

Battery operated UNICOM 300



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& Sikkema**
Since 1921

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Preface

- This manual provides important information about the use of the UNIGAS 300. Please read this manual carefully.
- Various remarks and warnings in this manual are marked with symbols. Read these carefully and take measures where necessary.

The symbols used have the following meaning:



REMARK

Suggestions and recommendations to make tasks easier.



NOTE

A note draws user's attention to potential problems.



WARNING

If the procedure is not carried out correctly, a dangerous situation may develop, data or settings may be lost.



ESD

Electrostatic discharges (ESD) can cause damage to internal electrical components if you do not take precautions. ESD is caused by static electricity and the damage caused is usually permanent.



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Table of contents

Introduction.....	4
1. Explosion safety instructions (Ex).....	4
3 Functions and data structure.....	5
4 Installation	5
4.1 Mounting.....	5
4.2 Front UNICOM 300.....	6
4.3 Connections.....	7
4.4 Inside lid UNICOM 300.....	9
4.5 Front view inside UNICOM 300.....	10
5 SIM-card.....	11
6 Antenna.....	12
6.1 Standard antenna	12
6.2 External antenna	12
7 Into service	13
7.1 Activation and registry	13
7.2 Device init function	13
7.3 Adaptation of use: data logger <-> transparent modem.....	13
7.4 Out of service	13
8 Activation of the modem, TCP and NTP services.....	14
8.1 Activation of the modem.....	14
8.2 Activation of TCP services	14
8.3 Activation of NTP services	14
9 Function Check	15
9.1 System status check UNICOM 300.....	15
9.2 System status check UNICOM 300.....	15
10 Configuration.....	16
10.1 Gas meters with encoder	16
10.1.1 Initialization encoder.....	16
10.1.2 Manual encoder initialization	16
10.1.3 Readout of gas meter data	16
10.1.4 Readout of encoder counters	16
10.2 Gas meters with a pulse output.....	17
10.3 Transparent modem (Electronic volume converter type UNIGAS)	17
10.4 Deactivating the data logger.....	17
11 Battery packs.....	18
11.1 Battery lifespan.....	18
11.2 Battery replacement	18
12 Software	19
13 Counters and registers	20
13.1 UNICOM 300.....	20
13.2 UNICOM 300 datalogger.....	24
Appendix 1: Schematic display of the functionalities.....	31
Appendix 2: Schematic display of the data structure	32
Appendix 3: Technical specification.....	33
Appendix 4: Serial connections UNIGAS converters	37

Introduction

Battery-powered UNICOM 300 is a 2G/4G modem or data logger equipped with a GSM CSD/GPRS/LTE Cat. 1 modem or GPRS/LTE Cat. M1 modem. The modem used can be found on the type label (Cat 1 or Cat M1), see also chapter 4.2. Further specifications of both modems can be found in Appendix 3 of this manual.

The inputs are equipped with EX barriers so that UNICOM 300 may be used with equipment that is placed in a zone 0 with a potentially explosive atmosphere.

Two microprocessors provide several functions including pulse registration, readout of an encoder counter, processing and storage of data (data logging), communication of this data via 2G/4G, timer (scheduler) for switching the 2G/4G modem on and off and creating and sending logged data in an FTP message.

UNICOM 300 is equipped with inputs for both Encoder and two pulse contacts and a serial connection for communication with UNIGAS 300.

UNICOM 300 can communicate in the following ways:

- through GSM data (CSD, only Cat. 1 modem);
- through a TCP connection over GPRS/LTE Cat. (M)1;
- by sending FTP files. One FTP server can be set up where the FTP files are to be sent to;
- synchronizing clock (date / time) with an NTP server.

UNICOM 300 is battery powered. UNICOM 300 detects the presence of 1 or 2 battery packs and will adjust several relevant functions.

UNICOM 300 is equipped with 2 internal schedulers, which are only active with battery power. The schedulers support recall windows and call window shortening for GSM data and TCP connections. The window shortening can optionally be switched off. This may be necessary if several parties want to read the UNICOM 300 within a window.

1. Explosion safety instructions (Ex)

The safety instructions and declaration of conformity are included in a separate document that must be supplied with every UNICOM 300.

See the *DDN5800CVML* EU Declaration of Conformity and Safety instructions UNICOM 300 N511 for the Dutch / English document.

3 Functions and data structure

UNICOM 300 supports basic functions for the registry of counter values of a connected gas meter:

1. Two pulse inputs
2. Encoder (NAMUR)
3. Two pulse outputs
4. One serial input for UNIGAS 300

UNICOM 300 can count two pulses in the first two counters, readout an encoder in a third counter and log these into an interval logger.

UNICOM 300 can transmit the incoming pulses or encoder counter position to two pulse outputs.

UNICOM 300 can connect to UNIGAS 300 for serial communication.

Pulse input two can also be used as an alarm input. When an alarm is detected, a status message will be registered.

The pulse outputs can be configured as alarm outputs, see also "Settings for pulse outputs", p. 25, OBIS C.93.2 and C.93.3.

In Appendix 1 the functions are shown schematically and in Appendix 2 the data structure is schematically shown for the UNICOM 300.

4 Installation

The housing of UNICOM 300 has a protection class IP65 in accordance with EN60529. UNICOM 300 may be placed in the open air.



First read Explosion safety instructions (Ex) of document *DDN5800CVML* EU Declaration of Conformity and Safety instructions UNICOM 300 N511 before proceeding.

Depending on the function and the configuration of UNICOM 300, the inputs are already configured from factory and it is possible that the corresponding cable (s) is (are) mounted.

4.1 Mounting

See assembly instructions *DDN5002MHML* for installation/mounting possibilities and installation instructions.

The instruction can be downloaded from www.wigersma-sikkema.com

To install the mounting brackets for mounting on a gas meter or on the wall UNICOM 300 does not need to be opened.

4.2 Front UNICOM 300

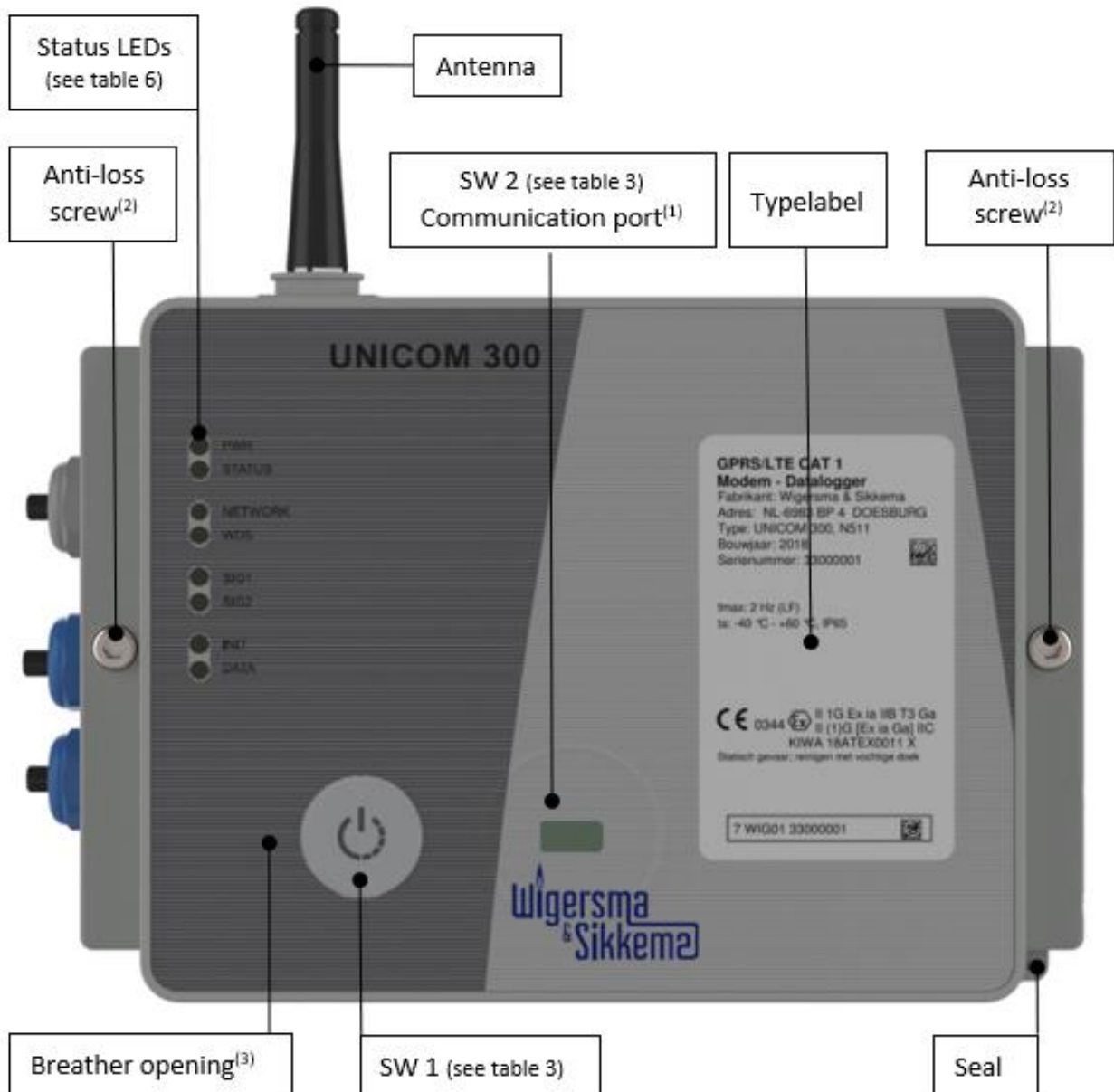


Figure 1: front view UNICOM 300

- (1) Communication port for reading and configuring UNICOM 300 on location.
This communication port is suitable for an infrared communication head in combination with the software program UNITOOL.
- (2) Opening the housing.
Turn the two-cylinder head screws until the screw comes loose (anti-loss screw). Then open the housing on the right side. It is possible that the sealing will stick, making the housing more difficult to open.



Closing of the housing must be done with caution when the UNICOM 300 is hanging upright. Make sure that the lid does not rest on the hinge when closing.

- (3) Breather opening for pressure equalization between UNICOM 300 and ambient atmosphere.
Behind the breather opening a membrane is placed that prevents ingress of moisture.



Take care not to damage the membrane. The membrane must not be covered. See also figure 1, point 3.

4.3 Connections

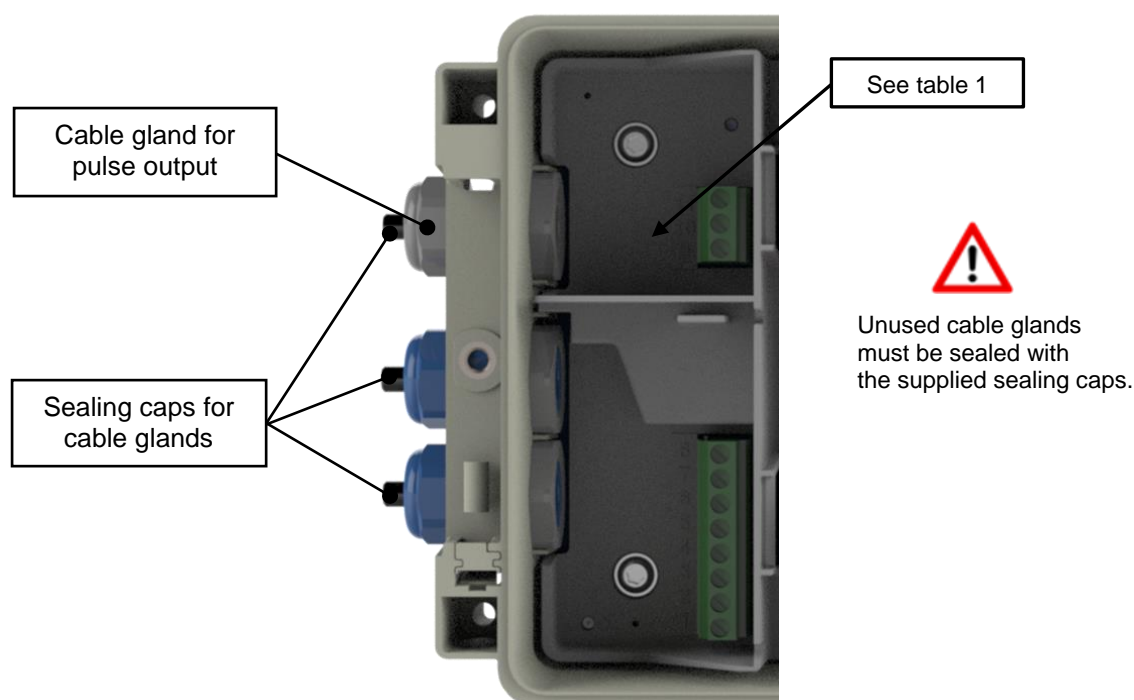


Figure 2a: connections output UNICOM 300

Output	Terminal number	Name	Meaning
Pulse	11	Pulse out 2	connection for pulse output 2
	10	GND	ground for pulse out cable
	9	Pulse out 1	connection for pulse output 1

Table 1: Connections outputs



When installing the UNICOM 300 in the Explosion safe environment, the pulse outputs are suitable for a switching voltage of 3 to 20 V with a switching current of 10 μ A to 50 mA. When installed in the explosion hazardous area, see Chapter 2.



To ensure a good connection between the wires and the terminals, it is important to ensure that the clamp block is fully open (about 10 revolutions) before the wire is placed and the clamp is closed.

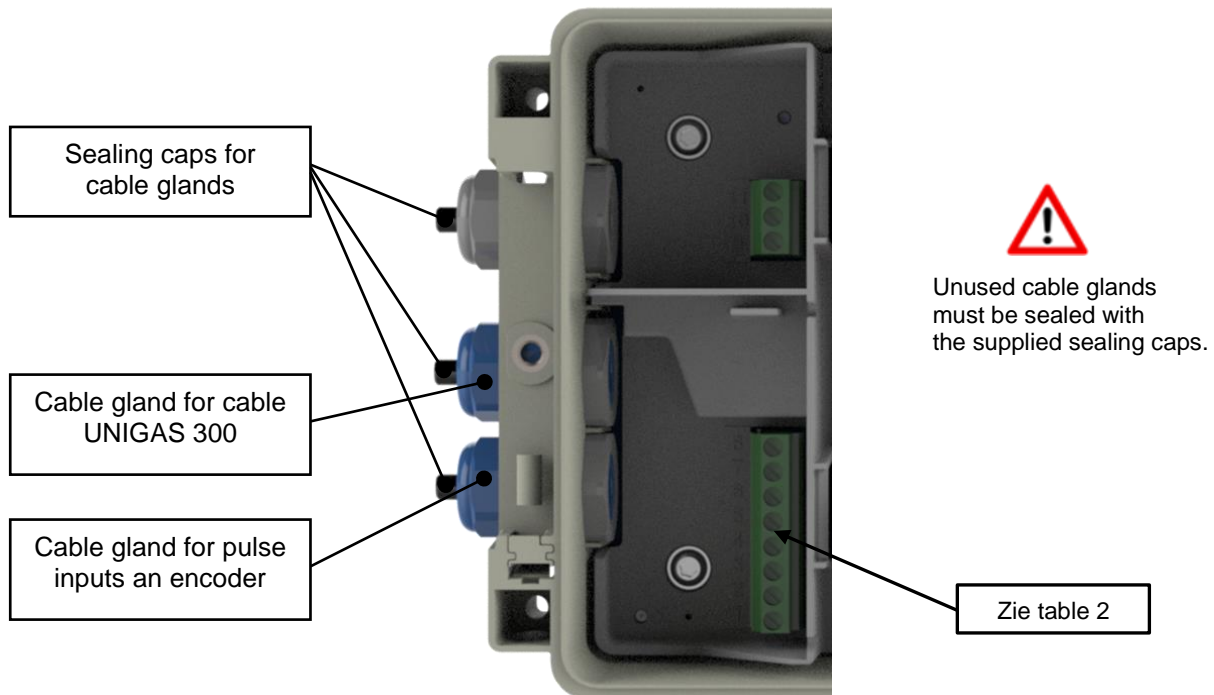


Figure 2b: connections input UNICOM 300

Input	Terminal number	Name	Meaning	Wigersma & Sikkema cable color coding
Serial	8	REQ	Serial data to UNIGAS EVCD	White
	7	GND/SHIELD	Ground/shield data cable	Black / Green
	6	DATA	Serial data from UNIGAS EVCD	Brown
Pulse	5	GND/SHIELD	Combined cable ground and shield for pulse cable	Black / Green
	4	PULSE 2	connection for pulse input 2	White
	3	PULSE 1	connection for pulse input 1	Brown
Encoder	2	NAMUR - / GND	Connection for Encoder	-
	1	NAMUR +	Connection for Encoder	-

Table 2: connections inputs



To ensure a good connection between the wires and the terminals, it is important to ensure that the clamp block is fully open (about 10 revolutions) before the wire is placed and the clamp is closed.



A different color coding for the serial wire connection may apply for UNIGAS (see Appendix 4).

4.4 Inside lid UNICOM 300

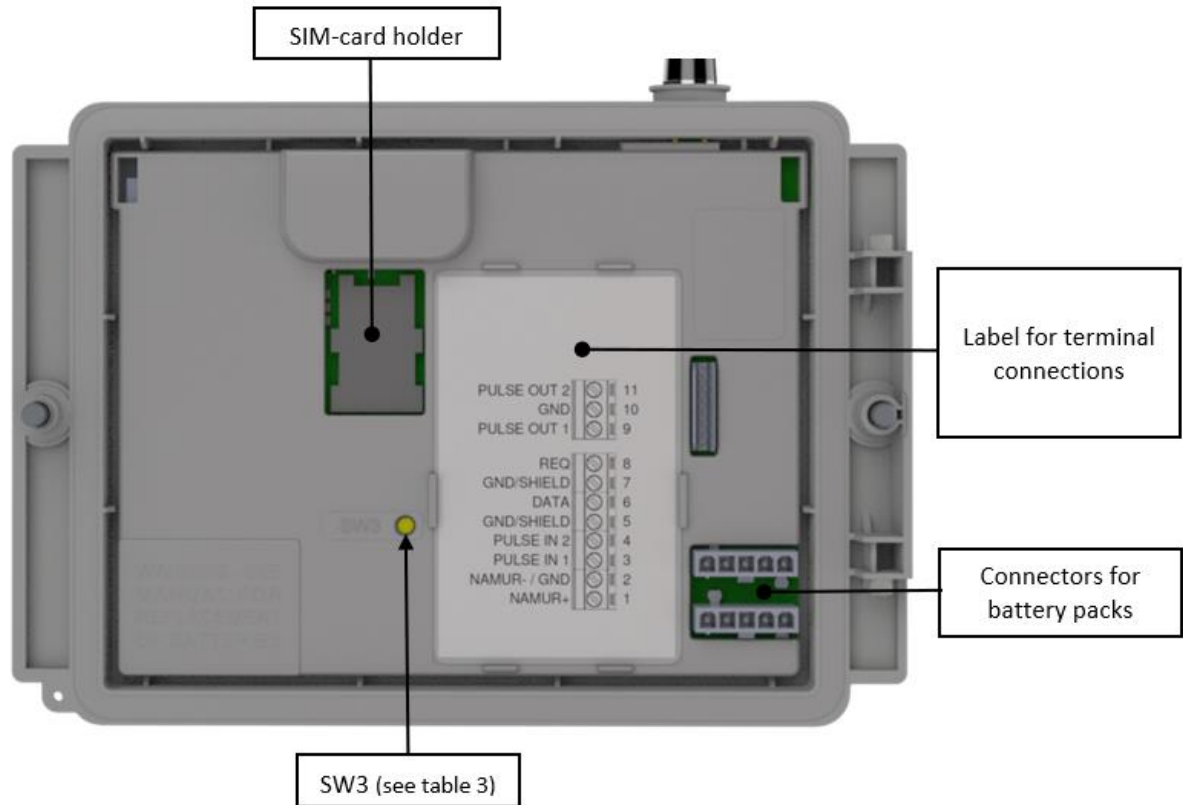


Figure 3: inside lid UNICOM 300

Switch	Switch operation	Function
optical head detection	-	Optical head placed; Status LEDs and optical head detection are activated.
SW1 (MODEM function)	until the NETWORK status LED comes on	Modem is turned on; 30 minutes service window is opened. If modem is on, it is switched off and on again. Status LED's are activated during the service window. To start the device INIT function, switch SW1 must remain pressed until the INIT LED blinks once every 4 seconds. After that, SW1 can be released, and the initialization will be carried out further. See also 5.2.
SW1 (MODEM function)	For 1 second	NOTE! Functionality available from firmware version 11.0.21. Optical head and status LEDs are activated for 30 minutes. Optical head detection will not function. This makes it possible to use an optical head other than those of Wigersma & Sikkema.
SW3 (MODEM function)	For at least 4 seconds	Restore the battery consumption counter and counters of the communication time and connected to network time Status LED INIT will go on for 10 seconds.
SW1 & SW3 (MODEM function)	For at least 4 seconds	Stock lock activation After activating stock lock, the status LED will start for 10 seconds. This is independent of state SW1 / SW2.

Table 3: function switches (Modem)

4.5 Front view inside UNICOM 300

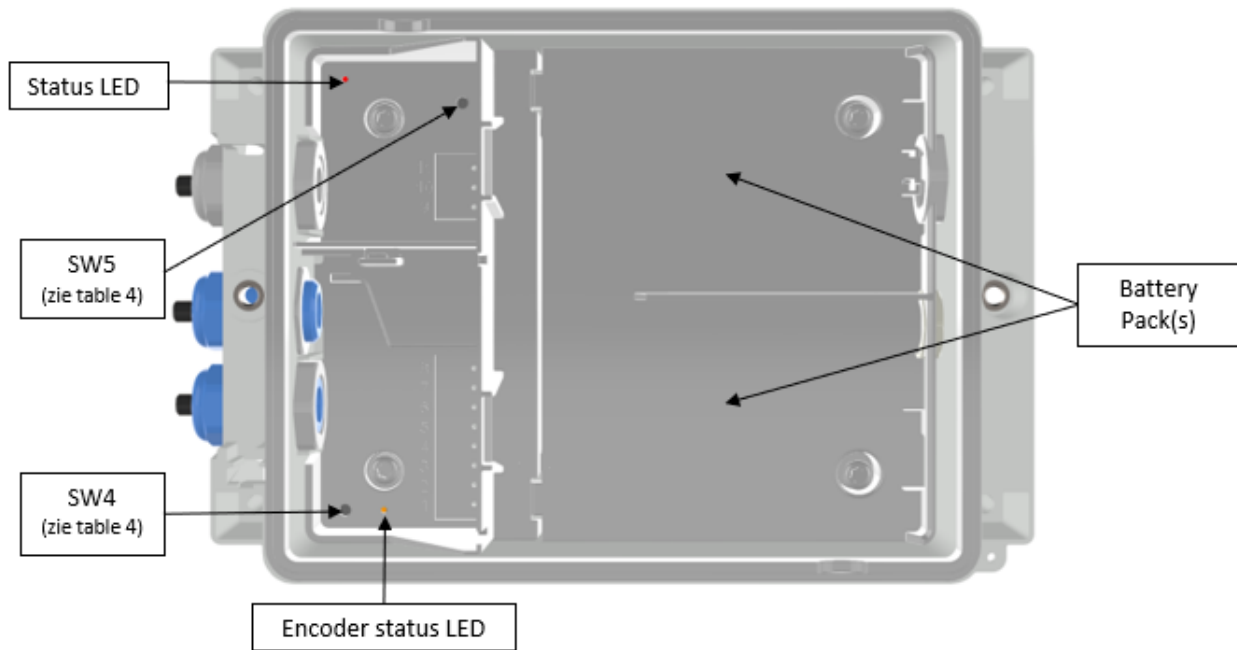


Figure 4: front view inside UNICOM 300

Switch	Switch operation	Function
SW4 (LOGGER function)	Manual Encoder initialization	Manual initialization of encoder readout The status of the initialization is shown through the Encoder status LED.
SW5 (LOGGER function)	Programming Switch	Security of defined parameters through local physical operation of the switch. (SW5 can be sealed on request. A seal can also be placed for access to the circuit board).

Table 4: function switches (Logger)

5 SIM-card

UNICOM 300 can be pre-equipped with a SIM-card.

Suitable GSM-subscriptions are for example M2M subscriptions for GSM CSD and/or GPRS / LTE cat. (M)1 data.

When using GPRS / LTE Cat. (M)1, UNICOM 300 requires several settings with which UNICOM 300 can log on to an APN; such as APN name with the corresponding username and password.

Placement or exchanging SIM-card

Open UNICOM 300 (see figure 1, note 2). The mini-SIM holder is located in the lid of the UNICOM 300 (see figure 3).

Press the metal-colored fastening of the mini-SIM holder with little force and turn counterclockwise, unlocking the mini-SIM holder and opening it. The mini-SIM can be placed with the gold contacts facing backwards and the beveled corner upwards (figure 5, item 1). Close the mini-SIM holder by performing the above-mentioned operations in reverse order.

Insert the SIM card as shown in figure 5, pos. 2.

After placing the mini-SIM, test the correct operation as described in chapter 5.



If the SIM card is changed, SW1 **must always** be pressed until the NETWORK status LED lights up to perform a re-registration, see also Table 3.

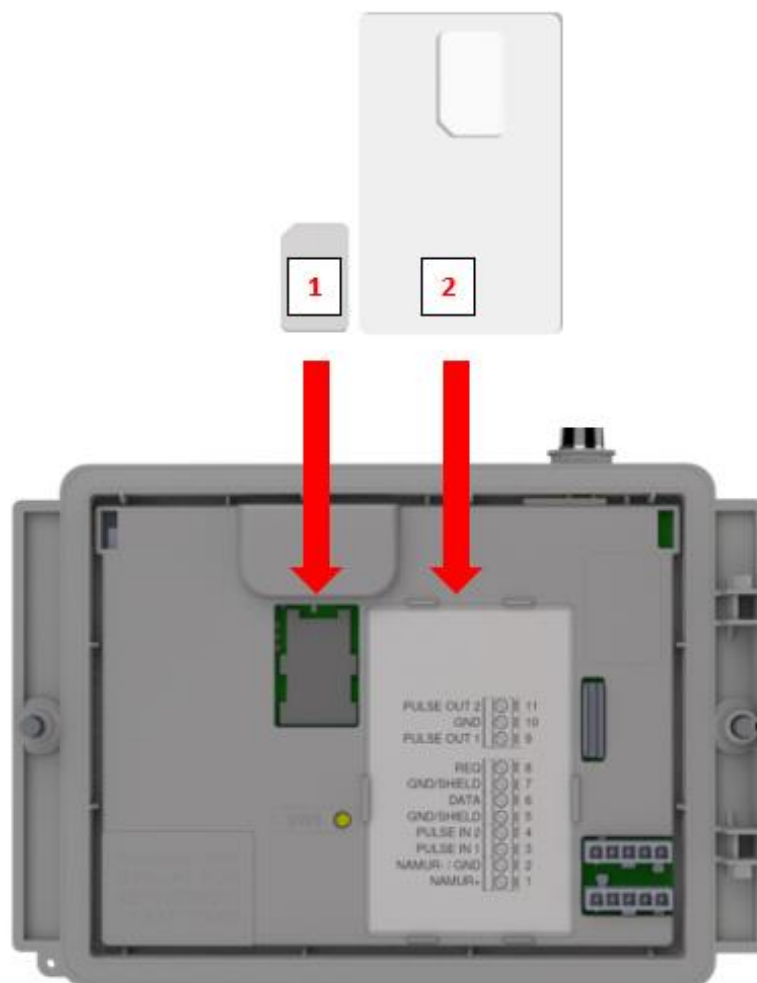


Figure 5: placement mini-SIM and SIM card

6 Antenna

6.1 Standard antenna

UNICOM 300 is supplied with a standard antenna. Below is a summary of the description/calculation of signal strength.

Value consists of 4 characters (xxyy)

XX: Received signal strength indication. To comply with the specification of 3GPP TS27.007, levels are assigned to the range 0...31

00	: -113 dBm or lower
01-30	: -111 dBm ... -53 dBm; 2 dBm per step (i.e. - 113dBm + number x 2)
31	: -51 dBm or higher
99	: unknown or undetectable

YY: For 2G

Measurements of the bit error rate of the channel, expressed in %, are mapped as shown below

Values

00	: below 0.2%
01	: 0.2% to 0.4%
02	: 0.4% to 0.8%
03	: 0.8% to 1.6%
04	: 1.6% to 3.2%
05	: 3.2% to 6.4%
06	: 6.4% to 12.8%
07	: over 12.8%
99	: unknown or undetectable

YY: For 4G

Quality received reference signal.

The levels are displayed in the range 0...7.

Values

00	: -4...-3 dB
01	: -6...-5 dB
02	: -8...-7 dB
03	: -10...-9 dB
04	: -13...-11 dB
05	: -15...-14 dB
06	: -17...-16 dB
07	: -19...-18 dB
99	: unknown or undetectable

6.2 External antenna

For various applications, Wigersma & Sikkema has external antennas available; a round-beam antenna, a directional antenna and a vandal-proof antenna. The external antennas are supplied including mounting material and instructions for connection to UNICOM 300.

The standard antenna can be unscrewed from the UNICOM 300. Another antenna can then be connected to the vacant connection. See also *DDN003MHNL*.



If the external antenna is placed in the Ex-zone, the antenna should not have gain greater than 2dB.

7 Into service

7.1 Activation and registry

When using the UNICOM 300 as data logger, it is necessary to carry out the following action with the central acquisition system:

Activate the modem by operating SW1 the NETWORK status LED lights up (see figure 1). The UNICOM 300 now logs on. The registration may take a few minutes. If UNICOM 300 has successfully logged on to the network, the NETWORK status LED (table 6) will flash. When TCP is active, the WDS status LED will be active. The UNICOM 300 is now registered.

Let the central acquisition system connect to UNICOM 300 and synchronize the clock. This ensures that the internal clock is synchronized with the central acquisition system. Wigersma & Sikkema delivers UNICOM 300 standard with deactivated data logger and modem functions. Clock synchronization will activate the datalogger functions (the scheduler, interval logger, the historical logger and, if activated, the FTP). If UNICOM 300 is configured for encoder readout, an encoder initialization will also take place with the data from the gas meter being read out.

7.2 Device init function

The device init function is used for synchronizing the clock with an NTP-server, sending a first FTP-message and deactivating the stock lock function after installation of the UNICOM 300.

To activate the device init function, press switch SW1 until status LED INIT flashes once every 4 seconds (figure 6, 3). Then release SW1.

The device init function can only be activated if NTP, FTP and the APN are programmed. If they are not programmed, the function cannot be activated, and the status LED INIT will flash 1x per second (figure 6, 1) when pressing switch SW1.

The initialization then starts, and the current date, time and modem information are requested. The stock lock of UNICOM 300 is also deactivated. The meter (UNIGAS 300 or UNICOM 300) will then handle the further device init. If the UNICOM 300 is set as Encoder, the encoder initialization will also be carried out. When the encoder initialization is complete, the status LED INIT will flash once every 2 seconds (Figure 6, 2).

Next, an FTP message will be sent, and after sending the first FTP-message, the status LED INIT will be on continuously for 10 seconds (Figure 6, 7) to indicate that the device init has been completed correctly.

If device init is not to be executed, the user must release SW1 within 4 seconds.

7.3 Adaptation of use: data logger <-> transparent modem

Adaptation of use as a data logger to use as a transparent modem:

- Check with UNITOOL whether value C.93.15 is "off" or set the value C.93.15 to "off".
- Activate the stock lock function, see table 3.

Adaptation of use as a transparent modem to data logger:

- Check with UNITOOL whether value C.93.15 is set to "on" or set the value C.93.15 to "on".
- This is done automatically with a clock synchronization by the central acquisition system or when a device init is executed (see chapter 5.2).

7.4 Out of service

If the UNICOM 300 data logger is taken out of service, the data logger functions must be deactivated to prevent unnecessary battery consumption and the logging of non-relevant data. Activate the stock lock function, see table 3.

When FTP/NTP are enabled the device INIT can be started to obtain a service message (see chapter 5.2).

8 Activation of the modem, TCP and NTP services

8.1 Activation of the modem

The modem can be turned on by pressing switch SW1 until the NETWORK status LED starts flashing, SW1 can then be released. The UNICOM 300 modem will remain on for 25 to 30 minutes.

If switch SW1 is operated again, the modem will log in again, turning the modem off and on again. This is apparent as the NETWORK status LED (see Chapter 5) is off for a short time.

8.2 Activation of TCP services

If the TCP server function is activated in UNICOM 300, the device will log on to GPRS/LTE cat. (M)1 when the modem is switched on.

Before the TCP server is activated an IP-address will be assigned to UNICOM 300. If logging on to GPRS/LTE cat. (M)1, or activating the TCP server fails, this will be repeated up to four times. If after four attempts the registration is not successful, UNICOM 300 will be registered on the GSM network, (NETWORK status LED will flash) but not on the GPRS/LTE cat. (M)1 network. Press SW1 until the NETWORK status LED lights up to initiate a re-registration.

8.3 Activation of NTP services

UNICOM 300 is equipped with a function to read out the NTP-time server. When connected to this time server, the date and time are read out. If NTP is activated and UNICOM 300 has been synchronized with the NTP server in the last 24 hours, then UNICOM MODEM's clock is no longer synchronized by monitoring data traffic.

To activate NTP functionality, the NTP time server must be set via C92.65 and C.92.66. In addition, the APN data must also be set.

The requested NTP time is the GMT time. Through time zone setting (C.92.64) and with DST (summer/wintertime) the time is adjusted in UNICOM 300.

Specific behavior with battery power and clock reading when NTP function is activated:

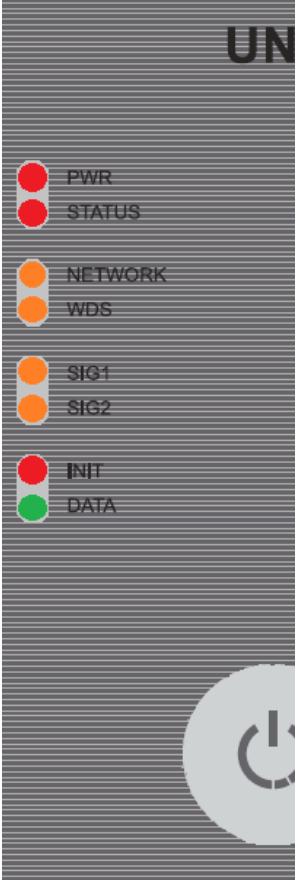
- The NTP clock is read once per 24 hours, after switching on the modem.

If reading out the NTP time server fails, after 12 hours another attempt will be made to read out the NTP time server. For battery power, this will only happen if the modem is switched on by a call window or FTP. Backup battery / back up battery?

9 Function Check

9.1 System status check UNICOM 300

There are eight status LEDs on UNICOM 300 that show different states. The status LEDs are active if an optical head is placed on the communication port (SW2, figure 1), or if SW1 (service window) is operated. This way, the status LEDs are only active in the event that a technician is on site.



Status LED	Condition LED (see figure 6)
PWR; Supply	Continuously on; BATTERY GOOD Blinking 1 x per 4 seconds; BATTERY LOW Blinking 1 x per second; BATTERY FLAT
STATUS; UNICOM status	10 seconds on; Stock lock activated Blinking 1 x per 2 seconds; Stock lock not activated Blinking 1 x per 4 seconds; Stock lock activated Blinking 1 x per second; Critical error
Network; Network status	Continuously on; network registry started Blinking 1 x per 4 seconds; registered on network Blinking 1 x per 2 seconds; Connection (CSD; FTP; TCP) Off; Modem off
WDS; 2G/4G status	Continuously on; Registered on 2G / TCP services Blinking 1 x per 4 seconds; Registered on 4G Blinking 1x per 2 seconds; Registered on 4G / TCP services Off: registered on 2G CSD (only Cat. 1 modem)
SIG1; GSM signal status	Continuously on; Main cell < -92 dBm; Blinking 1 x per 4 seconds; Main cell ≥ -92 dBm en < -80 dBm Blinking 1 x per 2 seconds; Main cell ≥ -80 dBm;
SIG2;	Not functional
INIT;	10 seconds continuously on; device INIT successfully completed or battery counters reset Blinking 1 x per 4 seconds; device INIT started Blinking 1 x per 2 seconds; Encoder readout completed Blinking 1x per second; device INIT in ERROR Off: device INIT not activated
DATA;	Blinking at transfer of data by modem

Table 6: status LEDs UNICOM 300 MODEM

9.2 System status check UNICOM 300

On the datalogger part of UNICOM 300 two status LEDs (see figure 4) are available which show different conditions.

Status LED	Condition LED
Status	Blinking 5 ms every 10 seconds; Stock lock activated Blinking 5 ms every 5 second; Stock lock not activated
Encoder	10 seconds on; Encoder initialization completed successfully Blinking 1x per 2 seconds; Encoder initialization active Blinking 1x per second; repeated every 10 seconds. Encoder initialization in error.

Table 7: status LEDs UNICOM 300 datalogger

10 Configuration

10.1 Gas meters with encoder

Application: data logger

UNICOM 300 is suitable for the use of gas meters with an encoder output from the Itron, GWF, Honeywell (Elster), Dresser, FMG, RMG, GFO or RMA (Aerzen) products, which are equipped with a NAMUR interface. To use this function, parameter C.93.40 must be set on by means of UNITool service software. Registration of the encoder counting mode takes place in counter 3.

10.1.1 Initialization encoder

Because UNICOM 300 is provided with a check on the encoder counter value, not every counter value will be accepted (Reading the encoder counter positions, chapter 8.1.4). To ensure that UNICOM 300 takes over the encoder counter value once, when UNICOM 300 is installed or when changing the gas meter, UNICOM 300 has four ways to initialize the encoder counter:

1. If the data logger functions are activated. The interval logger and the historic logger are deleted. Activation can be performed using:
 - UNITool and setting parameter C.93.30; deactivating stock lock
 - or
 - Takes place when the clock of UNICOM 300 is synchronized by for example a central data acquisition system or manual time synchronization.
2. When parameter C.93.40 is set to value encoder by means of service software UNITool
3. Manual initialization by SW4 (see chapter 8.1.2)
4. Device init as described in chapter 5.2.

10.1.2 Manual encoder initialization

It is possible for a user to manually start an encoder initialization on location.
The procedure is as follows:

- Press SW4 until the Encoder status LED blinks 1x per 2 seconds or is continuously on.
- The Encoder status LED will show the status of the initialization (see table 7 and figure 6).

10.1.3 Readout of gas meter data

UNICOM 300 will, if supported by the encoder counter, read the gas meter data. Data from the gas meter are serial number, manufacturer and year of manufacturing.

The data from the gas meter is read out:

- When encoder initialization takes place, see chapter 8.1.1.
- If the encoder counter is read out successfully after a failure notification of encoder readout has been set in the status registry.

10.1.4 Readout of encoder counters

If an encoder counter is connected without initializing it and the position of the encoder counter is lower or much higher than the value in counter 3 (Vm3) of UNICOM 300, UNICOM 300 will not take over the encoder counter mode. In the status register a message is made of an incorrect readout of the encoder counter.

If the encoder counter is reduced, the counter mode will not be adopted by UNICOM 300. A status message is made of this in the status register. If the return is temporary, UNICOM 300 will take over the counting position again as soon as it is larger than the last meter reading.

10.2 Gas meters with a pulse output

Application: data logger

Input 1 is always set to pulse, input 2 may be set to pulse or alarm.



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

For UNICOM 300 pulse outputs, a choice can then be made for Vm1-Vm2-Vm3 or Alarm1 via the parameters mentioned in chapter 12.

10.3 Transparent modem (Electronic volume converter type UNIGAS)

Application: modem for EVC types UNIGAS

Connect the serial cable of the UNIGAS to the serial terminals and make sure settings are as described in chapter 5.3 and activate the modem.

10.4 Deactivating the data logger

If necessary, the data logger functions of UNICOM 300 can be deactivated.

Deactivation can be performed using UNITool and setting parameter C.93.30 or by activating stock lock with SW1 and SW3 (see table 3).

11 Battery packs

UNICOM 300 is powered by one or two lithium battery packs (see Figure 4). UNICOM 300 is equipped with two power supply connectors: CON1 and CON2 (see figure 3). A battery pack can be connected to each connector. UNICOM 300 automatically detects the presence of 1 or 2 battery packs to calculate the nominal battery capacity.

11.1 Battery lifespan

The year of production is mentioned on the battery pack. The service life is specified in the table below (table 8). Contact Wigersma & Sikkema for other user profiles than indicated in the table.

User profile	1 battery pack	2 battery packs
1 hour online on the network, 1-minute communication a day	> 4 years	> 8 years
½ hour online on the network, 1-minute communication a day	> 6 years	> 10 years
Daily FTP (1x24h), logger 60 min., 30 min. Service window a week	> 10 years	15 years

Table 8. Lifespan battery pack(s)

11.2 Battery replacement

First read the ATEX safety instructions (chapter 2).

Battery packs (article number NN2710 or NN2711) must be replaced within the recommended time period, see table 8. When using 2 battery packs, both battery packs have to be of the same article. A combination of e.g. NN2710 and NN2711 is not allowed.



DO NOT REPLACE BATTERY WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT



	Proceedings to replace a single battery pack:	Proceedings to replace two battery packs:
1	Open the UNICOM 300 (see figure 1)	Open the UNICOM 300 (see figure 1)
2	Leave the battery pack to be replaced connected to the UNICOM 300.	Disconnect the connector from one of the two battery packs (CON1 or CON2) and remove the battery pack from UNICOM 300.
3	Insert a new battery pack with the label visible upwards.	Insert a new battery pack with the label visible upwards.
4	Connect the connector of the battery pack with a free battery connection (CON1 or CON2).	Connect the connector of the battery pack with a free battery connection (CON1 or CON2).
5	Disconnect the old battery pack connector and remove it from the housing.	Then replace the second battery pack in the same way (steps 1 to 3).
6	After replacing the battery pack, the battery consumption counter must be reset. To do this, press switch SW3 for at least 4 seconds. This operation may be performed regardless of the state in which UNICOM 300 is located.	After replacing the battery packs, the battery consumption counter must be reset. To do this, press switch SW3 for at least 4 seconds. This operation may be performed regardless of the state in which UNICOM 300 is located.
7	Close UNICOM 300.  When closing the cover, ensure that no cables are trapped between the UNICOM 300 housing and lid.	Close UNICOM 300.  When closing the cover, ensure that no cables are trapped between the UNICOM 300 housing and lid.
8	If necessary, seal the housing as indicated in chapter 3.	If necessary, seal the housing as indicated in chapter 3.

Table 9: proceedings for battery pack replacement



The battery packs may be replaced regardless of the state in which UNICOM 300 is located, provided that the battery packs are replaced one by one so that one package always remains connected to UNICOM 300.



When placing the battery pack (s), it is important that the notches (see figure 6, pos. 1) are placed in the right way and that the tab (see figure 6, item 2) is secured with a click in the housing

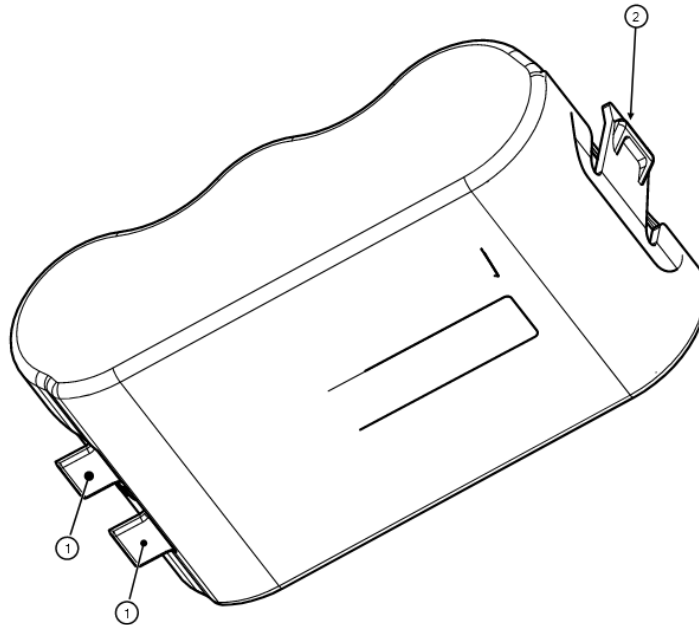


Figure 6: placement of battery packs

12 Software

The following software package is available:

- Configuration and readout of a single UNICOM 300:

UNITOOL software: <https://www.wigersma-sikkema.com/en/downloads-2/software/>

13 Counters and registers

Below are the counters and registers (parameters) that are present in UNICOM 300 MODEM function or UNICOM 300 LOGGER function.

The name is displayed per counter or register, supplemented by the OBIS code, the security level and a short description.

All counters and registers are readable with the software UNITOOL.

Counting and register can be provided with a write protection. The following security levels are present in UNICOM 300:

- Protection by programming switch: writing is only possible if the programming switch SW5 is operated during writing. This form of security can be disabled, see register C.93.24
- Security level 1: password 1 is used to access the mode in which counters and registers can be read and written.
- Security level 2a: with register 2a, writing of registers is possible. Password 2a corresponds to the VDEW password.

If passwords are not programmed, registers can be read and written without the use of passwords or with the use of a random password.

13.1 UNICOM 300

Device data

Name	Unit	OBIS	Security level	Description
Device type	-	C.1.1		Device type and version UNICOM 300.
Serial number	-	C.1.0		Serial number of the UNICOM 300.
Firmware version	-	7-0:0.2.0		Firmware version
Firmware CRC	-	C.91.3		16-bit CRC-value of the memory
SW modem engine	-	C.90.23		Software version of the modem module
IMEI number	-	C.90.24		IMEI number
SIM-card number	-	C.90.25		The number of the inserted SIM card
Modem type	-	C.90.32		Modem engine type
Track and Trace data	-	C.91.5		Track and Trace data UNICOM 300 PCA
GSM Main cell	-	C.90.7		Strength of the GSM main cell

Other settings

Name	Unit	OBIS	Security level	Description
Device address	-	C.90.1	Password 2a	UNICOM 300 device address
EAN-code	-	C.96.0	Password 2a	Customer specific code for meter location
Stock lock	-	C.93.30	Password 2a	Activate or deactivate Lock in stock. Is set to Unlocked after a time-date synchronization.

Consumption data

Name	Unit	OBIS	Security level	Description
Battery voltage MODEM	mV	C.90.6		Battery voltage
Battery hour counter MODEM	h	C.6.0		Number of hours in operation on battery
Operation	h	C.90.13		Number of hours in operation
nominal battery capacity	Ah	C.90.31		The nominal battery capacity. This is determined - 1x a day at 00:33 - With a power-on
Supply type	-	C.91.15		Supply type; Options are: <ul style="list-style-type: none"> • BAT • BAT – BAT • EXT • EXT – BAT • EXT – ACCU
Ah-used	Ah	C.90.21		Consumed energy from the UNICOM 300 battery in Ah.
Networkh	h	C.90.4		GSM / GPRS connected to network time registration
Commh	h	C.90.5		GSM / GPRS communication time registration

GPRS / LTE cat. (M)1 settings

Name	Unit	OBIS	Security level	Description
TCP APN Name	-	C.92.40	Password 2a	APN name on which UNICOM 300 must log in for TCP
TCP APN user	-	C.92.41	Password 2a	User name with which you must log on to the APN for TCP
TCP APN password	-	C.92.42	Password 2a	Password that must be registered on the APN for TCP
TCP server port number	-	C.92.48	Password 2a	TCP server port number Do not program port 0. This will result in modem errors
TCP Firewall IP address	-	C.92.67		Firewall IP address
TCP Firewall IP address mask	-	C.92.68		Firewall IP address Mask
TCP server	-	C.92.51	Password 2a	TCP server activated
FTP server 1 user	-	C.92.43	Password 2a	FTP user name
FTP server 1 password	-	C.92.44	Password 2a	FTP password
FTP server 1 IP of DSN	-	C.92.46	Password 2a	FTP server IP address or DNS naam
FTP server port number	-	C.92.47	Password 2a	FTP server port number Do not program port 0. This will result in modem errors
FTP workingdir	-	C.92.89		The working directory for the FTP file. The FTP file is stored in this directory.
FTP APN name		C.92.90		APN name on which UNICOM 300 must log in for FTP Optional: can be used for another APN for FTP. If these have not been entered, the TCP APN data will be used for FTP.
FTP APN user		C.92.91		Username with which you must log on to the APN for FTP Optional: can be used for another APN for FTP. If these have not been entered, the TCP APN data will be used for FTP.
FTP APN password		C.92.92		Password which must be registered on the APN for FTP Optional: can be used for another APN for FTP. If these have not been entered, the TCP APN data will be used for FTP.
FTP mode	-	C.92.50	Password 2a	FTP mode passive or active
NTP server IP or DNS	-	C.92.65		NTP IP address or DNS name
NTP server port number	-	C.92.66		NTP port number

GPRS / LTE cat. (M)1 settings (continued)

Name	Unit	OBIS	Security level	Description
Modem CHV1 ME password	-	C.92.61	Password 2a	Pin code for modem. If an incorrect PIN is used for a SIM card with PIN protection, an ERRORPIN message will be issued if this object is read out.
Assigned IP address	-	C.92.45		Assigned IP address. If unsuccessfully logged on to the APN, no value is displayed (i.e. not the IP address of a previous successful login)
Selection of wireless network	-	C.93.37	Password 2a	Selection of network <ul style="list-style-type: none"> • 2G • 4G • 4G – 2G fallback

Clock and call window

Name	Unit	OBIS	Security level	Description
Time	(z)hhmmss	0.9.1	Password 2a	Actual time
Date	(z)ddmmjj	0.9.2	Password 2a	Actual date
ns	s	C91.1	Password 2a	value where the status bit clock_set> ns is set
Time zone setting GMT offset	-	C.92.64	Password 2a	GMT time zone setting. To correct the clock at NTP.
SSW_modem_on	-	C.93.21	Password 2a	If the value is "on", after the object has been programmed, the modem will remain on regardless of which function the modem wants to turn on or off. If the value is set to "off", the UNICOM MODEM will start the service window. The modem is switched off after 30 minutes.
Presentation scheduler DST	-	C.93.8	Password 2a	Switch for use scheduler clock in DST
Start date and time billing scheduler	-	C.90.12	Password 2a	Start date and time of the billing scheduler
Billing scheduler	-	C.90.11	Password 2a	Settings for billing scheduler
Start date and time service scheduler	-	C.90.33	Password 2a	Start date and time of the service scheduler
Service scheduler	-	C.90.34	Password 2a	Settings for service scheduler
Call window shortening Billing scheduler	-	C.93.16	Password 2a	Billing scheduler: <ul style="list-style-type: none"> •Call window shortening on / off •MonthSync window on / off
Call window shortening Service scheduler	-	C.93.36	Password 2a	Service scheduler: <ul style="list-style-type: none"> •Call window shortening on / off •MonthSync window on / off
MonthSync_amount Billing scheduler	-	C.90.35	Password 2a	The times (in days) that the billing scheduler must be executed at the time of synchronization.
MonthSync_amount Service scheduler	-	C.90.36	Password 2a	Service scheduler: see C.90.35

13.2 UNICOM 300 datalogger

Device data

Name	Unit	OBIS	Security level	Description
Device type	-	C.1.1		Device type and version UNICOM 300.
Serial number	-	C.1.0		Serial number of the UNICOM 300.
Firmware version MODEM PCB	-	7-0:0.2.0		Firmware version UNICOM MODEM PCB
Firmware version LOGGER PCB		7-0:0.2.1		Firmware version UNICOM LOGGER PCB
Firmware CRC MODEM	-	C.91.3		16-bit CRC-value UNICOM Modem firmware
Firmware CRC LOGGER	-	C.91.4		16-bit CRC-value UNICOM LOGGER firmware
Track and Trace data	-	C.91.5		Track and trace data UNICOM PCA logger.

Other settings

Name	Unit	OBIS	Security level	Description
Device address		C.90.1	Password 2a	Device address for IEC 62056-21 communication protocol.
EAN-code		C.96.0	Password 2a	Customer specific code for the meter location
End of gas day	h	C.91.2	Password 2a	Moment when UNICOM 300 ends the day and logs in the monthly logger. If the log interval is at 24h, logging takes place in the interval logger and is also used for FTP
Gas meter Serial number	-	7-1:0.2.14	Password 2a	Serial number of the connected gas meter. When an encoder telework is used, the serial number is automatically taken over. In this case, the setting cannot be changed by the user.
FLAG coding gas meter manufacturer	-	C.91.10	Password 2a	FLAG coding from the manufacturer of the gas meter (3 letters). When using an encoder telework, the FLAG code is automatically adopted. In this case, the setting cannot be changed by the user.
Gas meter year of construction	-	C.91.11	Password 2a	Construction year of the gas meter. When an encoder telework is used, the year of construction is automatically adopted. In this case, the setting cannot be changed by the user.
Broadcast mode	-	C.93.15	Password 2a	Response to a 1107 request. In "Off" UNICOM 300 does not respond if there is no device address in the request (transparent modem) With "On", there will be a response if there is no device address in the request (logger)
Setting interval time interval logger		0.8.5	Password 2a	Interval time for the interval logger P.01
Stock lock	-	C.93.30	Password 2a	Activate or deactivate stock-lock or datalogger functions. Is set to Unlocked after a time-date synchronization.
Security SW 5	-	C.93.24	SW5	Switch for activating protection by SW5. If value is On, then the parameters with protection SW5 are protected by means of switch SW5. If value is Off, then the parameters are either by SW5, or by PWD2

Counter values

Name	Unit	OBIS	Security level	Description
Counter value input 1	m ³	1:23.0.0	SW2	Counter value input 1
Counter value input 2	m ³	2:23.0.0	SW2	Counter value input 2
Counter value input 3	m ³	3:23.0.0	SW2	Counter value input 3 Encoder

Settings for inputs

Name	Unit	OBIS	Security level	Description
INP1DIV	pulse/m ³	1:0.7.2	SW2	Pulse ratio input 1
INP2DIV	pulse/m ³	2:0.7.2	SW2	Pulse ratio input 2
sswEnc	-	C.93.40	Password 2a	Encoder input activation
sswPin2	-	C.93.41	Password 2a	Setting of input 2

Settings for warnings and alarms

Name	Unit	OBIS	Security level	Description
Alarm INP2 – INP1	m ³	C.92.9	Password 2a	Alarm for volume difference between set channels by sswInpDiff '. If = 0, the volume difference function is disabled.
sswInpDiff	-	C.93.39	Password 2a	Channels for determining volume difference

Settings for outputs

Name	Unit	OBIS	Security level	Description
OUT1_div	pulse/m ³	C.94.1	SW2	Pulse ratio output 1
OUT2_div	pulse/m ³	C.94.2	SW2	Pulse ratio output 2
SSW_pulsout1	-	C.93.2	Password 2a	Switch for pulse output 1 At the moment of the creation of an Alarm1 an impulse of 0.1s is issued with a frequency of 2Hz. If the status bit is then active, a pulse of 0.1 is issued every 5 minutes.
SSW_pulsout2	-	C.93.3	Password 2a	Switch for pulse output 2 (see also C.93.2)
SSW_Alarm mask 1	-	C.93.42	Password 2a	Bitmask for transmission error at status registers 7.1, 7.2 and 7.3 at alarm output 1.
SSW_Alarm mask 2	-	C.93.43	Password 2a	Bitmask for transmission error at status registers 7.1, 7.2 and 7.3 at alarm output 2.

Consumption Data

Name	Unit	OBIS	Security level	Description
UBatt LOGGER	mV	C.90.6		Voltage of the UNICOM 300
Battery hour counter LOGGER	h	C.6.0		Number of hours in operation on battery

Flow

Name	Unit	OBIS	Security level	Description
Q1_nx5	m ³ /h	1:43.0.0		Flow input 1, quantity under operating conditions based on moving average of n x 5 minutes.
Q2_nx5	m ³ /h	2:43.0.0		Flow input 2, quantity under operating conditions based on moving average of n x 5 minutes.
Q3_nx5	m ³ /h	3:43.0.0		Flow input 3, quantity under operating conditions based on moving average of n x 5 minutes.
Flow determination n	-	C.93.1	Password 2a	Time basis for determination of flow Q based on the moving average of n units of 5 minutes

FTP settings

Name	Unit	OBIS	Security level	Description
FTP filename	-	C.91.8	Password 2a	Text for display in the file name. If this object is set to 00000000, the serial number of UNICOM 300 is issued in the file name. This object is also displayed in data read out.
FTP interval	-	C.92.49	Password 2a	Interval for sending FTP messages. FTP config: off, 5, 10, 15, 30, 60 and 1440 minutes At 1440 minutes (24 hours) the sending of FTP takes place on gas day (parameter C.91.2)
FTP Billing Data	-	C.92.56	Password 2a	Interval for sending the billing data in the FTP file. Daily, weekly or monthly intervals
FTP offset randomizer		C.92.69	Password 2a	Setting for maximum random value. A random value is determined that lies within the set interval. If an FTP file cannot be sent, a new random value is calculated; Settings are 5, 10, 15, 30 minutes, 1 hour, 2 hours and 3 hours.

VDEW status registry

the VDEW status registry consists of 16 registrations of alarms and is represented as a hexadecimal number of 4 characters:

St: V₁V₂V₃V₄

Bitnumber		Value St	Description	Condition / Event
15 / F	1 ₁	8, 9, A, B, C, D, E, F	-	
14 / E		4, 5, 6, 7, C, D, E, F	logger is 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	SW5 has been operated during writing of OBIS parameter	Event
7	1 ₃	8, 9, A, B, C, D, E, F	-	
6		4, 5, 6, 7, C, D, E, F	UNICOM 300 had no power supply	Event
5		2, 3, 6, 7, A, B, E, F	Clock has been set with more than +/- ns	Event
4		1, 3, 5, 7, 9, B, D, F	A counter value has been set	Event
3	1 ₄	8, 9, A, B, C, D, E, F	DST active	Condition
2		4, 5, 6, 7, C, D, E, F	Fatal error; CRC-error	Event
1		2, 3, 6, 7, A, B, E, F	Alarm active: Differential Alarm input 1 and 2, Alarm input 2, error encoder readout	Event
0		1, 3, 5, 7, 9, B, D, F	Fatal error: battery flat, watchdog error	Event

Status registry 1; operational status 1

St : 1₁1₂1₃1₄

Status		Weergave			Omschrijving
CRC-error LOGGER	1 ₁	8, 9, A, B, C, D, E, F	E	F	CRC error occurred in program memory of the processor of the top PCB. The memory is checked once per hour
Watchdog LOGGER		4, 5, 6, 7, C, D, E, F	E	E	Watchdog of the program of the processor of the top PCB has been activated
CRC-error MODEM		2, 3, 6, 7, A, B, E, F	E	D	CRC error occurred in program memory of the processor of the bottom PCB. The memory is checked once per hour
Watchdog MODEM		1, 3, 5, 7, 9, B, D, F	E	C	Watchdog of the program of the processor of the bottom PCB has been activated
Reset	1 ₂	8, 9, A, B, C, D, E, F	E	B	Software has been rebooted
External power		4, 5, 6, 7, C, D, E, F	C	A	External power supply present
Alarm ENCODER		2, 3, 6, 7, A, B, E, F	C	9	Readout values from encoder counter are unusable (BCC error) or a encoder reading is lower than counter reading Vm3. Vm3 will not be modified.
Counters set	1 ₃	4, 5, 6, 7, C, D, E, F	E	6	A counter reading has been set
Alarm switch program		2, 3, 6, 7, A, B, E, F	C	5	SW5 was operated
Low battery	1 ₄	1, 3, 5, 7, 9, B, D, F	C	0	Battery voltage too low (< 8.5 V) or Ah_used > Ah_new State is ended when SW 3 is operated

Status registry 2; operational status 2

St : 2₁2₂2₃2₄

Weergave		Weergave			Omschrijving
Battery exchanged	2 ₁	2, 3, 6, 7, A, B, E, F	E	D	Battery exchanged through SW 3
Alarm volume difference		1, 3, 5, 7, 9, B, D, F	E	C	Volume difference measured between inputs 1 and 2 equal to or higher than value Vm1Vm2_warning. See chapter 17 for more details
	2 ₂				No function
	2 ₃				No function
Clock set	2 ₄	8, 9, A, B, C, D, E, F	E	3	Clock set
Clock set > 10 sec.		4, 5, 6, 7, C, D, E, F	E	2	Clock has been moved by more than ns (register C.91.1) s, see also chapter 12.1, table "Clock and call window".
Log book cleared		2, 3, 6, 7, A, B, E, F	E	1	Status log book erased
Logger cleared		1, 3, 5, 7, 9, B, D, F	E	0	Interval logger, day logger or month logger erased

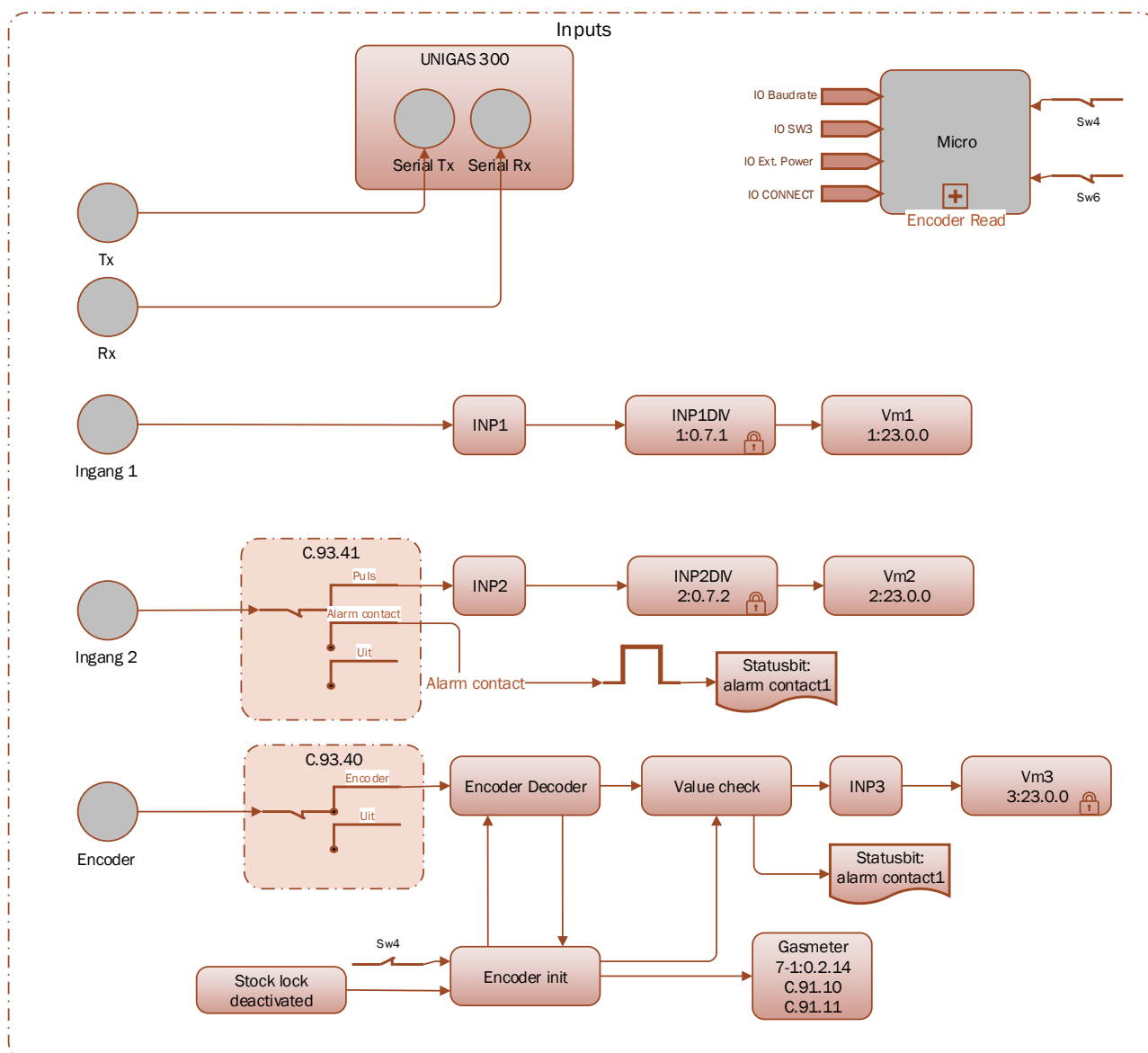
C= condition and E= event

Status registry 3; other alarm and warnings
St : 3₁3₂3₃3₄

Weergave		Weergave			Omschrijving
Encoder enable	3 ₁	4, 5, 6, 7, C, D, E, F	C	E	Set if encoder initialization could not be performed. This to indicate that encoder is functionally switched on, but not read out.
Stock lock		2, 3, 6, 7, A, B, E, F	C	D	If stock lock is active, this status bit is set.
Alarm NTP		1, 3, 5, 7, 9, B, D, F	C	C	Set if deviation RTC clock and NTP clock is greater than C.92.95. Removed if deviation is smaller, or by setting the clock manually.
Logboek (O) full	3 ₂	8, 9, A, B, C, D, E, F	C	B	Status log book is full; the oldest loggings will be overwritten. Is cancelled as soon as log book is deleted.
Alarm input 1		1, 3, 5, 7, 9, B, D, F	C	8	Connected alarm contact open

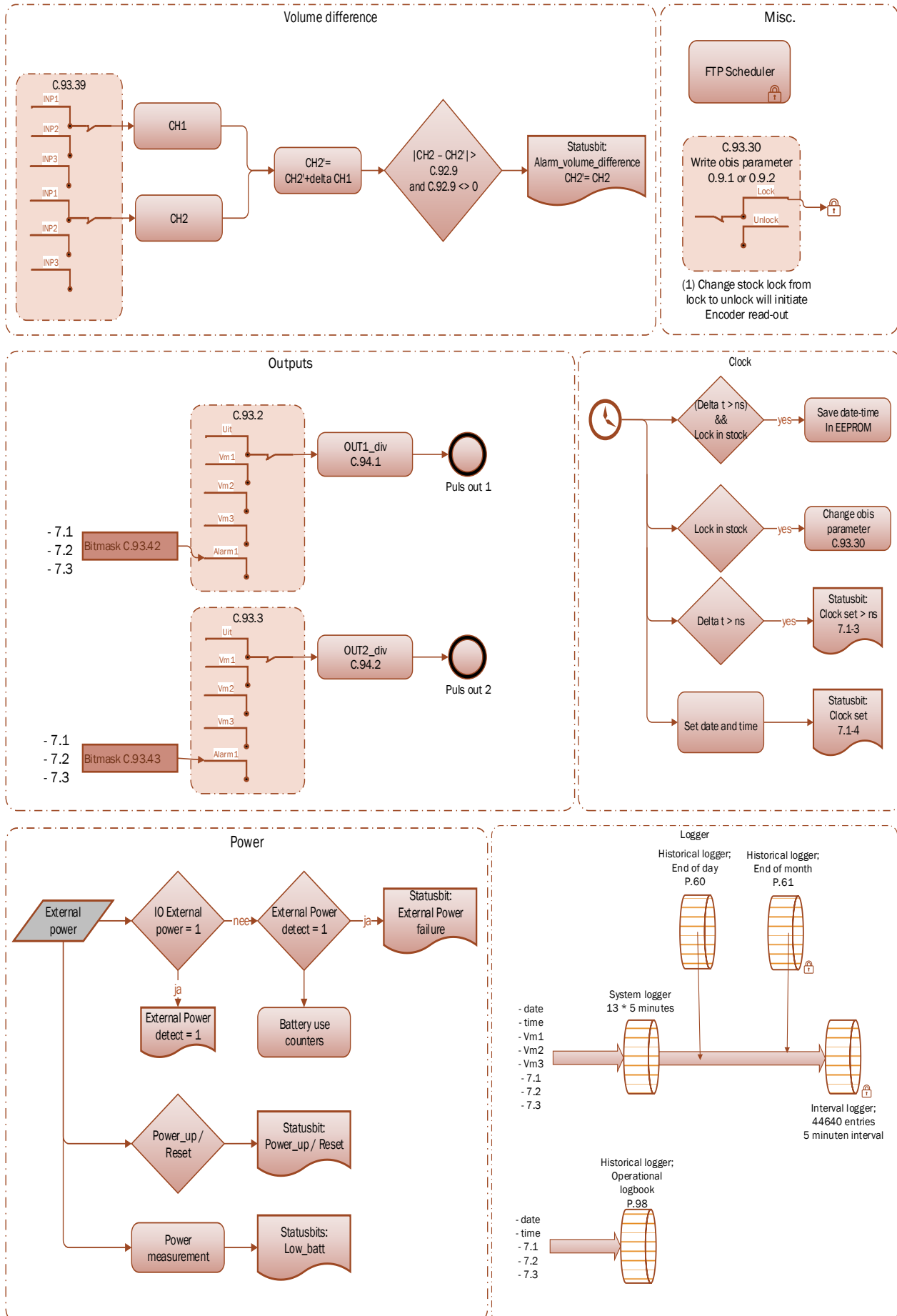
C= condition and E= event

Appendix 1: Schematic display of the functionalities



Schematic display of the functionalities of UNICOM 300 LOGGER


Appendix 2: Schematic display of the data structure



Schematic display of the data structure UNICOM 300 LOGGER

Appendix 3: Technical specification

Subject to changes

UNICOM 300	
General	
<ul style="list-style-type: none"> Supply Battery lifetime one battery pack Battery lifetime two battery packs Explosion safety 	<p>Battery; 1 or 2 pack's 3 x D cell lithium thionyl chloride battery, > 4 years at 1-hour idling and 1 minute communication per day * > 6 years at 0.5-hour idling at 1 minute communication per day * > 8 years at 1-hour idling and 1 minute communication per day * > 10 years at 0.5-hour idling at 1 minute communication per day * > 15 years at 1-hour idling and 1-minute communication every 3 day's *</p> <p>ATEX  II 1 G Ex ia IIB T3 Ga II (1) G [Ex ia Ga] IIC ta: -40°C to +60°C</p> <p>Suitable for natural gas installations Mounting in zone 0, 1, 2 and safe area.</p>
<ul style="list-style-type: none"> Technical lifetime Weight Dimensions h x w x d Material casing Color Protection class Operating temperature System Remote software update GSM antenna External GSM unidirectional antenna +6 Db External GSM directional antenna +9 Db 	<p>15 years max 2.3 kg with 2 battery packs approx. 140 x 200 x 85 mm Polyester RAL 9002 Grau Weiss IP 65, suitable for continuous outdoor use - 40 °C to + 60 °C, 0 – 100% RH condensing low power microprocessor, MSP 430 series, 2 Mb EEprom memory Yes standard mounted SMA (f) connector for external antenna optional (5 or 10 m cable) optional (5 m cable)</p>

* Use in West Europe; consult Wigiersma & Sikkema for battery lifetime at different schedule settings.

Battery power management

- | | |
|--|---|
| <ul style="list-style-type: none"> Monitors Low battery handling Battery exchange | <p>Battery voltage and used battery capacity
 Battery or 230VAC detection
 Automatic shutdown of modem to prevent flat battery: log functionality is guaranteed for at least 6 months
 Can be performed independent of functional state of UNICOM 300</p> |
|--|---|

Status indicator Front

- Status indicator LED's
Activated at placing optical head
- PWR (battery status (Good; Low; Flat))
- STATUS (stock-lock active, not active, critical error)
- NETWORK (IP service status: Non; registering; attached)
- WDS (network 2G/4G status: Non; registering; registered 2G; registered 4G; attached)
- SIG 1 (Signal strength)
 - Main cell < - 92 dBm (medium)
 - Main cell < - 80 dBm (good)
- INIT (initialization first put into use)
- DATA (received and sent data)

Communication ports

- Communication port for service
for serial communication with UNIGAS, infrared communication head according IEC 62056-21
- Baud rates
9600 baud full duplex

Real time clock

- Internal POSIX clock
yes
- Internal synchronization
NTP
- Daylight saving time support
yes

Communication protocol

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

Integrated 2G/4G Cat. 1 modem

- 4G-band
B1, B3, B7, B8, B20
- 2G-band
B3, B8
- Services
CSD, TCP, FTP, NTP
- Authentication
PAP, CHAP
- Operating temperature
- 40 °C to + 60 °C
- SIM card interface
mini-SIM

Integrated 2G/4G Cat. M1 modem

- 4G-band
B1, B2, B3, B4, B5, B8, B12, B13, B18, B19, B20, B25, B26, B27, B28, B66, B85
- 2G-band
B2, B3, B5, B8
- Services
TCP, FTP, NTP
- Authentication
PAP, CHAP
- Operating temperature
- 40 °C to + 60 °C
- SIM card interface
mini-SIM

for integrated 2G/4G-modem

- Activation service interval 30 minutes
Front push-button
- Flexible programmable scheduler
External; Started from external meter
- Flexible programmable billing scheduler
Internal
- Flexible programmable service scheduler
Internal

Scheduler for FTP client services

- Initiation FTP transfer
External; Started from UNIGAS

Service software PC platform

- UNITOOL
Windows 10

Status indicator

- 2 Status indicator LED's
- Diagnosis
NAMUR Encoder counter initialization

Inputs

- Inputs LF 1 and 2 pulse
 - Cable gland
 - Resolution counters input 1, 2
 - Input 1 range pulse input ratio
 - Input 2 range pulse input ratio
 - Extended functions
- 2 Hz max, reed and electronic switches with
length min 50 ms
Ø 4 -8 mm
XXXXXXXXX.XXX
XXXX.XX pulse/m3
XXXX.XX pulse/m3
Pulse difference to input 1,2 or 3 with
programmable alarm

Encoder

- Support for Encoder counters
- Manufacturer Itron, GWF, Honeywell (Elster),
Dresser, FMG, RMG, GFO or RMA (Aerzen)

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
 - Reading of Encoder "b" telegram
 - Resolution counter encoder
- Every 5 minutes and at serial communication
- data read out mode and reading counter
values
Read out initiated after:
- activation of logger functions
 - Encoder initialization
 - after resolving Encoder read error (VDEW status bit 1)
- XXXXXXXXX.XXX

Outputs

- Pulse outputs 1 and 2
 - Max. frequency
 - Pulse ratio
 - Pulse width
 - Switching voltage
- Off, Vm1, Vm2, Vm3, Alarm1
2 Hz
Equal as input or 1 – 100 m³/p, configurable
100 ms (dependant on switching voltage and
switching current)
Suitable switching voltage of 3 to 20 V with a
switching current of 10 µA to 50 mA.

ATEX approved Um 250V. When mounted in EX safe area, pulse outputs may be connected to other apparatus without additional EX safety interfaces. When mounted in the explosion hazardous area, see chapter 2.

Real time clock

- Internal POSIX clock
 - Daylight saving time support
 - Back-up function
- yes
back-up for few minutes clock running at power
down or battery exchange

Loggers

- Interval logger 155 days 5 minutes interval,
- Historical logger 36 end of month

Scheduler for FTP client services

- initiation FTP transfer Internal

Barcode definitions

- Code 128, Mode B (customer specific)
- Data matrix DIN 43863-5 (fixed)
- Data matrix Wigersma en Sikkema

Specification mounting bracket for mounting UNICOM 300

General




- dimensions approx. 180 x 50 mm
- material Stainless steel
- Weight 0,2 kg

Specification universal mounting bracket for mounting UNICOM 300 with UNIGAS 300

General

- dimensions approx. 40 x 240 mm
- material Stainless steel
- Weight 0,2 kg

Appendix 4: Serial connections UNIGAS converters

Connector type				
Description		Cable color black with M12 Male connector	Cable color blue with M12 Male connector	Cable color blue with optical connector
UNIGAS EVC type		UNIGAS 61D or UNIGAS 61E	UNIGAS 61D or UNIGAS 61E	UNIGAS 300
Serial connections UNICOM 300	REQ	Brown	White	White
	GND	Black	Green/ black	Green/ black
	DATA	Blue	Brown	Brown



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