Operating Manual

MultiXplo / MultiTox Detectors

DM-TX6-X (Catalytic)

DM-TT6-K (Catharometer)

OLDHAM | **SIMTRONICS**
Fire & Gas

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☐ Before any intervention on detector, please read the EN 60079-29-2 standard.

Warranty

☐ Under normal conditions of use and on return to the factory, MultiTox detectors carry a 1-year warranty excluding accessories such as tilt mount, weather protection, etc.

Destruction of the equipment
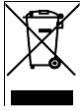
European Union (and EEA) only. This symbol indicates that, in conformity with directive DEEE (2002/96/CE) and according to local regulations, this product may not be discarded together with household waste.

It must be disposed of in a collection area that is set aside for this purpose, for example at a site that is officially designated for the 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 as before.

1. PRODUCT DESCRIPTION

The DM-TX6-X is designed to monitor explosions hazard induced by the presence of flammable gases or vapours (hydrogen, hydrocarbons, alcohol, etc…).

The DM-TT6-K is designed to monitor the gas concentration in %vol. induced by the presence of some special gases or vapours (hydrogen, helium, carbon dioxide, etc…).

The detector can be connected directly to a large range of traditional controllers or Programmable Logic Controllers (PLC).

The DM-TX6-X and the DM-TT6-K may be fully configured using the portable communication terminal (TLU600) in ATEX areas, providing flexibility to the user.

These detectors can be configured also using the Hart portable terminal TLH700 (in option).

The MultiXplo and MultiTox are also available for use in an addressable network system with distributed intelligence, SYNTEL. For more information, please refer to the Syntel module interface operating manual.

1.1. Application Fields

The DM-TX6-X and the DM-TT6-K are suitable for indoor and outdoor uses and offer a fast response time. Typical applications include:

- Storage and use of combustible/flammable gases and vapours(DM-TX6-X),
- Monitoring of processes with flammable products
- Hydrogen detection in inert atmosphere and in high concentration (DM-TT6-K),
- Chemical and petrochemical plants
- Pharmaceutical industry
- LNG/LPG
- Oil and gas facilities

1.2. DM-TX6-X

The detectors are calibrated on 100% LEL (Lower Explosive Limit) of a particular gas or vapour.

The DM-TX6-X is a MultiXplo detector based on a transducer with thermo-catalytic oxidation, which requires oxygen to function properly.

In the event of a long period without oxygen, the measurement will no longer be representative of the concentration of gases or vapours.

The characteristics of the device can also be altered by the presence of certain catalyst poisons such as silicone fumes, vapours of organometallic compounds and, to some extent by halogenated compounds.

1.3. DM-TT6-K

The DM-TT6-K is a MultiTox detector, based on catharometric transducer. Its measurement range is usually expressed in terms of %vol. relative to a particular gas (for example 5 %vol. H_2, 5 %vol. He...).

The DM-TT6-K measurement principle is based on the heat exchange between a heated filament and a "cold" separation. The effectiveness of the exchange between those two elements depends, in particular, of the thermal conductivity value of the mixture which separate them.

This measurement principle is very stable, and able to operate with high gas concentrations.

In this configuration, the presence of oxygen is not essential, and catalytic poisoning is not an issue.

1.4. Technical specifications

Each detector is constructed as follows:

- A wall-mounted support secured by two screws, allows assembly of a cable gland (M20) (optional) and up to three plugs.
- An explosion-proof housing (epoxy coated aluminium or 316 SS) containing:

  - A set of tropicalized electronic cards
  - An infrared communication head, located on the detector's housing. It allows communication with the remote control (TLU600).

- A colour coded cartridge. Yellow for Combustible Gas Detector with thermo-catalytic cells (DM-TX6-X) and brown for catharometers (DM-TT6-K). The cartridge is located in the lower part of the detector, and it is connected to the detector body by an open ring leaving the label visible.
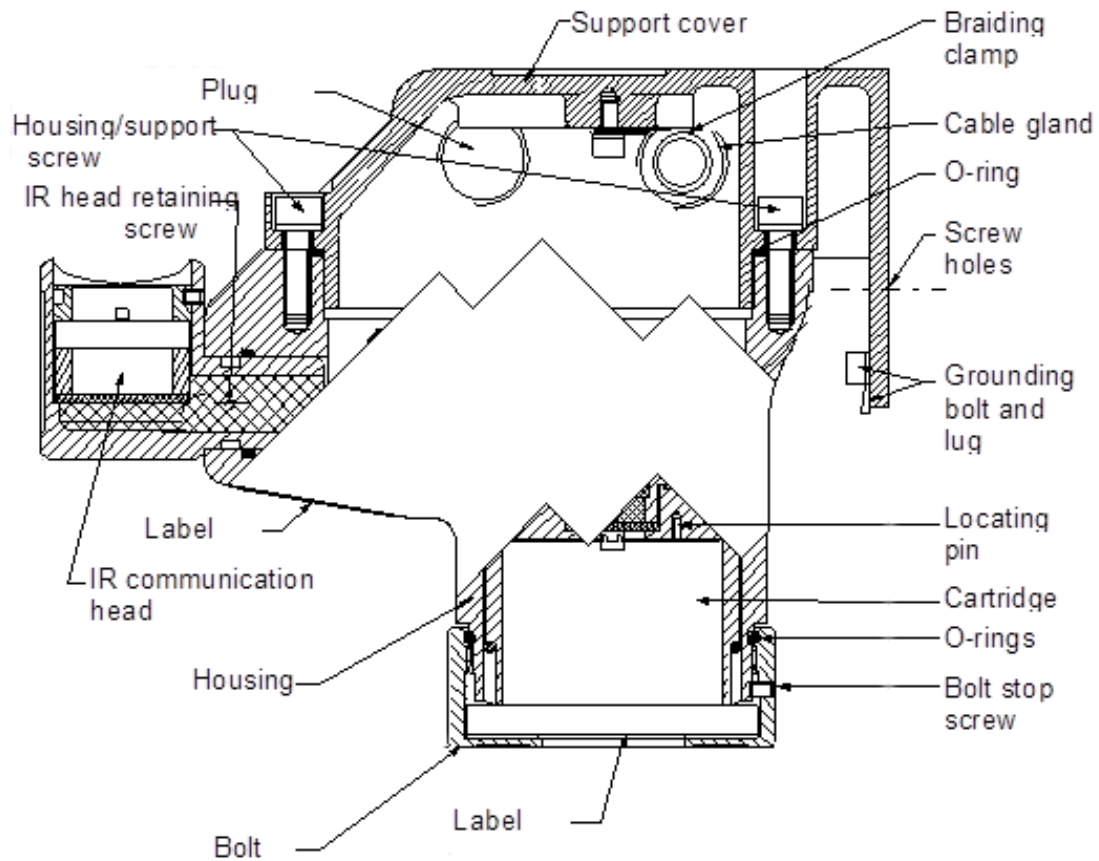
Figure 1 : Layout Drawing

(Congestion see Figure 2*)*

1.5. Detection Cartridge

Detection Cartridges are explosion proof designed.

They are common to all Oldham Simtronics MultiXplo and MultiTox-K products in order to reduce the number of spare parts.

- DM-RX6-X and DM-RT6-K: Network versions for Syntel loop,
- DM-TX6-X and DM-TT6-K: « Telecapteur » versions,

For combustible gas detector's cartridges, if the difference between the storage temperature and the operating temperature does not exceed 20°C, the nominal characteristics are obtained after a few minutes. Otherwise, wait for the balancing thermal unit, about half an hour.

Catharometer cartridges (cartridges K) need to be in thermal balance with their environment to provide nominal performance. Thus, when the cartridges have been unpowered more than half-an-hour, a warm-up time is required when power is restored. The duration of warm-up is usually range from ½ hour to 4 hours, depending on the temperature difference between the cartridge and the ambient temperature.

The cartridge temperature information is available on the TLU.

⚠️ **The cartridge must not be unplugged when the detector is powered.**

1.6. Communication interfaces

1.6.1. Wireless Configuration Tool

Information and status of the detector are available via the wireless configuration tool TLU600.

Configuration and tests are performed using this wireless configuration tool (IrDA protocol). This tool is common for all Oldham Simtronics MultiFlame, MultiXplo and MultiTox products.

The TLU600 provides access to devices, which would otherwise require major logistic operations for maintenance or for configuration (calibration …).

For more details, please refer to the wireless configuration tool operating manual.

1.6.2. HART communication

The HART communication authorizes an addressing of devices, allowing the communication in read/write mode.

It consists in getting connection on the current loop on which

the numerical data are superimposed.

Most of the HART terminal can read these information and send commands

The use of a DD (Device Descriptor) facilitates the interface Man-Device. It can be uploaded on our website.
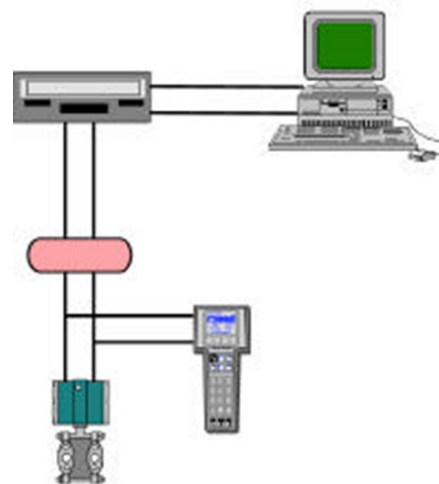
The HART output is an option. It is available only on the devices equipped with an electronic type C, in HART configuration (H):DGi-7-****-**H-**-***-*-C-*

OLDHAM SIMTRONICS devices under HART protocol enable the use of all the functions available with the TLU600 via the HART terminal.

See the document D1401002 for the using of Hart terminal TLH700 (the Detector Device Descriptor must be downloaded).

1.7. Product Code

Product codes are created from functional codes: **DM**-T*6-****-***-**-***-*-*-*

Detector type														
T	X	6	30	DG	-X	X	H	-X	0	-00J	-0	-C	-0	

C**	Compact Sensor	
T**	Télécaptor	
R**	Network version	
S**	Replacement cell	
X**	Accessories	

	Families	
T	Toxic	
V	Flame	
X	Flammable gas	
0	None	

	Version	
****6**	BT606 housing	
****7**	BT10 housing	

	Gas type	
**	Refer to gas matrix	

	Measurement range	
**	Refer to gas matrix	

	Type	
XV	UVIR2	
XT	IR3	
XW	UV	

	Detection range	
A0	Standard range	
B0	Long range	

	Input Type	
0**	Not used or flame	
E**	Electrochemical	
S**	Semi-conductor	
K**	Catharometer	
X**	Catalytic	
M**	MECH	
R**	TOR input	
C**	Current input 0/22 mA	
I**	Infrared	
W**	½ Wheatstone bridge	

DGi-TT7-E/O & DMi-TT6-E/O

DG-TT7-S / DM-TT6-S

	Variant	
A	Aluminium	
X	SS316	

	Output Interface	
****M**	1-2 mA protocol	
****A**	0-22mA protocol (fault signalling in 0-4mA range)	
****E**	4-20 mA protocol (Common fault signal 2 mA)	
****H**	4 – 20 mA / 0-22 mA configurable & HART protocol	
****C**	4 – 20 mA / 0-22 mA configurable	
****W**	Wheatstone	
****L**	LON	
****X**	4 – 24 mA for compact explosimeter (magnet)	

T	X	6	30	DG	-X	X	H	-X	0	-00J	-0	-C	-0

	Cartridges	
	0*	No cartridge or not specified or flame
DGi-TT7-O / Dmi-TT6-O	**M***	Electrochemical type M
	G*	Electrochemical type G
Dgi-TT7-E / Dmi-TT6-E / DGi-TT7-O / Dmi-TT6-O	**Y***	Electrochemical type Y
	N*	Electrochemical type N
DG-TT7-X / DM-TT6-X	**X***	Catalytic
DG-TT7-S / DM-TT6-S	**S***	Semi-conductor (general designation for semiconductor type G)
	F*	Semi-conductor type 30 (previously SF) since 2015
	C*	Semi-conductor type 31 since 2015
DG-TT7-K / DM-TT6-K	**K***	Catharometer
	E*	EX05, EX09 (external)
	L*	SX202-06
	T*	SX202-10
	U*	SX202-14
Half Wheatstone bridge probes	**V***	SX202-17
	H*	MTHX-S
	J*	MTHX (/ , E, N, NE)
	W*	SD122
DG-TT7-I / DM-TT6-I	**D***	Infrared type D
	P*	Infrared type P

	Semicond.Sensor type & special configurations	
	*0	Not specified or standard
	*A	20
	*B	23
DG-TT7-S / DM-TT6-S	***C**	24
	*D	25
	*E	27
	*F	30 (become obsolete to release *R association)
	*K	SD122 (EK)
	*M	Special version MarED (TX6 and TV6 in type A only)
Options	***N**	Special version with ALRM LED not memorized (not in compliance with EN 54-10) (flame version only)
	*R	With relay board for HW type D (gas)
	*T	MTHX-S (ET)
	*X	SX202 (EX)
Customized versions	***1**	Customized EPR (special follow up, SP4M20) (DM and DMi only)
	*2	

	Configuration	
	000	Standard
	**A	Absolutely no grease
	**B	Special version MarED (old code) (TX6 and TV6 in type A only)
	**C	Not EN 54-10 compliant version (not latched ALRM LED) (type A only)
	**D	IRDA cap instead of display
	**E	0V not connected to housing ground on Tox type C
	**F	TCM02 instead of IRDA cap
	**G	Hydrocentrifugon paint (nuclear applications)
	**H	Special paint : light grey (10A03 according to « British standards 4800/5252 »)
	**J	Special paint : red (RAL 3001)
	**K	Machining of additional cable gland input
	L	Paint thickness > 200 µm(ATEX versionIIB)

Language		
0	Fr / GB	
F	French	
E	English	
P	Portuguese	
C	Chinese	
Hardware version		
A	Type 63	
B	Type 65	
C	Type 67 (HART)	
D	Type 69 (magnet)	
Software version		
0	Standard	

2.   TECHNICAL FEATURES

GENERAL

Type	Gas detector
DM-TX6-X	MultiXplo (catalytic gas detector)
DM-TT6-K	MultiTox (catharometer gas detector)
DM-RX6 or DM-RT6	Network detector
Calibration	Factory set, recommended test every 6 months

OUTPUT SIGNALS

4-20mA loop signal	Type active (source) maximum load impedance 700Ω
« 4-20mA » format	4-20mA with one fault level

- 0% full scale	4 mA
- 100% full scale	20 mA
- 105% full scale	20.8 mA
- Ambiguity function	21.7 mA (DM-TX6-X)
- Fault or inhibition	2 mA

« 0-22mA » format	4-20mA with several fault levels, for PLC and some recent control units

- 0% full scale	4 mA
- 100% full scale	20 mA
- >105% full scale	20.8 mA
- Ambiguity function	21.7mA (DM-TX6-X)
- Inhibition	3.4 mA
- Fault measure	2.6 mA
- Device fault (HW/SW) 2.0 mA	

Output relays	2 x configurable relays max 1A / 30V $_{AC/DC}$

ELECTRICAL

Power supply	24VDC, (18 – 28 V DC versions DM-T#6)
	(18 – 30 V DC versions DM-R#6)
Consumption	1,5 W typical, 5 W maximum [1]
	2.2 W typical, 5W maximum for a network detector
Wiring	0,5mm² (20AWG)-1,5mm² (16AWG).
MTBF	164 000h (Version DM-T#6) out of the sensing element)

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[1] Typical power: voltage 24 Vdc, current 4 mA, 1 relay activated
Maximum power: voltage 30 Vdc, current 22 mA, 2 relays activated

ENVIRONNEMENT

Storage temperature	5°C to +30°C (2 years in « clean » atmosphere)
Temperature range	-20°C to +60°C
Pressure	1013 Hpa ± 10%
Humidity	95% RH (non-condensable)
Protection	IP66
RFI/EMI (DM-TX6-X)	EN 50270
	IEC 60092-504, IEC 60533 and EN60945 (version config 00B)
Warm-up time (DM-TX6-X)	< 100 sec
Stabilisation time (DM-TX6-X)	< 190 sec

PERFORMANCE (DM-TX6-X)

European	EN 60079-29-1

EXPLOSION PROOF HOUSING

Material	stainless steel 316 L or epoxy coated aluminium
Weight	2.3kg (5.1 Lbs) (Aluminium)
	4 kg (14.3 Lbs.) (Stainless steel)
ATEX/IECEx	Please refer to § 8
Dimensions	
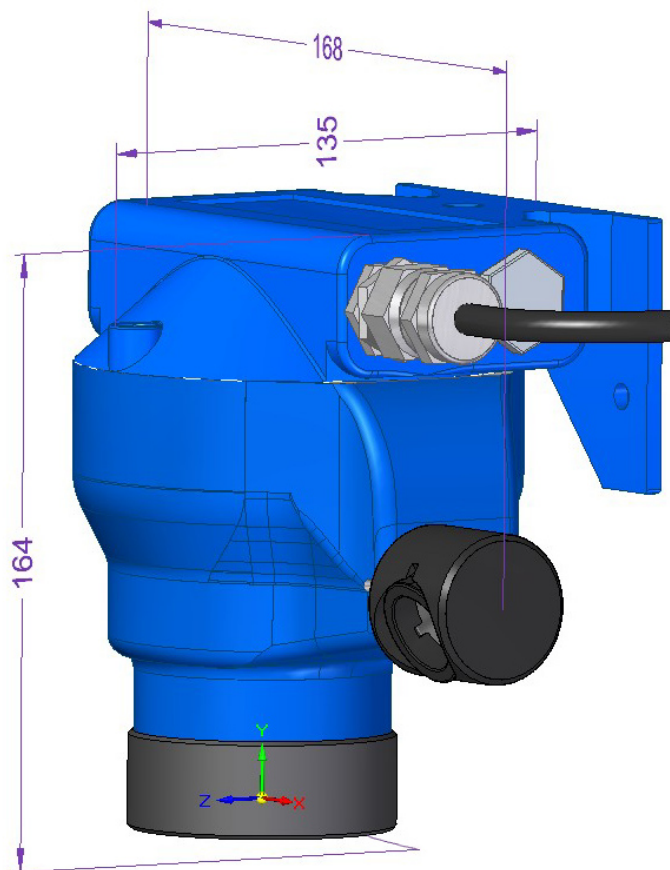
Figure 2: Outline drawing

3.   PERFORMANCES

Expected life time in standard conditions:

- >5 years for DM-TX6-X
- >10 years for DM-TT6-K

This lifetime can be reduced in case of exposure to dusty environments.

⚠️ **For catalytic version, some compounds are known to poison sensors. These include, organometallic, silicone and some halogenated compounds**

PERFORMANCES	DM-TX6-X			DM-TT6-K		
	CH_4	H_2	C_4H_{10}	H_2	CO_2	He
Ranges	100 % L.E.L. (5.0 %vol)	100 % L.E.L. (4.0 %vol)	100 % L.E.L. (1.86 %vol)	5%vol 20%vol 100%vol	20%vol	5% vol 20% vol 100% vol
Relative sensitivity	1.70 ❶	1.70 ❶	1.00 ❶			
τ (0-90%) (sec)❽	< 15	< 10	< 20	< 10	< 30	< 10
Zero point stability ❷	< 3	< 3	< 3	< 3	< 3	< 3
Sensitivity drift ❷	< 3	< 3	< 3	< 3	< 3	< 3
T° range (°C) ❼	-20 / +65	-20 / +65	-20 / +65	-20 / +65	-20 / +65	-20 / +65
Temperature Zero drift ❷ ❸	< 2	< 2	< 2	< 3	< 5	< 3
Temperature sensitivity drift❷ ❸	< 3	< 3	< 3	< 3	< 5	< 3
Linearity ❷	< 3	< 1	< 3	< 2	< 2	< 2
Repeatability ❷	< 1	< 1	< 1	< 1	< 1	< 1
Service life (years) ❹	>5	>5	>5	10	10	10
Relative humidity (% RH)	0 – 95 % without condensation			15 - 95 % without condensation		
Pressure range	Pa±10%					
Cross sensitivity	All inflammable compounds❻			All gases with either very high or very low thermal conductivity		
Poisons	Silicon compounds, certain halogen compounds, and some organometallic compounds.			None		
Effect of O_2 –enriched or depleted atmospheres	15 % O_2 min.	10 % O_2 min.	15 % O_2 min.	None		
Warm-up or biasing time ❺	90 secs			120 secs		

❶ Measured at 50 % LEL of the considered gas

❷ In % full scale

❸ On the range: -10°C to +40°C.

❹ (In years) Expected values based on "typical" site operating conditions without poison or corrosive compounds.

Lifetime can significantly vary (better or worse) depending on real site conditions.

❺ Measure is available but full performances may require longer time. (See Chapter 2).

❻ As soon as a gas or vapour is flammable, it is may be sensed by the combustible gas detector.

Sensitivity (regarding LEL range) and the response time depend on the compound. Basically, as the molecule size increase, the response time increase and the sensitivity decrease.

Table below gives some examples of cross sensitivity:

Detector	CH_4			H_2			C_4H_{10}		
Injected gas	CH_4	H_2	C_4H_{10}	CH_4	H_2	C_4H_{10}	CH_4	H_2	C_4H_{10}
Cross sensitivity*	1	0.95	1.7	1.06	1	1.7	0.57	0.54	1
τ(0-90%) (sec)	<15	<10	<20	<15	<10	<20	<15	<10	<20

If CH_4 (50% LEL) is injected on a H2 detector, the concentration displayed will be 47.2% (50/1.06)*

❼ For external probe versions, temperature range is limited to -20 / +60 °C

❽ Under conditions of natural diffusion and available on any of the outputs of the device (HART, 4-20mA, ...).

4. INSTALLATION

Detectors described in this manual are safety instruments intended to be installed in explosive atmospheres and have been designed in compliance with standards EN60079-0 and EN60079-1, EN 60079-29-1, CEI 60079-0 and CEI 60079-1.

Intervention in some sites may be subject to restrictions that we invite you to follow for your own safety and those of others.

4.1. Positioning

The detector must be positioned as close as possible to sources of potential leakage, taking into account airflows (e.g. upper and lower ventilation). The height is determined by the density of the gas to detect.

Generally speaking, a detector will not be placed in front of an air inlet that brings clean air

This height may be adjust to take into account the specific conditions which may interfere on the risk level (gas density, ambient temperature…)

There are no limit positions of the detector however it is recommended to position the detector vertically (ie with the cartridge pointing downwards).

Air velocity limits: 6 m/s.

4.2. Assembly

Use two 6 mm diameter screws to secure the support.

It is highly recommended to install the support with cable-gland downward in order to avoid water infiltrations. In case of horizontal position, it is advised to make one or two loops with the cable at the entry of the cable-gland.

When mounting the cable gland (optional), if no tightening torque is specified by the manufacturer, consider than a tightening torque of 20N.m +/-10% is the most suitable.

On stainless steel housings, plugs are sealed with Loctite. If the plugs are moved or removed, it must be sealed again, using Loctite or equivalent.

On aluminium housings, plugs are equipped with seals.
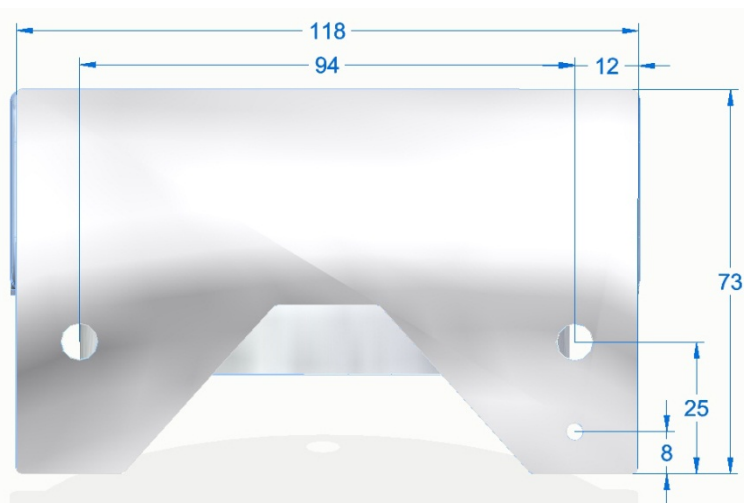
Figure 3: Drilling dimensions for support fixing.

4.2.1. Detector's assembly

Check the presence of the O-ring on the explosion proof seal, make sure that it is correctly greased and has no visible damage.

Plug the connectors to the base, as described in paragraph "Electric connection".

Fit the main housing on the base, placing the excess of cable in the base.

> ⚠️ **Make sure to correctly tighten the 2 fixing screws once the correct position has been obtained.**
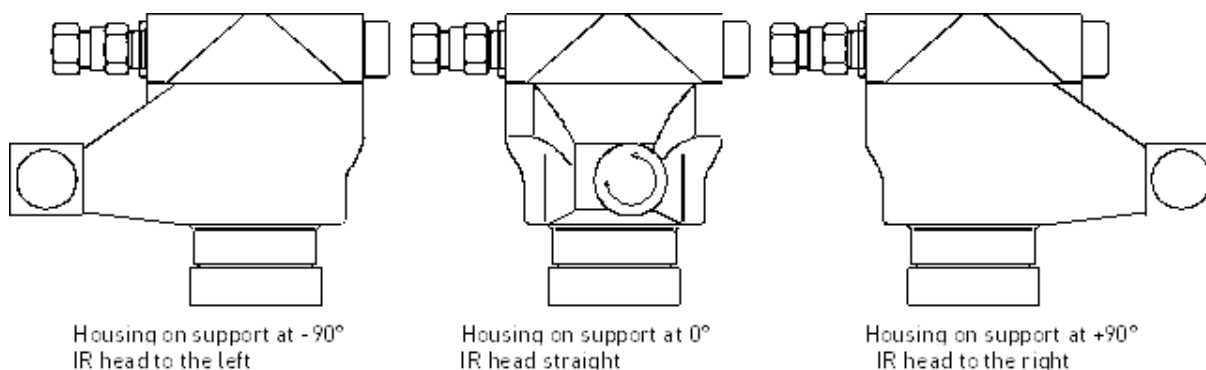
Figure 4 : Housing orientation

4.2.2. Orientation of the communication head

The IR communication head can be rotated from top to bottom in order to optimize the connection with the wireless communication tool. Avoid direct sunlight on head.

Once the correct position has been obtained, tighten the stopping screw to set the adjustment.

A 1.5 mm Allen wrench is required for this operation.

Do not touch the anti-removal screw of the IR communication head which is masked by the label "Do not retire".

4.2.3. Cable's inputs (as an option)

Connection cables must pass through a cable gland (Explosion Proof certified)

For installation details, refer to the instructions provided by the manufacturer of the cable gland used.

The unassigned cable glands entries must be blanked with explosion proof certified plugs (M20). On stainless steel version, they are glued with Loctite or equivalent compound. If a plug is moved or removed, it must be glued again with Loctite or an equivalent.

4.3. Electric connection

⚠️ **Never adjust electric connections when detectors are powered. Maintenance must be undertaken by qualified staff. Observe safety site rules.**

The MultiXplo and MultiTox are sensors with standard current output (4-20mA or 0-22mA). The connection can be on 3 or 4 wires. The 4 wires configuration allows insulation between the signal and power loops.

In addition, two independent relays outputs can be connected directly to a controller or signal device.

We recommend using an armoured and shielded cable, type NF M 87 202, in accordance with the requirements for hazardous areas and NF C 15 100. Other cables can be used if they are compliant with the local regulations and standards.

The table below shows the maximum cable lengths in meter (ft) based on the wire cross section and the supply voltage.

Min. single wire cross area mm²/AWG	0.5 (20)	0.9 (18)	1.5 (16)
Supply voltage 24VDC / consumption power ≤ 2W	580 (1900)	1000 (3280)	1000 (3280)
Supply voltage 24VDC -10% / consumption power ≤ 2W	340 (1110)	600 (1960)	1000 (3280)
Supply voltage 24VDC / 2W < consumption power ≤ 3.5W	330 (1080)	580 (1900)	1000 (3280)
Supply voltage 24VDC -10% / 2W < consumption power ≤ 3.5W	200 (650)	340 (1110)	600 (1960)
Supply voltage 24VDC / 3.5W < consumption power ≤ 5W	230 (750)	400 (1310)	710 (2320)
Supply voltage 24VDC -10% / 3.5W < consumption power ≤ 5W	140 (450)	240 (780)	430 (1410)

NB : Those values are calculated considering the minimum supply voltage at 18VDC at the sensor level

4.3.1. Connection of the electrical ground braid

The braid is wrapped around the sheath. The mechanical bridge retains the cable and makes the electrical contact.

4.3.2. Grounding

Local ground connection is located on the base of the detector. It is recommended to use a yellow / green wire with a ring lug (section ≥ others wires and≥1.5 mm²) which should be fixed to the base by a screw M4. The armour of the power cable is normally connected to the ground of the detector, but it may depend on site practices.
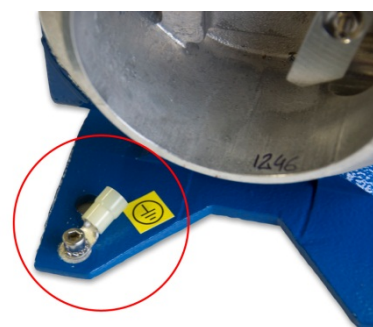
4.3.3. Installation recommendation

There are three different type of power supply:

- 3-wires connection (source) :
  The output current is not isolated from power supply, provided from detector (standard connection).
- 3-wires connection (sink) :
  The output current is not isolated from power supply, consumed by the detector
- 4-wires connection :
  The output current is isolated from power supply

NB :The power potentials are isolated fromthe electric ground of the housing.

Total loop resistance:
Whatever the power supply type (3 wires source ou sink, 4 wires), the total loop resistance (resistor + cable) should not exceed the following value:

$$R\,maxi = \frac{Power\,supply\,voltage - 8V}{22mA}$$

The total loop resistance should not exceed 700 Ω with a voltage of 24Vdc.

Terminal blocks

Point	JP11	Description
1	V–	0 V
2	V+	+24VDC power supply
3	V+	+24VDC power supply loop (connected to point 2)
4	V–	0 V, Connected to point 1
5	L+	20mA Current loop: entry
6	L–	20mA Current loop: output

4.3.4. 3-wires connection
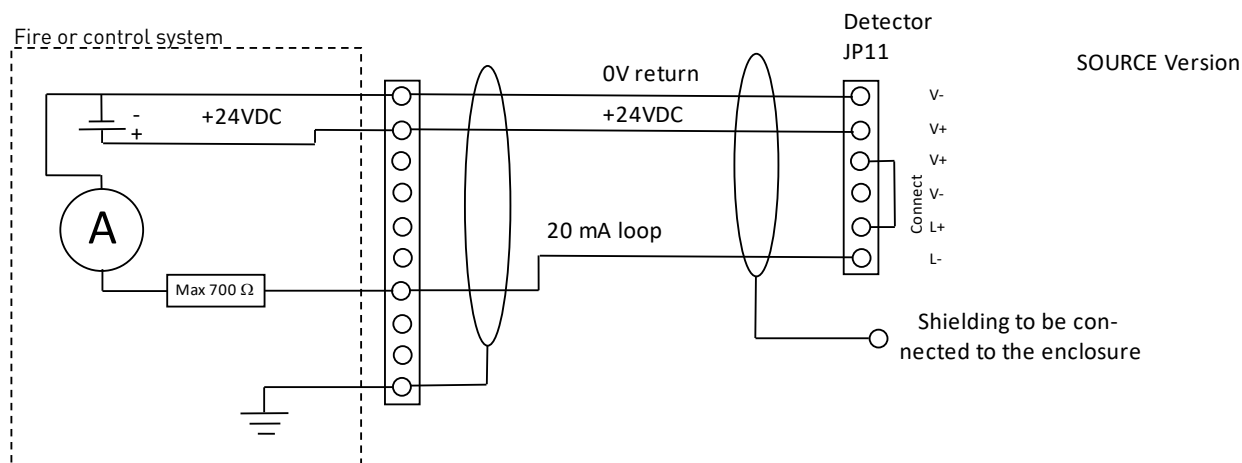
In this case, the output current is not isolated from power supply, provided from detector (standard connection).

The 20mA current loop must be supplied with 24 V at terminal L+. To proceed, connect the 3 (V +) and 5 (L +) terminals at the terminal block level of the device

4.3.5. 3-wires connection (Sink)
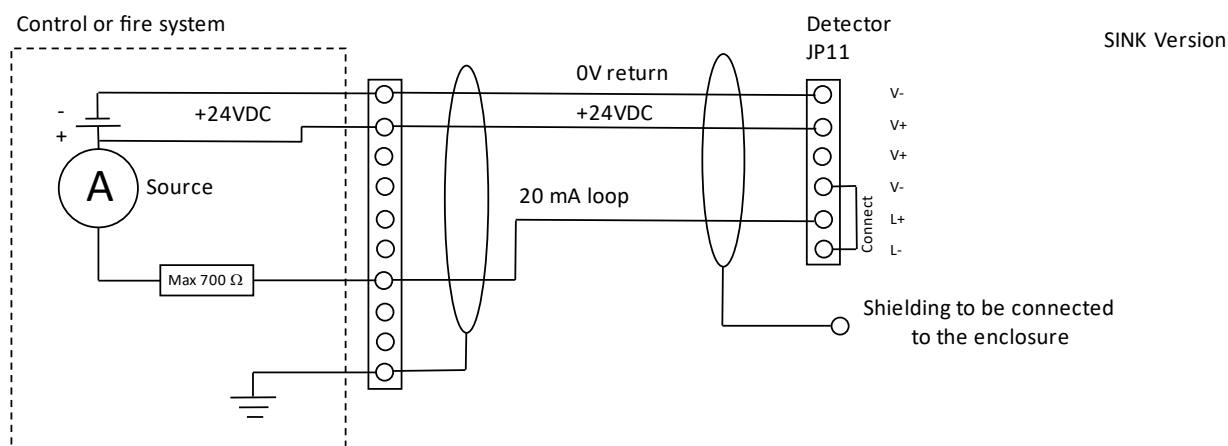
In this case, the output current is not isolated from power supply, consumed by the detector.

The 20mA current loop must be supplied with a PLC. The current return must be connected to the 0V at the level of the L- terminal. To proceed, please connect the 4 (V-) and 6 (L-) terminals at the terminal block level of the devise.

4.3.6. 4-wires connection (isolated power)
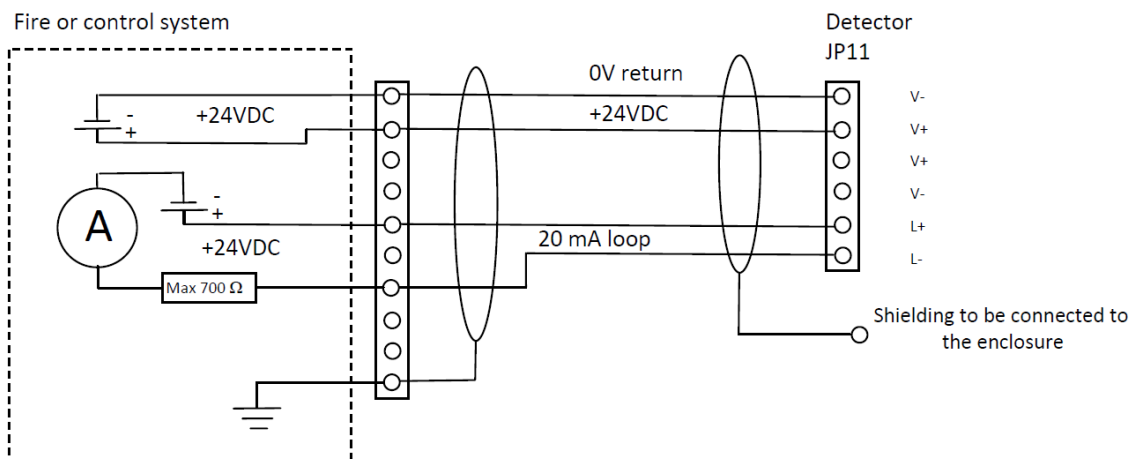
When using a 4 wires connection, the current loop is provided by the input module or PLC. The loop (L + and L–) is optically isolated from the detector. 4-20mA or 0-22mA input module of the PLC has to power up the current loop with, at least 8V at the terminal level.

4.3.7. Relay
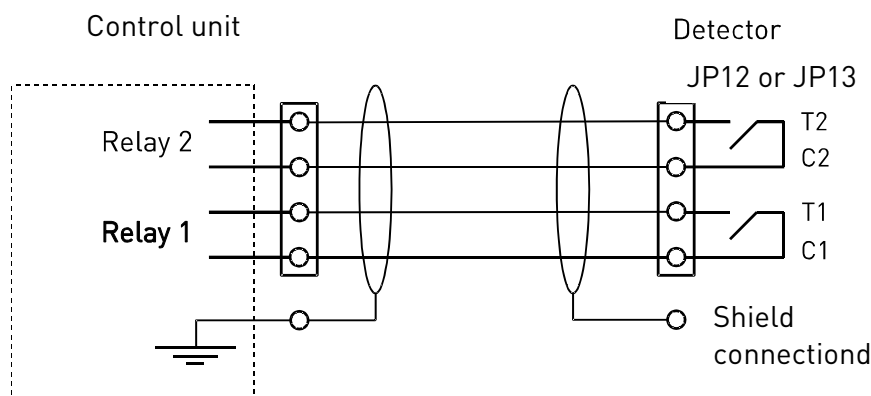
Point	JP12 & JP13	Description
1	T2	Relay 2
2	C2	Relay 2
3	T1	Relay 1
4	C1	Relay 1

Only the common and working contacts of the 2 relays are output on the terminal blocks JP12 and JP13.
To facilitate wiring, the same contacts are output on both JP12 and JP13: the contacts are connected together, terminal to terminal.

Each relay can be configured :
- normally closed or normally open. In the last case, the relay are opens when the detector is no longer powered.
- on one or more states of the detector (fault, permanent Inhibition, alarms).

Relays configured at factory setting : refer to 6.7.5.1

4.3.8. EOL Resistor

⚠️ **This applies to ATEX/IEC installations only. The EOL resistor must only be used inside the housing on the terminal block.**

The EOL resistor allows to a detection unit equipped with the line control function to ensure the continuity of the relay cable.

The EOL resistor must be placed on the relay contact connector to be monitored.

Maintain a 10mm minimum gap between the resistor and the terminal block or any other neighboring parts.
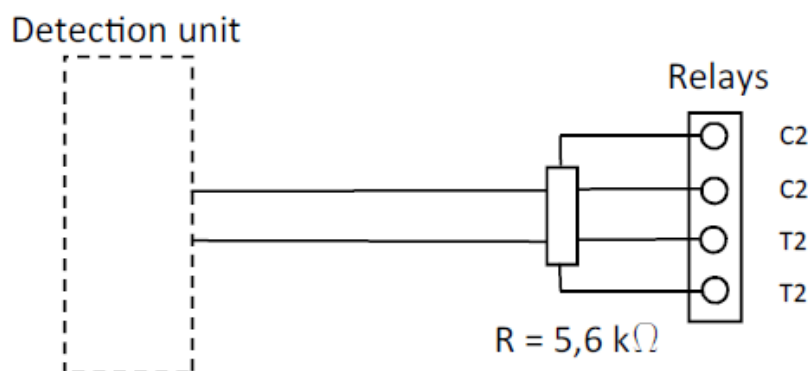
NB :

The R1 value is given as an indication. It must comply with the following conditions:

- Minimum consumption = 5 Watts
- Maximum dissipation = 2.5 Watts

4.3.9. Syntel connection
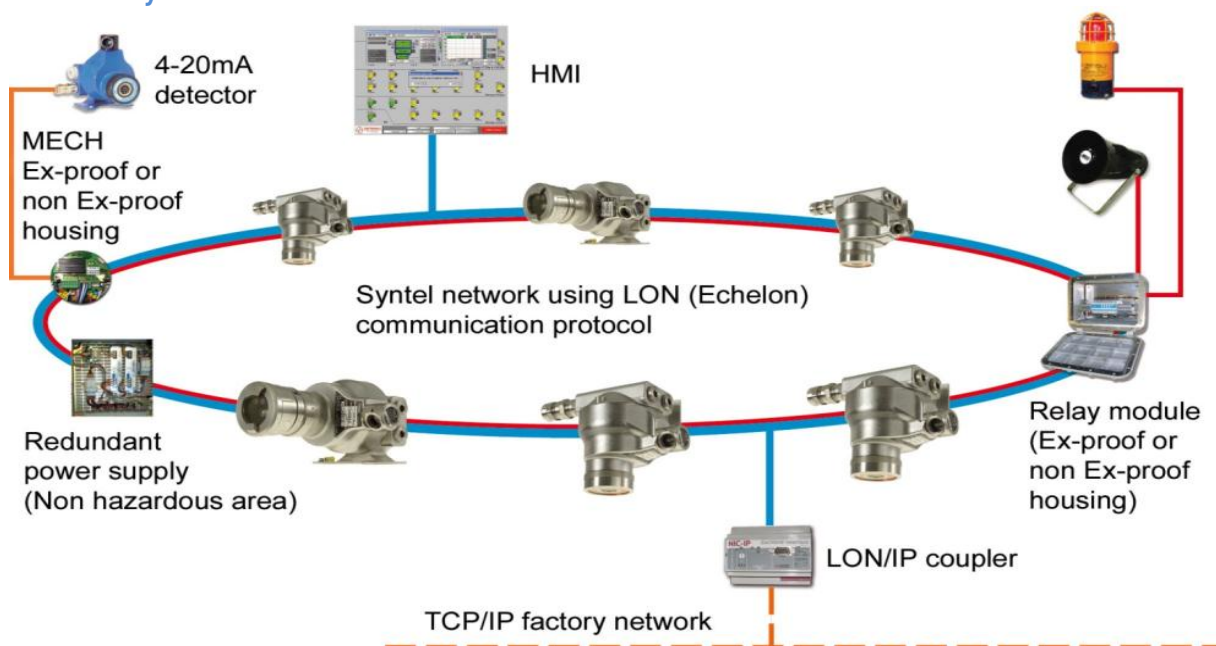
In this network version, an electronic board is inserted in the detector body and is used for electric connection. Connecting the ground terminal should be performed thanks to 3-wires shielded cables.

The connection of power supply wires (4 on side A and 4 on side B).

- Two red wires on V +: +24 V
- Two white wires on V-: 0 V

Connection of the media wires (2 on side A and 2 on side B)

- A red wire on one of the N
- A white wire on the other N (no specific edge)
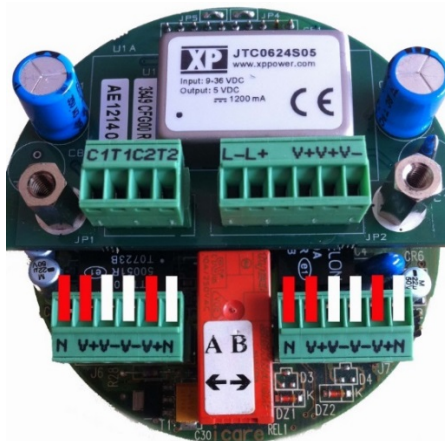
Figure 5: Connecting drawing of the network versions

For more detail, thanks to refer to the operating manual NOSP15251

4.3.10. 0-22mA input connection

In one of its inputs type, type (C): **DM**-**6-****-C**-**-***-*-*-* the device enables to use a 0-22mA input from another sensor.

RS485 :
Terminal block
not used

T+ T- R+ R- 0V 0V   I_{in} / 0V 0V

RS485   Connection to remote sensor

PIE 3508

Connection to detector
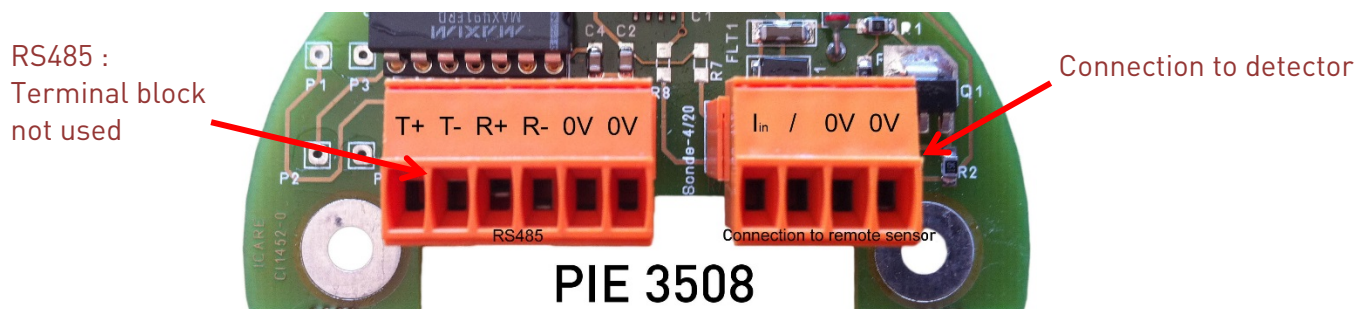
In that case, an inputs of the cable gland or an accessory in replacement of the cartridge enables the connection between the hosted sensor and the device.

In order to operate this analogue input, an additional electronic card (PIE 3508 or PIE 3509) is added above the numeric card

The hosted sensor NEEDS to get its own power
The connecting wires to another detector are limited to a 1 mm² section.

Using this board leads to a connection between 0V from power supply and housing ground.

4.3.11. Half bridge explosimeter input

It is possible to configure a device with an Ex05 remote explosimeter probe or a SX202 as an external probe. In the below configuration, the input is of type Combustible Gas Detector (X) and the cartridge is of type E.

With half bridge explosimeter probe (SX202, MTHX), the device is designed as: DM-**6-****-X**-#*-***-*-*-*

With the external half bridge explosimeter detector (EX05, EX09), the device is designed as:
DM-**6-****-W**- E*-***-*-*-*

In that case, an input of the cable gland or an accessory in replacement of the cartridge enables the connection between the hosted sensor and the device.

In order to operate this analogue input, an additional electronic card (PIE3521) is added above the numeric card.

Probe connection :
- M : measurement (red)
- C : common (white)
- R : reference (blue)

Connection to numerical board
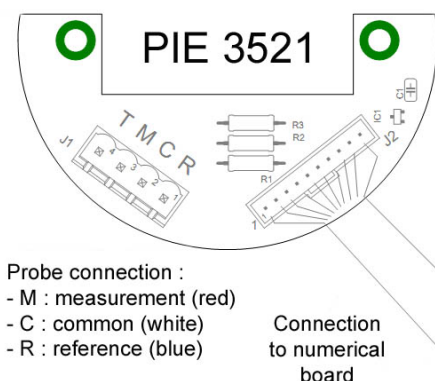
⚠️ **Using this board leads to a connection between 0V from power supply and housing ground.**

The cross section of the wires of the connection cable of the probe must be between 0.9 and 1.5mm². The table below shows the maximum cable lengths according to the cable section.

Minimum copper conductor section in mm² (AWG)	0,5 (20)	0,9 (18)	1,5 (16)
Maximum length	/	15 m	30 m

4.4. Detection cartridge

The cartridge is separated from the detector to enable its replacement. Its dismantling is extremely easy and does not need to touch the rest of the unit.

Caution during the assembly and the disassembly of the cartridge on the detector:

- **Slide the positioning pin of the cartridge into the corresponding hole in the housing (at the bottom of the receiver).**
- **Take care to not damage the cartridge connector when tightening the two parts.**
- **This operation imperatively requires power to be off**

Loosen the locking screw on the side of the nut (see Figure 1), then unscrew the nut, along the first part of the thread. With the nut, pull on the cartridge to remove it and then unscrew the cartridge from the nut.

Cartridges have an identification colour ring (see §1.4).

Insert a new cartridge of the same colour into the case respecting the position defined by the centring pin, screw the nut until it stops ensuring the presence of O-ring. Then, tighten the locking screw.

Switch on the device in order to make the calibration of the new cartridge and the zero adjustment.

5. COMMISSIONING

5.1. Visual inspection

Make certain that all the operations of the "Installation" chapter have been achieved correctly.

Pay particular attention on installation conformity, check the cables entry, the presence of O-rings, and the connection of the cartridge.

- The label on the smart sensor indicates the type of detector, the type of gas and the range for which the instrument has been calibrated,
- The cartridge colour must correspond to the type of detector: yellow for combustible gas, brown for catharometer.

5.2. Power-up

The smart sensor is powered through the multichannel detection unit or the Programmable Logic Controller. It results in the flashing of the green LED in the communication head.

5.3. Operational tests

All MultiXplo / MultiTox detectors are delivered set and tested. Some additional tests are necessary to check the good working of the loop. Please make sure to have all authorizations needed before running the following operations:

- Check the states/information using the wireless configuration tool (TLU),
- Check the alarm levels
- Zero point:
  If there are no polluting gases or, if necessary, by injecting clean air at 30 l/h using the calibration kit equipped with an air cylinder
- Sensitivity:
  By injecting a suitable gas mixture at 30 l/h using the calibration kit
- Check the servo controls

6. OPERATION

6.1. Environmental conditions

The lifetime of the catalytic cartridge depends on the operating environment related to certain pollutants.

Take care to avoid exposures to some vapours products as silicone (vapours of some paintings, some seals ...), halogenated products (molecules containing one atom of chlorine, fluorine, bromine) or as sulphur ones (H2S ...).

6.2. Inhibition

Maintenance Inhibition is temporary. It appears during power up and maintenance phases. Inhibition stops automatically when the operator get out of the maintenance menus or 10 minutes after the end of communication with the TLU.

Maintenance inhibition can be configured in "frozen" mode (factory setting) or in "free" mode.

- In "frozen" mode, outputs (current and relay) remain in their previous state.
  For example, if the device indicated a failure (2.0 mA), this state would be maintained during the inhibition.
- If the unit is configured in "free" inhibition mode, the output current will be on the same level as for the permanent inhibition

The permanent inhibition is activated by an order issued by the TLU when an operation is performed at/or around the device, or when the operator wants to inhibit a faulty device. The permanent inhibition must be removed by an operator's deliberate action using the TLU.

6.3. Signal current loop

State	¨4-20¨ [mA]	¨0-22¨ [mA]	TLU state
Line fault	0.0	0.0	
Configuration fault	2.0	2.0	DEF
Detector fault (electronic)	2.0	2.0	DEF
Measure fault	2.0	2.6	DEF
Start inhibition	2.0	3.4	Warming up remaining time including power up
Permanent inhibition	2.0	3.4	INH
Maintenance inhibition Fixed configuration (fault) / (¨free mode ¨) *	Previous value/ (2.0)	Previous value/ (3.4)	INH
Alarm verification	21.7	21.7	DOUT
0% of full scale	4.0	4.0	No detection No alarm
25% of full scale	8.0	8.0	Alarm if overran level
50% of full scale	12.0	12.0	Alarm if overran level
75% of full scale	16.0	16.0	Alarm if overran level
100% of full scale	20.0	20.0	Alarm
105% of full scale	20.8	20.8	Alarm

(*) Maintenance inhibition may be available in frozen or free mode.

6.4. Alarm indication (LED)

A red LED located in the head of communication flashes in case of confirmed alarm status.

- Flashing 1 Hz: Level 1
- Flashing 3 Hz: Level 2

If the alarm memorization is activated, the LED continues to flash until the alarm is acknowledged with the TLU or until the detector is powered off, then powered on again.

If the alarm memorization is disabled, the LED stops flashing when the alarm fades.

> If the device is used in a safety loop in a potentially explosive area (EN60079-29-1), the upper alarm must be memorized, and a manual action must be taken to clear it.

6.5. Wireless communication tool TLU600

All settings and tests of detectors can be done by the wireless communication tool TLU600. This communication tool and its software are compatible with all Oldham Simtronics detectors: MultiFlame, MultiTox and MultiXplo. Communication is made via infrared link (IrDA), similar but more efficient than infrared links for computers. IrDA head should not be placed facing the sun as it significantly reduces the communication with the TLU600.

Please refer to the wireless communication tool operating manual for more details.

The TLU600 menu is composed of 2 access levels allowing both settings and obtaining information about detector's status.

- level 1 : exploitation
- level 2 : Maintenance

6.5.1. Main screen

The main screen is composed into several data fields.

C 1		C 2		C 3	C
C 4					1
C 5					0
C 6	I	C 7	I	C 8	I	C 9	

- *C1: Detector name field*
- *C2: Field blank if normal operation; INH- if inhibited*
- *C3: Field blank if normal operation; FLT- if at least one fault has occurred*
- *C4: State of detection: no detection, cartridge fault*
- *C5: State of alarm: alarm, no alarm*
- *C6, C7, C8 and C9: Name of keys F1, F2, F3 and F4*
- *C10: Wireless communication tool pictograms*

Main screen displays identity and state of the detector.

```
DM-TX6
     0% LIE C4H10
[0 ---------- 100%]
INFO|ADJT|MAIN|FCNX
```

6.5.2. General operation

The user can navigate through the menu with the F1 to F4 keys, whose functions change depending on the fields displayed above each key. Standard functions:

- >>>>   Scroll function / next screen.
- ESC   Exit the current menu and return to the previous one.
- CHG   Changing displayed value.
    - VAL   Validation and Check-in of the changed value.

The changed value must be confirmed by pressing [VAL] key, otherwise the old value will be kept when leaving the menu.

6.5.3. Menu structure

- **Exploitation** :
  This level enables access to the information and the status of the detectors. It does not allow the configuration operations or write access.
- **Maintenance** :
  The access to the parameters and other maintenance operations is protected by a password. Default password (6 digits which can be changed): **012345**.
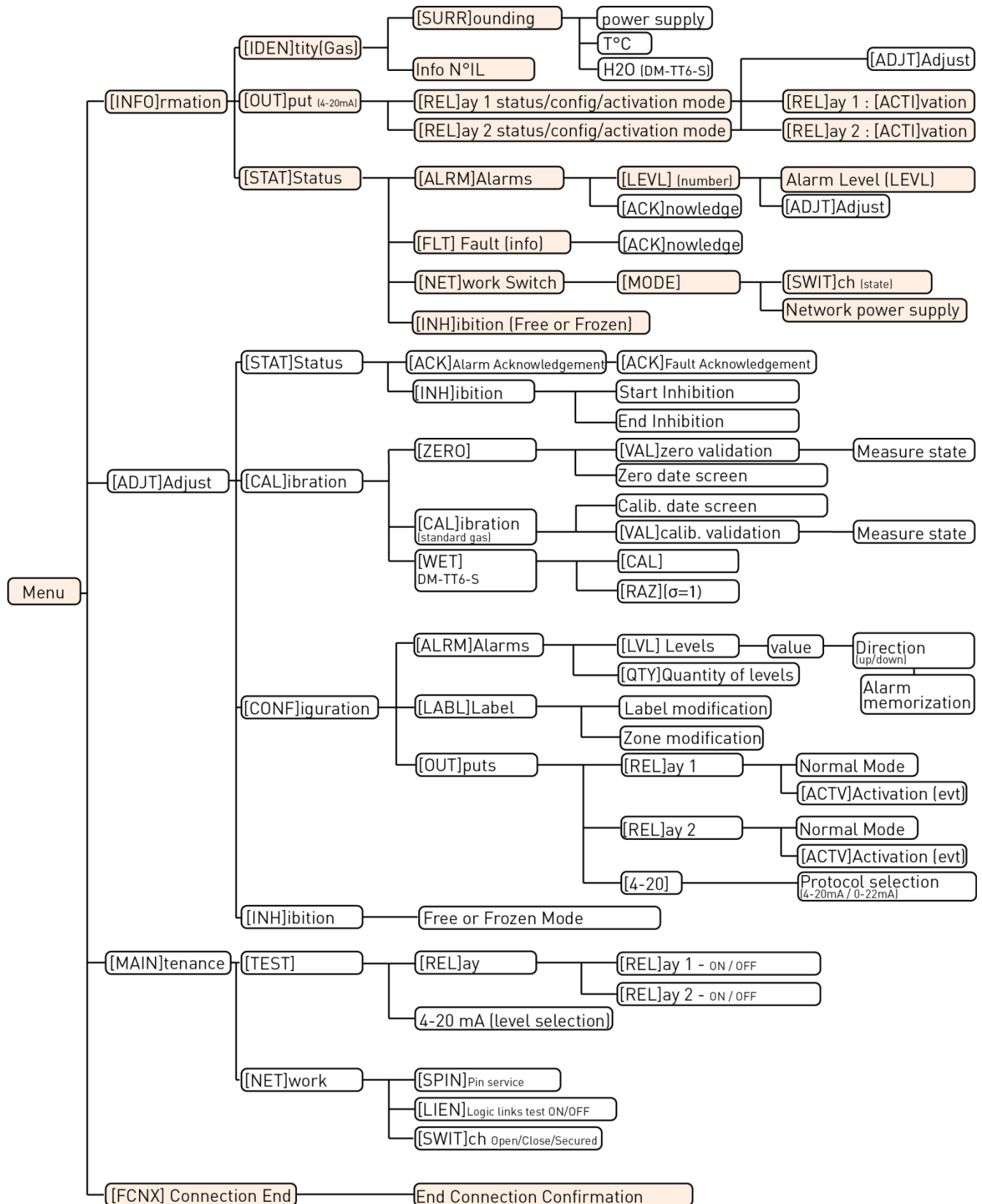
6.6. Information menu [INFO]

The information menu contains all information concerning the identity and settings of the detector. The first screen gives the detectors reference and its serial number.

6.6.1. [IDEN]tity submenu
Presentation of:

- The serial number
- The device reference
- The scale and the targeted gas

Sub-menus present the board software version, the power supply voltage and the temperature read in the cartridge.

6.6.2. [OUT]put submenu
Presentation of:

- Current protocol (0-20 mA or 4-20 mA).
- Normal state of the relays (normally open or normally closed).
- Condition of relays activation.

Relays can be set with a level 2 access.

6.6.3. [STAT]e Information submenu
Presentation of:

- Number and value of activated alarm levels.
- List of eventual faults (press F1 key to scroll through the list)
- Possibility to acknowledge alarms
- Possibility to acknowledge ambiguity (DM-TX6)

6.6.3.1. [ALRM] Alarm screen
Allows setting of levels and alarms acknowledgement.

6.6.3.2. [FLT.] Fault screen
Displays a list of eventual faults (press F1 key to scroll through the list) and allows their acknowledgment.

6.6.3.3. Network screen: switch state
This menu and its sub-menus are used for the network detector settings. For any further details, please refer to the Syntel system operating manuals.

MODE SCREEN
The first line shows the operating mode of the sensor in the network (logic link test / out of order / emulation).
The second line shows if the network part of the detector is "operating" or "out of order". For any further details, please refer to the Syntel system operating manuals.

NETWORK SCREEN: ALIM
Information displayed:

- Voltage A: ON / OFF
- Voltage B: ON / OFF

For any further details, please refer to the Syntel system operating manuals

6.6.3.4. The INH screen:

This screen is dedicated to verify the inhibition mode configuration (frozen or free). If the access level permits it, it is possible to change this setting.

6.7. Adjustment menu [ADJT]

This menu presents all the detector settings. All the functionalities, except alarm level acknowledgment, request access level 2.

6.7.1. [STAT]us sub-menu

6.7.1.1. Alarm Acknowledgement

This menu enables the acknowledgement of the memorized alarms. The alarm can be acknowledged only if the alarm condition has disappeared.

6.7.1.2. Inhibition / End of inhibition

The inhibition (called permanent inhibition) is activated or deactivated manually using the menu. This function is used for deactivating the detector outputs (example: during maintenance).

The « inhibition » menu is available if the sensor is not in inhibition, maintenance inhibition or simulation.

Selecting the inhibition mode will switch the detector in inhibition mode.

The message "End of inhibition" is displayed on the TLU.

Press on "End of inhibition" to get the detector back to normal operating mode.

6.7.2. CALIBRATION sub-menu

6.7.2.1. Zero point setting

The operator can set the zero point with the wireless communication tool TLU600.

The detector is in maintenance inhibition mode for 10 minutes after it goes back to main screen. Use the setting menu and validate the INH command for acknowledgement.

Press F4 key to stop communication between TLU600 and the detector.

```
DM-TX6
  0% LIE C4H10
[0 ---------- 100%]
INFO|ADJT|MAIN|FCNX
```

The zero point setting is ignored and the previous value is retained

```
    ADJUSTMENT


STAT|CAL.|    | >>
```

```
    ADJUSTMENT


ZERO|CAL.| << |ESC
```

Detector goes into maintenance inhibition mode

Zero point is correct

```
  ZERO ADJUSTMENT
    % LIE C4H10
Validation?
ZERO|[%] |DATE|ESC
```

Please refer to next chapter

```
 ZERO SETTING DATE
Current:06/08/2011
Next   :07/09/2011
 -- | ++ | >> |VAL.
```

Zero date screen*:
Used to set a date for the zero point and suggest the next zero point scheduled date

Wait until measurement stabilizes
Zero point is NOT correct (out of scale)

```
  ZERO ADJUSTMENT
Fault
Sensor in fault?
YES | NO |    |
```

```
    ZERO ZONE

[0 000000---- 100%]
   |    | << |ESC
```

Zero positionning screen :
Indicates current deviation from initial factory setting

The detector switches to fault state
4-20 mA: = 2 mA
0-22 mA: = 2.6mA

* The device doesn't embed battery, it is then not able to keep real time. The date indication for zero or calibration points, as well as the next expected date for similar operations, are entered manually by the operator. Those data are for information only and their update is optional.mise à jour est facultative.

6.7.2.2.   Calibration

Calibration must be made with the gas the detector is set to detect, with the SET menu (F2 key) of the wireless communication tool TLU600 and a calibration kit. The calibration gas should be injected at a flow rate between 30 l/h and 60 l/h.

The detector is in maintenance inhibition mode for 10 minutes after it goes back to main screen. Use the setting menu and validate the INH command for acknowledgement.

To end of communication between the TLU600 and the detector is done by pressing F4 key on main menu.

```
DM-TX6
  0% LIE C4H10
[0 ---------- 100%]
INFO|ADJT|MAIN|FCNX
```

```
      ADJUSTMENT


STAT|CAL.|    | >>
```

The calibration point setting is ignored and the previous value is retained

```
      ADJUSTMENT


ZERO|CAL.| << |ESC
```

Detector goes into maintenance inhibition mode

Calibration is correct

```
  CALIBRATION GAS
    50% LIE C4H10
value: [10 - 100]
VAL.|    | << |ESC
```
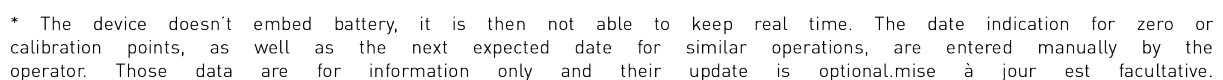
Modify the cylinder gas concentration on the keypad (if necessary) and [VAL]idate

```
  CALIBRATION GAS
    41% LIE C4H10
Validation?
CAL.|[%] |DATE|ESC
```

Inject the reference gas at a flow rate between 30l/h and 60l/h. Wait until the measurement is stabilized

```
CALIB. SETTING DATE
Current:06/08/2011
Next   :07/09/2011
 -- | ++ | >> |VAL.
```

Calibration date screen*:
Used to set a date for the calibration point and suggest the next calibration point scheduled date

Wait until measurement is stabilized
Calibration is NOT correct (out of range)

```
    CALIBRATION
Fault
Sensor in fault?
YES | NO |    |
```

```
  CALIBRATION ZONE

[0 000000---- 100%]
    |    | << |ESC
```

Calibration positionning screen :
Indicates current deviation from initial factory setting

The detector switches to fault state
        4-20 mA: = 2 mA
        0-22 mA: = 2.6mA

* The device doesn't embed battery, it is then not able to keep real time. The date indication for zero or calibration points, as well as the next expected date for similar operations, are entered manually by the operator. Those data are for information only and their update is optional.mise à jour est facultative.

6.7.3.   Alarm sub-menu

The menu gives access to:

- The number of alarms levels used (0 to 4).
- The trigger's value of the alarm (levels values)
- The alarm trigger sense (up/down)
- The alarm memorization (yes/no)

On one hand, the alarm memorization maintains relays and alarm information on the wireless communication tool. On the other hand, the current output and the concentration displayed on the wireless communication tool are always updated with the real concentration.

6.7.4.   Label and zone sub-menu

This menu allows label and zone's modification. After selecting a label or a zone, the modification function operates in the same manner.

The numeric keys correspond to different alphanumeric characters. For each displayed page, the numeric keys have a different assignment.

Both "Label" and "Zone" fields are free text type for identification of the detector (name and position of the detector).

To edit fields, select [label] or [zone].

- Press on the corresponding numeric key to select a figure.
- Press [>>] to go to the next figure in the field.
- Press [PAGE] to go next page.

The label or zone modification must be confirmed by pressing the key VALID, otherwise the modification is not taken into account

6.7.5.   Output configuration sub-menu

6.7.5.1.   [Adjust] / [Config] / [Outputs]

This menu gives access to the configuration of the relay operating mode and to conditions of activations.

State of the relays:
Each relay can be configured:

- Normally open (not energized)
- Normally closed (energized)

Activation of the relays:
Each relay can be activated on one or several following conditions:

- Alarm
- Fault
- Inhibition

Factory setting:

- Relay 1:   normally not energized, activated on alarm levels
- Relay 2:   normally energised, activated by any fault or inhibition
  Contacts are then described as below :

Detector status	Relay 1 "Alarm"	Relay 2 "Fault"
Normal (no alarm, no fault, no inhibition and detector powered	C1-T1 open	C2-T2 closed
Alarm	C1-T1 closed	C2-T2 closed
Ambiguity function (TX explosimeter only)	C1-T1 closed	C2-T2 open
Fault or inhibition	C1-T1 open	C2-T2 open
Maintenance Inhibition (during maintenance mode)	Depend of configuration. See chapter 6.2	
Power loss	C1-T1 open	C2-T2 open

6.7.5.2.   Output current configuration

This menu allows you to switch the format of the output current between 4-20 mA and 0-22 mA.
Factory setting: the output current is 4-20 mA

6.7.6. [INH]ibition submenu

Maintenance inhibition can be configured in « frozen » mode (factory setting) or « free » mode. For further details, please, refer to §6.2

- In « frozen» mode, the outputs (current and relay) remain in their previous state. For example, if the device displays a fault (2.0 mA), it will remain in this mode during the inhibition.
- If the device is configured in « free » mode, the current output will remain at the same level than the permanent inhibition

6.8. The maintenance menu [MAIN]

The maintenance menu allows the user to check if the detector is in normal operation conditions

- (Test of the relay and current outputs).

6.8.1. TEST sub-menu

6.8.1.1. Relay menu

This menu gives access to activation or deactivation of the relays.

The detector goes to inhibition mode. The detector will stay in inhibition mode if the user goes back through the steps to the main menu. Otherwise, the detector will return to its "current" state.

6.8.1.2. The 4-20 mA screen

This menu allows the output current to be set at a chosen value. The possible output values are: 2mA, 4mA, 8mA, 12mA, 16mA, 20mA or 22mA.

During this phase, the detector goes automatically to inhibition mode. The detector will stay in inhibition mode if the user goes back through the steps to the main menu. Otherwise, the detector will return to its "current" state.

6.8.2. NETWORK sub-menu

This menu gives direct access to different tests for the network. For any further details, please refer to the additional network operating manual:

- SPIN sends the detectors network identification.
- LIEN switches from normal mode to logic link mode.
- SWITCH enables the switches to go on mode open/closed/open secured.

6.9. Ambiguity function in combustible gas detector smart sensors

In compliance with applicable standards, the ambiguity function is activated when a detected gas concentration rises above 120% LEL. The signal is locked at 21.7 mA to protect against any false measurement due to oxygen deficiency.

This function also cuts the power to the cartridge to avoid damaging the sensitive element.

⚠️ **The measurement signal can only be unlocked by the operator using the TLU600 remote control unit. Before that, the non-presence of inflammable gas or vapour in atmosphere must be control by the user.**
Even switching the power off and power on again from the control room will not unlock the signal.

The TLU displays the following screen:

```
DM-TX6      DOUT FLT.
> 100% LIE C4H10
[0 0000000000 100%]
INFO|ADJT|MAIN|FCNX
```

To clear the ambiguity, follow the instruction below with the TLU600:

INFO / STAT / ALRM / ACK. (YES)

```
    ALARM ACKNOLEDGE
    + Overshoot ack.
Confirm?
YES |  >>  |  <<  |ESC
```

The device then goes in warm-up mode (refer to §6.3) for 90s. The detector is in inhibition mode. The current output and the default relay (if factory configuration) are consequently activated.

A warming-up timer starts to countdown from 90 sec.

```
DM-TX6      INH.
Warming-Up : 87s
[0 00000----- 100%]
INFO|ADJT|MAIN|FCNX
```

Then, the inhibition is released.

7. MAINTENANCE

The interventions described in this chapter must be performed by competent and qualified staff. Device performances may be affected if present instructions are not respected.
Cartridge unplug or device opening imperatively require power to be OFF.

Zero adjustment does not affect the sensitivity of the detector and vice versa.

7.1. Power off / opening of housing

All the power supply wires must be cut to put unpowered the detector

7.2. Periodic maintenance

We recommend re-calibration of the smart sensor every six months. Correct the zero point if needed.

7.2.1. Preventive maintenance

A gas test is recommended every six months. Run a calibration if necessary. A zero point calibration with clean air has to be done first.

We recommend using gas mixture with the target gas at 50% of the measuring range. The complement of the mixture should be Air for DM-TX6-X and air or Nitrogen for DM-TT6-K.

Periodicity of the maintenance should be adjusted (reduced) if the device is exposed to the conditions defined by the IP rating.

If the detector enters in ambiguity mode, a test of the zero point and a calibration are recommended. We recommend cleaning the communication head window at the same time.

For any other operation, please contact your supplier or our technical services.

7.2.2. Corrective maintenance

If the detection unit or the PLC signals a detector's fault, the detector must be tested directly with the wireless communication tool to determine the type of fault.

If the detector is configured in 0-22 mA output, it is possible to have a pre-diagnostic of the fault.

7.3. List of main faults

In addition of the current loop faults, other information are available from the wireless communication tool TLU600 (refer to § 6.5). If the detector does not work properly, the following table can help you to determine the causes and effects of different possible troubles.

FAULTS	CAUSES	SOLUTIONS
Green LED OFF	Power supply failure	Check the power supply (18 and 28 V_{DC}) at the detection unit or the PLC output
	Continuity issue	Check line continuity
No 4-20 mA / 0-22 mA signal 3-wires cabling	Power supply failure	Check the power supply (18 and 28 V_{DC}) at the detection unit or the PLC output
	Continuity issue	Check line continuity
	No shunt between V+ and L+	Place the shunt
No 4-20 mA / 0-22 mA signal 4-wires cabling	Power supply fault	Check the loop with a milliammeter.
ZERO_FAULT (Zero point fault)	Zero point resetting impossible	Fault memorized, even on a power supply shut down. To acknowledge this fault, make a full calibration (in general, the sensor needs to be replaced).
DRIFT_FAULT (Zero point drift)	Sensor drift: the measure is below -10%	Non-memorized fault. Automatic acknowledgement when the measure goes back above -10%. Resetting the zero point is necessary.
CALIB_FAULT (Calibration fault)	Calibration resetting impossible	Memorized fault, even on a power supply shut down. To acknowledge this fault, make a full calibration (in general, the sensor needs to be replaced).
SELFTEST_FAULT SENSOR_FAULT (Fault material)	Material trouble (electronic part failure) on the sensor or on the electronic board of the detector This fault is triggered if there is no sensor in the detector.	Non-memorized fault. Automatic acknowledgement when the detector is back to normal operation conditions. An electronic failure of the detector hardly happens. Replacing the cartridge will solve the problem most of the time.
TEMPERATURE_FAULT Temperature fault)	Temperature sensor is out of order or disconnected. The temperature sensor is in the cartridge.	Non-memorized fault. Automatic acknowledgement when the detector is back to normal operation conditions. Replace the cartridge.
No wireless communication tool connection	Detector unpowered	Check that the green LED flashes.
	Dialogue problem	Check the wireless communication tool by using it on another detector.
Detector fault (Material fault)	Electronic fault	Replace the detector

7.4. Replacing the cartridge

Follow the instruction in §4.4.

7.5. Replacing the complete detector

If the operator needs to replace the complete detector, the easiest way is to take off the main housing from the base of the detector (for more details, refer to §4.2.1.

As the base of the detector remains in place, cable glands do not need to be dismantled. If the detector is not replaced immediately, the "open" base must be protected against humidity, dust and shocks

No intervention should be carried out when the detector is powered.

8. ATEX / IECEX MARKING

The detector identification label is placed on the main housing, according to ATEX directives ATEX 2014/34/UE.

- Constructor: Oldham Oldham Simtronics
- Model: DM-TX6…

  DM-TT6…
- Serial number: S/N : xxxxxxxxx   (xxxxaamm)
- Type of certification: CE0080   ⟨Ex⟩   II2G / Ex db IIC T 6 Gb

  -20°C < Ta < + 65°C
- Certificate number: ATEX: LCIE 03 ATEX 6257, LCIE 03 ATEX 6263

  IECEx: LCI 09.0019, LCI 09.0018
- Reference of the product standard   EN 60079-29-1: INERIS 11ATEX0033(DM-TX6-X)
- Warnings   Warning - Do not open under power
- Ingress rate: IP66*
- Max. power supply voltage: 30 VDC
- Maximum consumption: 5 W

* IP rating does not mean that the equipment will detect the gas during or after exposure to the defined conditions.

It is also recommended to use the device with the following accessories: AS056-250, AS019, AS015.

9. ACCESSORIES AND SPARE PARTS

9.1. Spare parts

- O-ring spare parts
  For the base (All models) - Joint kit BT606   Ref: 04000284
- Lubricant for explosion proof seal and thread: MOLYKOTE Brand, reference P40.
- Combustible gas detector cartridges type X: DM-SX6-SADG-XX0-X0 (inox)
  (Gas to specify)   DM-SX6-SADG-XA0-X0 (alu)

- Catharometer cartridges type K: DM-SX6-SADG-KX0-X0(inox)
  (Gas and scale to specify)   DM-SX6-SADG-KA0-X0(alu)
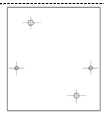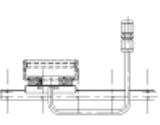
<u>Storage life of accessories and spare parts :</u>

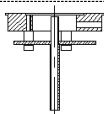| Ref	Temperature	Humidity	Pressure	Time
TLU600	-20°C to +45°C	95% HR (non condensable)	1013 hPa +/- 20%	2 ans in « clean » atmosphere
TLH700	-20°C to +60°C	95% HR (non condensable)	1013 hPa +/- 20%	2 ans in « clean » atmosphere
Mechanical Products (*)	-20°C to +40°C	95% HR (non condensable)	1013 hPa +/- 20%	2 ans in « clean » atmosphere
CAL-K##-...	Same as detector			
Joints d'étanchéité	Same as detector			
Joint kit BT10	Same as detector			
MOLYKOTE réf P40	Same as detector			60 mois
Cartouches Explo	Same as detector			
Cartouches Catha	Same as detector			

* Products called « mechanical » in the previous table are :
AS045, AS005, AS215, AS015, AS016, AS011-2X, AS02x, AS019, AS052, AS053, AS047, AS048, AS056-250, AS205, AS055.

9.2. Accessories

Accessories	Designation	Description	Part Number
	Remote control unit	Required for adjustments and maintenance	TLU 600
	Remote control unit HART	Avalaible for adjustments and maintenance	TLH 700
	Adapting Plate	Used to adapt old detector attachments to fit new generation detectors	AS006
	Calibration cup	Fits all cartridges	AS005 ❶❹
	Tag plate	For on-site identification of detectors	AS215
	Calibration kit	The kit comprises: • One air cylinder and one pressurized cylinder containing a mixture of air and a gas of titrated concentration, • A 30 l/H flow rate pressure reducing and regulating valve, • A 3 meter pipe. The calibrating cup is not included in the calibrati except for H_2 DM-TX6-X	CAL-K##-…
	Filter support	For use in certain situations with molecular filters in order to block out interfering gases.	AS015 ❷
	Remote calibration connection	Accessory enabling a gas supply tube to be attached near the cartridge.	AS016 ❶
	Stainless steel sample flow with 2 ways	For use with gas circuit systems.	AS011-2X ❶
	Duct mounting	A series of accessories for installing detectors on different types of ducts	AS02x ❶
	Water, sand and dust protection	Adaptation to all cartridges, the assembly is directly in front of cartridge thanks to the nut of maintain (black on version -A).	AS019 ❸

	Wall spacer	Avoid fixing the detector directly on the wall	AS014
	Suspension cable enclosure/body	Enables to connect the enclosure with the body during the maintenance operations	AS052
	Tube mounting adapter	Enables DM-T#6, DMi-TT6, DG-T#7, DGi-TT7 et GD10P lines to be mounted on a 2 inch to 2.5 inch diameter tube	AS053
	Weather protection (wall or tube mounting)	Dedicated to protect apparatus from sun / rain / snow.	AS056-250❹
	Godet de calibrage SX202 / MTHX-S	Se visse sur la sonde (sonde déportée uniquement)	AS205 ❶

❶ Detector sensitivity is not modified, response time depend on the flow rate used for injection. A flow rate between 0.5 L/min and 1 L/min should comply with "standard" response time.

❷ Detector sensitivity is not modified; response time can increase depending on the molecular filter used.

❸ Detector sensitivity is not modified, response time (T90) (natural diffusion condition) is increased by 50%.

❹ Detector sensitivity and response time are not modified.

❺ This accessory is included into the EN60079-29-1 Performance Certificate.

Wipe non-conductive parts (plastic) that can use in ATEX area with a damp cloth (risk of electrostatic charges)

9.3. Gas table codes & range table codes

According to the new references: **DM-TX6-F1F2-X☐☐-☐☐-☐☐☐-☐-☐-☐**

F1	Formula	Gas name	Comment	F2	Range
01	AsH_3	Arsine		00	Pas
02	C_2H_2	Acetylene		AA	1 ppm
03	C_2H_4	Ethylene		AB	2 ppm
04	C_2H_4O	Ethylene oxide		AC	5 ppm
05	C_2H_6O	Ethanol		AD	10 ppm
06	C_2H_6O	Dimethylene		AE	20 ppm
07	C_3H_6	Propene		AF	50 ppm
08	C_3H_6O	Acetone		AG	100 ppm
09	C_3H_8	Propane		AH	200 ppm
10	$i-C_4H_{10}$	i-Butane		AJ	500 ppm
11	C_5H_{12}	Pentane		AK	1000 ppm
12	C_6H_{14}	Hexane		AL	2000 ppm
13	C_6H_6	Benzene		AM	5000 ppm
14	C_7H_8	Toluene		AN	10000 ppm
15	C_8H_8	Styrene		AP	3000 ppm
16	CH_2Cl_2	Dichloromethane		AQ	25 ppm
17	CH_4	Methane		BA	1 %Vol
18	CH_4	Methane	(Biogas)	BB	2 %Vol
19	CH_4O	Methanol		BC	5 %Vol
20	Cl_2	Chlorine		BD	10 %Vol
21	CO	Carbon monoxide	(H2S comp)	BE	20 %Vol
22	CO	Carbon monoxide		BF	50 %Vol
23	CO_2	Carbon dioxide		BG	100 %Vol
24	CO_2	Carbon dioxide	(CH4 immune)	BH	3 %Vol
25	$COCl_2$	Phosgene		BJ	25 %Vol
26	X	All gases		BK	4 %Vol
27	CTFE	CTFE		BL	21 %Vol
28	CVM	Vinylchloride		BM	24 %Vol
29	F_2	Fluorine		BN	17 %Vol
30	H_2	Hydrogen		BZ	Other % vol
31	H_2S	Hydrogen sulphide		DE	20 %LIE (1)
32	HCl	Hydrogen chloride		DF	50 %LIE (1)
33	HCN	Hydrogen cyanide		DG	100 %LIE (1)
34	He	Helium		DH	30 %LIE (1)
35	HF	Hydrogen fluoride		DJ	15 %LIE (1)
36	MCPE	MCPE		DP	125 %LIE (1)
37	N_2	Nitrogen		EE	20 %LIE (2)
38	$n-C_4H_{10}$	n-Butane		EF	50 %LIE (2)
39	NH_3	Ammonia		EG	100 %LIE (2)
40	NO	Nitric oxide		GC	5 LELm
41	NO_2	Nitrogen dioxide		KA	1 ppm*m
42	O_2	Oxygen		JB	2 ppm*m
43	O_3	Ozone		KC	5 ppm*m
44	PFBA	PFBA		KD	10 ppm*m
45	R22	Chlorodifluoromethane		KE	20 ppm*m
46	R23	Trifluoromethane		KF	50 ppm*m
47	SO_2	Sulphur dioxide		KG	100 ppm*m
48	C_5H_{10}	Cyclopentane		KH	200 ppm*m
49	VC_2	VC2		KJ	500 ppm*m
50	D40	White Spirit		KK	1000 ppm*m
51	/	Gasoil		KL	2000 ppm*m

F1	Formula	Gas name	Comment	F2	Range
52	/	Super 95		KM	5000 ppm*m
53	/	Super 98		KN	10000 ppm*m
54	/	LPG		LH	200 ppm*m/100 LEL*m
55	C_2H_5Cl	Ethyl chloride		LJ	500 ppm*m/100 %LEL*m
56	C_2H_6	Ethane		LK	1000 ppm*m/100 %LEL*m
57	C_3H_3N	Acrylonitrile/Vinyl cyanide		LM	5000 ppm*m /100 %LEL*m
58	$C_3H_6Cl_2$	Dichloroethane		ZZ	Other
59	C_3H_6O	Propylene oxide			
60	C_3H_8O	Isopropyl alcohol			
61	C_3H_8O	Propyl alcohol			
62	$C_4H_{10}O$	Butanol			
63	C_4H_6	Butadiene			
64	C_4H_8	Butene			
65	C_4H_8O	Butanal			
66	C_4H_8O	Methyl-ethyl-ketone(MEK)			
67	$C_4H_9O_2$	Ethyl acetate			
68	$C_5H_{10}O$	Methyl-isopropyl-ketone			
69	$C_5H_{10}O_2$	Propyl acetate			
70	$C_5H_{12}O$	Isopentanol			
71	C_5H_8	Isoprene			
72	C_6H_{10}	D-limonene			
73	C_6H_{12}	Cyclohexane			
74	C_6H_{12}	Hexene-1			
75	$C_6H_{12}O_2$	Butyl acetate			
76	C_7H_{16}	Heptane			
77	$C_6H_4(CH_3)_2$	Xylene			
78	$C_7H_{12}O_2$	N-butyacrylate			
79	C_2H_4	Ethylene	(special : low interf.C2H6)		
80	C_3H_8	Propane	(special: low interf. CH4)		
81	CH_4	Methane	(special : low interf.C3H8)		
82	C_8H_{18}	Octane			
83	$CF_3\text{-}CFH_2$	R134a			
84	/	Kerosene			
85	C_2Cl_4	Tetrachloroethene			
86	C_2H_4	Ethylene	Special customer (EG)		
87	HC lourd	F1850	Special customer		
88	$(CH_3)_3COCH_3$	MTBE			
89	H2S + CH4	Hydrogen sulfide + Methane			
SA	Xs	Special combustible gas	App SA		
CS	H2	Hydrogen in Argon	Complement Argon		
CU	H_2	Hydrogen in Azote	Complement Azote		

Regarding reference F2 = DG (100% LEL), the following table defines what OLDHAM SIMTRONICS uses of correspondence between %vol and 100% LEL.

F1	Nom produit	Name of compound	Formule Formula	% vol équivalent à 100 % LIE / LEL
63DG	1,3-butadiène	1,3-Butadiene	C_4H_6	1.4
64DG	1-Butène	1-Butene	C_4H_8	1.6
08DG	Acétone	Acetone	C_3H_6O	2.6
02DG	Acétylène	Acetylene	C_2H_2	2.2
39DG	Ammoniac	Ammonia	NH_3	16.0
13DG	Benzène	Benzene	C_6H_6	1.2
38DG	n-Butane	n-Butane	C_4H_{10}	1.8
38EG	n-Butane (LIE 2)	n-Butane	C_4H_{10}	1.4
28DG	Chlorure de vinyle	Vinyl chloride	C_2H_3Cl	3.6
73DG	Cyclohexane	Cyclohexane	C_6H_{12}	1.3
06DG	Diméthyle éther	Dimethyl ether	C_2H_6O	2.7
56DG	Ethane	Ethane	C_2H_6	3.0
56EG	Ethane (LIE 2)	Ethane	C_2H_6	2.4
05DG	Ethanol	Ethanol	C_2H_5OH	3.3
03DG	Ethylène	Ethylene	C_2H_4	2.7
76DG	Heptane	Heptane	C_7H_{16}	1.1
30DG	Hydrogène	Hydrogen	H_2	4.0
10DG	Isobutane	Iso-butane	$i-C_4H_{10}$	1.8
60DG	Isopropanol	2-Propanol	C_3H_8O	2.0
17DG	Méthane	Methane	CH_4	5.0
17EG	Méthane (LIE 2)	Methane	CH_4	4.4
19DG	Méthanol	Methanol	CH_3OH	5.5
12DG	n-Hexane	n-Hexane	C_6H_{14}	1.1
12EG	n-Hexane (LIE 2)	n-Hexane	C_6H_{14}	1.0
11DG	Pentane	Pentane	C_5H_{12}	1.4
09DG	Propane	Propane	C_3H_8	2.2
09EG	Propane (LIE 2)	Propane	C_3H_8	1.7
07DG	Propylène / propène	Propylene / propene	C_3H_6	2.0
15DG	Styrène	Styrene	C_8H_8	1.1
14DG	Toluène	Toluene	C_7H_8	1.2
77DG	Xylène	Xylene	$C_6H_4(CH_3)_2$	1.0

10. CONFORMITY CERTIFICATE

TELEDYNE OLDHAM SIMTRONICS
Everywhere**you**look™

DECLARATION UE DE CONFORMITÉ

EU CONFORMITY DECLARATION

Réf : UE DM_NOSP0017346_4.1.doc

Nous,
We,
Teledyne Oldham Simtronics S.A.S., ZI Est, 62000 Arras France

Déclarons, sous notre seule responsabilité, que le matériel suivant :
Declare, under our sole responsibility that the following equipment :

Type / *Type*	DETECTEUR MULTIGAZ / *MULTIGAZ DETECTOR*
Modèle / *Models*	DM
Marquage / *ATEX marking*	CE0080 Ⓔx II2G / Ex db IIC T6 Gb -20°C ≤ Ta ≤ +65°C
N° attestation UE de type / *EU type-examination certificate N°*	LCIE 03ATEX6263 INERIS 11ATEX0033
Notification de l'Assurance Qualité de la production / *Quality Assurance Notification Number*	INERIS 00ATEXQ403
L'organisme notifié en charge du suivi de la Directive ATEX *The notified body in charge of monitoring the ATEX Directive is*	INERIS, Parc Alata 60550 Verneuil en Halatte, France
Numéro d'identification / *Identification Number :*	0080

Est conçu et fabriqué en conformité avec les Directives et normes applicables suivantes :
Is designed and manufactured in compliance with the following applicable Directives and standards:

ATEX	Directive 2014/34/UE *Directive 2014/34/EU*	EN 60079-0:2012+A11 :2013 EN 60079-1:2014 (*) EN 60079-29-1 : 2016 (**) EN 50271 : 2010 (**)
CEM /EMC	Directive 2014/30/UE *Directive 2014/30/EU*	EN 50270 :2015 EN 50130-4 :2011
DPC-RPC /	Directive 93/68/CE + Règlement (UE) 305/2011 Directive 93/68/EC + Regulation (EU) 305/2011	EN 54-10 :2002+A1 :2005

(*) La conformité à la EN 60079-1 a été obtenue sur la base de la version 2007, cependant les modifications apportées par la versions 2014 ne la remettent pas en cause / *Compliance with the EN 60079-1 has been obtained on the basis of the 2007 version, however, the changes of the 2014 version does not affect it.*

(**) Uniquement pour les modèles DM-TX6-..DG et DM-RX6-..DG / *Only for DM-TX6-..DG et DM-RX6-..DG models.*

Ce matériel ne doit être utilisé qu'à ce pour quoi il a été conçu et doit être installé en conformité avec les règles applicables et suivant les recommandations du fabricant.
This equipment shall be used for the purpose for which it has been designed and be installed in accordance with relevant standards and with manufacturer's recommendations.
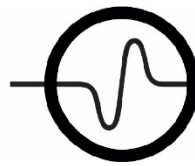
A Arras, le 28/04/2020 / *Arras, April 28th 2020*

AM. Dassonville
Certification Responsible

Dass

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