# CLOG500

User Manual

| Data | Versão | Descrição | Autor |
|------|--------|-----------|-------|
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Índice

# 1 General Information

The **CLOG500** is a multi-purpose autonomous (GSM/CDMA/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 or TCP, 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.

## 1.1 CLOG500 Model Numbering

| aaC5_xxyz | | | | |
|---|---|---|---|---|
| aa | EX = Equipment for Hazardous location (Certified for ATEX, IECEx, USA and Canada) | | Blank = Generic use equipment | |
| xx[1] | 00 = 3 Inputs (software selectable from analogue or digital) | | | |
| | 10 = 2 analog inputs | | | |
| | 11 = 1 analog input and 1 digital input | | | |
| | 20 = 2 Analog Inputs | | | |
| | 30 = 3 Digital Inputs | | | |
| | 40 = 1 analog Input and 1 digital input | | | |
| | 90 = 1 current (0-20mA) input.[2] | | | |
| Y[3] | 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 | |

[1] Check the safety manual for input parameters.

[2] This model does not have hazardous location.

# 2 FCC PART 15 compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You may also find helpful the following booklet, prepared by the FCC: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402.

WARNING: Changes and Modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission's rules.

## 2.1 RF Exposure Information

This device meets government's requirements for exposure to radio waves.

This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of U.S. Government.

The device complies with FCC radiation limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposures limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

# 3 Warnings

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

Reading of this manual and safety 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.

**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 Typical Installation procedure

This procedure is valid for versions that contain a GSM or CDMA modem.

For version that only contains the ISM Band transceiver the only necessary steps are the sensor connection, equipment placement and activation.

1) <u>Connect the sensor</u> to the **_CLOG500_** (see section 6). Some models may already have this connection.

2) Position the equipment next to the target (gas tank gauge, pulse meter, etc) and <u>attach it</u> using the base of the equipment (see section 7).

3) <u>Attach the sensor to the target</u>.

4) <u>Prepare the SMS</u> to send to the equipment (see section **Error! Reference source not found.**).

5) <u>Activate the **_CLOG500_**</u>, passing the magnet in order to prepare it to receive the SMS configuration (see section 8.1). In some models it may be possible that you need to operate the ON/OFF switch in order to activate the **_CLOG500_** (see section 8).

   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) <u>Send the SMS</u> to the **_CLOG500_** (see section **Error! Reference source not found.**).

7) <u>Wait for the response</u> from the **_CLOG500_** (see section **Error! Reference source not found.**).

8) <u>Check</u> if the values for the 'SQ:' and 'MEM:' are correct (see section **Error! Reference source not found.**).

9) <u>Check</u> if the value for the cabled channel is identical to the one shown by the respective sensor. A 4%~ 6% errors is admissible.

10) <u>Take note</u> of the installation data on a sheet (see section **Error! Reference source not found.**).

11) Take all the <u>waste</u> with you.

12) Congratulations, the installation is complete.

# 6  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 equipment.

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.

## 6.1 *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.

Check Installation and safety manual for cable color code and safety parameters.

# 7 Placing the *CLOG500*

## 7.1 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.

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) |

## 7.1.1 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:
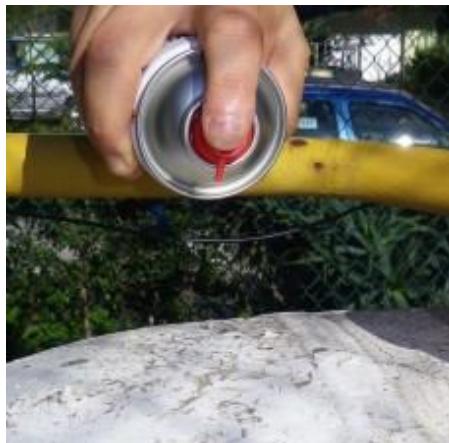
Figure 7 - Cleaning the tank surface before applying glue.

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.

## 7.1.2 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.

## 7.2 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.

# 8 Equipment activation

## 8.1 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 12 - Location to pass the magnet on the **CLOG500**.

## 8.2 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 13 - Location of the red and green LED on the **CLOG500**.

Equipment that only have the ISM Transceiver will only have the RED LED.

| Visual indicator | Status | Observations |
|---|---|---|
| Green (modem LED) | OFF | Modem OFF |
| | Always ON | Modem ON, waiting for GSM Network registration |
| | Flashing | Modem ON and registered on GSM Network, waiting for SMS |
| Red (system LED) | OFF | System on stand-by mode |
| | Flashing | System in Installation phase, accepts installation SMS |
| | Always ON | Error state |

Table 1 - Visual Indicators description for equipment's with GSM / CDMA modem.

| Visual indicator | Status | Observations |
|---|---|---|
| Red (system LED) | OFF | System on stand-by mode |
| | Flashing (Fast) | Equipment in installation phase, can respond to radio messages. |
| | On (Duration 2s) | Equipment transmitting a Radio message. |
| | Always ON | Error state |

Table 2 - Visual Indicators description for equipment with only ISM Band Transceiver.

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.

## 8.3 Equipment information

Equipment information, such as SIMCard phone number, IMEI, serial number, Radio ID 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.

# 9 *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.

## 9.1 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.

| | Sensor Type / Possible inputs (input number)* | | | | |
|---|---|---|---|---|---|
| | **R** | **D** | **E** | **M** | **N** |
| **CLOG500** Model | 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 |

| | | | | | |
|---|---|---|---|---|---|
| **EXC5_00XY** | SIG1 (**1**) | SIG1 (**1**) / SIG2(**2**) | SIG1 (**1**) | SIG1(**1**) / SIG2(**2**) / SIG(**3**) | SIG1(**1**) / SIG2(**2**) / SIG(**3**) |
| **EXC5_10XY** | SIG1 (**1**) | SIG1 (**1**) / SIG2(**2**) | -- | -- | -- |
| **EXC5_11XY** | SIG1 (**1**) | SIG1 (**1**) | -- | SIG2(**2**) | SIG2(**2**) |
| **EXC5_20XY** | SIG1 (**1**) / SIG (**2**) | SIG1 (**1**) / SIG (**2**) | SIG1 (**1**) / SIG (**2**) | -- | -- |
| **EXC5_30XY** | -- | -- | -- | SIG1(**1**) / SIG2(**2**) / SIG(**3**) | SIG1(**1**) / SIG2(**2**) / SIG(**3**) |
| **EXC5_40XY** | SIG1 (**1**) | SIG1 (**1**) | -- | -- | -- |
| (*) input number is the number to be used in the SMS installation (example for the input 2: CLOGI C1:<u>2</u>RC TEL:+351912345678). | | | | | |

Table 3 – 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.

### 9.1.1 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.

# 10 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:

  CLOGM01000000PP0000000

- 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:

  CLOGI C1:-- TEL:+351912345678

Troubleshooting

| Problem | Diagnostic/Solution |
|---|---|
| If you receive a SMS starting with ????Mxx, an error has occurred on the configuration SMS. The error code is indicated by xx:<br>**01** – Unknown message<br>**02** – Error on the control code<br>**03** – Message length error<br>**04** – Invalid arguments<br>**05** – Message not processed<br>**06** – Installation message out of installation period | **01** – Verify the installation message and try sending the SMS again.<br>**02** – The control code is incorrect. Verify the control code and try sending the SMS again.<br>**03** – Installation SMS is incorrect; verify the arguments and try sending the SMS again.<br>**04** – Correct the arguments in the installation SMS and try sending the SMS again.<br>**05** – Installation SMS is incorrect; verify the arguments and try sending the SMS again.<br>**06** – The configuration time exceeded. Repeat the installation procedure. |
| You don't receive an SMS back | Check if green LED is blinking, if yes: |

| and you don't receive the delivery report. | • **Erroneous telephone number:** 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.<br>• **Damaged equipment:** If the phone number is correct, please change the equipment and repeat the installation procedure.<br>• **GSM Signal is too weak:** Change the location of the equipment and try again. If the problem persists again, don't install equipment in that location. |
|---|---|
| You don't receive an SMS back but you receive the delivery report. | • **Erroneous telephone number:** 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.<br>• **Damaged equipment:** If the phone number is correct, please change the equipment and repeat the installation procedure.<br>• **GSM Signal is too weak:** Change the location of the equipment and try again. If the problem persists again, don't install equipment in that location.<br>• **Daily SMS counter by type of SMS reached the limit** (10 by default). Send an CLOGM type SMS to reset the counter (see tips section 10). |
| A channel was incorrectly configured – I'd like to uninstall it. | • Send an installation SMS with one dash instead of input number and one dash instead the sensor type. For instance:<br>CLOGI C1:1RC C2:-- TEL:+351912345678 |

Table 4 – Troubleshooting.