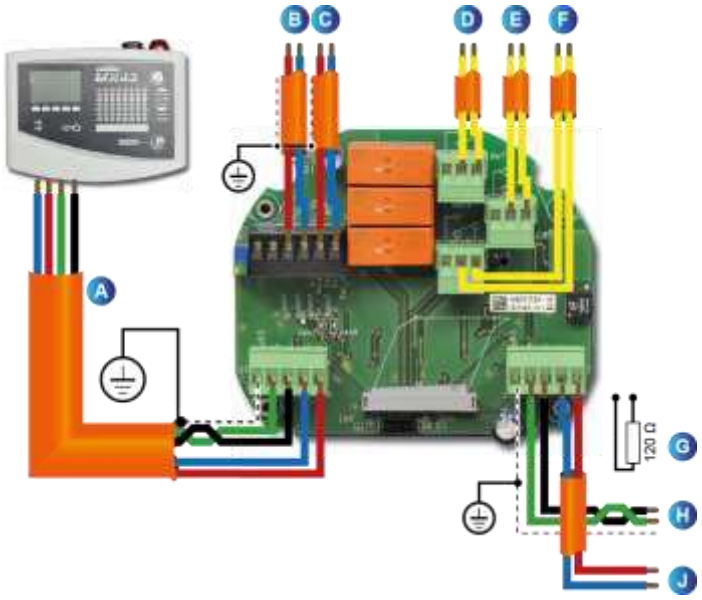

Figure 42: wiring in RS485 network topology (Modbus).

Item	Description
A.	24 VDC power supply. RS485 line.
B.	Auxiliary input #1, 4-20 mA, 24 VDC.
C.	Auxiliary input #2, 4-20 mA, 24 VDC.
D.	Fault relay output. Dry contact. Interrupting capacity: 30 VDC - 250 VAC – 2A.
E.	Alarm #2 relay output. Dry contact. Interrupting capacity: 30 VDC - 250 VAC – 2A.
F.	Alarm #1 relay output. Dry contact. Interrupting capacity: 30 VDC - 250 VAC – 2A.
G.	120 Ω end-of-line resistor. (To be connected if the sensor is the last in the line.)
H.	RS485 line output to subsequent sensor. Parallel terminal on A2.
J.	24 VDC power output to the next sensor in series. Parallel terminal at A1.

Recommended cable type:
Shielded cable designed for RS485 communication, e.g., Belden 3841 cable.

Grounding the housing

Connect the housing's earth terminal to the ground in accordance with regulation. The *OLCT 80* has a dedicated terminal for grounding located on the outside of the housing (Figure 2, 3).

Closing the cover

The cover must be tightly closed before connecting the cable to the terminal of the central system. Insert and tighten the locking screw (Figure 2, 4).

Transfer curve

The curve below gives the transmitter output current as a function of gas concentration. In the event that the user connects the transmitter to a non-Oldham central controller, the user must ensure that the transfer curve is compatible with the equipment's input characteristics to correctly interpret the data coming in from the transmitter. Similarly, the central controller must provide sufficient voltage to compensate for any voltage drop caused by the cable.

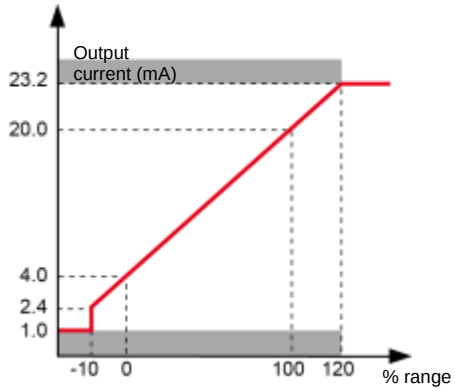

Figure 43: transfer curve for a 4-20 mA detector.

Chapter 5 | Wireless Version

Purpose

The *OLCT 80* is available in a wireless version that may be appropriate in the following situations:

- Data transmission over long distances.
- Gas detection on moving equipment (e.g., crane bucket).
- Situations where wiring would be problematic, if not impossible (e.g., across a road, waterway or railway).
- Situations in which installation costs would be prohibitive.

The *OLCT 80* communicates with the central measuring controller or PLC via 2.4 GHz radio waves in Europe or 900 MHz in the US over a distance of up to 3200 or 9600 meters, respectively, under free-field conditions.

Concept

The wireless *OLCT 80* transmitters (A) communicate between one another until the signal reaches a *master* receiver (B), which is connected to the *MX 43* central controller (via an RS485 Modbus connection). This *master* receiver is used to manage a mesh network of up to 49 *OLCT 80*transmitters.

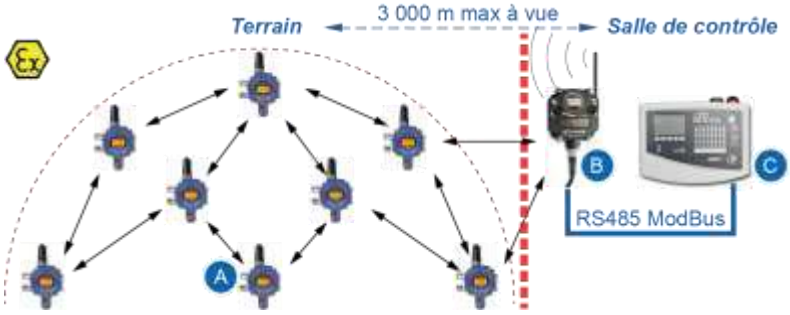

Figure 44: mesh network topology.

Components

The RS485 output of the *OLCT 80* is connected to an integrated wireless card (rep.B) within the transmitter. A certified antenna (rep.A) transmits the radio waves to a *master* receiver (rep.C), which is connected to an *MX43* central controller (rep.D).

Figure 45: wireless *OLCT 80* and *master* receiver (rep.C).

Connection

Master receiver

The *master* receiver must be connected to the RS485 input of an *MX43* central controller or supervision system following the figure and table below.

Figure 46: connecting the *master* receiver's 5-pin connector.

Prong	Function	Wire color
1	Positive terminal (+), 10-40 VDC power supply.	Brown
2	RS485 / +.	White
3	Common power supply (ground).	Blue
4	RS485 / -.	Black
5	Unused.	Gray

Wireless OLCT 80 transmitter

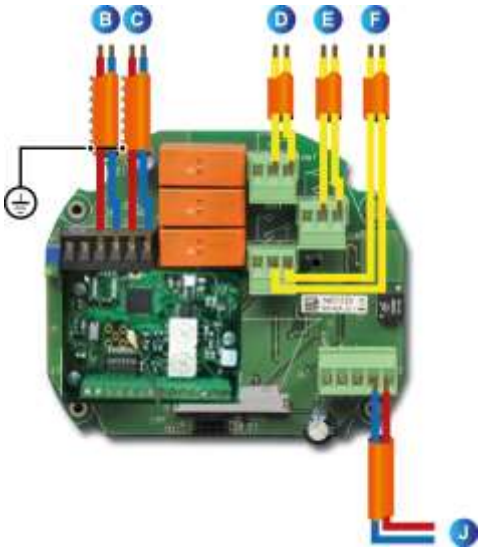

Figure 47: wireless OLCT 80 connections.

Item	Description
B.	Auxiliary input #1, 4-20 mA, 24 VDC.
C.	Auxiliary input #2, 4-20 mA, 24 VDC.
D.	Fault relay output. Dry contact. Interrupting capacity: 30 VDC - 250 VAC – 2A.
E.	Alarm #2 relay output. Dry contact. Interrupting capacity: 30 VDC - 250 VAC – 2A.
F.	Alarm #1 relay output. Dry contact. Interrupting capacity: 30 VDC - 250 VAC – 2A.
J.	24 VDC power supply.

Configuration

This procedure must be performed in a workshop, i.e., a non-hazardous area.

The data transmission speed of the Modbus serial connection is 9600 bauds, no parity.

Modifying the microswitches

In a mesh network, the *OLCT 80*'s wireless cards must be configured in *repeater* mode. Follow the steps below:

- Cut off power to the *OLCT 80* before modifying the position of the microswitches.
- Position the microswitches as shown below (Figure 48, A) **on the wireless card of each *OLCT 80***:

Switch No.	8	7	6	5	4	3	2	1
Position	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
								ON

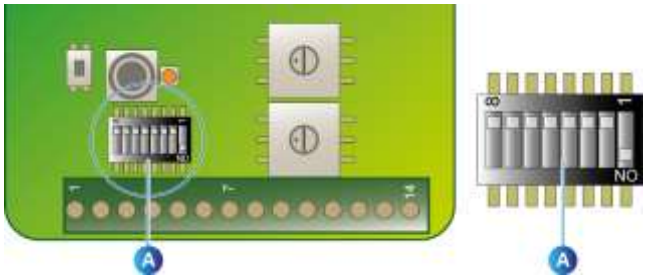

Figure 48: micro switch configuration on the *OLCT 80*.

- Position the microswitches as shown below (Figure 49, A) **after opening the cover of the *master* receiver**:

Switch No.	1	2	3	4	5	6	7	8
Position	ON							ON
		OFF	OFF	OFF	OFF	OFF	OFF	

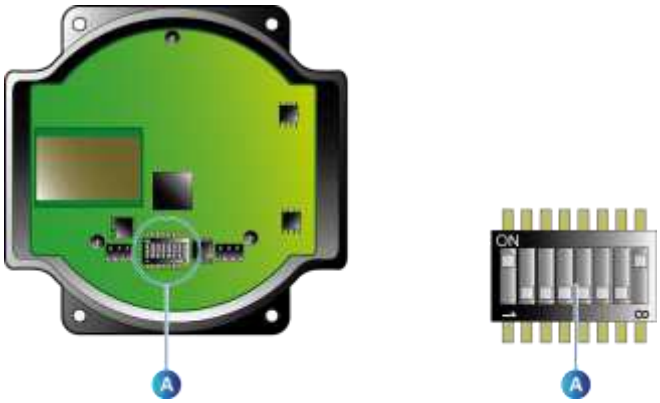

Figure 49: micro switch configuration on the *master* receiver.

Configuring the addresses

Configuring addresses on *OLCT 80s*

Each sensor (main sensor, *ANA1*, *ANA2*) will have its own address for communication with the *MX43* central controller according to the configuration of the controller (refer to the document entitled *MX43 Central Digital and Analog Measurement Unit - User Manual*).

Follow the steps below:

- Configure the addresses of the *OLCT 80* as indicated under *Serial connection configuration* on page 39.
- Calculate the address of the *OLCT 80's* internal wireless care by adding 50 to the slave number of the main sensor.

Example: one OLCT 80 transmitter with one ANA1 input used:
Address of the main sensor: 1.
Address of the ANA1 sensor: 2.
Address of the OLCT 80's internal wireless card: 51 (i.e., 50 + 1).

The @50 address is reserved for the master receiver.

Configuring the addresses of the OLCT 80's wireless cards

To configure the address of the *OLCT 80*'s wireless card, move the 10s-place switch (B) and the 1s-place switch (A) to the desired values (i.e., 51 in the case of the example above).

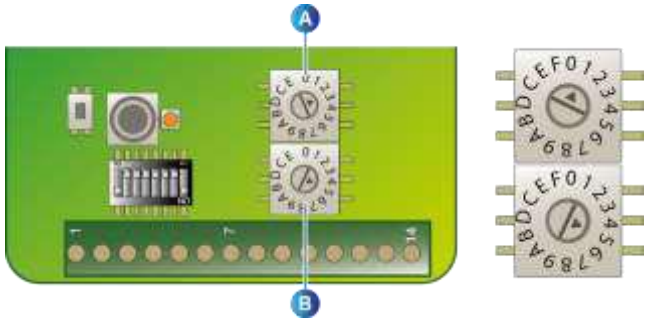

Figure 50: configuring the address of the wireless card.

Configuring the addresses on the *master* receiver

Selecting the address for the master receiver wireless cards

The *master* receiver's address must be set to @50.

Figure 51: configuring the *master* receiver's address to @50.

Start-up

Follow safety rules for opening explosion-proof equipment (hot-work permit, etc.) when powering and coupling the system.

Figure 52: buttons and indicator lights on the *master* receiver.

Follow the steps below:

1. Check that the addresses have been configured properly (rotary switches, *OLCT 80* wireless cards (Figure 50, A and B) and *master* receiver wireless cards (Figure 52, D).
2. Turn on power to the *OLCT 80s* and the *master receiver*.
3. **On the *master* receiver** (see: Figure 52: buttons and indicator lights on the *master* receiver.press three times fast on the button marked "E" in the figure.

   The two LEDs (B and F) blink on and off in red and the LCD screen (C) displays the words "*BINDING*" and " *MASTER*."
4. **On the *OLCT 80* wireless card** (see Figure 53: *OLCT 80* wireless card.press three times fast on the coupling button marked "A" in the figure.

   The LED (B) will change from red to green and then orange for 4 seconds before blinking 4 times to indicate that it has found the *master* receiver. Once the coupling code transmitted by the *master* receiver is received, the wireless card will automatically exit coupling mode.

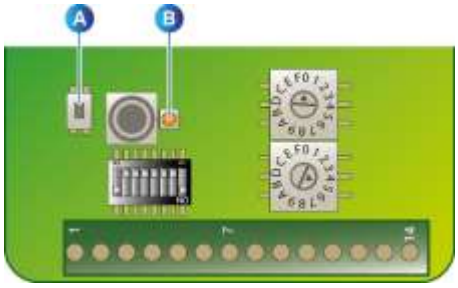

Figure 53: *OLCT 80* wireless card.

5. Repeat step 4 for each *OLCT 80*.
6. Once all of the wireless codes are coupled, leave coupling mode on the *master* receiver by pressing twice on the button marked "E" in Figure 52.

   In normal operating mode, the LED (Figure 53, B) of the *OLCT 80* 's wireless card blinks orange, while the LED (Figure 52, F) of the *master* receiver blinks red.
7. Close the housings

The *OLCT 80*s must be at least 2 meters away from the *master* receiver.

Chapter 6 | Operation

The operations explained in this section must be performed by authorized, qualified personnel because they could affect detection reliability.

Configuring the transmitter

Configure the sensor following the standard steps described in the table below:

Step	Description	See section	See page
1.	System date and time.	*Date and time*	22
2.	Main sensor.	*PG sensor*	26
3.	ANA1 sensor (if used).	*PG CH1*	27
4.	ANA2 sensor (if used).	*PG CH2*	30
5.	Settings for the main sensor's alarms.	*AL SENSOR*	31
6.	Settings for the #1 input alarms, ANA1 sensor.	*AL CH1*	32
7.	Settings for the #2 input alarms, ANA2 sensor.	*AL CH2*	34
8.	Conditions triggering the Rel1 relay.	*RELAIS 1*	35
9.	Conditions triggering the Rel2 relay.	*RELAIS 2*	37
10.	Conditions triggering the fault relay.	*RELAIS D*	37
11.	Configure the RS485 connection (if used).	PG SERIE	38
12.	Configure the LCD backlighting.	PG SERIE	38
13.	Change the code to access the configuration menus.	PG PASSW	41
14.	Zero and calibration gas test for the main sensor.	Cal sens.	45
15.	Calibration test for the ANA1 sensor (if used).	Cal CH1	48
16.	Calibration test for the ANA2 sensor (if used).	Cal CH2	48

Start-up

Preliminary inspection

Check the following:

- That wiring was performed correctly.
- That the detector housing is grounded.
- That the braided shield of the connection cable is connected to the ground of the central system.
- That the device is securely mounted (screws, cable gland, cover screwed on and locked).

Powering the detector

1. Block the central measuring controller or PLC to avoid accidentally triggering any alarms during the procedure.
2. Power the detector.
3. Once the reading has stabilized, switch the central controller to normal mode.

Stabilization time

After the device is mounted, it is important to allow the detector's temperature to stabilize. Also, once the detector is powered, certain sensors require additional pre-heating time If adjustments are made before the time indicated below has passed, readings may be incorrect, which could put people and goods in danger. Total wait time is summarized below:

- Combustible sensor: 2 hours
- Oxygen sensor: 1 hour
- Electrochemical sensor: 1 hour, except for:
  - NO (nitric oxide): 12 hours
  - HCl (hydrochloric acid): 24 hours
  - ETO (ethylene oxide): 36 hours
- Semiconductor sensor: 4 hours
- Infrared sensor (XPIR): 2 hours

Gas reading display

Normal display (no fault)

- The display indicates the concentration measured, the type of gas and the unit for the selected channels (*Channel Configuration* menu, on page **Erreur ! Signet non défini.**).
- The indicator light (⚡) blinks.

Figure 54: display under normal operating conditions.

Display in the event of a fault

- The display will read "8888" followed by a fault code.
- The *DEF* fault indicator light will illuminate. See page 111 for a list of error and fault codes.

Figure 55: display in the event of a fault.

Verification

This pertains to catalytic sensors if the *Verification* setting has been activated for the channel (see page 27 or 30).

- For safety reasons, when measuring a gas concentration above 100% LEL, the word "*sup*" will appear on the display and the fault and alarm indicator lights will illuminate. Meanwhile, the reading will be interrupted and the output signal will remain at 23.2 mA.
- To exit this mode (after verifying the absence of an explosive atmosphere using a portable explosimeter for instance), press *ENTER* on the *IR20* remote control. Once "*ACQUIT ?*" appears, press *ENTER* again. The alarm indicator lights will turn off and the alarm relays will switch to non-alarm positions.

Figure 56: detection of high LEL concentration.

Acknowledging an alarm

- For alarms configured for *Manual acknowledgment*, point the infrared remote control to the sensor reporting the alarm and press *ENTER*. The word "*ACQUIT ?*" will appear on the display. Press *ENTER* again to acknowledge the alarm. The alarm indicator lights will turn off and the alarm relays will switch to non-alarm positions if the measurement has fallen below/risen above the defined alarm threshold.
- The user can press *ESC* to leave the menu without acknowledging the alarm(s).

Figure 57: press *ENTER* on the reading to acknowledge an alarm.

Figure 58: alarm acknowledgment diagram.

Zeroing

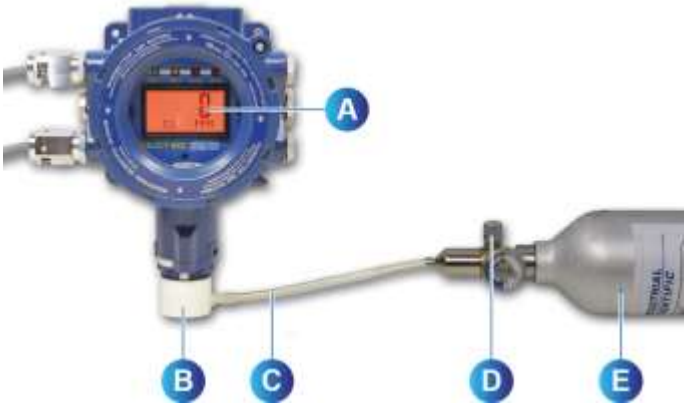

Figure 59: zero test.

1. Go to the *Test* menu using the IR20 remote control. The relays will be blocked for 5 minutes.
2. Place the calibration hood over the detector head (Figure 59, B).
3. Connect the calibration hood to the bottle of clear air (Figure 59, E) using a piece of flexible tubing (Figure 59, C).
4. Open the valve on the bottle of clear air (flow rate of 30-60 l/h or 60-120 l/h for OLCT IR versions) (Figure 59, D).
5. After the reading has stabilized (after about 2 minutes) read the detector's display (Figure 59, A).
6. If the value does not fall within the proper range, follow the calibration procedure (*Zeroing and adjusting sensitivity*, on page 80).
7. Continue to the instructions under *Gas sensitivity test* below.

Gas sensitivity test

1. Once the zero test has been performed, connect the calibration hood to the calibration gas bottle (Figure 59, E) using a piece of flexible tubing (Figure 59, C).
2. Open the valve (Figure 59, D) on the calibration gas bottle (flow rate of 30-60 l/h or 60-120 l/h for OLCT IR versions).
3. Once the reading has stabilized (after about 2 minutes), view the display.
4. If the value does not fall within the proper range, follow the calibration procedure (*Zeroing and adjusting sensitivity*, on page 80).
5. Close the bottle's valve (Figure 59, D) and remove the calibration hood (Figure 59, B). Wait until the measurement reading returns to zero and leave the *Test* menu by pressing *ESC* on the IR20 remote control. This completes the zero and gas sensitivity test procedure. The detector may now be used.

Chapter 7 | Pre-installation Hardware Configuration

These steps only need to be followed if one or both of the 4-20 mA inputs (*ANA1/ANA2* sensor inputs) is used.

This procedure must be performed by qualified, licensed personnel. Since transmitters are factory configured, there is no need to adjust these settings unless the configuration changes.

Since solder joints need to be created, this procedure must be performed in a workshop with a non-explosive atmosphere.

The *OLCT 80* must be disconnected from power during the soldering procedure.

Purpose

This procedure is used to configure the connections on the printed circuit board for 2 auxiliary inputs (*In1* and/or *In2*) depending on the type of sensor to be connected (*4-20 mA* with 2, 3 or 4 wires).

Access the internal printed circuit board

Remove the display circuit board as follows:

- Open the housing in a non-hazardous zone.
- Remove the 4 screws used to secure the display circuit board. Remove the circuit board. The flat connection cable and the lower printed circuit board can remain in place.
- The lower printed circuit board is now accessible.

Locate the solder pads

There are 3 solder pads (Figure 35) for each auxiliary input:

- *In 1* input: pads PPS1, PPS2 and PPS7 (A and B in the figure).
- *In 2* input: pads PPS3, PPS4 and PPS8 (A and B in the figure).

Configuration principle

The *ANA1/ANA2* sensors are each configured by creating a solder joint.

- Item C in the figure: no solder joint created.
- Item D in the figure: solder joint formed.

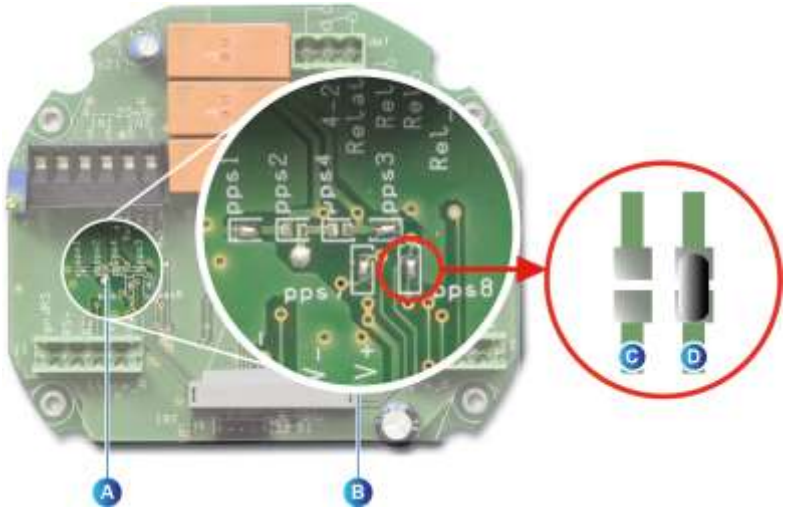

Figure 60: example of a solder pad with and without a solder joint.

Configuring the auxiliary inputs to connect a 2-wire 4-20mA sensor

- *In 1* input used: apply a solder joint to PPS2 and PPS7, remove PPS1.
- *In 2* input used: apply a solder joint to PPS4 and PPS8, remove PPS3.

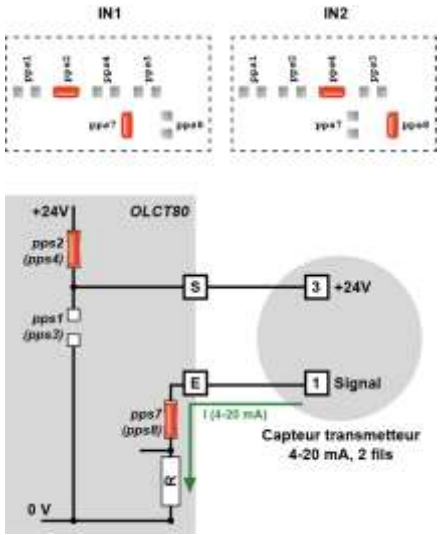

Figure 61: auxiliary input configuration for a 2-wire 4-20mA sensor.

Configuring the auxiliary inputs to connect a 3-wire 4-20mA sensor

- *In 1* input used: apply a solder joint to PPS2 and PPS7, remove PPS1.
- *In 2* input used: apply a solder joint to PPS4 and PPS8, remove PPS3.

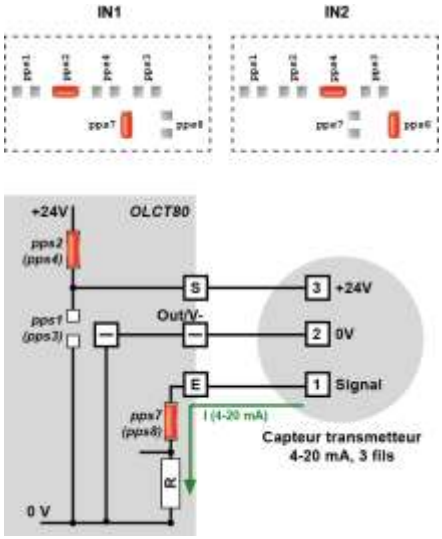

Figure 62: auxiliary input configuration for a 3-wire 4-20mA sensor.

Configuring the auxiliary inputs to connect a 4-wire 4-20mA sensor

- *In 1* input used: apply a solder joint to PPS1 and PPS7, remove PPS2.
- *In 2* input used: apply a solder joint to PPS3 and PPS8, remove PPS4.

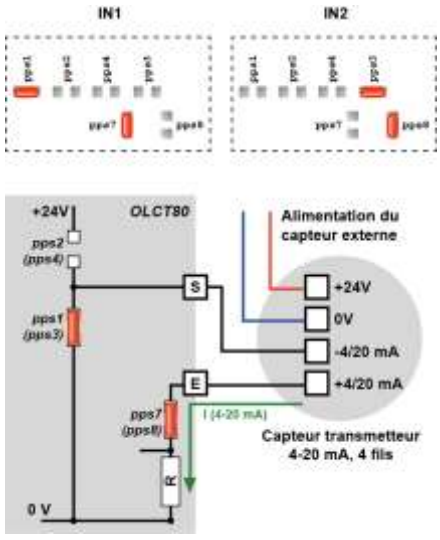

Figure 63: auxiliary input configuration for a 4-wire 4-20mA sensor.

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Chapter 8 | Preventative Maintenance

Periodic inspections ensure that the equipment and system is functioning properly and providing reliable detection services. The section describes the preventative maintenance procedures required and how often they are to be performed. Inspection and maintenance must be carried out in accordance with the current editions of EN60079-17 and eventually with any local or national additional requirements that may apply in the country of installation.

Maintenance frequency

Gas detectors are safety devices. Oldham recommends regular testing of fixed gas detection installations. This type of test involves injecting a standard gas of sufficient concentration into the detector to trigger pre-set alarms. This test does not, in any event, replace a full calibration of the detector.

Frequency of gas testing depends on the industrial application in which the detector is used. Inspection should occur frequently during the months following installation start-up; later it may be spaced out if no significant problem is observed. If a detector does not react upon contact with gas, it must be calibrated. Calibration frequency will depend on the results of these tests (moisture, temperature, dust, etc.); however, the device should be calibrated at least once per year.

The site manager is responsible for implementing the safety procedures at the site. Oldham is not responsible for implementing safety procedures.

OLCT 80

Periodic maintenance involves the following steps:

- Remove dust from the sensor's protective housing, using a dry cloth only. Do not use water or any type of solvent.
- When using the equipment in dusty explosive atmospheres, the equipment should be thoroughly cleaned on a regular basis to prevent the build-up of dust. If a layer of dust does build up on the detector, this layer may not exceed 5 mm.
- Replace the screws: use high-quality screws > A4.70.
- Perform the zero test with clean air: follow the steps described under *Sensor calibration* on page 45 in the event of deviation.
- Perform the gas sensitivity test: follow the steps described under *Sensor calibration* on page 45 in the event of deviation.

Chapter 9 | Maintenance

Maintenance mainly involves replacing any sensors that no longer meet their original metrological specifications.

The operations explained in this section must be performed by authorized, qualified personnel because they could affect detection reliability. Inspection and maintenance must be carried out in accordance with the current editions of EN60079-17 and eventually with any local or national additional requirements that may apply in the country of installation.

Possible transmitter errors

The table below lists various potential detector errors.

Fault observed	Possible cause	Action	Page
0 mA line current	Connection cable	Check the cable.	-
	Power supply	Check the voltage at the transmitter's terminals (see *Alim V* under the *Maintenance* menu).	42
	Electronic board	Replace the board.	-
Line current > 0 mA and < 1mA	Sensor	Replace the sensor (see *Sensor Replacement* menu).	47 and 80
	Line resistance too high	Check the cable.	
	Power supply	Check the voltage at the transmitter's terminals (see *Alim V* under the *Maintenance* menu).	42
	Improper calibration gas	Check the concentration of the calibration gas	-
		Check the input value (see *Calibration gas* under *Sensor Replacement* menu)	45
Zeroing not possible	Sensor	Replace the sensor (see *Sensor Replacement* menu).	47 and 80
Sensitivity adjustment impossible	Sensor	Replace the sensor (see *Sensor Replacement* menu).	47 and 80
"*SUP*" displayed	Verification required	Acknowledge verification.	71

Replacing the sensor cell

(combustible, oxygen, toxic and XPIR sensors)

A defective sensor should only be replaced using an identical sensor (same gas, same range).

Replacement frequency

The sensor back needs to be replaced any time it is not possible to perform zeroing, gas calibration or preventative calibration.

Replacing the sensor

Step	Action
1.	Gather the following items: ■ New sensor pack. ■ 4- and 5-mm hex key. ■ Calibration kit (bottle, hood, etc.).
2.	Block the transmission of alarms within the central system.
3.	Disconnect the *OLCT 80* from its power source.
4.	Unscrew the locking screw from the detector head and rotate the detector head 30° counter-clockwise.
5.	Unplug the connector and remove the defective detector head.
6.	Replace the used detector head with an identical new one.
7.	Reverse the procedure to reassemble the device; insert and tighten the locking screw.
8.	Restore the signal from the *OLCT 80* to the central system.
9.	Reset the *OLCT 80*'s wear rate to zero as described under *Sensor replacement* on page 47.
10.	Perform a gas sensitivity test as explained on page 72.

Zeroing and adjusting sensitivity (calibration)

Refer to the instructions under *Sensor calibration* on page 45.

Cross gas factors for combustible gases

Poison resistant catalytic sensor, type 4F

Gas	Methane	Pentane	Hydrogen
Acetone	1.80	0.90	
Acetylene	1.40	0.70	
Ammonia	1.00	0.50	
Benzene	2.10	1.05	
n-Butane	1.80	0.90	
Ethane	1.40	0.70	
Ethanol	1.60	0.80	
Ethylene	1.40	0.70	
n-Hexane	2.85	1.40	
Hydrogen			1.00
Isopropanol	1.80	0.90	
JP-4	3.00	1.50	
JP-5	3.10	1.55	
JP-8	3.20	1.60	
Methane	1.00		
Methanol	1.35	0.65	
n-Pentane	2.00	1.00	

Gas	Methane	Pentane	Hydrogen
Propane	1.60	0.80	
Styrene	2.40	1.20	
Toluene	2.50	1.25	
Xylene	2.40	1.20	

Table 2: calibration coefficients for 4F-type combustible sensors

Gas	*Molecular formula*	*LEL* *(% v/v)*	*UEL* *(% v/v)*	CH4 coef.	H2 coef.	C4H10 coef.	C5H12 coef.
Ethyl acetate	$C_4H_8O_2$	2.10	11.50	1.65		0.90	0.80
Acetone	C_3H_6O	2.15	13.00	1.65		0.90	0.80
Acetylene	C_2H_2	2.30	100	2.35	1.90	1.25	1.15
Acrylic acid	$C_3H_4O_2$	2.40	8.00	5.00		2.65	2.40
Butyl acrylate	$C_7H_{12}O_2$	1.20	8.00	3.50		1.85	1.70
Ethyl acrylate	$C_5H_8O_2$	1.70	13.00	3.05		1.65	1.50
Acrylonitrile	C_3H_3N	2.80	28.00	1.45	1.20	0.80	0.70
Ammonia	NH_3	15.00	30.20	0.90	0.75	0.50	0.45
Benzene	C_6H_6	1.20	8.00	4.00		2.15	1.90
1,3-butadiene	C_4H_6	1.40	16.30	2.55		1.35	1.25
Butane	C_4H_{10}	1.50	8.50	1.90		1.00	0.90
Butanol (butyl alcohol)	$C_4H_{10}O$	1.4	11.3	1.95		1.05	0.95
2-butanone (MEK)	C_4H_8O	1.80	11.50	3.90		2.10	1.90
Cyclohexane	C_6H_{12}	1.20	8.30	2.00		1.10	1.00
Dimethylether	C_2H_6O	3.00	27.00	1.80		0.95	0.90
Dodecane	$C_{12}H_{26}$	0.60	~6.0	4.00		2.15	1.90
Ethane	C_2H_6	3.00	15.50	1.50		0.80	0.75
Ethanol	C_2H_6O	3.30	19.00	2.15	1.75	1.15	1.05
Ether (diethylether)	$(C_2H_5)_2O$	1.70	36.00	1.90		1.00	0.90
Ethylene	C_2H_4	2.70	34.00	1.65	1.35	0.90	0.80
G.P.L.[2]	Prop+But	1.65	~9.0	1.9		1.00	0.90
Diesel	mixture	0.60	~6.0	3.20		1.70	1.55
Natural gas	CH_4	5.00	15.00	1.05		0.60	0.50
Heptane [4]	C_7H_{16}	1.10	6.70%	2.20		1.20	1.05
Hexane [4]	C_6H_{14}	1.20	7.40	2.10		1.15	1.00
Hydrogen	H_2	4.00	75.60		1.00		
Isobutane	C_4H_{10}	1.50	8.40	1.50		0.80	0.75
Isobutylene	C_4H_8	1.60	10.00	2.20		1.20	1.05
Isopropanol	C_3H_8O	2.15	13.50	1.60		0.85	0.80
Kerosene (JP-4)	C_{10}-C_{16}	0.70	5.00	5.00		2.65	2.40
Methyl methacrylate	$C_5H_8O_2$	2.10	12.50	2.25		1.20	1.10
Methane	CH_4	5.00	15.00	1.00			
Methanol (methyl alcohol)	CH_3OH	5.50	44.00	1.40	1.15	0.75	0.70
Naphtha	mixture	0.90	5.90%	3.50		1.85	1.70
Nonane	C_9H_{20}	0.70	5.60	4.40		2.35	2.10

Gas	*Molecular formula*	*LEL* *(% v/v)*	*UEL* *(% v/v)*	CH4 coef.	H2 coef.	C4H10 coef.	C5H12 coef.
Octane	C_8H_{18}	1.00	6.00	2.70		1.45	1.30
Ethylene oxide (epoxyethane)	C_2H_4O	2.60	100	2.10	1.70	1.15	1.00
Propylene oxide (epoxypropane)	C_3H_6O	1.90	37.00	2.35	1.90	1.25	1.15
Pentane	C_5H_{12}	1.40	8.00	2.10		1.15	1.00
Propane	C_3H_8	2.00	9.5	1.55		0.85	0.75
Propylene	C_3H_6	2.00	11.70	1.65		0.90	0.80
Styrene (vinyl benzene)	C_8H_8	1.1	8.00	6.30		3.35	3.00
Premium unleaded gasoline (95)	-	1.10	~6.0	1.80		0.95	0.90
Toluene	C_7H_8	1.20	7	4.00		2.15	1.90
Turpentine oil	-	0.8	6.0	3.50		1.85	1.70
Triethylamine	$C_6H_{15}N$	1.20	8	2.05		1.10	1.00
White spirit	mixture	1.10	6.50	3.50		1.85	1.70
Xylene	C_8H_{10}	1.00	7.60	4.00		2.15	1.90

Items in gray: recommended gas for calibrating the detector.

Table 3: calibration coefficients for standard catalytic sensors (VQ1)

Example

Calibration of an “acetone” detector using a calibration gas with 1% butane
Value to be displayed:

$$\frac{1\%\ \text{(injected butane)}}{1.5\%\ \text{(butane LEL)}} \times 100 \times 0.90\ \text{(butane/acetone coefficient)} = 60\%\ \text{LEL}$$

Note:

- LELs vary according to the source.
- Coefficients are accurate to ± 15%.

Maintaining the remote control

Replacing the batteries

The two AA batteries (1.5 V) in the device need to be replaced if transmission quality decreases. In this case, remove the remote control (1) from its case (2), remove the cover from the battery compartment (4) and replace the old batteries (3) with two new identical batteries. Replace the cover (4), insert and tighten the screws, and put the remote control (1) back into its case (2).

Figure 64: installing new AA batteries (1.5 V).

Chapter 10 | Accessories

Accessory	Use	Illustration	Code
Tool kit	Tool kit for maintenance.		6147870 6145856
Gas injection pipe	Inject the calibration gas onto the measurement sensor. Impact on reading: measurement similar to measurement in diffusion mode. Impact on response time: none.		6331141 ⚠ Plastic material. Risk of electrostatic charges. Wipe with a damp cloth
Gas flow head	Used to take bypass readings. Impact on reading: none if calibration is performed under the same conditions (pipe, flow rate). Impact on response time: none.		6327910 ⚠ Plastic material. Risk of electrostatic charges. Wipe with a damp cloth
Splash guard	Protects the detector from liquids. Impact on reading: none. Impact on response time: response time in diffusion mode may increase for certain gases; contact us for more information.		6329004 ⚠ Plastic material. Risk of electrostatic charges. Wipe with a damp cloth
Splash guard in Stainless Steel	Protects the detector from liquids. Impact on reading: none. Impact on response time: response time in diffusion mode may increase for certain gases; contact us for more information.		6129010
Splash guard (high risk)	Protects the detector from liquids. Impact on reading: none. Impact on response time: response time may increase for certain gases; contact us for more information.		6329014 ⚠ Plastic material. Risk of electrostatic charges. Wipe with a damp cloth
Remote gas injection head	Used to detect ambient gases while a calibration gas injection pipe is being used. Only for combustible gases, Impact on reading: none. Impact on response time: negligible.		6327911 ⚠ Plastic material. Risk of electrostatic charges. Wipe with a damp cloth
Removable PTFE protection filter	Protects the gas inlet from liquids and dust. Impact on reading: none, but this part cannot be used for the detection of O3, HCL, HF and CL2. Impact on response time: response time may increase for certain gases; contact us for more information.		6335975 ⚠ Plastic material. Risk of electrostatic charges. Wipe with a damp cloth

Accessory	Use	Illustration	Code
Ceiling gas collector	Allows the sensor to detect gases more quickly. (ceiling-mounted) Impact on reading: none. Impact on response time: may increase by 10%.		6331168
Weather guard	Protects outdoor-mounted detectors. Impact on reading: none. Impact on response time: negligible.		6123716
IR20 remote control	Used to configure and maintain the OLCT 80.		6327878

Chapter 11 | Replacement Parts

All replacement parts must be Oldham-manufactured parts. The use of non-Oldham parts could jeopardize the instrument's safety.

Accessories for the OLCT 80

Part number	Description
6 343 490	M25 cable grand kit for armored cable
6 343 489	M20 cable grand kit for armored cable
6 343 492	M25 stainless steel cap kit
6 343 491	M20 stainless steel cap kit
6 111 147	IR20 remote control battery

Flameproof approved replacement sensors

Part number	Description
6 313 685	OLCT 80 sensor pack, 0-100% LEL, type VQ1
6 313 872	OLCT 80 sensor pack, 0-100% LEL, butadiene/acetylene, type VQ1
6 313 974	OLCT 80 poison control sensor pack, 0-100% LEL, type 4F
6 313 687	OLCT 80 sensor pack, 0-100% vol. CH_4
6 313 986	OLCT 80 sensor pack, 0-100% vol. SF_6
6 313 203	OLCT 80 sensor pack, 0-100% vol. H_2
6 314 100	Infrared sensor pack, 0-5% vol. CO_2, for OLCT 80 XP IR
6 314 101	Infrared sensor pack, 0-10% vol. CO_2, for OLCT 80 XP IR
6 314 146	Infrared sensor pack, 0-100% vol. CO_2, for OLCT 80 XP IR
6 313 710	OLCT 80 O_2 sensor pack, 0 - 30% vol.
6 313 707	OLCT 80 NH_3 sensor pack, 0-100 ppm
6 313 708	OLCT 80 NH_3 sensor pack, 0-1000 ppm
6 313 894	OLCT 80 NH_3 sensor pack, 0-5000 ppm
6 313 690	OLCT 80 CO sensor pack, 0-100 ppm
6 313 691	OLCT 80 CO sensor pack, 0-300 ppm
6 313 692	OLCT 80 CO sensor pack, 0-1000 ppm
6 313 693	OLCT 80 CO sensor pack, 0-1000 ppm compensated H2
6 313 695	OLCT 80 H_2S sensor pack, 0-30 ppm
6 313 965	OLCT 80 H_2S sensor pack, 0-30 ppm, no HC interference
6 313 696	OLCT 80 H_2S sensor pack, 0-100 ppm
6 313 697	OLCT 80 H_2S sensor pack, 0-1000 ppm
6 313 698	OLCT 80 sensor pack, 0-100 ppm NO
6 313 699	OLCT 80 sensor pack, 0-300 ppm NO

Part number	Description
6 313 700	OLCT 80 sensor pack, 0-1000 ppm NO
6 313 706	OLCT 80 sensor pack, 0-2000 ppm H_2
6 313 772	OLCT 80 explosion-proof methylene/methylene chloride sensor pack
6 313 773	OLCT 80 explosion-proof sensor pack, R12
6 313 774	OLCT 80 explosion-proof sensor pack, R134a
6 313 775	OLCT 80 explosion-proof sensor pack, MOS

Intrinsically-safe approved replacement sensors

Part number	Description
6 313 748	OLCT 80 intrinsically-safe O_2 sensor pack, 0 - 30% vol.
6 313 728	OLCT 80 intrinsically-safe NH_3 sensor pack, 0-100 ppm
6 313 729	OLCT 80 intrinsically-safe NH_3 sensor pack, 0-1000 ppm
6 313 895	OLCT 80 intrinsically-safe NH_3 sensor pack, 0-5000 ppm
6 313 694	OLCT 80 intrinsically-safe CO sensor pack, 0-1000 ppm compensated H_2
6 313 711	OLCT 80 intrinsically-safe CO sensor pack, 0-100 ppm
6 313 712	OLCT 80 intrinsically-safe CO sensor pack, 0-300 ppm
6 313 713	OLCT 80 intrinsically-safe CO sensor pack, 0-1000 ppm
6 313 716	OLCT 80 intrinsically-safe H_2S sensor pack, 0-30 ppm
6 313 717	OLCT 80 intrinsically-safe H_2S sensor pack, 0-100 ppm
6 313 718	OLCT 80 intrinsically-safe H_2S sensor pack, 0-1000 ppm
6 313 719	OLCT 80 intrinsically-safe NO sensor pack, 0-100 ppm
6 313 720	OLCT 80 intrinsically-safe NO sensor pack, 0-300 ppm
6 313 721	OLCT 80 intrinsically-safe NO sensor pack, 0-1000 ppm
6 313 722	OLCT 80 intrinsically-safe NO_2 sensor pack, 0-10 ppm
6 313 723	OLCT 80 intrinsically-safe NO_2 sensor pack, 0-30 ppm
6 313 727	OLCT 80 intrinsically-safe H_2 sensor pack, 0-2000 ppm
6 313 730	OLCT 80 intrinsically-safe HCl sensor pack, 0-30 ppm
6 313 731	OLCT 80 intrinsically-safe HCl sensor pack, 0-100 ppm
6 313 724	OLCT 80 intrinsically-safe SO_2 sensor pack, 0-10 ppm
6 313 725	OLCT 80 intrinsically-safe SO_2 sensor pack, 0-30 ppm
6 313 726	OLCT 80 intrinsically-safe SO_2 sensor pack, 0-100 ppm
6 313 734	OLCT 80 intrinsically-safe Cl_2 sensor pack, 0-10 ppm
6 313 746	OLCT 80 intrinsically-safe ETO sensor pack, 0-50 ppm
6 313 732	OLCT 80 intrinsically-safe HCN sensor pack, 0-10 ppm
6 313 733	OLCT 80 intrinsically-safe HCN sensor pack, 0-30 ppm
6 313 736	OLCT 80 intrinsically-safe $COCl_2$ sensor pack, 0-1 ppm
6 313 740	OLCT 80 intrinsically-safe ClO_2 sensor pack, 0-3 ppm
6 313 735	OLCT 80 intrinsically-safe O_3 sensor pack, 0-1 ppm
6 313 737	OLCT 80 intrinsically-safe PH_3 sensor pack, 0-1 ppm
6 313 739	OLCT 80 intrinsically-safe HF sensor pack, 0-10 ppm
6 313 738	OLCT 80 intrinsically-safe AsH_3 sensor pack, 0-1 ppm
6 313 747	OLCT 80 intrinsically-safe SiH_4 sensor pack, 0-50 ppm

Chapter 12 | EU Declarations of Conformity

The following pages represent copies of the EU declarations of conformity for the following devices related to the *OLCT 80* detector:

- *OLCT 80* without antenna
- *OLCT 80* with antenna
- *IR 20* remote control

OLDHAM

Déclaration UE de Conformité
EU Declaration of Conformity

CE

La société **Oldham S.A.S.**, Z.I. Est, 62000 Arras France, atteste que les
Oldham S.A.S. company, *Z.I. Est, 62000 Arras France, declares that*

Détecteur de gaz *(Gas Detector)* OLCT 80 sans antenne *(without antenna)*

est conforme aux exigences des Directives Européennes suivantes:
complies with the requirements of the following European Directives:

I) Directive Européenne ATEX 2014/34/UE du 26/02/14: **Atmosphères Explosives**
European Directive ATEX 2014/34/UE dated from 26/02/14: Explosive Atmospheres

Normes harmonisées appliquées : *Harmonised applied Standards*	EN 60079-0:12/A11:13 EN 60079-1:14 ('d') EN 60079-11:12 ('i') EN 60079-31:14 ('t')	Protection du matériel-règles générales *Equipment protection-general requirements*

Attestation CE de Type du matériel :
EC type examination certificate — **INERIS 03 ATEX 0240X**

Catégorie *(category)* / Marquage *(marking)* :

OLCT 80 d (avec cellule intégrée)
(with on board sensor)
Ex II 2 GD
Ex db IIC T6…T5 Gb / Ex tb IIIC T85°C…T100°C Db
(-20°C<Ta<+60°C)

OLCT 80 D d (avec cellule déportée)
(with remote sensor)

sur le transmetteur
(on the transmitter)
Ex II 2 GD
Ex db IIC T6…T5 Gb / Ex tb IIIC T85°C…T100°C Db
(-20°C<Ta<+60°C)

sur la cellule déportée
(on the remote sensor)
Ex II 2 GD
Ex db IIC T6 Gb / Ex tb IIIC T85°C Db
(-20°C<Ta<+70°C)

OLCT 80 id (avec cellule intégrée)
(with on board sensor)
Ex II 2 GD
Ex db [ia Ga] ia IIC T4 Gb / Ex tb [ia Da] ia IIIC T135°C Db
(-20°C<Ta<+60°C)

OLCT 80 D id (avec cellule déportée)
(with remote sensor)

sur le transmetteur
(on the transmitter)
Ex II 2 (1) GD
Ex db [ia Ga] IIC T4 Gb / Ex tb [ia Da] IIIC T135°C Db
(-20°C<Ta<+60°C)

sur la cellule déportée
(on the remote sensor)
Ex II 1 GD
Ex ia IIC T4 Ga / Ex ia IIIC T135°C Da
(-20°C<Ta<+70°C)

UE_ATEX_OLCT80_revB

OLDHAM

Déclaration de Conformité UE
EU Declaration of Conformity

CE

Notification Assurance Qualité de Production :
Notification of the Production QA

INERIS 00 ATEX Q403

Délivré par l'Organisme notifié numéro 0080 :
Issued by the Notified Body n°0080

INERIS, Parc Alata
60550 Verneuil en Halatte France

II) Directive Européenne CEM 2014/30/UE du 26/02/14: Compatibilité Electromagnétique
European Directive EMC 2014/30/UE dated from 26/02/14: Electromagnetic Compatibility

Normes harmonisées appliquées : EN 50270:15 for type 2
Harmonised applied Standard

CEM-Appareils de détection de gaz
EMC- apparatus for the detection of gases

Arras, le 11/12/2017 (December 11th, 2017)

Oldham S.A.S.
Z.I. EST – C.S. 20417
62027 ARRAS Cedex – FRANCE
www.oldhamgas.com

Michel Spellemaeker
Product Manager

UE_ATEX_OLCT80_rev8

OLDHAM

Déclaration UE de Conformité
EU Declaration of Conformity

CE

La société **Oldham S.A.S.**, Z.I. Est, 62000 Arras France, atteste que les
Oldham S.A.S. company, *Z.I. Est, 62000 Arras France, declares that*

Détecteur de gaz *(Gas Detector)* OLCT 80 avec antenne *(with antenna)*

est conforme aux exigences des Directives Européennes suivantes
complies with the requirements of the following European Directives

I) Directive Européenne ATEX 2014/34/UE du 26/02/14: Atmosphères Explosives
European Directive ATEX 2014/34/UE dated from 26/02/14: Explosive Atmospheres

Normes harmonisées appliquées : *Harmonised applied Standards*	EN 60079-0:12/A11:13 EN 60079-1:14 ('d') EN 60079-11:12 ('i') EN 60079-31:14 ('t')	Protection du matériel-règles générales *Equipment protection-general requirements*

Attestation CE de Type du matériel :
EC type examination certificate — **INERIS 03 ATEX 0240X**

Catégorie *(category)* / Marquage *(marking)* :

OLCT 80 W d (avec cellule intégrée)
(with on board sensor)
Ex II 2 G
Ex db IIB T5 Gb
(-20°C<Ta<+60°C)

OLCT 80 WD d (avec cellule déportée)
(with remote sensor)

sur le transmetteur
(on the transmitter)
Ex II 2 G
Ex db IIB T5 Gb
(-20°C<Ta<+60°C)

sur la cellule déportée
(on the remote sensor)
Ex II 2 GD
Ex db IIC T6 Gb / Ex tb IIIC T85°C Db
(-20°C<Ta<+70°C)

OLCT 80 W id (avec cellule intégrée)
(with on board sensor)
Ex II 2 G
Ex db [ia Ga] ia IIB T4 Gb
(-20°C<Ta<+60°C)

OLCT 80 WD id (avec cellule déportée)
(with remote sensor)

sur le transmetteur
(on the transmitter)
Ex II 2 (1) G **Ex db [ia IIC Ga] IIB T4 Gb**
Ex II (1) D **[Ex ia IIIC Da]**
(-20°C<Ta<+60°C)

sur la cellule déportée
(on the remote sensor)
Ex II 1 GD
Ex ia IIC T4 Ga / Ex ia IIIC T135°C Da
(-20°C<Ta<+70°C)

UE_ATEX_OLCT80W_revB

OLDHAM

Déclaration UE de Conformité
EU Declaration of Conformity

CE

Notification Assurance Qualité de Production : **INERIS 00 ATEX Q403**
Notification of the Production QA

Délivré par l'Organisme notifié numéro 0080 : **INERIS,** Parc Alata
Issued by the Notified Body n°0080 60550 Verneuil en Halatte France

II) Directive Européenne CEM 2014/30/UE du 26/02/14: Compatibilité Electromagnétique
European Directive EMC 2014/30/UE dated from 26/02/14: Electromagnetic Compatibility

Normes harmonisées appliquées : EN 50270:15 for type 2 CEM-Appareils de détection de gaz
Harmonised applied Standard *EMC- apparatus for the detection of gases*

Arras, le 11/12/2017 (December 11th, 2017)

Oldham S.A.S.
Z.I. EST – C.S. 20417
62027 ARRAS Cedex – FRANCE
www.oldhamgas.com

Michel Spellemaeker
Product Manager

UE_ATEX_OLCT80W_revB

OLDHAM

Déclaration UE de Conformité
EU Declaration of Conformity

CE

La société **Oldham S.A.S.**, Z.I. Est, 62000 Arras France, atteste que:
Oldham S.A.S. company, *Z.I. Est, 62000 Arras France, declares that:*

Télécommande *(remote controler)* IR20

est conforme aux exigences des Directives Européennes suivantes:
complies with the requirements of the following European Directives:

I) Directive Européenne ATEX 2014/34/UE du 26/02/14**: Atmosphères Explosives**
The European Directive ATEX 2014/34/UE dated from 26/02/14: Explosive Atmospheres

Normes appliquées :
Applied standards

EN 50014:97 Protection du matériel-règles générales
Equipment protection-general requirements
EN 50284 (1G) / EN 50020:02 (i)

Note: l'équipement n'est pas impacté par les modifications majeures des versions harmonisées EN 60079-0:2012/A11:2013 et EN 60079-11:2012
(the equipment is not impacted by the major changes of EN 60079-0:2012/A11:2013 and EN 60079-11:2012 harmonized versions)

Télécommande (*remote control*) **IR 20** — Ex **II 2 G EEx ia IIC T4**

Attestation CE de Type du matériel
EC type examination certificate — **INERIS 04 ATEX 0011X**

Notification Assurance Qualité de Production
Notification of the Production QA — **INERIS 00 ATEX Q403**

Délivrées par l'Organisme Notifié sous le numéro 0080
Issued by the Notified Body n°0080 — **INERIS,** Parc Alata 60550 Verneuil en Halatte France

II) Directive Européenne CEM 2014/30/UE du 26/02/14: **Compatibilité Electromagnétique**
The European Directive EMC 2014/30/UE dated from 26/02/14: Electromagnetic Compatibility

Norme appliquée:
Applied standard

EN 50270:06 for type2
CEM-Appareils de détection des gaz
EMC- apparatus for the detection of gases

Arras, le 11/12/2017 (December 11th, 2017)

Oldham S.A.S.
Z.I. EST – C.S. 20417
62027 ARRAS Cedex – FRANCE
www.oldhamgas.com

Michel Spellemacker
Product Manager

UE_ATEX_IR20_revB

Chapter 13 | Technical Specifications

Dimensions

Figure 23: dimensions.

Metrological characteristics

Complete detector

Function:	Transmitter with 1-3 sensors.
Gas detected, detection method and measurement range:	Depends on the sensor pack connected. See the section on *Sensors*.

Display:	■ 4-digit backlit LCD screen. ■ Displays reading, gas type, unit, faults and menus. ■ Green indicator light: power. ■ Red indicator light: fault or maintenance. ■ Red indicator lights (2): alarm #1 or alarm #2.
Alarms:	■ 2 independent alarm levels per channel. ■ Fault alarm. ■ Relays: 3 independent relays (alarm #1, alarm #2, fault). RCT dry contact output. Interrupting capacity: 30 VDC - 250 VAC – 2A.
Local sensor pack:	■ Precalibrated. ■ Either catalytic, electrochemical, infrared (IR) or semiconductor-type.
Power supply at detector terminals:	■ 16-28 VDC (catalytic, infrared and semiconductor sensors). ■ 12-30 VDC (electrochemical sensors).
Average power consumption by sensor pack type:	■ Catalytic: 140 mA. ■ Electrochemical: 80 mA. ■ XPIR infrared: 120 mA.
Max. power :	*With digital link* ■ 0.2 W (electrochemical sensor). ■ 1.3 W (catalytic or semiconductor sensor). ■ 5.3 W (infrared sensor). *With 25 mA output current* ■ 0.9 W (electrochemical sensor). ■ 2 W (catalytic or semiconductor sensor). ■ 6 W (infrared sensor). *With 25 mA output current and relays activated* ■ 2.4 W (electrochemical sensor). ■ 3.5 W (catalytic or semiconductor sensor). ■ 7.5 W (infrared sensor).
Input current (signal):	■ 2 independent 4-20 mA inputs. ■ 120 Ω load resistance.
Output current (signal):	■ Source of coded current from 0-25 mA (non-isolated). ■ Linear 4-20 mA current reserved for reading. ■ Electronic fault or power failure: 0 mA. ■ Fault: <1 mA. ■ Maintenance mode: 2 mA. ■ Out of range: current greater than 23 mA. ■ Verification: 23 mA.
Maximum load resistance (4-20 mA output):	500 Ω.
RS485 output (signal):	Modbus.

Cable inlet:	■ 4 x M20 and 2 x M25. ■ 3 on top (2 x M20 and 1 x M25) (option available).
Connection cable:	*4-20 mA connection* Shielded cable with 3 active wires between detector and central controller. *RS485 connection* Shielded cable with 4 active wires between detector and central controller (2 wires for power and 1 twisted pair for RS485 Communication).

Electromagnetic compatibility:	Compliant with EN50270:2015 – Type 2
Degree of protection:	IP66
ATEX certification:	■ Depend on version (see page 105).Certificate INERIS 03 ATEX 0240X
NEPSI certification:	■ Conforms to BG 3836.1.2010, GB 3836.2-2010 for OLCT 80d and OLCT 80 D d. Certificate NEPSI GYJ17.1201X ■ Conforms to BG 3836.1.2010, GB 3836.2-2010, GB 3836.4-2010 for OLCT 80id and OLCT 80 D id. Certificate NEPSI GYJ17.1202X
Weight:	3.5 kg with local sensor pack.
Materials:	■ Housing: painted aluminum with epoxy polyester coating. ■ Sensor: 316L stainless steel.
Operating and storage temperature:	■ Depends on the type of sensor used.

Remote control

Function:	Intrinsically-safe remote control for non-intrusive maintenance.
Power source:	Two AA 1.5-V batteries.
Buttons:	4 soft-touch buttons.
Case:	■ Material: bonded leather. ■ The case must be used in classified hazardous areas.
Certifications:	■ EEx ia IIC T4. Certificate INERIS 04ATEX0011X.
Dimensions:	120 x 65 x 23 mm (L x W x D).
Weight:	190 grams with case and batteries.

Sensors

Gas type		Measure-ment range (ppm)	Explosion-proof sensor	Intrinsically-safe sensor	Temp. range (°C)	% RH	Accuracy (ppm)	Average service life (months)	Resp. time T50/T90 (s)	Storage conditions and time
Combustible gases	Catalytic	0-100% LEL	■		-25 to +55	0-95	+/-1% LEL (from 0-70% LEL)	40	6/15 (CH4)	(b)
AsH_3	Arsine	1.00		■	-20 to +40	20 - 90	+/- 0.05	18	30/120	(a)
Cl_2	Chlorine	10.0		■	-20 to +40	10 - 90	+/- 0.4	24	10/60	(a)
ClO_2	Chlorine dioxide	3.00		■	-20 to +40	10 - 90	+/- 0.3	24	20/120	(a)
CO	Carbon monoxide	100 300 1000	■ ■ ■	■ ■ ■	-20 to +50	15 - 90	+/- 3 (0-100 range)	40	15/40	(a)
CO_2	Carbon dioxide	0-5% vol.	■		-25 to +55	0 - 95	+/- 3%	48	11/30	(a)
$COCl_2$	Phosgene	1.00		■	-20 to +40	15 - 90	+/- 0.05	12	60/180	(c)
ETO	Ethylene oxide	30.0		■	-20 to +50	15 - 90	+/- 1.0	36	50/240	(a)
H_2	Hydrogen	2000	■	■	-20 to +50	15 - 90	+/- 5%	24	30/50	(a)
H_2S	Hydrogen sulfide	30.0 100 1000	■ ■ ■	■ ■ ■	-25 to +50	15 - 90	+/- 1.5 (0-30 range)	36	15/30	(a)
HCl	Hydrogen chloride	30.0 100		■	-20 to +40	15-95	+/- 0.4 (0-30 range)	24	30/150	(a)
HCN	Hydrogen cyanide	30.0		■	-25 to +40	15-95	+/- 0.3 (0-10 range)	18	30/120	(c)
HF	Hydrogen fluoride	10.0		■	-10 to +30	20 - 80	+/- 5%	12	40/90	(c)
NH_3	Ammonia	100 1000 5000	■ ■ ■	■ ■ ■	-20 to +40	15 - 90	+/- 5 +/- 20 +/- 150 or 10%	24	25/70 20/60 60/180	(a)
NO	Nitric oxide	100 300 1000	■ ■ ■	■ ■ ■	-20 to +50	15 - 90	+/- 2 (0-100 range)	36	10/30	(a)
NO_2	Nitrogen dioxide	30.0			-20 to +50	15-90	+/-0.8	24	30/60	(a)
O_2	Oxygen	0-30% vol.	■	■	-20 to +50	15 - 90	0.4% vol. (from 15-22% O2)	28	6/15	(a)
O_3	Ozone	1.00		■	0 to +40	10 - 90	+/- 0.03 (from 0-0.2 ppm) +/- 0.05 (from 0.2-1 ppm)	18	40/120	(c)
PH_3	Phosphine	1.00		■	-20 to +40	20 - 90	+/- 0.05	18	30/120	(a)
SiH_4	Silane	50.0		■	-20 to +40	20 - 95	+/- 1.0	18	25/120	(a)
SO_2	Sulfur dioxide	10.0 30.0 100		■ ■ ■	-20 to +50	15 - 90	+/- 0.7 (0-10 range)	36	15/45	(a)
CH_3Cl	Chloro-methane	500	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
CH_2Cl_2	Dichloro-methane	500	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Freon R12		1% vol.	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Freon R22		2000	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Freon R123		2000	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
FX56		2000	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Freon R134a		2000	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Freon R11		1% vol.	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Freon R23		1% vol.	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Freon R143a		2000	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Freon R404a		2000	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Freon R507		2000	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Freon R410a		1000	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)

Gas type		Measure-ment range (ppm)	Explosion-proof sensor	Intrinsically-safe sensor	Temp. range (°C)	% RH	Accuracy (ppm)	Average service life (months)	Resp. time T50/T90 (s)	Storage conditions and time
Freon R32		1000	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Freon R407c		1000	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Freon R408a		1000	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/90	(d)
Ethanol		500	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/60	(d)
Toluene		500	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/60	(d)
Isopropanol		500	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/60	(d)
2-butanone (MEK)		500	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/60	(d)
Xylene		500	■		-20 to +55	20 - 95	+/- 15% (from 20-70% PE)	40	25/60	(d)

a) +4°C to +20°C
20% to 60% RH
1 bar ± 10%
6 months maximum

b) -25°C to +60°C
20% to 60% RH
1 bar ± 10%
6 months maximum

(c) +4°C to +20°C
20% to 60% RH
1 bar ± 10%
3 months maximum

(d) -20°C to +50°C
20% to 60% RH
1 bar ± 10%
6 months maximum

JBus communication specifications

The *OLCT 80* has two JBus communication modes:

- ASCII mode.
- Binary mode.

ASCII mode

- This mode is used if the OLCT 80 is connected via a digital link to an Oldham central controller type MX 62.
- Speed: 38400 bauds,1 start bit, 7 bits, even parity, 1 stop bit.
- 450 ms timeout (reading response time is less than 10 ms).

Binary mode

- This mode is used if the OLCT 80 is connected via a digital link to an Oldham MX 43 central controller.

Transfer table with register numbers in decimal notation.

/* readings */

Registre N°	0	Mesure courante capteur (sans virgule)	Mot de 16 Bits
	1	Mesure courante voie ana 1 (sans virgule)	Mot de 16 Bits
	2	Mesure courante voie ana 2 (sans virgule)	Mot de 16 Bits
	3	Tension Alimentation (x10)	Mot de 16 Bits
	4	Température Interne (x10)	Mot de 16 Bits
	5	Température externe (x10)	Mot de 16 Bits
	6		Mot de 16 Bits
	7	Tension de référence capteur 2V5	Mot de 16 Bits
	8	Taux d'usure capteur (x10)	Mot de 16 Bits
	21	Etat des DEFAUTS	Mot de 16 Bits
	22	Etat des Alarmes & Défaut	Mot de 16 Bits
	23	Etats	Mot de 16 Bits
	25	Etat des RELAIS	Mot de 16 Bits

/* statuses */

Registre N°**21**	ETAT des DEFAUTS	
Bit N°	0	Zéro en dehors des plages lors de calibration
Bit N°	1	Manque de sensibilité Cell. Lors de calibration
Bit N°	2	Cellule usée
Bit N°	3	Défaut eeprom
Bit N°	4	Signal trop bas (dépassement négatif)
Bit N°	5	Signal trop haut hors gamme (dép. échelle)
Bit N°	6	Défaut du capteur de T° dans la cellule
Bit N°	7	Défaut du capteur de T° dans l'OLCT 80
Bit N°	8	Bloc cellule défectueux ou Absent.
Bit N°	9	Tension d'Alim. En dehors des plages autorisées
Bit N°	10	défaut signal sur Voie analogique 1
Bit N°	11	défaut signal sur Voie analogique 2
Bit N°	12	
Bit N°	13	
Bit N°	14	Défaut électronique sur un capteur type OLCTIR
Bit N°	15	Défaut optique sur un capteur type OLCTIR
Registre N°**22**	ETAT des Alarmes & Défaut	
Bit N°	0	AL1 active sur une des voies
Bit N°	1	AL2 active sur une des voies
Bit N°	2	Défaut présent sur l'appareil
Bit N°	3	AL1 acquittée
Bit N°	4	AL2 acquittée
Bit N°	5	Défaut acquittée
Registre N°**23**	BIT des ETATS	
Bit N°	0	Non utilisée
Bit N°	1	Non utilisée
Bit N°	2	Non utilisée
Bit N°	3	une alarme est présente
Bit N°	4	un défaut est présent
Bit N°	5	interruption 1Hz en cours d'exécution
Bit N°	6	Non utilisée
Bit N°	7	Non utilisée
Bit N°	8	message sur l'afficheur
Bit N°	9	message de défaut sur l'afficheur
Bit N°	10	Non utilisée
Bit N°	11	Ce bit indique si l'OLCT 80 est stabilisée
Bit N°	12	Non utilisée

Bit N°	13	Non utilisée
Bit N°	14	Non utilisée
Bit N°	15	Non utilisée

;

/* relays */

Registre N°**25**		ETAT des RELAIS
Bit N°	0	Etat du relais 1 en Sécurité + ou Sécurité -
Bit N°	1	Etat du relais 2 en Sécurité + ou Sécurité -
Bit N°	2	Etat du relais Défaut en Sécurité + ou Sécurité -
Bit N°	3	Etat du relais 1 ON ou OFF
Bit N°	4	Etat du relais 2 ON ou OFF
Bit N°	5	Etat du relais Défaut ON ou OFF
Bit N°	6	Demande externe d'acquit du Rel1
Bit N°	7	Demande externe d'acquit du Rel2
Bit N°	8	Demande externe d'acquit du Rel défaut
Bit N°	9	
Bit N°	10	
Bit N°	11	
Bit N°	12	
Bit N°	13	
Bit N°	14	
Bit N°	15	

Adjustable speed, 1 start bit, 8 data or control bits, 1 stop bit. 450 ms timeout (reading response time is less than 10 ms).

Sample thread

5A 03 00 04 00 05 C9 23

5 words read from address 4 of slave 5A.

Byte	Meaning
5A	Slave number.
03	Function number (N words to be read).
00	Most significant bit of the address of the 1st word.
04	Least significant bit of the address of the 1st word.
00	Most significant bit of the number of words to be read.
05	Least significant bit of the number of words to be read.
C9	Least significant bit of the CRC16 (checksum).
23	Most significant bit of the CRC16 (checksum).

Chapter 14 | Special instructions for use in explosive atmospheres and fonctional safety

General comments

OLCT 80 gas detectors comply with the requirements of ATEX 2014/34/UE European Directive relating to explosive Dust and Gas atmospheres.

The information given in the following sections should be respected and taken into account by the manager of the site where the equipment is installed. With respect to requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres, please refer to ATEX 1999/92/CE European Directive.

Warnings

Do not open when energized. After de-energizing, delay 2 minutes before opening. Read instructions notice (cable glands).

Requirements for use in dust explosive atmospheres

For the equipment installed in dust explosive atmosphere, user shall ensure a sufficient cleaning to prevent dust accumulation on the device. The maximum permissible thickness of a dust layer must be less than 5 mm.

Cable entries

Cable glands and other wiring accessories (plugs, adaptors, etc.) shall be “db” certified for use in gas explosive atmospheres and “tb” for use in dust explosive atmospheres. They must be at least IP66 and of M20x1.5 6g or M25x1.5 6g types in accordance with ISO965-1 and ISO965-3 standards. Minimum depth of engagement must be 5 threads and installation must be done in accordance with current version of EN 60079-14 and eventually with any local or national additional requirements that may apply in the country of installation.

The cables should be suitable for use at a temperature equal to or greater than 80°C.

Threaded joints

Threaded joints have different values than those specified in EN60079-1 standard. Oldham does not allow the repair of the threaded joints and shall not

be held responsible for any damage to the equipment or for any physical injury or death resulting from any product modification.

The threaded joints on the *OLCT 80* may be lubricated to ensure protection against explosions. Only non-hardening lubricants or non-corrosive agents without volatile solvents may be used. Warning: silicone-based lubricants are strictly prohibited since they contaminate some of the gas sensing elements used in the *OLCT 80*.

Limitations of use

Gas detection cells have certain limitations that shall be known and understood by the user.

Overange and exposition to specific components

- A bump test and/or a calibration is recommended each time the detector has been exposed to high gas concentration and moreover if the detector went to overange condition.
- Vapors from silicone or sulfur compounds can affect the catalytic sensor and thereby distort the measurements. If the sensors have been exposed to these types of compounds, an inspection or calibration must be performed.
- High concentration of organic solvents (e.g. alcohols, aromatic solvents, etc.) or exposure to gas concentration above the measuring range can damage electrochemical sensors. If sensors have been exposed to such condition, a bump test or calibration must be then performed.
- In the event of high levels of Carbon Dioxide (CO2 > 1% vol.), electrochemical Oxygen (O2) sensors can slightly overestimate the actual concentration of oxygen by 0.1 to 0.5% volume.

Operation under low oxygen levels

- If an electrochemical detector sensor is used in an atmosphere comprising less than 1% oxygen for over one hour, the measurement may be an underestimate.
- If a thermocatalytic detector sensor is used in an atmosphere comprising less than 10% oxygen, the measurement may be an underestimate.
- If a semiconductor detector sensor is used in an atmosphere comprising less than 18% oxygen, the measurement may be an underestimate.

Installation and calibration

- The detector will be installed with the sensor cell pointing downwards
- The detector should be calibrated with the gas to be measured. With respect to combustible gases only, and in the event it is impossible to calibrate with the targeted gas, see tables on pages 80 and further for recommended calibration gas and cross gas interference.

Marking

Safety relevant parameters. Maximum power dissipated(*) :

- 4 W with class T6 or T85°C
- 10 W with class T5 or T100°C and T4 or T135°C

OLCT 80 d detector (with local sensor, 'd' type)

OLDHAM SAS
62027, ARRAS France
OLCT80 d
CE0080
INERIS 03ATEX0240X
 II 2 G D
Ex db IIC T6…T5* Gb
Ex tb IIIC T85°C…T100°C* Db
T.Amb : -20°C to 60°C

WARNING: Do not open when energized. After de-energizing, delay 2 minutes before opening. Read user manual (cable glands).

(*) T6…T5 ou T85°C…T100°C according to maximum power dissipated

OLCT 80 D d detector (with remote sensor, 'd' type)

On the detector:
OLDHAM SAS
62027, ARRAS France
OLCT80 D d
CE0080
INERIS 03ATEX0240X
 II 2 G D
Ex db IIC T6…T5* Gb
Ex tb IIIC T85°C…T100°C* Db
T.Amb : -20°C to 60°C

WARNING: Do not open when energized. After de-energizing, delay 2 minutes before opening. Read user manual (cable glands).

(*) T6…T5 ou T85°C…T100°C according to maximum power dissipated

On the remote sensor:
OLCT 80 D d
CE0080
INERIS 03ATEX0240X
 II 2 G D
Ex db IIC T6 Gb
Ex tb IIIC T85°C Db
T.Amb : -20°C to 70°C

WARNING: Do not open when energized.

OLCT80 id detector (with local sensor, 'i' type)

OLDHAM SAS
62027, ARRAS France
OLCT 80 id
CE0080
INERIS 03ATEX0240X
 II 2 G D
Ex db [ia Ga] ia IIC T4 Gb
Ex tb [ia Da] ia IIIC T135°C Db
T.Amb : -20°C to 60°C

WARNING: Do not open when energized. After de-energizing, delay 2 minutes before opening. Read user manual (cable glands).

OLCT80 D id detector (with remote sensor, 'i' type)

On the detector:
OLDHAM SAS
62027, ARRAS France
OLCT 80 D id
CE0080
INERIS 03ATEX0240X
 II 2 (1) G D
Ex db [ia Ga] IIC T4 Gb
Ex tb [ia Da] IIIC T135°C Dd
T.Amb : -20°C to 60°C

WARNING: Do not open when energized. After de-energizing, delay 2 minutes before opening. Read user manual (cable glands).

On the remote sensor:
OLCT 80 D id
CE0080
INERIS 03ATEX0240X
 II 1 G D
Ex ia IIC T4 Ga
Ex ia IIIC T135°C Da
T.Amb : -20°C to 70°C

OLCT80 W d detector (wireless version with local sensor, 'd' type)

OLDHAM SAS
62027, ARRAS France
OLCT 80 W d
CE0080
INERIS 03ATEX0240X
 II 2 G
Ex db IIB T5 Gb
T.Amb : -20°C to 60°C

AVERTISSEMENT: Do not open when energized. Wait for two minutes before opening. Read user manual (cable glands).

OLCT80 WD d detector (wireless version with local sensor, ‘d’ type)

On the detector:
OLDHAM SAS
62027, ARRAS France
OLCT 80 WD d
CE0080
INERIS 03ATEX0240X
II 2 G
Ex db IIB T5 Gb
T.Amb : -20°C to 60°C

WARNING: Do not open when energized. After de-energizing, delay 2 minutes before opening. Read user manual (cable glands).

On the remote sensor:
OLCT 80 WD d
CE0080
INERIS 03ATEX0240X
II 2 G
Ex db IIC T6 Gb
Ex tb IIIC T85°C Db
T.Amb : -20°C to 70°C

AVERTISSEMENT: Do not open when energized.

OLCT80 W id detector (wireless version with local sensor, ‘i’ type)

OLDHAM SAS
62027, ARRAS France
OLCT 80 W id
CE0080
INERIS 03ATEX0240X
II 2 G
Ex db [ia Ga] ia IIB T4 Gb
T.Amb : -20°C to 60°C

WARNING: Do not open when energized. After de-energizing, delay 2 minutes before opening. Read user manual (cable glands).

OLCT80 WD id detector (wireless version with remote sensor, 'i' type)

On the detector:
OLDHAM SAS
62027, ARRAS France
OLCT 80 WD id
CE0080
INERIS 03ATEX0240X
II 2 (1) G
II (1) D
Ex db [ia IIC Ga] IIB T4 Gb
[Ex ia IIIC Da]
T.Amb : -20°C to 60°C

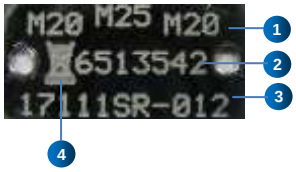
WARNING: Do not open when energized. After de-energizing, delay 2 minutes before opening. Read user manual (cable glands).

On the remote sensor:
OLCT 80 WD id
CE0080
INERIS 03ATEX0240X
II 1 G D
Ex ia IIC T4 Ga
Ex ia IIIC T135°C Da
T.Amb : -20°C to 70°C

Side label

This label shows the following :

Id.	Description
1.	Thread diameter and pitch of the cable entries (here 2x M20 and 1x M25)
2.	P/N of transmitter (here OLCT80 d variant) without the sensor cell
3.	S/N of transmitter : first two digits (here 17) correspond to the year of construction (here 2017).
4.	Recycling symbol



For the Handheld Unit IR20

Special instructions for use in ATEX Explosive Atmospheres:

- In ATEX zones 1 and 2, the use of the protective case is mandatory to avoid any risk of electrostatic discharges. The batteries must be replaced with batteries that are identical to those indicated by Oldham.
- The operating temperature is between - 40° C and + 70 °C.

The marking of the IR20 handheld is as follows:

OLDHAM
ARRAS FRANCE
IR20
INERIS 04ATEX0011X
 II 2 G
EEx ia IIC T4
Serial Number
Year of construction

AVERTISSEMENT: Do not open in Explosive Atmosphere

Chapter 15 | Errors and Faults

In the event that the OLCT 80 detects a fault or error:

- The orange DEF indicator light (Figure 4, 2) will illuminate.
- A specific message will be displayed (Figure 4, 5).

Cause of the error or fault	Display	Corrective action
Zero fault		Follow the zeroing procedure (see page 72).
Sensitivity fault		Adjust sensitivity; see page 72.
Worn sensor		Replace the sensor; see page 80.
Main sensor missing		The main sensor is disconnected. After taking all of the necessary safety precautions (if the *OLCT 80* is installed in an ATEX zone), open the cover of the *OLCT 80* and check the connection between the sensor and the terminal on the printed circuit board.
Reading out of range		The gas concentration measured is outside the sensor's approved measurement range.
Negative reading		Follow the zeroing procedure (see page 72) or replace the sensor (see page 80).

Cause of the error or fault	Display	Corrective action
Sensor temperature out of range		Protect the sensor from extreme variations in temperature. See the *Metrological characteristics* on page 95.
OLCT 80 temperature out of range.		Protect the *OLCT 80* from extreme variations in temperature. See *Operating temperature* under *Metrological characteristics* on page 95.
Line voltage too low		Check the voltage of the *OLCT 80*'s power supply. See *Power supply at detector terminals* under *Metrological characteristics* on page 95.

Other fault codes that may be displayed include the following:

- eeprom
- def ana1
- def ana2
- def ir elc
- def ir opt
- def RAMint
- def RAMext
- def ROM
- def eeprom
- MEM perdue

These faults require a maintenance technician and cannot be resolved by the user.