



Intelligent Sensing  
Anywhere

# CLOG500

Installation manual and safety instructions

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# 1 General Information

The *CLOG500* is a multi-purpose autonomous (GSM/GPRS based, battery powered) remote management system providing data logging, automatic meter reading and alarms, certified to be used under potential explosive atmospheres.

Collected and stored data is sent to a central server via GSM, through SMS, with a configurable frequency from several times a day to one time per week. This data can be requested by any cell phone using SMS.

The system's supply is obtained through a long life lithium battery which guarantees great autonomy and easiness in installation.

## 2 Marking and Legal Conformity

The **CLOG500** is in certification process for the following legal framework:

**1. Directive 94/9/EC (ATEX):**

- a. EN 60079-0: 2012 - Electrical apparatus for explosive gas atmospheres – Part 0: General requirements.
- b. EN 60079-11:2011 - Explosive atmospheres – Part 11: Equipment protection by intrinsic safety 'i'.
- c. EN 60079-26:2007 - Explosive atmospheres – Part 26: Equipment with equipment protection level (EPL) Ga.

**2. Directive 2004/108/EC (EMC)**

- a. EN 300 386 V1.4.1 (April 2007): Electromagnetic compatibility and Radio spectrum Matters (ERM); Telecommunication network equipment; Electromagnetic Compatibility (EMC) requirements.
- b. EN 55022:2006+A1:2007: Formation Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement.

**3. Directive 1999/5/EC R&TTE**

- a. EN 301 489-1 V1.4.1- Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.
- b. EN 301 489-7 V1.3.1 - Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS).
- c. EN 301 511 V9.0.2 - Global System for Mobile communications (GSM); Harmonized standard for mobile stations in the GSM 900 and DCS 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC).

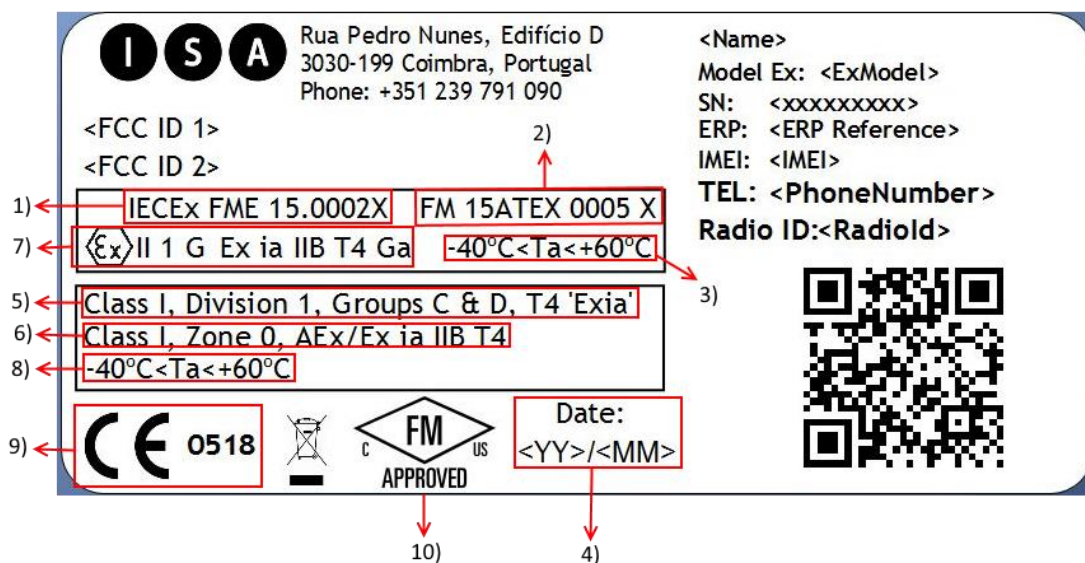
**4. IECEx Scheme**

- a. IEC 60079-0:2011 - Electrical apparatus for explosive gas atmospheres – Part 0: General requirements.
- b. IEC 60079-11:2011 - Explosive atmospheres – Part 11: Equipment protection by intrinsic safety 'i'.
- c. IEC 60079-26:2006 - Explosive atmospheres – Part 26: Equipment with equipment protection level (EPL) Ga.

**5. UL Scheme NEC 505 (for USA/Canada market):**

- a. FM 3600 - Approval standard for electric equipment for use in hazardous (Classified) location general requirements.
- b. CSA C22.2 No. 0 - General requirements - Canadian electrical code, part II.

- c. CSA E60079-0 - Electrical apparatus for explosive gas atmospheres – Part 0: General requirements.
- d. FM 3610 - Intrinsically safe apparatus and associated apparatus for use in Class I, II and III, Division 1 hazardous (Classified) location.
- e. CSA C22.2 No. 157 - Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations.
- f. CSA E60079-11 - Explosive atmospheres – Part 11: Equipment protection by intrinsic safety 'i'.
- g. ANSI/ISA - 60079-26:2008 - Electrical equipment for use in Class I, Zone 0 hazardous (classified) locations.



**Legend:**

- 1) **IECEx Certificate Number:** IECEx: reference to IECEx Scheme; FME: Name of Body Performing IECEx Certification; 15: year of certification; 0002: serial number; X: indication for user to check safety manual for special instructions.
- 2) **ATEX Certificate Number:** FM: Name of Notified Body performing EC-type Examination; 15 year of certification; ATEX: reference to ATEX 95 Directive; 0005: serial number; X: indication for user to check safety manual for special instructions.
- 3) **IECEx and ATEX temperature range.**
- 4) **Date of production:** YY: Year, MM: Month.
- 5) **Ex Marking (US – NEC 500 and CEC Annex J):** Class I: Hazard Class; Division 1: Area Classification 135°C; Groups C&D: Gas Group; T4: Temperature Class> 135°C.
- 6) **US Ex Marking (NEC 505):** Class I: Hazard Class> Flammable Gases; Zone 0: Area Classification: Gas atmospheres, “very high” level of protection; AEx/Ex: Approved US Standards; ia: protection concept code> intrinsic safety; IIB: gas group; T4: Temperature Class> 135°C.
- 7) **ATEX and IECEx classification:** II: Equipment Group; 1G: equipment category> gas atmospheres, “very high” level of protection; ia: type of protection> intrinsic safety; IIB: Gas group; T4: Temperature Class 135°C; Ga: Equipment protection level.
- 8) **US And Canada temperature range.**
- 9) **CE Marking by Notified Body**
- 10) **FM Approvals Marking to US and Canadian Market**

Equipment: *CLOG500*

Year of construction: since 2014

## 3 Warnings

**PLEASE READ CAREFULLY BEFORE ANY MANIPULATION OF THE EQUIPMENT.**



Reading of this manual is mandatory prior to any manipulation of the equipment. Failure to comply with presented safety instructions may lead to severe damage or injury and loss of liability by the manufacturer.



These instructions must be kept and followed throughout the life of the equipment.



Never open the equipment when a potential explosive atmosphere may be present.



POTENTIAL ELECTROSTATIC CHARGING HAZARD. CLEAN ONLY WITH DAMP CLOTHS.



Only use approved batteries.



The enclosure of the CLOG500 is non-conducting and may generate an ignition-capable level of electrostatic charges under certain extreme conditions. The user shall ensure that the equipment is not installed in a location where it may be subjected to external conditions that might cause a build-up of electrostatic charges on non-conducting surfaces, additionally; cleaning of the equipment should be done only with a damp cloth.

Check other warnings in this manual (always marked with .

## 4 Maintenance



The equipment will have no maintenance inside the safety zone. The maintenance possible to perform on the field is just the batteries exchange and SIM Card replacement. For others problems the equipment must be returned to manufacturer.

## 5 Equipment Usage Area

This equipment is certified for use under Group II, Category 1 for gases, vapor or mists as defined in Directive 94/9/EC of 23 March 1994 (Annex I - 2).

*“[...] Equipment in this category is intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapours or mists [...] are present continuously, for long periods or frequently. [...]”*

## 6 Training Instructions

The installation, maintenance and removal/replacement of the equipment must be performed by Manufacturer Authorized Personnel Only. Training will not be required.

## 7 Typical Installation procedure



The installation, maintenance and removal/replacement of the equipment must be performed by Manufacturer Authorized Personnel Only. Training will not be required.



Opening procedure must always be made outside the safety area or outside the reservoir area.



This equipment is certified to be used in potentially explosive atmospheres (please check the group/class to comply with installation local).



The equipment does not require any adjustments during service.

- 1) Connect the sensor to the **CLOG500** (see section 8). Some models may already have this connection.
- 2) Position the equipment next to the target (gas tank gauge, pulse meter, etc) and attach it using the base of the equipment (see section 9).
- 3) Attach the sensor to the target.
- 4) Prepare the SMS to send to the equipment (see section 12.3).



- 5) Activate the **CLOG500**, passing the magnet in order to prepare it to receive the SMS configuration (see section 10.1). In some models it may be possible that you need to operate the ON/OFF switch in order to activate the **CLOG500** (see section 10).
  - a) Check if a red LED starts to flash inside the **CLOG500**.
  - b) After 2 minutes a green LED should turn ON and, after 30 seconds, start to flash. This means that the modem is already registered on the GSM network (ready for the SMS).
- 6) Send the SMS to the **CLOG500** (see section 12.3).
- 7) Wait for the response from the **CLOG500** (see section 12.4).
- 8) Check if the values for the 'SQ:' and 'MEM:' are correct (see section 12.4).
- 9) Check if the value for the cabled channel is identical to the one shown by the respective sensor. A 4%~ 6% errors is admissible.
- 10) Take note of the installation data on a sheet (see section 13).
- 11) Take all the waste with you.
- 12) Congratulations, the installation is complete.

## 8 Sensor connection

The only external component connected to the equipment may be a Rochester6320S level sensor (max length= 3 m), or any sensor / digital switch which are compatible with the parameters in section 15.2.

The sensor must already have the correct plug to connect to the **CLOG500**. The sensor connector is illustrated in the following picture:



Figure 1 - Sensor connector location.

Attention: The sensor connector has a correct position for the cable insertion.



Figure 2 - CLOG500 with sensor connected.

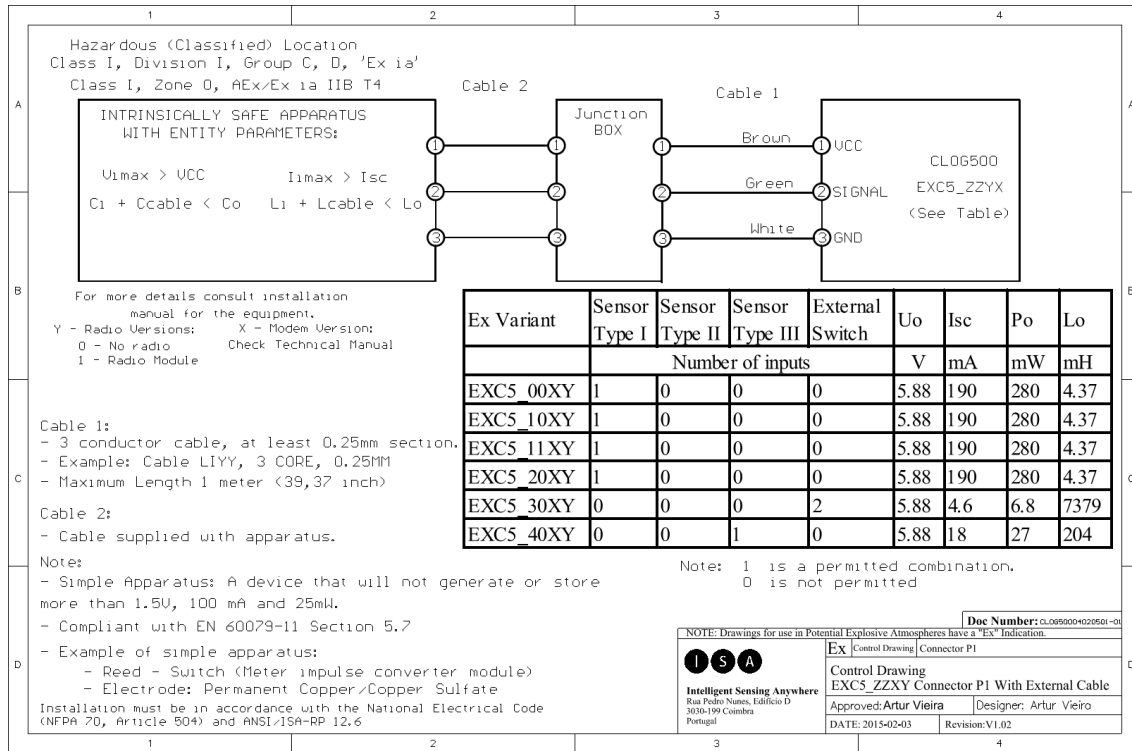
## 8.1 **CLOG500** supplied with external cable

The equipment may be supplied with external cable for sensor connection. The connection between the equipment and the sensor should be made using a junction box.

The user must check the sensor installation manual to check the correct connection diagram between sensor and **CLOG500**.

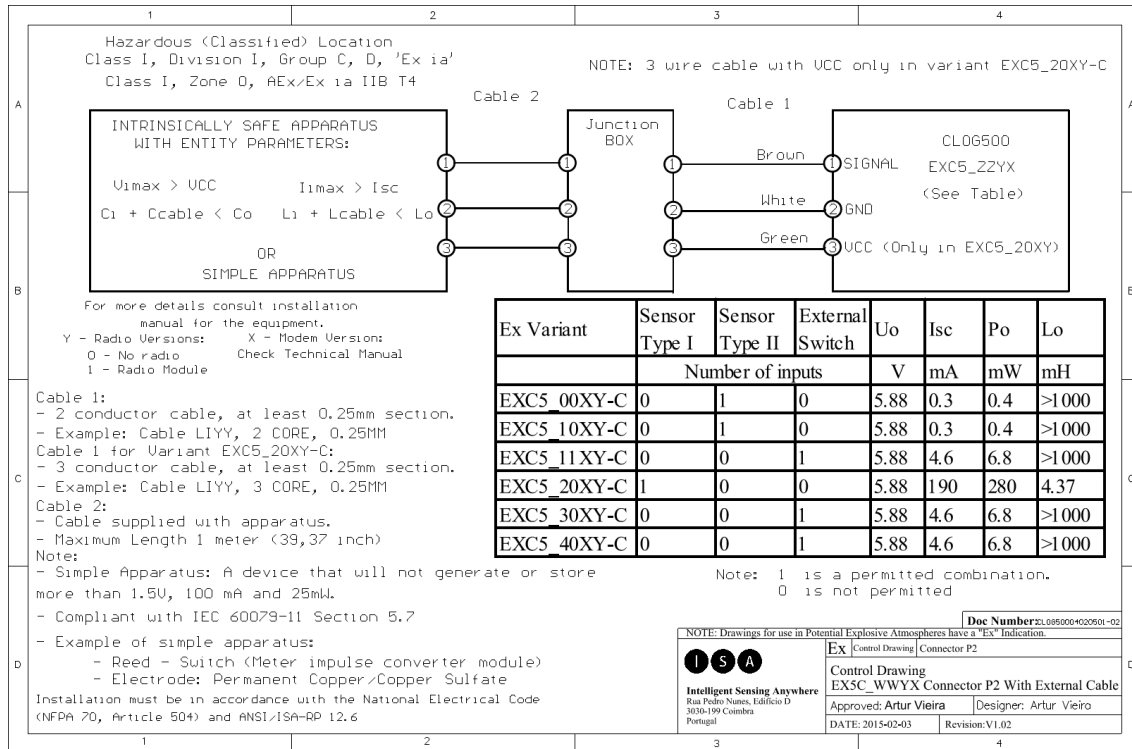
### 8.1.1 External cable with 3 conductors Header P1

This cable is internally connected to connector P1 (Input 1).



### 8.1.2 External cable with 2 / 3 conductors Header P2 (via Cable Gland)

This cable is internally connected to connector P2 (Input 2).



## 9 Placing the CLOG500

The location of the CLOG500 is a prime consideration.

Not close to pipes, metalwork, pressure relief devices or other solid obstacles (other than the body of the tank upon which it is mounted).

As high off the ground as possible.

The location should minimize the chance of the CLOG500 being subject to physical shock or vibration.

Note: The cellular network signal strength is often improved by mounting the CLOG higher or further away from metal objects.

### 9.1 Attaching the CLOG500

The equipment should be attached to a solid surface (1m to 2m from the ground) with a vertical orientation (if possible) optimized for radio transmission and communication.



Due to possible electrostatic build up on the enclosure, precautionary measures must ensure that electrostatic build up does not occur. This includes cleaning only with damp cloths.



Do not install the equipment in places where movement or mechanical shocks can happen (covers, doors, etc.). Whenever possible the **CLOG500** attachment must occur in rigid fixed points, free of impact or mechanical movements capable of damage.



Care must be taken to avoid the placement in areas where the equipment may be subject to extreme conditions (like in front of pressure/vapor valves) or other conditions that might damage the equipment.



The enclosure of the CLOG500 is non-conducting and may generate an ignition-capable level of electrostatic charges under certain extreme conditions. The user shall ensure that the equipment is not installed in a location where it may be subjected to external conditions that might cause a build-up of electrostatic charges on non-conducting surfaces, additionally; cleaning of the equipment should be done only with a damp cloth.

To attach the equipment, it is recommended to use glue to fix the enclosure to the tank or use cable ties. The next Figure shows an example of how to correctly attach the **CLOG500** to a gas tank hook with cable ties or glue.



Figure 3 – Example of correct attaching on a gas tank hook with cable ties or glue.

Some provided or recommended accessories:



Figure 4 - Cable ties.



Figure 5 - Wurth MS Instant (Ref: 0893226100)



Figure 6 –C leaner product - Wurth Brake Cleaner (Ref: 08901087)

### 9.1.1 Using glue to attach

1. In case of fixation by glue, the user should clean the tank surface to remove dirt and degrease from the area where is going to apply glue:



Figure 7 - Cleaning the tank surface before applying glue.

2. Next, apply glue to the base that is going to be fixed in the tank and attach to the tank. Apply sufficient glue to provide a good fixation.



Figure 8 - Base fixation.

3. Remove any glue excess.
4. Wait some minutes to allow the glue to fix.
5. Hook the **CLOG500** in the base.





Figure 9 – CLOG500 in the final position.

### 9.1.2 Using cable ties to attach

1. Attach the base to a pipe or some other acceptable place using cable ties.



Figure 10 - Fixation of the base.

2. Hook the **CLOG500** in the base.



Figure 11 - Final position of **CLOG500**.

The **CLOG500** should be installed as indicated in the previous figure, vertical position and the sensor cable at the lowest side.

## 9.2 Possible scenarios

The installation attaching option should be based on tank type. Equipment should always be placed in a vertical position when possible.

The **CLOG500** must be conveniently placed on a solid area (not in places that can move or have mechanical shock, for example covers, doors or fences), safe from flooding and particular attention should be paid to installation in totally metallic boxes, due to the effect of the *Faraday* cage.

The following photos may not be with **CLOG500** equipment, they are just for indication.



## 9.2.1 Aerial tank



Figure 12 – Aerial tanks.

Attach the **CLOG500** to the gas pipe using the cable ties.



Figure 13 – Equipment correctly placed and attached on an aerial tank (example 1).



Figure 14 - Equipment correctly placed and attached on an aerial tank (example 2).

## 9.2.2 Buried tank

The **CLOG500** installation will depend on the tank case and lid.



Figure 15 – Metallic case tank examples.



Figure 16 - PVC lid tank.



Figure 17 - Metallic lid tank.

- **PVC case:** Attach the **CLOG500** to the tank case wall, maximum height possible above the ground.
- **Metallic case with PVC lid** - the equipment can be installed inside the case and should be attached to the wall.
- **Metallic case with metallic lid** - you have to check the SQ signal quality to evaluate if you can make the installation inside the tank case or not. If it cannot be done inside the tank lid you should attach it on the opposite side of the opening of the lid.



Figure 18 - Correct installation in buried tank.



Figure 19 - Incorrect installations: the opening and closing movement of the cover may damage the equipment.

## 10 Equipment activation

### 10.1 Passing the magnet to activate

In order to activate the **CLOG500** the user must have a magnet. The location to wave the magnet over is illustrated in the following picture. In the **CLOG500** the magnet is on the opposite side from the sensor connection.



Figure 20 - Location to pass the magnet on the **CLOG500**.

### 10.2 Operation over internal switch to activate

Some models, usually without pre-connected sensor or without SIMCard installed, need to be activated in different way. In that case, the procedure is as follow:

1. Open the enclosure.
2. Place de ON/OFF switch in the 'ON' position (after SIMCard installed).
3. Close the enclosure and attach the screws.



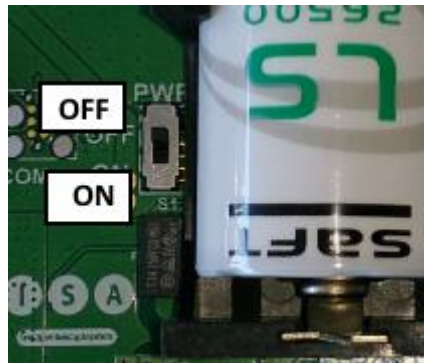


Figure 21 - *CLOG500* switch position indication.

## 10.3 Visual Indicators

The *CLOG500* has two LED lights that can be seen from the outside, visible on the bottom, if looking through the semi-transparent enclosure.



Figure 22 - Location of the red and green LED on the *CLOG500*.

Visual indicator	Status	Observations
Green (modem LED)	OFF	Modem OFF

	Fast blinking (Period 1s, Ton 0.5s)	Modem ON, waiting for GSM Network registration
	Slow blinking (Period 3s, Ton 0.3s)	Modem ON and registered on GSM Network, waiting for SMS
	Always ON	A call is active
Red (system LED)	OFF	System on stand-by mode
	Slow Blinking (Period 2s, Ton 1s)	System in Installation phase, accepts installation SMS
	Fast Blinking (Period 0,1s, Ton 0,05s)	Equipment received a valid SMS. This mode is only visible for 0.2s
	Always ON	Error state

Table 1 - Visual Indicators description.

The **CLOG500** only accepts the installation SMS if both red and green LEDs are flashing. If the equipment receives an installation SMS when the red LED is OFF, the equipment will respond with an SMS error.

It is advisable to only send messages to the equipment after the green LED is flashing; otherwise the SMS can take longer to be delivered to the equipment, delaying the installation procedure.

## 10.4 Equipment information

Equipment information, such as SIMCard phone number, IMEI, serial number and product reference can be found in metallic labels at the bottom of the equipment. The equipment has a bar code (QR Code) that can be read with most mobile phones with all such information.



Figure 23 - CLOG500 labels.

Attention: The labels in the previous picture are just an example; the final equipment may have different labels.

## 11 Other operation in the equipment

Some **CLOG500** models do not need to be opened on site as they are provided with external connector for the sensors. With sealed equipment, opening the enclosure can void the warranty.

The only external component connected to the equipment may be a Rochester6320S level sensor, or any sensor / digital switch which are compatible with the parameters in section 15.2.

Please pay attention when closing the equipment because there is a correct orientation for the cover to be fitted in the bottom ("ISA" symbol in the cover on the same side as the sensor connection).



When opening the equipment enclosure, care must be taken in order not to damage any part of the equipment. Appropriate tools should be used.



Opening procedure must always be made outside the safety area or outside the reservoir area.

## 11.10pening the **CLOG500**







Figure 24 – **CLOG500** enclosure.



Figure 25 – Electronics inside the **CLOG500**.

All the equipment should have a SIMCard inserted and the respective phone number on a label in the enclosure. If the user wants to exchange the SIMCard follow the procedure in section 11.3.

In case it is necessary to open the **CLOG500** enclosure for sensor connection, some precautions must be observed:

-  When opening the equipment enclosure, care must be taken in order not to damage any part of the equipment. Appropriate tools should be used.
-  Do not open the equipment after its installation. This instruction must be followed throughout the life of the equipment. Otherwise the warranty may be void.
-  A visual inspection should be made to check for damage on enclosure, screw, rubber sealant, antenna, battery or any other component of the equipment.
-  Only non-damaged equipment may be put into service.

In case it is necessary to open the **CLOG500** enclosure for battery replacement or some other operation:

- Disconnect the sensor from the equipment (Removing the connector or disconnecting the sensor in the junction box). Or disconnect the sensor from the gas tank.
- Remove the equipment outside safety area.
- Remove the four screws from the equipment cover.
- Separate the cover from the bottom **carefully** so that there is no damage to the connection cable between the GSM modem and the equipment (which is about 15cm long).

The next figure shows the location of some devices that user may need to operate.

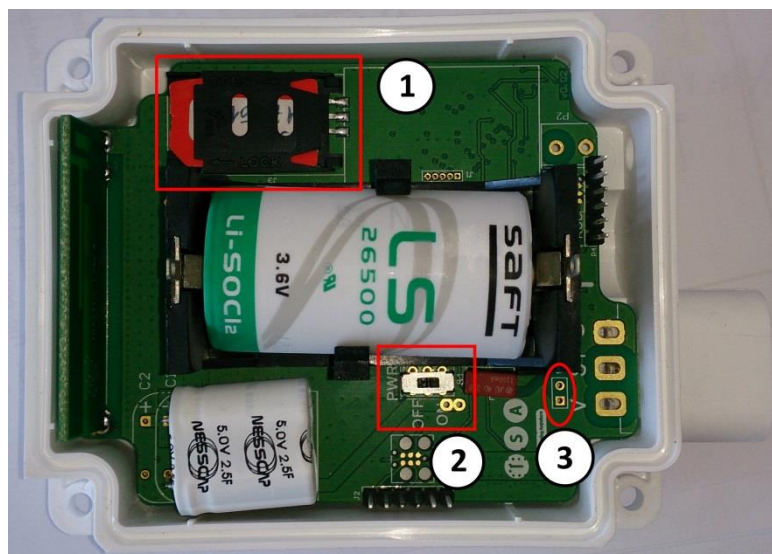


Figure 26 - Location of *jumpers*, SIMCard holder.

1 - SIMCard holder.



2 - ON/OFF switch (indication on the PCB of 'ON' and 'OFF' position).

3 - Switch to control input 3 type. Switch Closed: analog Input; Switch Open: Digital Input (Only valid for variant EXC5\_00XY)

## 11.2 Exchange Batteries

It is possible to exchange the battery of the equipment, as long as the new battery is one of the batteries indicated on **Table 6**.

In order to exchange the batteries, follow this procedure:

1. Disconnect sensor from **CLOG500**.
2. Remove **CLOG500** from its base.
3. Place the **CLOG500** outside the explosive atmosphere zone.
4. Open the enclosure removing the 4 screws.
5. Place the ON/OFF Switch in the 'OFF' position.
6. Remove the battery.
7. Place new battery (be careful with polarity, if battery insert reversed the equipment may be damage).
8. Place the ON/OFF Switch in the 'ON' position.
9. Wait up to 16 seconds, and check that the red LED is blinking.
10. Close the enclosure, making sure to tighten the screws properly.
11. Place the **CLOG500** in its original position.
12. Attach the sensor.
13. Repeat the installation procedure to make sure the equipment is working properly.

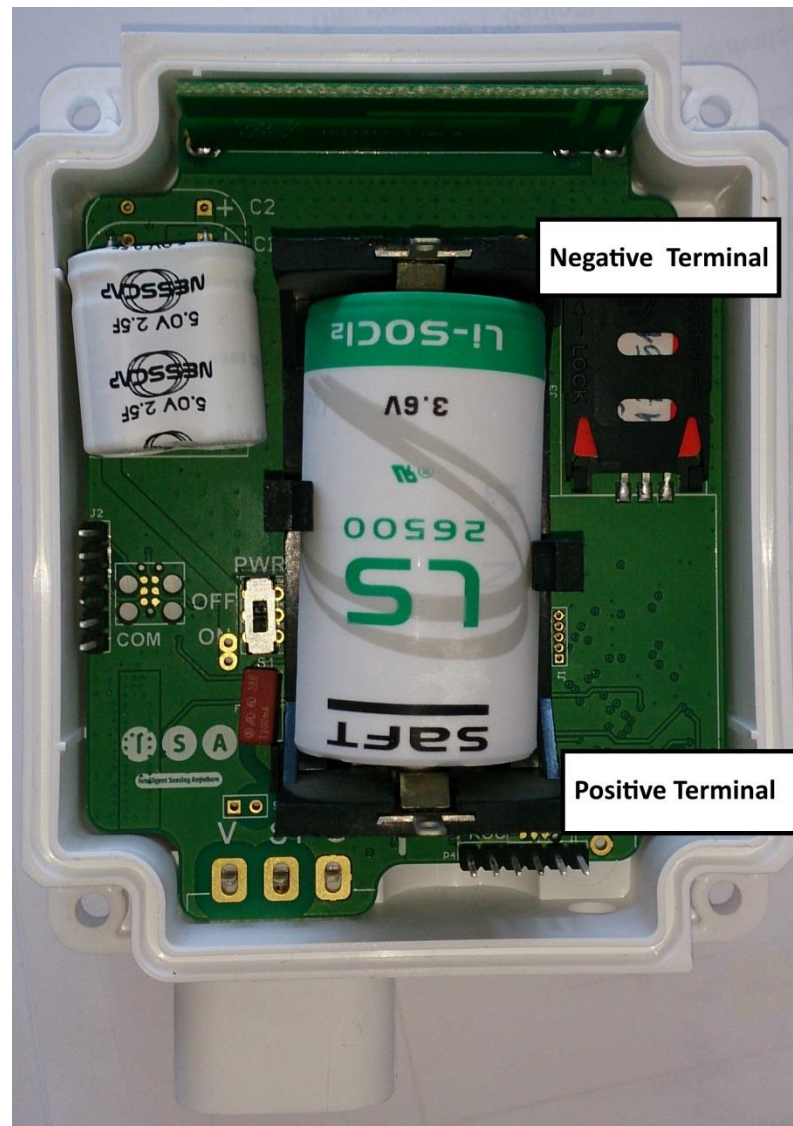


Figure 27 - Battery polarity.

## 11.3 Exchange SIMCard

The equipment can accept any SIMCard, as long the pin code is '6412'. It is also possible to use a SIMCard without pin code.

1. Disconnect sensor from **CLOG500**.
2. Remove **CLOG500** from its base.
3. Place the **CLOG500** outside the explosive atmosphere zone.
4. Open the enclosure removing the 4 screws.
5. Place the ON/OFF Switch in the 'OFF' position.
6. Locate the SIMCard holder.

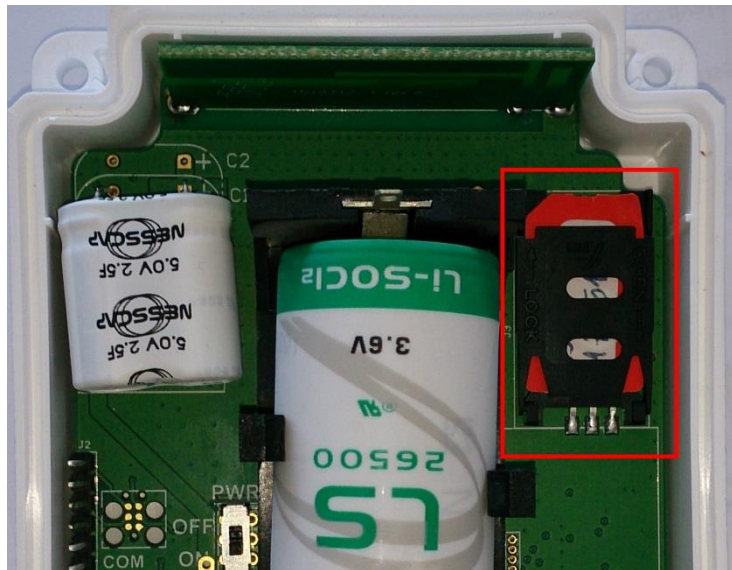


Figure 28 - SIMCard holder location.

7. Open the SIMCard holder (slide and push).
8. Place new SIMCard.
9. Close the SIMCard holder (slide and push).
10. Place the ON/OFF Switch in the '**ON**' position.
11. Wait up to 16 seconds, and check that the red LED is blinking.
12. Close the enclosure, making sure to tighten the screws properly.
13. Place the **CLOG500** in its original position.
14. Attach the sensor.
15. Repeat the installation procedure to make sure the equipment is working properly.

## 12 **CLOG500** configuration

The **CLOG500** has physical inputs and wireless inputs (in some models) available to connect several sensor types. The sensor readings are associated with logic inputs (channels). The data associated to each channel is saved and sent later to a remote server, by SMS.

The configuration consists of associating each sensor (connected to a particular input) with a channel. This configuration is assured by sending a message (SMS installation) to the **CLOG500**, which sends back another SMS. This means that the installer cell phone number must be part of the SMS installation.

## 12.1 CLOG500 model number scheme

aaC5_bbxxy-C				
aa	EX = Equipment for Hazardous location (Certified for ATEX, IECEx, USA and Canada)			Blank = Generic use equipment
bb	00 = 2 Inputs			
	10 = 2 inputs			
	11 = 2 inputs			
	20 = 2 Inputs			
	30 = 3 Inputs			
	40 = 2 inputs			
y	0 = No modem	3 = 2G Modem	4 = CDMA 1xRTT modem	7 = 2G + GPS modem
z	0 = No ISM Band Transceiver		1 = with ISM Band transceiver	
-C	Optional, if exists means equipment with cable gland and cable to connections to connector P2			

Figure 29 - CLOG500 model number scheme.

## 12.2 Sensor types and input numbers

Note that not all the inputs are available for all sensor types. There are differences between **CLOG500** models. The next table shows the possible combinations depending on the sensor type and on the **CLOG500** model.

<b>CLOG500 Model</b>	<b>Sensor Type / Possible inputs (input number)*</b>				
	<b>R</b>	<b>D</b>	<b>E</b>	<b>M</b>	<b>N</b>
	Voltage Data: 0~100%	Digital-Voltage Data: 0~1023	Voltage 0-5V Data: 0~1023	Digital - Impulses Data: 0 ~2^32	Digital - Input Data: 0 or 1
<b>EXC5_00XY</b>	SIG1 (1)	SIG1 (1) / SIG2(2)	SIG1 (1)	SIG1(1) / SIG2(2) / SIG(3)	SIG1(1) / SIG2(2) / SIG(3)
<b>EXC5_10XY</b>	SIG1 (1)	SIG1 (1) / SIG2(2)	--	--	--
<b>EXC5_11XY</b>	SIG1 (1)	SIG1 (1)	--	SIG2(2)	SIG2(2)
<b>EXC5_20XY</b>	SIG1 (1) / SIG (2)	SIG1 (1) / SIG (2)	SIG1 (1) / SIG (2)	--	--
<b>EXC5_30XY</b>	--	--	--	SIG1(1) / SIG2(2) / SIG(3)	SIG1(1) / SIG2(2) / SIG(3)
<b>EXC5_40XY</b>	SIG1 (1)	SIG1 (1)	--	--	--

(\*) input number is the number to be used in the SMS installation (example for the input 2: ABCDI C1;2RC TEL:+351912345678).

Table 2 – Possible sensor types on each **CLOG500**.

Note: In order to use input 3 “SIG(3)” in variant EXC5\_00XY as Digital Input or Digital Impulses is necessary to place the Jumper S2 in the Open Position.

### 12.2.1 Sensors connect through radio device

For sensors connect via a radio device (RTU), the input number to put in the installation message is the “Radio ID:” field presented in the technical label of the radio device. This number can have any value from 10 to 65530.

## 12.3 Making an SMS text installation

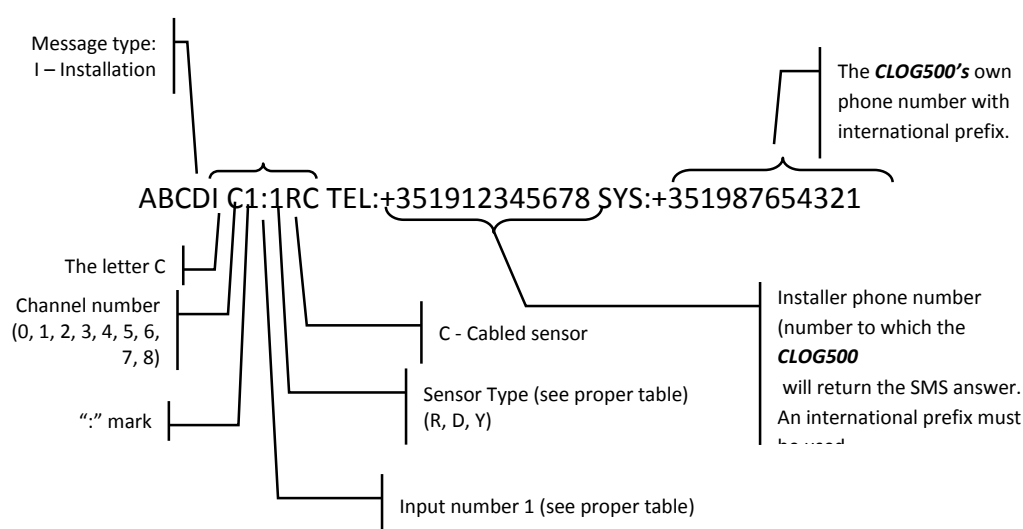


Figure 30 – SMS installation structure.

Field name	Example	Possibilities	Notes
Control code	ABCD	ABCD	4 characters.
SMS type	I	I – Installation S – Status M – Maintenance	For installation use “I”.
Channel configuration	Channel number	C1:	C0, C1, C2, C3, C4, C5, C6, C7, C8 Maximum 9 channels.
	Input number	1	1 (see section 12.2)
	Sensor type	R	R, D, Y (see section 12.2)
		C	C – Cable, W – Wireless C for physical connected sensors. W for radio sensors
...	Others channel configuration (optional)		
Installer cell phone number	TEL:+351912345678	Phone number with international code (ex. +351).	
System phone number	SYS:+351987654321	The <b>CLOG500's</b> own phone number with international code (ex. +351).	

		Usually this parameter is already configured. Check with supplier at time of order for more information.
--	--	--

Table 3 – SMS installation fields interpretation.

Please note the existence of space characters in the SMS. Capital letters must be used.

ABCDI C1:1RC TEL:+351912345678 SYS:+351987654321

One example for a installation with radio devices

ABCDI C1:1000RW TEL:+351912345678 SYS:+351987654321

Some equipment may already have most of these fields configured (check with supplier at time of order). For the rest of the equipment, the user must send the complete SMS. But the minimum installation SMS must be similar to:

ABCDI TEL:+351912345678

## 12.4 Response SMS from CLOG500

As a response to the installation message the user should receive a status SMS back, similar to the following one:

ABCDS00043603 C01:078%R SQ:10 BAT:3.47V-PP DAT:09/12/28 14:58 M:0001  
S:0000 R:0000 MEM:1 VER:2000G LSC:00000

Table 4 – SMS response interpretation.

Field	Interpretation	Observations
ABCDS	SMS status type message	Depending on firmware version the equipment may answer with LOGGS
00043603	<b>CLOG500</b> ID *	--
C01:078%R	Channel 1 reads 78% from a type R sensor.	It is useful to check if it matches with the analog display of the sensor.
SQ:10	GSM Signal strength is 10	If <9, the user should change the position of the <b>CLOG500</b> to get better GSM coverage.
BAT:3.47V-PP	Battery voltage *	--
DAT:09/12/28 14:58	Time*	--
M:0001	*	--
S:0000	*	--
MEM:1	--	Must be 1. Otherwise, a fault is present and equipment should be returned.
VER:2000G	Firmware version *	--
LSC:00000	--	Last sensor communication. Useful to know about the last RTU serial ID communication received.

Field	Interpretation	Observations
* Not relevant for installation purpose.		

If the user wants to know the actual status of the **CLOG500** they can send the following SMS to the equipment:

ABCD5

The response is similar to the one received when sending the installation SMS.

## 12.5 Example of installation SMS

For **CLOG500** EXLGC100 with voltage cabled sensor:

ABCDI C1:1RC TEL:+351912345678

The channel number '1' should always be used for the cable sensors (the wireless sensors used in some **CLOG500** models should be configured on channel 2 and above).

## 13 Installation sheet

For each **CLOG500**, the installer should fill in a form (sheet) indicated by the supplier and take some photos. Do not leave the installation location without filling it in. See the example form below in Portuguese. For a form in other languages, please contact ISA.

[illegible]

Figure 31 – Example of installation sheet.



## 14 Tips and Tricks

Here are some useful tips and tricks for **CLOG500** installer:

- For level sensors use channel 1 to 2 because the **CLOG500** sends instant data to these channels. Instant data is very useful for level sensors.
- Always configure cabled sensor on channel 1 and wireless sensor on channel 2 (wireless sensors are available only on some **CLOG500** models).
- When passing the magnet to activate equipment, rub it 3 or 4 times.
- The PIN code of the SIMCard should be deactivated or changed to the PIN code provided by ISA.
- Enable your SMS report on the installer cell phone in order to get feedback from the SMS (delivery report).
- The **CLOG500** has a limit to the number of SMS (for each type of SMS) it can send each day. In case the limit is reached, the installer can reset the counter in order to receive an SMS from the **CLOG500**. To reset the daily SMS counter, send the following SMS:

ABCDM01000000PP0000000

- To uninstall a sensor from a channel, send an installation SMS with one dash instead of input number and another dash instead the sensor type. For instance:

ABCDI C1:-- TEL:+351912345678

### Troubleshooting

Problem	Diagnostic/Solution
<p>If you receive a SMS starting with ???Mxx, an error has occurred on the configuration SMS. The error code is indicated by xx:</p> <p><b>01</b> - Unknown message <b>02</b> - Error on the control code</p>	<p><b>01</b> - Verify the installation message and try sending the SMS again.</p> <p><b>02</b> - The control code is incorrect. Verify the control code and try sending the SMS again.</p> <p><b>03</b> - Installation SMS is incorrect; verify the arguments and try sending the SMS again.</p> <p><b>04</b> - Correct the arguments in the installation SMS and try sending the SMS again.</p>

<p>03 – Message length error 04 – Invalid arguments 05 – Message not processed 06 – Installation message out of installation period</p>	<p>05 – Installation SMS is incorrect; verify the arguments and try sending the SMS again. 06 – The configuration time exceeded. Repeat the installation procedure.</p>
<p>You don't receive an SMS back and you don't receive the delivery report.</p>	<p>Check if green LED is blinking, if yes:</p> <ul style="list-style-type: none"> <li>• <b>Erroneous telephone number:</b> Verify the phone number on the equipment and compare it with the number used to send the installation message. If the number is incorrect, please repeat the installation procedure.</li> <li>• <b>Damaged equipment:</b> If the phone number is correct, please change the equipment and repeat the installation procedure.</li> <li>• <b>GSM Signal is too weak:</b> Change the location of the equipment and try again. If the problem persists again, don't install equipment in that location.</li> </ul>
<p>You don't receive an SMS back but you receive the delivery report.</p>	<ul style="list-style-type: none"> <li>• <b>Erroneous telephone number:</b> Verify the phone number on the equipment and compare it with the number used to send the installation SMS. If the number is incorrect, please repeat the installation procedure.</li> <li>• <b>Damaged equipment:</b> If the phone number is correct, please change the equipment and repeat the installation procedure.</li> <li>• <b>GSM Signal is too weak:</b> Change the location of the equipment and try again. If the problem persists again, don't install equipment in that location.</li> <li>• <b>Daily SMS counter by type of SMS reached the limit</b> (10 by default). Send an <b>ABCDM</b> type SMS to reset the counter (see tips section 14).</li> </ul>
<p>A channel was incorrectly configured – I'd like to uninstall it.</p>	<ul style="list-style-type: none"> <li>• Send an installation SMS with one dash instead of input number and one dash instead the sensor type. For instance:  ABCDI C1:1RC C2:-- TEL:+351912345678</li> </ul>

Table 5 – Troubleshooting.

## 15 Electrical/Pressure/Temperature Limits

### 15.1 General characteristics

Electrical characteristics	
Power tension	3.6V
Average current consumption	40μA
Battery number	1
Battery Type	Lithium battery
Battery Brand*	SAFT-LS26500
Average Expected Lifetime	~5 years
Modem	GSM / GPRS / UMTS / CDMA
Analogue Inputs	1
Enclosure	109x147x59mm; IP67

Table 6 – Electrical characteristics.

\*Batteries for Potentially Explosive Atmospheres, depends on certification process.

## 15.2 Electrical characteristics for external circuits

For external connector or when supplied with a 3 conductor cable:

External Connector / 3 conductor cable / Connector P1						
	EXC5_00XY	EXC5_10XY	EXC5_11XY	EXC5_20XY	EXC5_30XY	EXC5_40XY
<b>U<sub>0</sub></b>	5.88V	5.88V	5.88V	5.88V	5.88V	5.88V
<b>I<sub>0</sub></b>	0,19A	0,19A	0,19A	0,19A	5mA	19mA
<b>P<sub>0</sub></b>	0.28W	0.28W	0.28W	0.28W	7mW	28mW
<b>C<sub>0</sub></b>	--	--	--	--	-	--
<b>L<sub>0</sub></b>	4.37mH	4.37mH	4.37mH	4.37mH	7379mH	204mH

Table 7 – Electrical characteristics for external sensors (P4 - Input 1).

\*This values depend on certification process.

When supplied with 2 or 3 conductor cable in the cable gland, only for variants EXC5\_zzXY-C.

3 conductor cable only available in Ex\_Model EXC5\_20XY-C.

External Connector / 2 / 3 conductor cable / Connector P2

	EXC5_00XY	EXC5_10XY	EXC5_11XY	EXC5_20XY	EXC5_30XY	EXC5_40XY
<b>U<sub>o</sub></b>	5.88V	5.88V	5.88V	5.88V	5.88V	5.88V
<b>I<sub>o</sub></b>	0,3mA	0,3mA	4.6mA	0,19A	5 mA	5 mA
<b>P<sub>o</sub></b>	0.4mW	0.4mW	6.8W	0.28W	7W	7W
<b>C<sub>o</sub></b>	--	--	--	--	--	--
<b>L<sub>o</sub></b>	>1000mH	>1000mH	>1000mH	4.37mH	>1000mH	>1000mH

Table 8 - electrical characteristics for external sensors (P5 - Input 2).

## 15.3 Environmental characteristics

**Pressure:** The equipment is to be used under normal atmospheric pressure conditions.

**Temperature range:** (ambient):  $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +60^{\circ}\text{C}$

**Humidity:** 100% Noncondensing.



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Gartner, Inc., Cool Vendors in Smart City Applications, 2012, Bettina Trott-Ryan, Federico De Siva, Afonso Veloso, April 19, 2012.