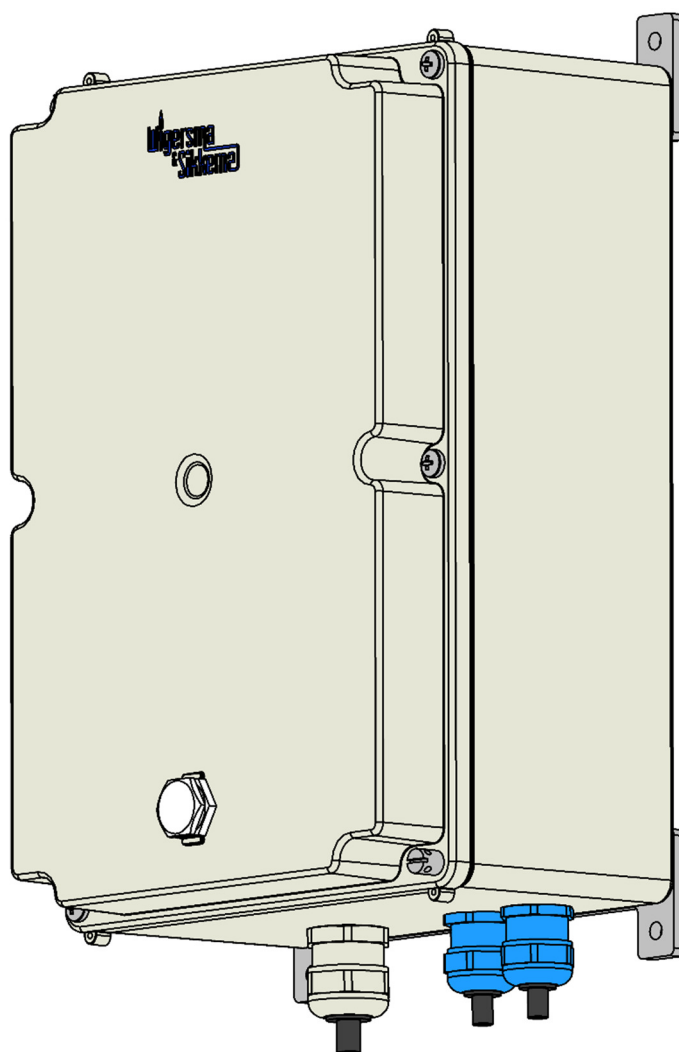


Battery operated UNILOG 300



Wigersma
& Sikkema

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All the figures and descriptions in this installation, operating and maintenance manual have been compiled only after careful checking. Despite this, however, the possibility of errors cannot be completely eliminated. Therefore, no guarantee can be given for completeness or for the content. Also, the manual cannot be taken as giving assurance with regard to product characteristics. Furthermore, characteristics are also described that are only available as options.

The right is reserved to make changes in the course of technical development. We would be very grateful for suggestions for improvement and notification of any errors, etc.

With regard to extended product liability the data and material characteristics given should only be taken as guide values and must always be individually checked and corrected where applicable. This particularly applies where safety aspects must be taken into account.

Further support can be obtained from the branch or representative responsible for your area. The address is printed on the back of this manual or simply enquire at Wigersma & Sikkema B.V.

Passing this manual to third parties and its duplication, in full or in part, are only allowed with written permission from Wigersma & Sikkema B.V.

Preface

- This manual provides important information on the use of UNILOG 300. Read this manual carefully.
- Various observations and warnings are marked in this manual by means of symbols. Read these carefully and take measures if necessary.

The symbols used have the following meaning:



OBSERVATION

Suggestions and recommendations to facilitate task performance.



PLEASE NOTE

An observation alerts the user to possible problems.



WARNING

If the action is not implemented correctly, data or settings may be lost.



ESD

An observation alerts the user to take measures for ESD.

The guarantee becomes invalid if the product described here is not handled properly, repaired or modified by unauthorized persons or if replacement parts are used which are not genuine parts from Wigersma & Sikkema B.V.

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1 Introduction

Battery operated UNILOG 300 is a GSM/GPRS modem and data logger. The inputs are equipped with an EX barrier in order that UNILOG 300 may be used with equipment installed in an explosion-hazardous environment. UNILOG 300 is equipped with an internal GSM antenna and can optionally be equipped with an external antenna.

A microprocessor handles many functions including pulse registration, reading an encoder counter, processing and storage of the data (data logging), communication of these data via GSM/GPRS, scheduler to turn the GSM/GPRS modem on and off and drawing up and sending logged data in an FTP message.

UNILOG 300 is available in three versions:

- 1 *Serial*; as a transparent GSM - GPRS modem suitable for reading 1 or 2 EVCD's of the UNIGAS series
- 2 *Encoder and Pulse*; as data logger for reading a gas meter or registering two pulse contacts/pulse outputs
- 3 *Serial, Encoder and Pulse*; as a combination of the abovementioned versions.

The version is marked on a label on the PCB inside the casing. Depending on the version, the relevant functions are already programmed. UNILOG 300 is delivered with the data logger functions deactivated. This includes the interval logger, historical logger, scheduler for the GSM modem and the internal FTP function.

These functions should be activated after installation and start-up only for use as data logger. This takes place automatically if the clock of UNILOG 300 is set, for example when a central system performs a data read-out for the first time.

A few characteristics of UNILOG 300 are:

- Easy to install and connect
- Suitable for continuous set-up outdoors
- Ambient temperature from -25°C to +55°C
- Can be read by remote control via GSM data, GPRS TCP (pull) or FTP (push)
- Suitable for connecting two UNIGAS devices
- Possible battery lifespan exceeding 10 years when reading daily (Depending on the application and the number of battery packs).

2 Explosion safety instructions (Ex)

See **DDN3801CVML**_EU Declaration of Conformity and Safety instructions

3 Functions and data structure

The functions and data structure are presented in a diagram in the figures below (figures 1 and 2). All counters and registers are explained in the chapter *Counters and Registers*.

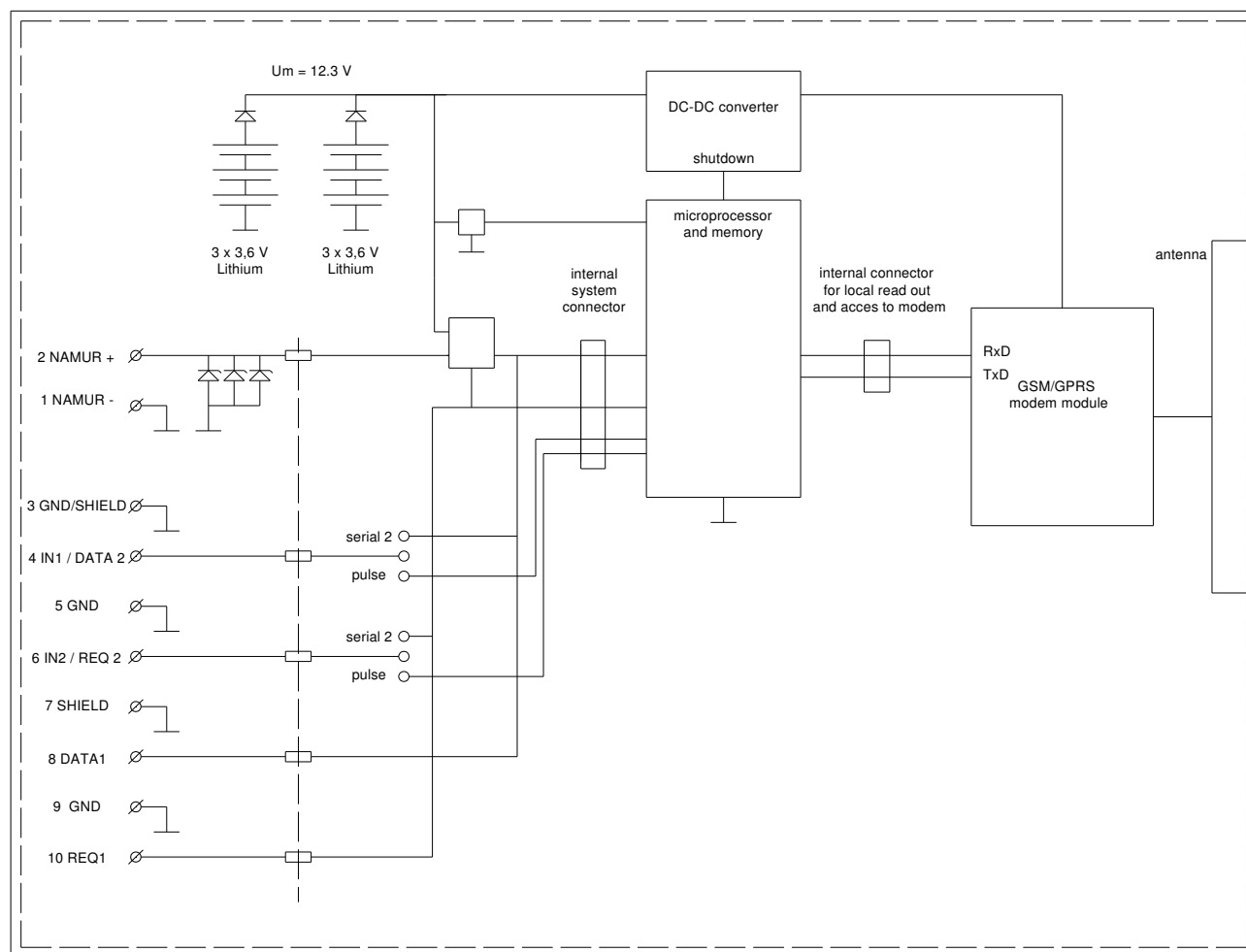


Figure 1. Schematic presentation of the functions

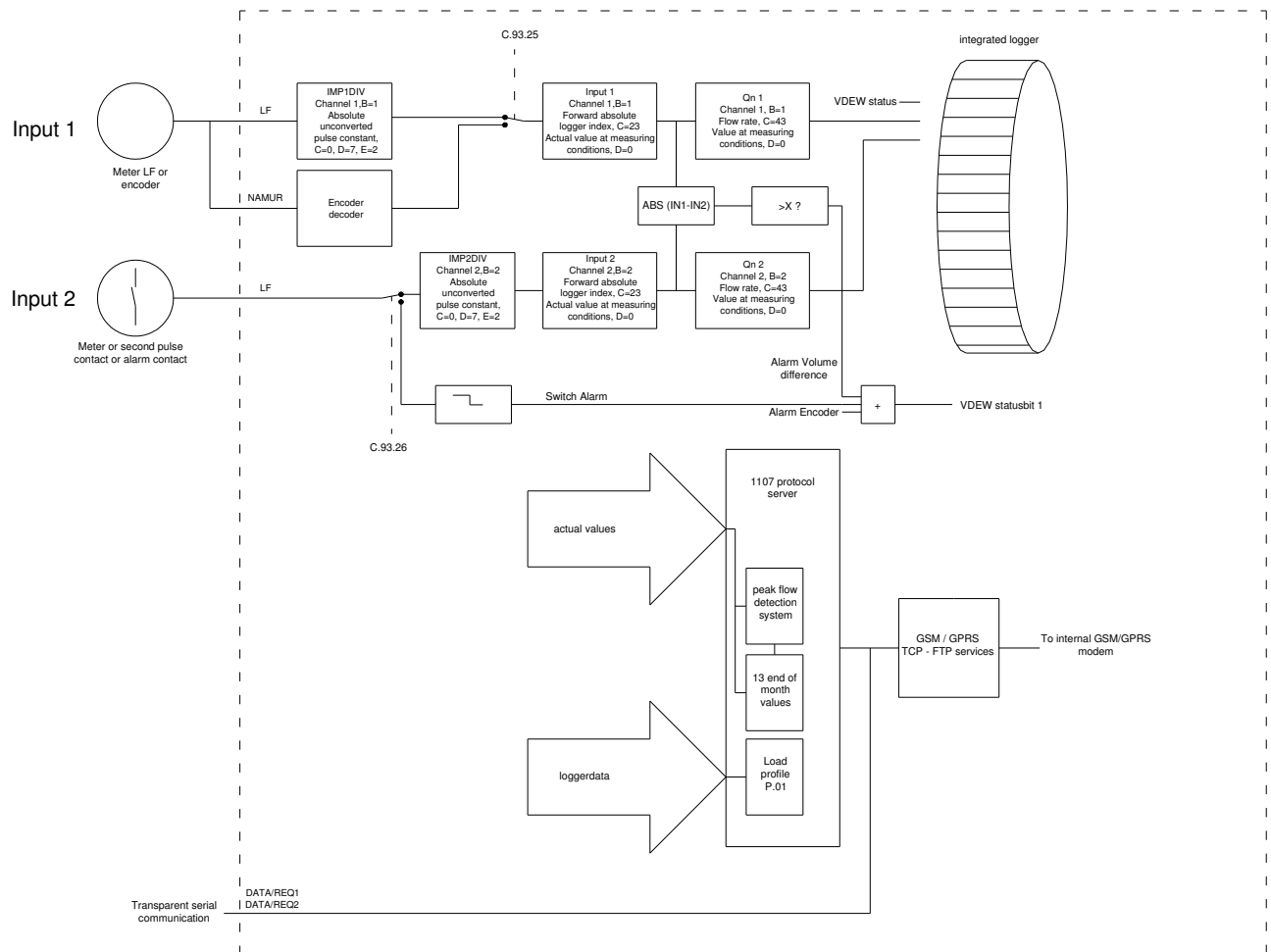


Figure 2. Schematic presentation of the data structure

4 Opening and closing the casing

UNILOG 300 is equipped with moisture protection. The protection includes a ventilation membrane and a silica gel desiccant inserted in the cover. Treat the cover with care as indicated below.



PLEASE NOTE

When opening the casing, take moisture absorption by the two silica gel bags into account. Limit the duration of the work to half an hour maximum and prevent the bags from coming in direct contact with water. If necessary, store the cover in a closed and dry, folded up plastic bag during the work. If there is any doubt, replace the silica gel bags. These are available at Wigersma & Sikkema, order number NN2461

4.1 Installing or replacing the silica gel bags

See the figure 3 below for the correct position of the two silica gel bags.

- Remove the bags in place by carefully pulling them from the cover. The rubber clamps (1) come loose automatically. Check to see that the packaging of the new silica gel bags to be installed is not damaged.
- Next take the new silica gel bags from the packaging. Check to see they are not damaged. If there is any doubt, do not use the silica gel bags.
- Hold the bag (2) on one side so that the filling drops completely to the bottom. Lay this side over the rib (3) and push the rubber clamp (1) between the rib and the edge of the cover.
- Hold the other side up so the filling moves to the side already clamped tight. Lay this side also over the rib and push the rubber clamp between the rib and the edge of the cover.
- Repeat the actions above for the second silica gel bag.

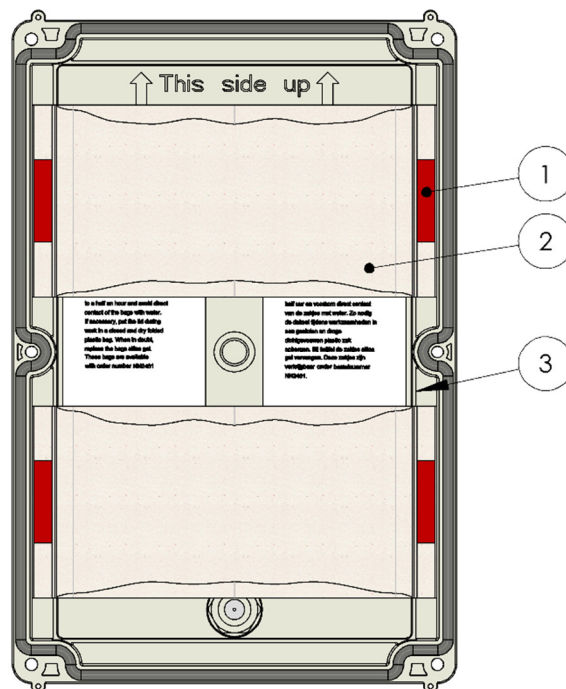


Figure 3. Positioning the silica gel bags in the cover

4.2 Closing the casing

Before closing the casing, check to see that the sealing edge of the cover is clean over the entire circumference, that the sealing rests against the casing properly and over its entire length, and that all (six) screws are in place. Place the cover on the casing with the text **This side up** (inside of the cover) facing up. First tighten the screws by hand and then screw them tight crosswise.

UNILOG 300 is fitted with two sealable screws that can be used to seal the cover if applicable.

5 Installation and use

The UNILOG 300 casing is in protection class IP65 according to EN60529. UNILOG 300 may be installed outdoors.

First read *Explosion safety instructions (Ex)* (Chapter 2) before continuing.

Depending on the function and the UNILOG 300 version, the inputs have been configured at the factory and it is possible that the corresponding cable(s) are already installed.



ESD

Electrostatic discharges (ESD) can cause damage to internal electrical components if no precautions are taken. ESD is caused by static electricity and the damage caused is usually permanent.

5.1 Installation

UNILOG 300 is equipped with installation brackets. UNILOG 300 does not have to be opened before installation. The installation brackets have installation holes with M6 thread so UNILOG 300 can also be installed via the other side of a wall.



PLEASE NOTE

Prevent contact of the casing with drilling, cutting or threading oil. Always install UNILOG 300 with the cable glands pointed down.

5.2 Components

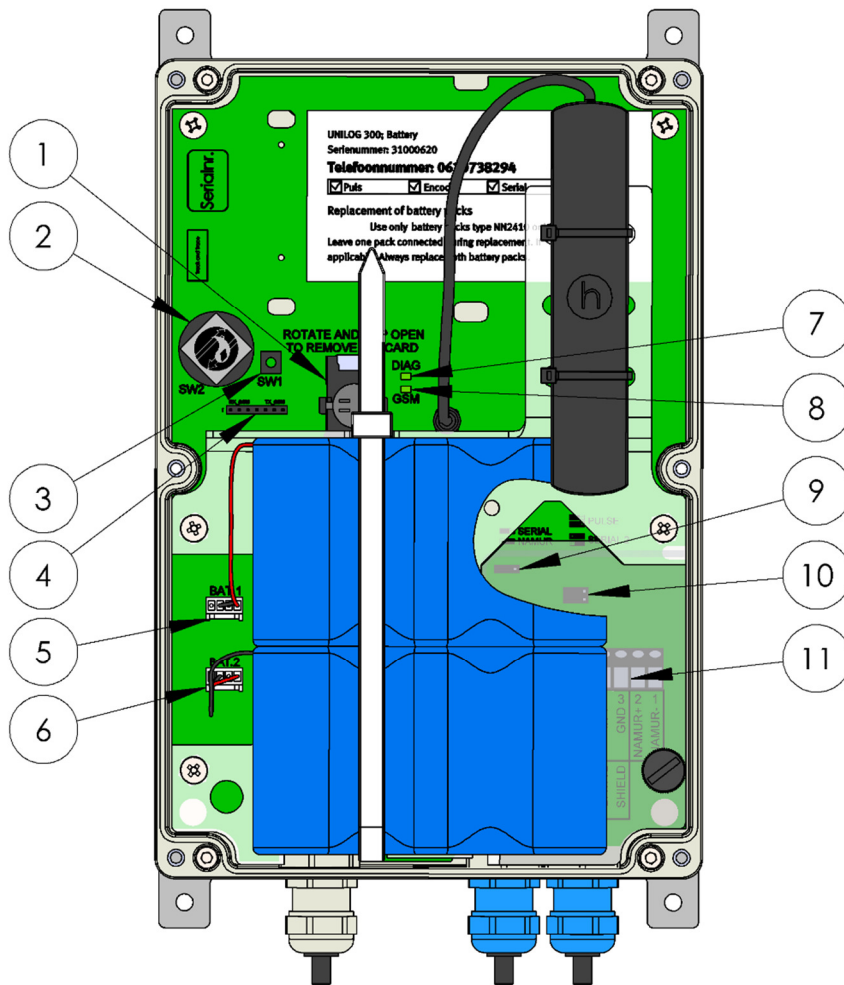


Figure 4. Opened UNILOG 300 with battery pack

1. SIM card holder
2. Sealable programming protection switch SW2
3. Switch SW1
4. Connection for local read-out*
5. Connection for battery pack 1
6. Connection for battery pack 2
7. System status LED (DIAG)
8. GSM status LED (GSM)
9. Jumper for NAMUR or serial connection
10. Jumpers for pulse outputs or serial connection 2
11. Screw terminals



PLEASE NOTE

*The use of the UNILOG-adapter (N2406) for local readout disrupts the on and off switching of the modem. It is advised to use the adapter if the modem is off or if the modem is on and the GSM-statusled flashes (modem is then logged on). Do **not** use the adapter if the GSM-statusled flashes rapidly (modem is communicating).

5.3 Connections

UNILOG 300 has 5 inputs. The terminal numbers and names are listed by the terminals in UNILOG 300 (figure 5). The inputs are numbered in sequence from 1 through 10, while terminal numbers 3 through 6 have a shared function (table 1).

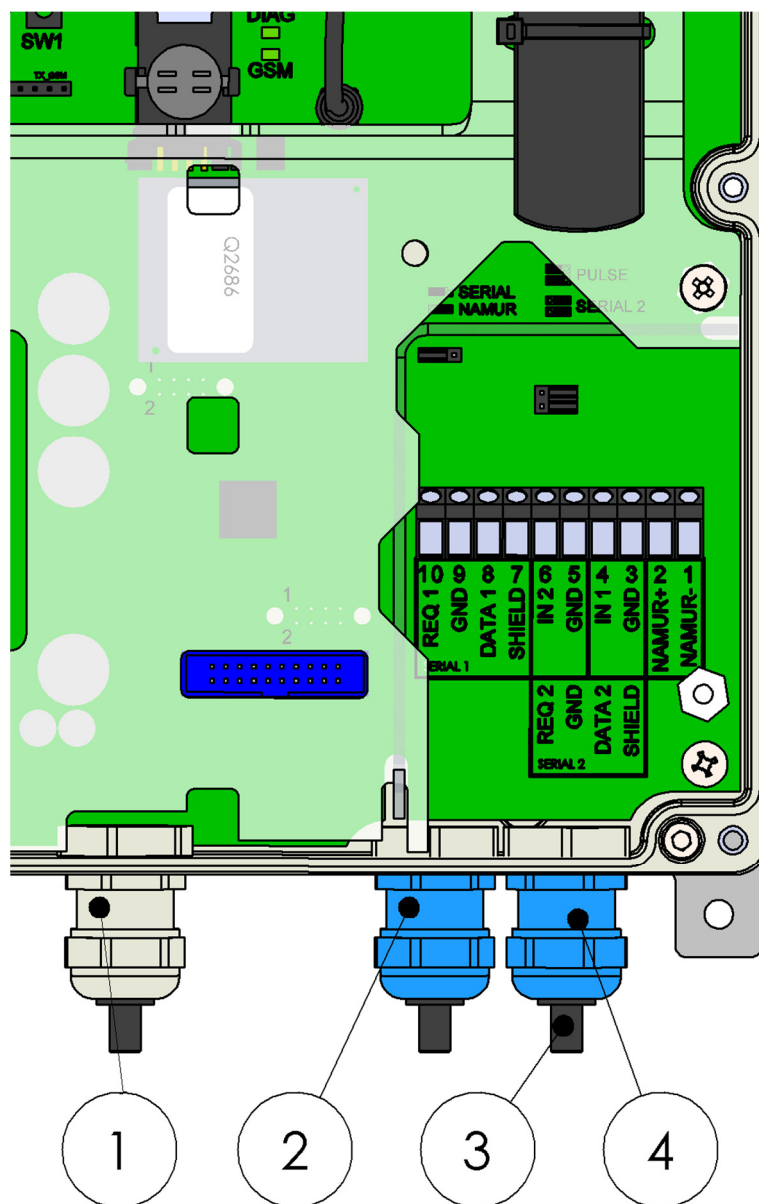


Figure 5. UNILOG 300 connections

1. Cable gland for optional cable gland for the external antenna
2. Cable gland for serial connection (SERIAL 1) or pulse inputs
3. Cap to seal an unused cable gland
4. Cable gland for pulse inputs or Encoder or serial connection 2 (Serial 2)



PLEASE NOTE

Cable glands that are not used must be sealed with the caps included in the delivery

Table 1. Connections

Input	Terminal number	Name	Meaning	Wigersma & Sikkema cable color coding
Encoder	1	NAMUR -	Connection for Encoder counter	-
	2	NAMUR +	Connection for Encoder counter	-
Puls	3	GND	Combined cable shield for pulse	Black
	4	IN1	Connection for pulse input 1	Brown
	5	GND	Combined Ground for pulse	Green
	6	IN2	Connection for pulse input 2	White
Serial 2	3	SHIELD	Cable shield for serial cable	Black
	4	DATA 2	Serial data from UNIGAS EVCD	Brown
	5	GND	Ground connection for serial cable	Green
	6	REQ 2	Serial data to UNIGAS EVCD	White
Serial 1	7	SHIELD	Cable shield for serial cable	Black
	8	DATA 1	Serial data from UNIGAS EVCD	Brown
	9	GND	Ground connection for serial cable	Green
	10	REQ 1	Serial data to UNIGAS EVCD	White

The following inputs can be used simultaneously:

- Encoder (terminal numbers 1 and 2) and pulse input 2 (terminal numbers 5 and 6)
- Serial input (terminal numbers 7, 8, 9 and 10) and pulse inputs 1 and 2 (terminal numbers 3, 4, 5 and 6)
- Serial input 1 and serial input 2 (terminal numbers 3, 4, 5, 6, 7, 8, 9 and 10)

**PLEASE NOTE**

For UNIGAS there can be a deviating cable color coding for the serial wire connection applicable (see appendix 3).

5.4 Jumper configuration

The inputs are configured by means of jumpers (figure 6). Whether an input is available depends on the version. See the label on the PCB in the casing.

Depending on which inputs will be used, the jumpers are installed in correspondence with the application (table 2).

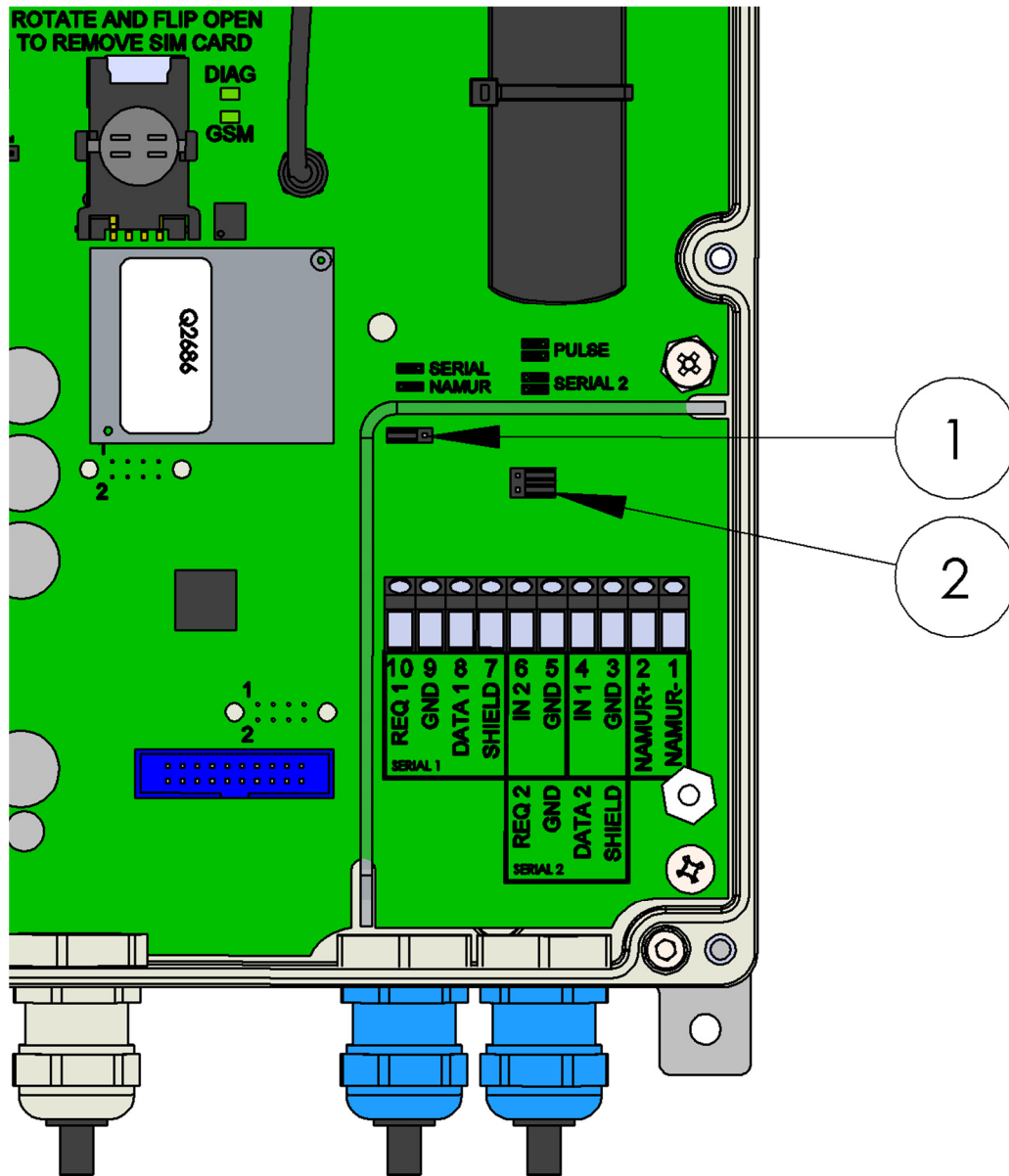


Figure 6. Jumpers

Table 2. Possible jumper settings

Use of the inputs	Jumper 1 position	Jumper 2 position
Encoder and pulse input 2	NAMUR	PULSE
Serial input 1 and pulse inputs 1 and 2	SERIAL	PULSE
Serial input 1 and serial input 2	SERIAL	SERIAL 2

5.5 Into service

5.5.1 Activate Data logger functions

When used as data logger, it is necessary to then take the following action with the central system:

- have the central system call in and set the clock of UNILOG 300. This will ensure that the internal clock is set to the same time as the central system. Wigersma & Sikkema delivers UNILOG 300 as standard factory set with deactivated data log functions. Clock synchronization will activate the data logger functions (the modem, scheduler, interval logger, historical logger and, if activated, the internal FTP scheduler). If UNILOG 300 is configured for Encoder counter reading, a reading of the Encoder counter will also take place for encoder counter reading initialization, and the data of the gas meter will be read as well.

5.5.2 Data logger encoder

Application: data logger with encoder counter

1. check if the jumpers are set as following:
 - a. Jumper 1: ~~SERIAL~~/NAMUR
 - b. Jumper 2: PULSE/~~SERIAL2~~
2. Connect the cable as following: screw terminal 1 (NAMUR-) and screw terminal 2 (NAMUR+).
3. Perform an Encoder initialization (see Chapter 7.1.2 ; Encoder counter reading initialization). This checks if the readout of the encoder counter is working properly.

If the Encoder initialization check fails, check the following:

 - a. The connection of the wiring of the encoder counter.
 - b. Jumper settings.
 - c. Version of the UNILOG 300; See the label inside the UNILOG 300; *Encoder* must be checked on this label.
4. Activate GSM or TCP by briefly pressing down switch SW1 (pos. 3, figure 4). The UNILOG 300 GSM modem will now be registered on the GSM network. Registration can take several minutes.

If UNILOG 300 is attached to the GSM network successfully, the GSM status LED (pos. 8, figure 4) will begin to flash.
5. Let the central system make contact with UNILOG (GSM or TCP) and the communication can be checked. When connection fails:
 - a. Check in case of GSM, the GSM status LED (pos 8, figure 4) flashes faster (once every two seconds)
 - b. Check, if applicable, the phone number.
 - c. Check, if applicable, the IP address.
6. Repeat, if necessary, step 4.
7. If all steps are performed correct, casing can be closed.

5.5.3 Data logger Pulse

Application: data logger with pulse input.

1. Check if the jumpers are set as follows:
 - a. Jumper 1: *SERIAL/NAMUR*
 - b. Jumper 2: *PULSE/SERIAL2*
2. Connect the cable to the following screw terminals:
 - 3 (*GND*)
 - 4 (*IN1*)
 - 5 (*GND*); if applicable, pulse input 2
 - 6 (*IN2*); if applicable, pulse input 2
3. Activate GSM or TCP by briefly pressing down switch SW1 (pos. 3, figure 4). The UNILOG 300 GSM modem will now be registered on the GSM network. Registration can take several minutes. If UNILOG 300 is attached to the GSM network successfully, the GSM status LED (pos. 8, figure 4) will begin to flash.
4. Let the central system make contact with UNILOG (GSM or TCP) and the communication can be checked. When connection fails:
 - a. Check in case of GSM, the GSM status LED (pos. 8, figure 4) flashes faster (once every two seconds)
 - b. Check, if applicable, the phone number.
 - c. Check, if applicable, the IP address.
5. Repeat, if necessary, step 3.
6. If all steps are performed correct, casing can be closed.

5.5.4 Transparent modem

Application: transparent modem:

1. Check if the jumpers are set as follows:
 - a. Jumper 1: *SERIAL/~~NAMUR~~*
 - b. Jumper 2: *PULSE/SERIAL2*
2. Connect the cable to the following screw terminals
 - 7 (*SCHIELD*)
 - 8 (*DATA1*)
 - 9 (*GND*)
 - 10 (*REQ1*)
3. Activate GSM or TCP by briefly pressing down switch SW1 (pos. 3, figure 4). The UNILOG 300 GSM modem will now be registered on the GSM network. Registration can take several minutes. If UNILOG 300 is attached to the GSM network successfully, the GSM status LED (pos 8, figure 4) will begin to flash.
4. Let the central system make contact with UNILOG (GSM or TCP) and the communication can be checked. When connection fails:
 - a. Check in case of GSM, the GSM status LED (pos 8, figure 4) flashes faster (once every two seconds)
 - b. Check, if applicable, the phone number.
 - c. Check, if applicable, the IP address.
5. Repeat, if necessary, step 3.
6. If all steps are performed correct, casing can be closed.

5.6 Changing the use: data logger <-> transparent modem

Changing from use as data logger to transparent modem is only possible for the *Serial, Encoder and Pulse* versions (see the label inside the UNILOG 300 for the version).

Changing the use from data logger to transparent modem:

- To do this, the actions as described in Chapter 5.7, *Taking out of use* must be performed.

Changing the use from transparent modem to data logger:

- This is done automatically when the central system synchronizes the clock.



PLEASE NOTE

In this case, the data that may have been present in the interval logger and the historical logger are erased. If these data are still important, have them read first by the central system or use UNITOOL to do so.

5.7 Taking out of service

If the UNILOG 300 is shut down while used as data logger, the data log functions must be deactivated to prevent unnecessary use of batteries and logging of irrelevant data.

Procedure:

1. Disconnect the battery pack(s) from the connector(s).
2. Next, wait a minute to make sure all functions are actually shut down. The DIAG LED stops flashing.
3. Keeping SW1 pressed down; connect a battery pack to UNILOG 300. As soon as the DIAG LED starts flashing, SW1 must be released. If applicable, connect the second battery pack too.
4. After UNILOG is completely started up, the DIAG LED enables recognition of whether the data log functions of UNILOG 300 have been deactivated:
 - System status LED (DIAG) lights up once every 5 seconds: data logging functions are activated.
 - System status LED (DIAG) lights up once every 10 seconds: data logging functions are deactivated.

6 Function check

6.1 System status check

A status LED is used to check the system status (pos. 5, figure 4).

LED colour: green (figure 7)

1. Once short every 10 seconds: all functions are working correctly, data log functions are deactivated; application as transparent modem.
2. Once short every 5 seconds: all functions are working correctly, data log functions are activated; application as data logger or data logger plus transparent modem.
3. Twice short every 5 seconds: Battery (batteries) almost empty, capacity at <5%, battery (batteries) need to be replaced on short notice.
4. Three times short every 5 seconds: Empty battery(batteries), GSM modem switched off to save battery consumption. Battery (batteries) must be replaced.
5. Once 5 seconds: confirmation that the battery consumption counter is reset.
6. Once per second for half a minute maximum: start up; this only happens if UNILOG 300 is powered up.
7. Continuously once per second: critical error, contact Wigersma & Sikkema.

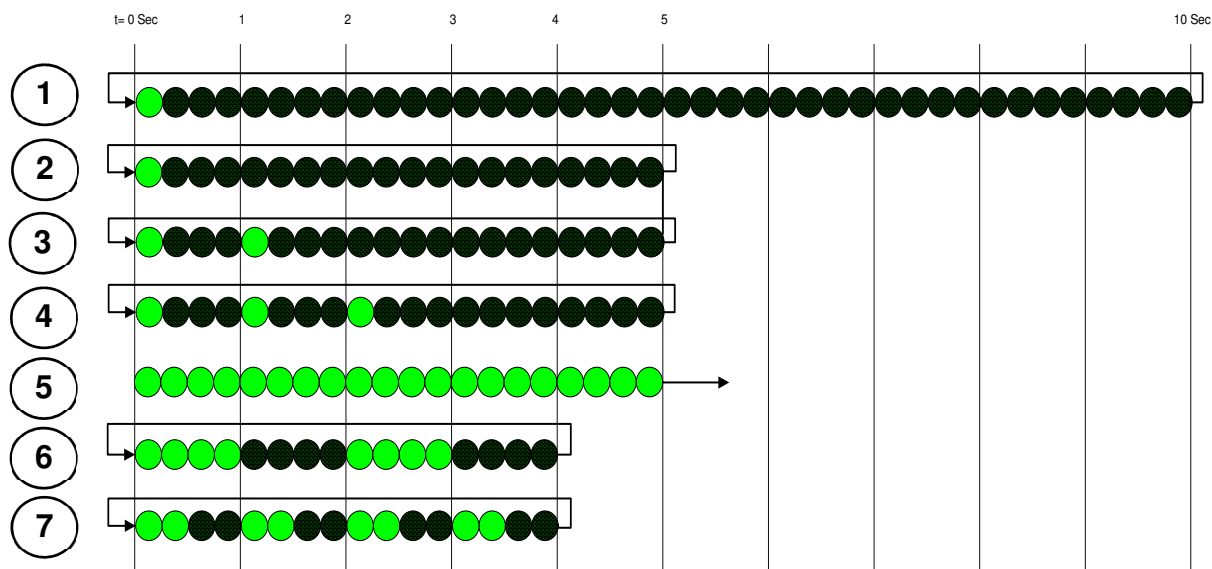


Figure 7. System-status led (DIAG) function

7 Configurations

7.1 Gas meters with an Encoder counter

Version: *Encoder and Pulse* or *Serial, Encoder and Pulse* (see the label inside the UNILOG 300 for the version).

Application: as data logger

UNILOG 300 is suitable for application of gas meters with an Encoder output of the GWF, Elster, Dresser, FMG or Aerzener manufactures equipped with a NAMUR interface. In order to use this functionality, parameter C.93.25 must be set to ENCODER by means of service software UNITOOL, in addition to the correct version and jumper configuration. This is normally already configured at delivery. The encoder counter readings are registered in counter 1.



WARNING

For application of reading an encoder counter, the function of the serial input of UNILOG 300 is disabled.

7.1.1 Jumper configuration

The Jumperconfiguration must be according to table 3 to read the encoder counter.

Table 1. Jumperconfiguration data logger with encoder readout

Use of the inputs	Jumper 1 position	Jumper 2 position
Encoder and/or pulse input 2	NAMUR	PULSE

7.1.2 Initialization Encoder counter:

Since UNILOG 300 performs a validation check on encoder counter readings, an initial reading is not always accepted (see *Read encoder counter, chapter 7.1.5.*) at installation or when the gas meter is replaced. To ensure that the UNILOG 300 accepts the encoder counter reading at initialization. This is possible in 3 ways:

1. At activation of the data log functions. Activation can be initiated by means of:
 - UNITOOL and setting of parameter C.93.30,
 - or
 - It takes place automatically when the UNILOG 300 clock is set, for example by a central system.
2. If parameter C.93.25 is set to *Encoder* by means of service software UNITOOL.
3. Manual initialization by means of SW2 and SW1 (see Chapter 7.1.3. *Manual initialization Encoder counter*).

7.1.3 Manual initialization Encoder counter:

It is possible to manually perform an encoder initialization.

The initialization procedure is as follows:

- Press down SW2 and keep it pressed
- Press down SW1
- Release SW2 and SW1
- Next: the system-status LED (DIAG) will indicate the status of the encode initialization (figure 8).
 1. Encoder initialization is being performed (LED flashes: 1 second on, 1 second off)
 2. Reading of the Encoder counter and gas meter data (when supported) has succeeded (LED on during 10 seconds)
 3. Reading of the Encoder counter has failed (LED flashes: 0,5 second on, 0,5 second off; during 10 seconds)

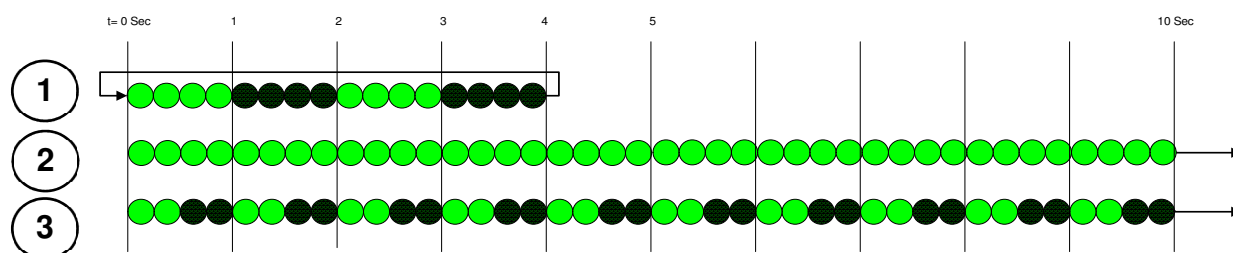


Figure 8. System-status led (DIAG) during manual encoder initialization by means of SW2 and SW1.

7.1.4 Read Gas meter data

If the Encoder counter supports this, UNILOG 300 will read the gas meter data. Gas meter data are serial number, manufacturer and year of manufacture.

The gas meter data are read:

- When the Encoder counter is initialized, see 7.1.3.
- If the Encoder counter is read correctly after an alarm for an incorrect encoder counter reading is set in the status register.

7.1.5 Read encoder counter

If an encoder counter is connected without being initialized and the reading of the encoder counter is lower or much higher than the value in counter 1 of UNILOG 300, UNILOG 300 will not process the encoder counter reading. An alarm is set in the status register for a failed reading of the encoder counter.

If the encoder counter decreases, the counter reading will not be processed by UNILOG 300. An alarm is set in the status register for a failed reading of the encoder counter. If the decrease is of a temporary nature, UNILOG 300 will reassume processing the encoder counter readings as soon as it is higher than the last processed encoder counter reading.

7.2 Gasmeters with a pulse

Version: *Encoder and Pulse* or *Serial, Encoder and Pulse* (see the label inside the UNILOG 300 for the version).

Application: as data logger

In order to use the two pulse inputs, parameter C.93.25 must be set to LF by means of service software UNITOOL.



PLEASE NOTE

Check and/or program the correct pulse ratios (parameters 1:0.7.2 and 2:0.7.2) by means of service software UNITOOL

7.2.1 Jumper configuration

In order to use as data logger with pulse registration, position jumpers according to Table 4.

Table 2. Jumper configuration data logger with pulse registration

Use of the inputs	Jumper 1 position	Jumper 2 position	Parameter C.93.25
Encoder and/or pulse input 2	NAMUR	PULSE	ENCODER
Pulse input 1 and/or 2	NAMUR	PULSE	LF
Pulse input 1 and/or 2 and optional as transparent modem	SERIAL	PULSE	LF

7.3 Transparent modem (Volume conversion device series UNIGAS)

Version: *Serial* or *Serial, Encoder and Pulse* (see the label inside the UNILOG 300 for the version).

Application: as transparent GSM – GPRS modem

In order to use the serial input, parameter C.93.25 must be set to Off or Pulse by means of service software UNITOOL. In addition, it must be ascertained that the version and jumper configuration correspond with the function for which UNILOG 300 is used. See Table 5.

7.3.1 Jumper configuration

In order to use as transparent modem, position jumpers according to Table 5.

Table 3. Jumper configuration transparent modem

Use of the inputs	Jumper 1 position	Jumper 2 position	Parameter C.93.25
Transparent modem (possible to connect second UNIGAS)	SERIAL	SERIAL2	n.a.
Transparent modem (optional as data logger)	SERIAL	PULSE	LF

8 GSM and TCP

8.1 GSM connection check

Correct functioning of the GSM connection can be checked by means of the GSM status LED (pos. 8, figure 4), color yellow. During start-up of UNILOG 300, the GSM status LED is lit up continuously

Figure 9, 1: until UNILOG 300 is attached to the GSM network. This may take 10 to 20 seconds, depending on the GSM network. As soon as UNILOG 300 is registered to the network, the GSM status LED will start flashing slowly.

Figure 9, 2: Once every three seconds. At the moment a connection with UNILOG 300 is established, the GSM status LED will start to flash quickly.

Figure 9, 3: Once every two seconds. After the connection is closed, the GSM status LED will start flashing slowly again (1).

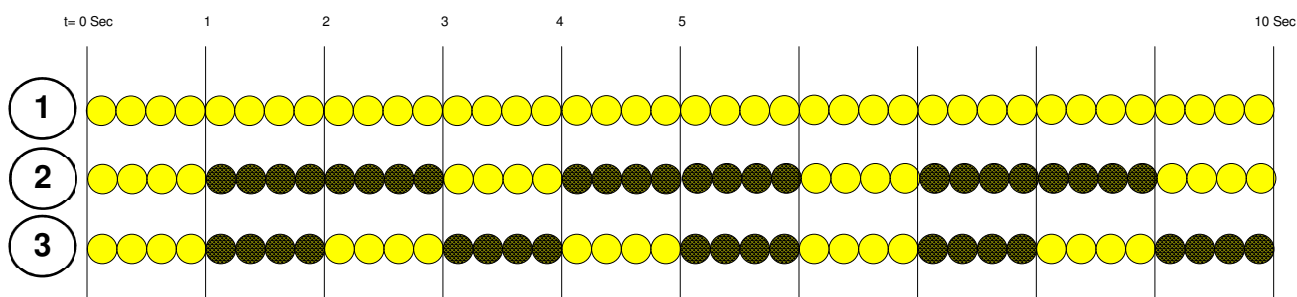


Figure 9. GSM- status led functions

8.2 GSM network check

If there are any doubts about the quality of the GSM network at the site the UNILOG 300 is installed, it is possible to check the reception quality by means of the Wigersma & Sikkema MODEM NETWORK MONITOR service software.

8.3 Activating the GSM-modem

After installation of UNILOG 300, the GSM modem can be switched on by briefly pressing down switch SW1 (pos. 3, figure 4). The UNILOG 300 GSM modem will stay on for 25 - 30 minutes.

If switch SW1 is operated once again, the GSM modem will register to the network again. To do this, the GSM-modem will go off and on. Also the GSM-status LED will be off for a short period of time.

8.4 Activation of TCP

In case the TCP-server function of the UNILOG 300 is activated, turning on the GSM-modem will result in a registration to the GSM network, followed by registration on the GPRS network and the TCP server will be activated.

Before the TCP-server is activated, an IP-address must be assigned to the UNILOG 300. If the registration to the GPRS network or activation of the TCP-server fails, others attempts will be made to register to the network with a maximum of 4 attempts. After 4 attempts, the UNILOG will register on the GSM network only. Manual it is possible to attempt a registration on the GPRS network my means of the SW1 switch.

9 SIM Card

A SIM card may already have been installed in UNILOG at the factory. If so, the corresponding telephone number is printed on the label in UNILOG 300.

Suitable GSM subscriptions are for example M2M for GSM data and/or GPRS data.

If GPRS is used, additional settings are required in UNILOG 300 so it can register to an APN: the APN name with the corresponding user name and password.

9.1 Inserting or replacing a SIM card

Open UNILOG 300, see *Opening and closing the casing* (Chapter 4). The SIM card holder is located above the battery holder in the back of the casing.

Lightly press on the metal-colored closing mechanism of the SIM card holder and twist it counter clockwise, unlocking the SIM card holder so it drops open. The SIM card can be inserted with the gold contacts facing to the back and the slanted corner upwards. Close the SIM card holder by reversing the above mentioned actions.

Note the telephone number of the SIM card on the label in UNILOG 300.

After concluding the entire installation, test for proper functioning as described in the Chapter 6; *Function check*.

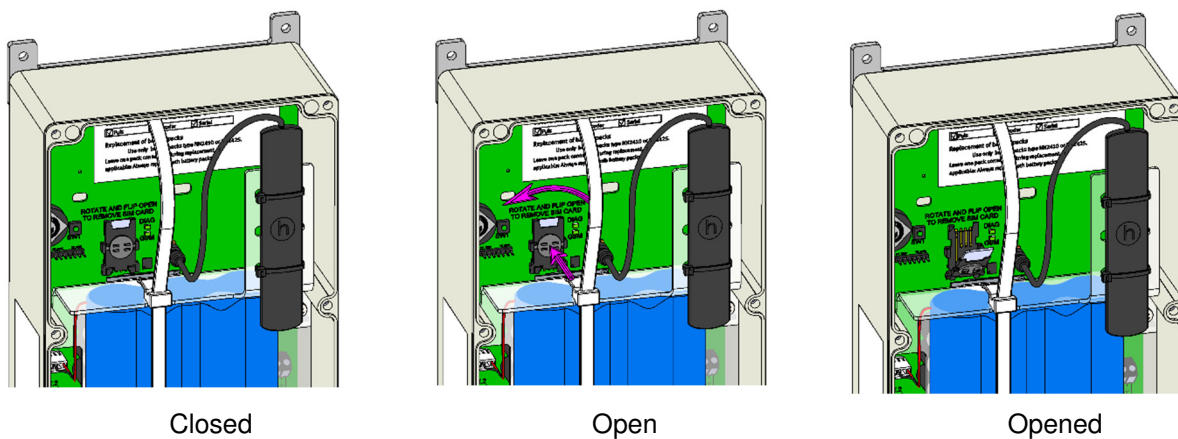


Figure 10. Opening the SIM card holder

10 Battery packs

10.1 Lifespan

UNILOG 300 is operated by one or two lithium battery packs. The battery packs are installed at the bottom of UNILOG 300 and connected to the connectors labelled *BAT.1* and *BAT.2*. The packs are attached by means of a cable tie that can be loosened. The production year is printed on the battery packs. The lifespan is specified in the table below (table 6). For any use other than as indicated in the table, contact Wigersma & Sikkema.

Table 4. Battery pack lifespan

Use	1 battery pack	2 battery packs
4 hours logged into the GSM network and 10 minutes of communication per month	More than 15 years	N/A
1/2 hour logged into the GSM network and 1 minute of communication per day	6 years	10 years
1 hour logged into the GSM network and 1 minute of communication per day	4.3 years	8.2 years
1 hour (or 2 times 1/2 hour) logged into the GSM network and 2 minutes (or 2 x 1 minute) of communication per day	3.2 years	6.3 years
5 minutes per hour logged into the GSM network and 20 s of communication	1.2 years	2.3 years

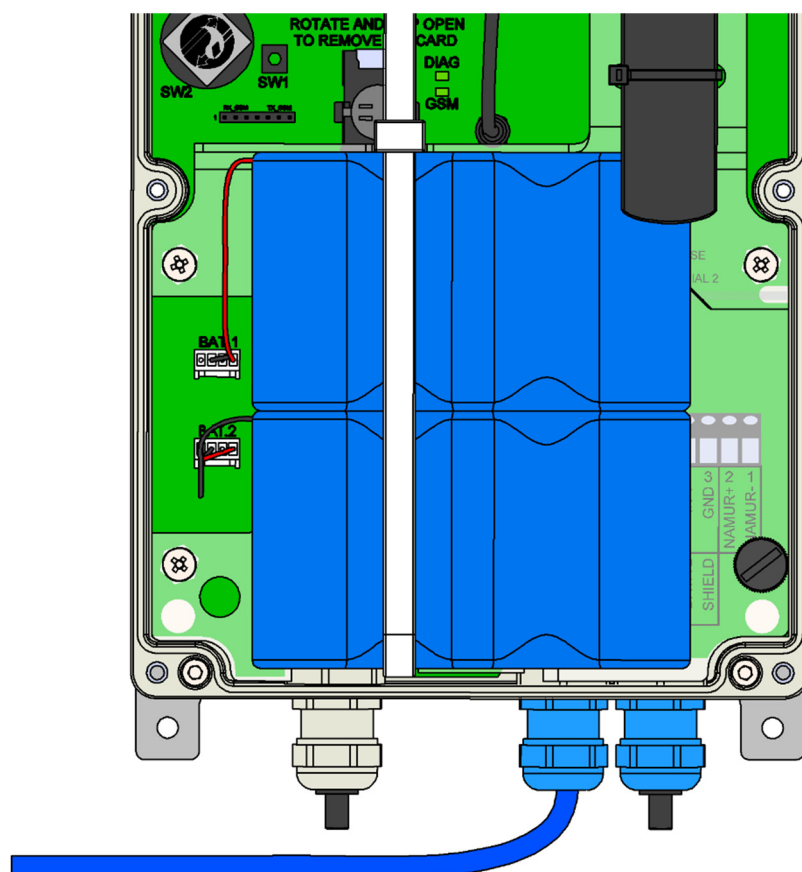


Figure 11. Battery pack(s) position

10.2 Battery pack replacement

First read *Explosion safety instructions (Ex)* (Chapter 2) and *Opening and closing the casing* (Chapter 4).

Battery packs must be replaced within the recommended term (table 6). New battery packs are delivered including silica gel and packaged as a set in a closed package. The package must not be opened until the moment of installation. This prevents mistaking the old and new packages for each other and the silica gel from losing its effectiveness.



OBSERVATION

The battery packs may be replaced regardless of the condition the UNILOG 300 is in, provided they are replaced one at a time, so that one pack is always connected to UNILOG 300. If only 1 battery pack is installed in the UNILOG 300, the new battery pack can be connected to the free battery connection. The old battery pack can then be removed.

Procedure for installation with 1 battery pack [type N31]

1. Disconnect the cable tie of the battery pack by carefully bending the cable tie outward and at the same time pulling the eye off the cable tie end.
2. Leave the battery pack connected to UNILOG.
3. Install the new battery pack with the label visible and the arrow on the label pointed upwards.
4. Connect the connector to the free battery connection.
5. Disconnect the connector from the old battery pack and remove it from the casing.
6. Place the eye of the cable tie back on the end of the tie and tighten it carefully.
7. Install the new silica gel bags as indicated in *Opening and closing the casing* (Chapter 4).

Procedure for installation with two battery packs [Type N32]

1. Disconnect the cable tie of the battery pack by carefully bending the cable tie outward and at the same time pulling the eye off the cable tie end.
2. Disconnect the connector from one of the two battery packs and remove the battery pack from UNILOG 300.
3. Now install a new battery pack with the label visible and the arrow on the label pointed upwards.
4. Connect the new battery pack to the free connector.
5. Replace the second pack the same way (step 1 through 3).
6. Place the eye of the cable tie back on the end of the tie and tighten it carefully.
7. Install the new silica gel bags as indicated in *Opening and closing the casing* (Chapter 4).

Procedure for installation of two battery pack instead of one battery pack

1. Disconnect the cable tie of the battery pack by carefully bending the cable tie outward and at the same time pulling the eye off the cable tie end.
2. Retrieve the cable strap by pulling the cable tie eye and pushing it at the end of the cable strap.
3. Place the cable tie in a way that it comes out on the side of the cable glands (figure 11)
4. Now install a new battery pack with the label visible and the arrow on the label pointed upwards.
5. Connect the new battery pack to the free connector.
6. Disconnect the connector from the old battery pack and remove the battery pack from UNILOG 300.
7. Now install a new battery pack with the label visible and the arrow on the label pointed upwards
8. Connect the connector of the battery pack to the free connector.
9. Place the eye of the cable tie back on the end of the tie and tighten it carefully
10. Install the new silica gel bags as indicated in *Opening and closing the casing* (chapter 4)

Resetting the battery consumption counter

The battery consumption counter must be reset after the battery/batteries have been replaced. To do so, press switch SW1 for at least 5 seconds (pos. 3, figure 4). The *DIAG* LED (pos. 7, figure 4) will remain on for 5 seconds consecutively to confirm the action. This action may be taken regardless of the condition UNILOG 300 is in.

Close UNILOG 300 and seal the sealable screws if necessary, as described in *Opening and closing the casing* (Chapter 4).

Battery packs

It is possible to order battery packs. It is possible to choose a single or dual battery pack. See Table 6 for lifespan of the batteries.

A single battery pack can be ordered under article number N3402. This is applicable to the UNILOG 300 and comes with silica gel.

A double battery pack can be ordered under article number N2402. This is applicable to the UNILOG 300 and UNILOG GPRS and comes with silica gel.

11 External antennas

If the signal strength is insufficient, UNILOG 300 can be equipped with an external antenna. Two types of external antennas may be used, an Omni directional antenna and a directional antenna.

Wigersma & Sikkema has selected a few models of external antenna's suitable for use with UNILOG 300. All models are supplied with mounting materials.

See Manual **DDN002MHGB** for more information. This manual is downloadable from the Wigersma & Sikkema website (www.wigersma-sikkema.com)

12 Counters and registers

The counters and registers (parameters) available in UNILOG 300 are listed below. The name of each counter or register is presented, supplemented by the OBIS code, the protection level and a short description.

All counters and registers can be read with the UNITOOL software (depending on UNITOOL user rights granted and the UNILOG 300 version).

Counters and registers may have writing protection installed. The following protection levels are present in UNILOG 300:

- Protection by programming switch: writing is only possible if the programming switch *SW2* (pos. 2, Figure 4) is operated during writing. This type of protection can be switched off, see register C.93.24
- Protection level 1: password 1 provides access to the mode in which counters and registers can be read and written.
- Protection level 2a: password 2a enables writing registers. Password 2a is the same as the VDEW password.

If passwords are not programmed, registers can be read and written without the use of passwords or by using an arbitrary password.

Service registers

Name	Unit	OBIS		Description
Type of equipment	-	C.1.1		Equipment type and version of UNILOG 300.
Serial number	-	C.1.0		Serial number and version of UNILOG 300
Firmware version	-	7-0:0.2.0		Firmware version
SW modem engine		C.90.23		Modem module software version
IMEI number		C.90.24		IMEI number
SIM card number		C.90.25		The number of the SIM card inserted
Track and Trace data		C.91.5		UNILOG PCB Track and Trace data
GSM main cell		C.90.7		Strength of the GSM main cell

Other settings

Name	Unit	OBIS	Protection level	Description
Device address		C.90.1	Password 2a	Device address for IEC 62056-21 communication protocol.
EAN code		C.96.0	Password 2a	Meter location code
End of gas day	h	C.91.2	Password 2a	Point of time when UNILOG 300 concludes the day and logs into the month logger. If the log interval is set to 24 hrs, logging into the interval logger will take place
Gas meter serial number	-	7-1:0.2.14	Password 2a	Serial number of the gas meter connected. If an Encoder counter is used, the serial number is set automatically. In that case, the setting cannot be changed by the user.
Gas meter manufacturer FLAG coding	-	C.91.10	Password 2a	Gas meter manufacturer FLAG coding (3 letters) If an encoder counter is used, the FLAG code is set automatically. In that case, the setting cannot be changed by the user.
Gas meter year of manufacture	-	C.91.11	Password 2a	Gas meter year of manufacture. If an Encoder counter is used, the year of manufacture is set automatically. In this case, the setting cannot be changed by the user.
Broadcast	-	C.93.15	Password 2a	Response to a 1107 request. When 'off', UNILOG 300 does not respond at an unaddressed sign on. When 'on', UNILOG 300 does respond at an unaddressed sign on.
Interval logger interval time setting		0.8.5	Password 2a	Interval logger interval time
Data logger functions	-	C.93.30	Password 2a	Activating or deactivating the data logger functions
SW2 protection	-	C.93.24	SW2	Disabling write protection by SW2 and enabling write protection by password 2a.

Counter readings

Name	Unit	OBIS	Protection level	Description
Counter reading input 1	m ³	1:23.0.0	SW2	Counter reading for input 1
Counter reading input 2	m ³	2:23.0.0	SW2	Counter reading for input 2

Settings for inputs

Name	Unit	OBIS	Protection level	Description
INP1DIV	p/m3	1:0.7.2	SW2	Division factor pulse input 1
INP2DIV	p/m3	2:0.7.2	SW2	Division factor pulse input 2
Function input 1		C.93.25	SW2	Functionality input 1 disabled, LF or Encoder

Settings for alarms

Name	Unit	OBIS	Protection level	Description
Alarm INP2 – INP1	m3	C.92.9	Password 2a	Alarm threshold for volume difference between input 1 and 2. If set to 0, this function is disabled.

Consumption data

Name	Unit	OBIS	Protection level	Description
Battery voltage	mV	C.90.6		Battery voltage
Operation	h	C.90.13		Number of operating hours
Ah-used	Ah	C.90.21		Battery capacity consumed. This register can be used to assess whether the UNILOG batteries must be replaced. When using 1 or 2 battery packs, respectively, in Western Europe, 12 Ah or 24 Ah, respectively, can be taken as the value at which the batteries will have to be replaced. This leaves approximately 10% residual capacity.
Networkh	h	C.90.4		Amount of hours connected to the GSM network
Commh	h	C.90.5		Amount of hours GSM communication

Flow rate

Name	Unit	OBIS	Protection level	Description
Q1_nx5	m3/h	1:43.0.0		Input 1 flow rate, quantity under measurement conditions based on a progressive average of n x 5 minutes.
Q2_nx5	m3/h	2:43.0.0		Input 2 flow rate, quantity under operating conditions based on a progressive average of n x 5 minutes.
Flow rate specification n	-	C.93.1	Password 2a	Time base to calculate the flow rate Q based on the progressive average of n units of 5 minutes

GPRS settings

Name	Unit	OBIS	Protection level	Description
APN Name	-	C.92.40	Password 2a	APN used for log-in
APN user	-	C.92.41	Password 2a	User name to log in at APN
APN password	-	C.92.42	Password 2a	Password to log in at APN
FTP server user	-	C.92.43	Password 2a	FTP server user
FTP server password	-	C.92.44	Password 2a	FTP server password
FTP server IP or DSN	-	C.92.46	Password 2a	FTP server IP or DSN
FTP server port number	-	C.92.47	Password 2a	FTP server port number
TCP server port number	-	C.92.48	Password 2a	TCP server port number
Modem CHV1 ME password	-	C.92.61	Password 2a	Pin code for the SIM card
FTP file name	-	C.91.8	Password 2a	Number to be issued in the FTP file name for an internal FTP message
IP address	-	C.92.45		The IP address assigned by the GPRS network. Only presented if the TCP server is activated
FTP interval	-	C.92.49	Password 2a	Interval for sending FTP messages
FTP mode		C.92.50	Password 2a	Passive or active FTP mode
TCP server		C.92.51	Password 2a	Activate TCP server

Clock and modem scheduler

Name	Unit	OBIS	Protection level	Description
Time	hhmmss	0.9.1	Password 2a	Current time
Date	ddmmyy	0.9.2	Password 2a	Current date
ns	s	C.91.1	Password 2a	Maximum deviation of the clock that may be corrected without setting a status bit in the VDEW status register.
Protocol clock DST presentation		C.93.7	Password 2a	Option switch for use of the communication protocol clock in summer or winter time
Call window clock DST presentation		C.93.8	Password 2a	Option switch for use of the call window clock in summer or winter time
Call window starting date and time		C.90.12	Password 2a	Call window starting date and time
Call window		C.90.11	Password 2a	Settings for call window and recall window
Call window shortening		C.93.16	Password 2a	If the UNILOG 300 is battery-operated, the modem is switched off after a correct communication session. The recall window will be cancelled.

VDEW status register

The VDEW status register consists of 16 registrations of an alarm and is presented as a 4-character hexadecimal number:

St: 1₁1₂1₃1₄

Bit number		Value St	Description	State / Event
15 / F	1 ₁	8, 9, A, B, C, D, E, F	-	
14 / E		4, 5, 6, 7, C, D, E, F	logger erased	event
13 / D		2, 3, 6, 7, A, B, E, F	-	
12 / C		1, 3, 5, 7, 9, B, D, F	-	
11 / B	1 ₂	8, 9, A, B, C, D, E, F	-	
10 / A		4, 5, 6, 7, C, D, E, F	-	
9		2, 3, 6, 7, A, B, E, F	-	
8		1, 3, 5, 7, 9, B, D, F	SW2 operated while writing obis parameter	Event
7	1 ₃	8, 9, A, B, C, D, E, F	-	
6		4, 5, 6, 7, C, D, E, F	UNILOG 300 was powered up after a power down	Event
5		2, 3, 6, 7, A, B, E, F	time set of clock more than <i>ns</i>	Event
4		1, 3, 5, 7, 9, B, D, F	-	
3	1 ₄	8, 9, A, B, C, D, E, F	summer time activated	State
2		4, 5, 6, 7, C, D, E, F	fatal error: CRC error	Event
1		2, 3, 6, 7, A, B, E, F	active alarm: Differential Alarm inputs 1 and 2 or Alarm input 2, error in Encoder reading	Event
0		1, 3, 5, 7, 9, B, D, F	Fatal error: empty battery, watchdog error	Event

If a status bit is set, it is dealt with as follows:

	Type	description/ behavior
State	Interval logger (P.01)	The actual state is stored at the time of logging in the interval logger
	Data read out mode	The actual state at the moment of readout is displayed in the status bit of readout
Event	Interval logger (P.01)	The state of the event is stored until the next log moment and subsequently logged in the interval logger. The status then gets stored and reset.
	Data read out mode	The status of the event is stored until parameter C. 5 is written. Except for status bit 5 (clock), status bit 5 resets after the time set of the clock.


13 Software Support

The following software packages are available:

- | | | | |
|---|---|---------------|----------|
| • | Programming and reading UNILOG 300: | | |
| | UNITOOL software | ordering code | G6900000 |
| • | Checking the signal quality of the GSM network connection: | | |
| | MODEM NETWORK MONITOR software | ordering code | N2400 |
| • | Tools for the use of UNILOG 300 software packages on site: | | |
| | UNILOG adapter for local reading (7-pin flat connector / USB) | | |
| | | ordering code | N2406 |

Annex 1: Specification

General

- | | |
|---|---|
| <ul style="list-style-type: none"> • Supply • Battery lifetime one battery pack | <p>Battery, 1 or 2 x 3 D cell lithium battery
> 4 years at 1 hour idling and 1 minute communication per day *</p> <p>> 6 years at 0.5 hour idling at 1 minute communication per day *</p> |
| <ul style="list-style-type: none"> • Battery lifetime two battery packs | <p>> 8 years at 1 hour idling and 1 minute communication per day *</p> <p>> 10 years at 0.5 hour idling at 1 minute communication per day *</p> |
| <ul style="list-style-type: none"> • EX approval | <p> II (1)G [Ex ia Ga] IIC
DEKRA 12ATEX0135
Mounting in safe area only</p> |
| <ul style="list-style-type: none"> • Weight • Dimensions • Material casing • Colour • Material mounting bracket • Protection class • Operating temperature • System | <p>2.3 kg with 2 battery packs
160 x 240 x 116 mm
Polycarbonate
Light grey, RAL7035
Stainless Steel
IP 65
- 25 °C to + 55 °C
Dual UART low power microprocessor
64 Kbyte Eeprom memory
Flash program memory</p> |
| <ul style="list-style-type: none"> • Remote software update • Internal reset • Watchdog | <p>Yes
Once a day
Implemented</p> |

* consult Wigersma & Sikkema for battery lifetime at different schedule settings. More information, see application note *Properties of periodic data reading with UNILOG, DDN2402TBNL*

Battery power management

- | | |
|--|--|
| <ul style="list-style-type: none"> • Monitors • Low battery handling | <p>Battery voltage and used battery capacity
Automatic shutdown of modem to prevent flat battery</p> |
| <ul style="list-style-type: none"> • Battery exchange | <p>Can be performed independent functional state of UNILOG 300</p> |

Status indicator

- | | |
|--|--|
| <ul style="list-style-type: none"> • Status indicator led's | <p>Yellow:</p> <ul style="list-style-type: none"> ▪ GSM network status <p>Green:</p> <ul style="list-style-type: none"> ▪ Battery status ▪ Encoder test status ▪ Data logger enabled indication ▪ Error indication ▪ Power-up indication |
|--|--|

Inputs

- Namur, Serial and pulse input
 - Cable glands two glands Ø 5 -8 mm
 - Available pre-assembled cables EMC shielded, color blue
- Ex specification of input terminals:
 - Namur (terminal 1, 2)
 - U_o = 9.6 V
 - I_o = 13 mA
 - P_o = 38 mW
 - C_o = 3.5 μ F
 - L_o = 100 mH
 - DATA 1 (terminal 7, 8) and IN 1/DATA 2 (terminal 3, 4)
 - U_o = 12.3 V
 - I_o = 25 mA
 - P_o = 75 mW
 - C_o = 1.2 μ F
 - L_o = 50 mH
 - REQ 1 (terminal 9, 10) and IN 2/REQ 2 (terminal 5, 6)
 - U_o = 12.3 V
 - I_o = 12 mA
 - P_o = 35 mW
 - C_o = 1.2 μ F
 - L_o = 100mH

Pulse inputs

- Input 1 and 2 2 Hz Reed contact, 3.3 V, 15 μ A
- Resolution counters input 1 and 2 XXXXXXXXX.XXX
- Input 1 range pulse input ratio XXXX.XX pulse/m³
- Input 2 range pulse input ratio XXXX.XX pulse/m³
- Extended functions input 2 Pulse difference to input 1 with programmable alarm

Serial ports

- Serial ports 2, suitable for UNIGAS 61 E and/or UNIGAS 300
- Signals DATA and REQ (Tx and Rx) 3.3 V, REQ active: 1.8 mA @ 1V2
DATA active: 1.5 mA sink
- Baud rate 9600 baud full duplex

Namur input

- Voltage and Ri 8.2V, 1k Ohm
- Support for encoder counters Manufacturer Itron, GWF, Elster, Dresser, FMG or Aertzener

Counter formats	Multiplier						
	10^{+3}	10^{+2}	10^{+1}	10^{+0}	10^{-1}	10^{-2}	10^{-3}
9	-	-	-	-	X	X	X
8	-	-	-	X	X	X	X
7	-	-	X	X	X	X	-
6	-	X	X	X	X	-	-

- Reading of encoder counter Every 5 minutes and at serial communication - data read out mode and reading counter values
- Reading of encoder “b” telegram Read out initiated after:
 - activation of logger functions
 - setting parameter C.93.25 to encoder
 - encoder test by switches SW2 and SW1
 - after resolving encoder read error (VDEW status bit 1)

Real time clock

- Internal POSIX clock
- Daylight saving time Yes / no (programmable)

Logger

- Logger capacity 1960 logs, 2 channels
- Recording interval 5, 10, 15, 30, 60 minutes or once a day programmable

Historical data

- Historical data Counter 1 and 2, Counter 1 and 2 peak flow
- Historical moment End of month
- Historical logger 13 end of month

Peak flow

- Flow calculation interval input 1 and input 2 5, 10, 15, 30 or 60 minutes selectable
- Peak flow detection input 1 and input 2 Maximum of flow

Internal serial port for local read out and programming of functions

- Connection Internal
- Signals RS232 Rx, Tx (REQ, DATA)
- Baud-rates 9600, full duplex

Communication protocol

- IEC 1107 mode C, VDEW 2.0 protocol for acquisition systems

Integrated GSM/GPRS-modem

- Type Sierra Wireless AirPrime™
- Model Q2686RD
- FCC N7NQ2686
- GSM-band Quad band E-GSM/GPRS 900/1800 and 850/1900 MHz
- GPRS Class 10
- GPRS services TCP and FTP
- GPRS authentication PAP, CHAP
- GSM-unit operating temperature - 25 °C to + 55 °C
- SIM card interface mini SIM and embedded SIM JEDEC SON-8
- Antenna Quad band 0 dB, integrated
External antenna optional

Scheduler for GSM or TCP communication

- Flexible programmable scheduler Start-time and date, On-time
Interval-time, Reschedule time, synchronic with month
- Resolution 5 minutes
- Activation service interval 30 minutes Internal push-button

TCP services

- Connect attempts 4

Scheduler for FTP client services

- initiation FTP transfer Internal scheduler or external
- scheduler internal FTP Off, every 5, 10, 15, 60 or 1440 minutes
programmable (1440 minutes, FTP is sent at the end of gas day 'C.91.2')

Service software PC platform

- UNITOOL version 1.0.0.1769 or newer Windows 7, 8, 10
- MODEM NETWORK MONITOR Windows 7, 8, 10

Annex 2: UNITOOL and UNILOG 300

UNITOOL is used to read or program the configuration and data of UNILOG 300. The user must log in to UNITOOL. UNILOG 300 is only available under *wsgas* user with password *wsgas*. After the user is logged in, Meter type group UNILOG GPRS/300 must be selected. UNITOOL shall use the standard device address UNILOG10. If a dedicated device address is programmed, this can also be used.

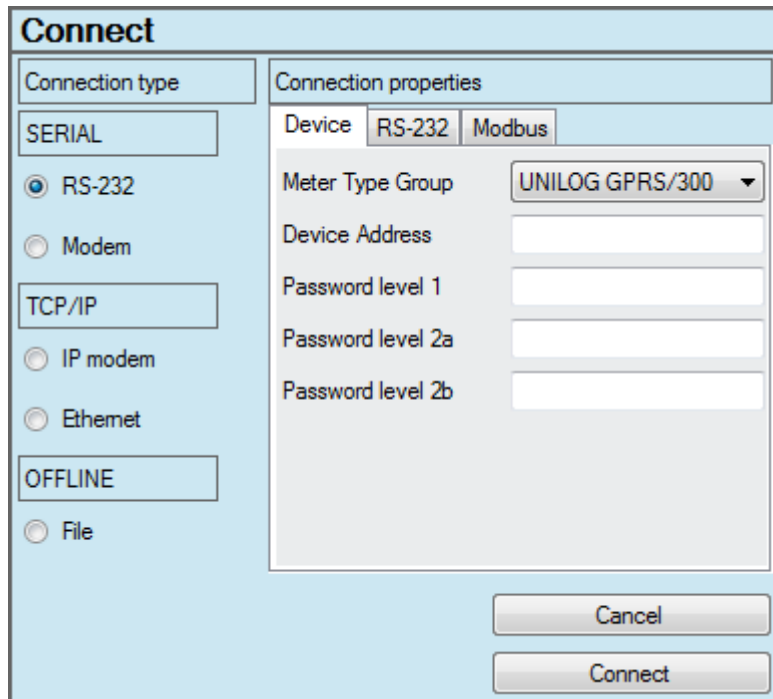





Figure 12. Selecting of Meter Type Group UNILOG in UNITOOL

Annex 3: Connector models and serial connection

UNIGAS series EVHI

Connector type				
Description		Cable color black provided with a fixed M12 Male connector	Cable color blue with an M12 Male connector	Cable color blue with an optic connector
UNIGAS EVHI model		UNIGAS 61D of UNIGAS 61E	UNIGAS 61D of UNIGAS 61E	UNIGAS 300
Serial connections	REQ 1	Brown	White	White
	GND	Black	Green / black	Green / black
	DATA	Blue	Brown	Brown



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