kamstrup

Installation and user's guide

GSM8H - 3G

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Description of GSM8H 3G

GSM8H is a modem, designed for the meters MULTICAL® 602, MULTICAL® 801, MULTICAL® 62 and for M-Bus Master. With this modem inserted in the module area, the meter can be read remotely. The module is a plug and play component which does not need any configuration at installation.

Contents

1 Installation

1.1 Installation order

1. Check that the meter is turned off when installing the module.
2. Insert the GSM module in module area 2 (see Figure 3, page 15).
3. Insert the SIM card (see Figure 5, page 16).
4. Connect the external antenna chapter 5, page 8.
5. Connect the power supply (see Figure 3, page 15).
6. Test the signal when the GSM module has been turned on chapter 4, page 6.
7. Find the best position for the external antenna.
8. Before leaving the installation, test the signal strength by SMS chapter 8, page 12.

Figure 1.

Tips

- Always install an external antenna.
- If the unit is installed in a metal cabinet, the antenna must be placed outside the cabinet.
- Use tri-band (900 MHz, 1800 MHz and 2100 MHz) GSM antennas to optimise the performance.
- Note that fire doors, concrete and metal plates disturb and weaken the GSM signal.
- It is possible to order directional antennas for areas with very poor signal conditions (please contact Kamstrup A/S for further information).

2 SIM card

2.1 Mounting the SIM card

The unit can be ordered with the SIM card mounted from the factory. Please check that the card has been inserted. The telephone number of the card appears from a label on the side of the module. Kamstrup A/S cannot be held responsible for theft or misuse of SIM cards from GSM8H 3G units.

When the SIM card holder is opened, the connection to the SIM card is disconnected.
When the SIM card has been inserted correctly and the holder is closed,
the module restarts automatically.

If the unit is supplied without a SIM card, make sure to insert one before using the unit.

The SIM card holder is opened by pushing the bright holder back and carefully tipping up the holder. Next, place the SIM card with the "cut-off" corner in the top left side and with the contacts facing the PCB.

2.2 SIM card requirements

The SIM card must fulfil the following requirements:

3G/GSM/GPRS, DATA/SMS-9.6. kb V110,
PIN code must be disabled, no voice and no pre-paid card can be used.

3 GPRS

Setup
Kamstrup A/S recommends creating a closed APN (Access Point Name) at the telecom supplier concerned which is only accessible via a VPN (Virtual Private Network). GSM8H uses the APN name to log into APN via GPRS.

In short, the following items must be clarified prior to activation:

- APN name (the name of a closed user group)
- VPN connection (tunnel between a GPRS unit and the reading system with data encryption)
- The network of the telecom supplier must be tested by Kamstrup A/S. If the module is configured for communication via GPRS, the GPRS diode switches on as soon as the module is connected to the GPRS network (approx. 20 secs. after start-up).

Please remember always to contact Kamstrup A/S before ordering GPRS.

4 Signal test

As an alternative to the signal indicator, it is possible to run a signal test in connection with the installation. The signal test states the signal level based on a scale with 32 levels, and consequently it results in a higher resolution than the signal indicator.

9 Push the push button for approx. 2 secs. (see Figure 5, page 16).

10 The TEST diode now emits light constantly for approx. 10 secs. (see Figure 5, page 16) after which the signal strength is indicated by flashes on a scale of 0 to 31:

- a long flash equals 10
- a short flash equals 1

This means that a signal strength of 14 is indicated by one long flash and four short flashes.

11 The recommended signal strength is minimum 12.

An external antenna must be installed outside the cabinet if the module is installed in a closed metal cabinet.
Always check the signal strength by sending an SMS when the cabinet is closed.

4.1 Diagram of signal conversion

Signal indicated in dBm	Signal with button	Signal indicator	
-113	***0***	***0***	
-111	***1***	***0***	
-109	***2***	***0***	
-107	***3***	***0***	
-105	***4***	***0***	
-103	***5***	***0***	
-101	***6***	***0***	
-99	***7***	***0***	
-97	***8***	***0***	
-95	***9***	***1***	
-93	***10***	***1***	
-91	***11***	***1***	
-89	**12**	**2**	GSM minimum
-87	**13**	**2**	
-85	**14**	**2**	
-83	**15**	**3**	
-81	**16**	**3**	
-79	**17**	**3**	
-77	**18**	**4**	
-75	**19**	**4**	
-73	**20**	**4**	
-71	**21**	**5**	
-69	**22**	**5**	
-67	**23**	**5**	
-65	**24**	**5**	
-63	**25**	**5**	
-61	**26**	**5**	
-59	**27**	**5**	
-57	**28**	**5**	
-55	**29**	**5**	
-53	**30**	**5**	
-51	**31**	**5**	

- At a signal strength below 12, a stable connection to the unit cannot be guaranteed.
- The installation must not be handed over before the signal strength is 12 or more.
- Always complete the installation by sending an SMS (=signal#) to control the signal strength when all doors and cabinets are closed.

5 Mounting of external antenna (to be ordered separately)

An external antenna must always be mounted on GSM8H 3G!

External antennas with DC resistance between the inner and outer conductors of 10 K ohms or less are detected automatically. This applies to the following antennas:

- Mini Triangle antenna (order no. 6699448)
- Triangle antenna (order no. 6699407 or 6699408)
- Directional antenna (order no. 6699456)

When using other antennas, the external antenna is selected manually. This is done in the following way:

The internal antenna has been selected by default:		EXT ANT diode is off:
Antenna selection	Button push	EXT ANT diode
Select external antenna	Push twice	On
Deselect external antenna	Push three times	Off

6 Light Emitting Diodes

The LEDs must provide the installer with sufficient knowledge to make a good installation without using external tools.

All diodes turn off after 10 mins.
They can be reactivated by pushing the test button.

6.1 Positioning of LEDs

6.2 Start-up

6.2.1 Checking the SIM card

Flashing
Flashing

6.2.2 Establishment of connection to the network

Flashing

6.2.3 Connection to 2G/3G network and to meter

It appears from the diodes at the bottom of the module to which 2G and/or 3G network the module is connected. More than one diode can be turned on. Furthermore, the red METER diode flashes if there is no connection between meter and module because the module has not been inserted correctly.

METER GPRS 3G

6.2.4 Signal strength indicator

When the signal strength is less than 2, an external antenna must be mounted. If an external antenna has already been mounted, it should be repositioned to obtain the required signal strength.

- *Very good*
- *Good*
- *Acceptable*
- *Low*

6.2.5 Error indication

If one of the diodes flashes, it means the following:

- *Flashing* → Communication error with modem
- *Flashing* → Missing network registration
- *Flashing* → No SIM card
- *Flashing* → SIM card protected by PIN code

6.2.6 External antenna

When mounting an external antenna, the EXT ANT diode turns on. For further details, see chapter 5, page 8.

EXT ANT

All diodes turn off after 10 mins.
They can be reactivated by pushing the test button.

7 Troubleshooting guide

SMS commands must be sent in either capital letters or small letters.

GSM8H 3G must always have mounted an external antenna of the type 6699407 or 6699408.

The METER diode flashes constantly	The module has no contact with the meter. Check that the module has been mounted correctly.
The three diodes at the bottom of the signal indicator flash constantly.	The SIM card has not been inserted correctly or is defective.
The two diodes in the middle of the signal indicator flash constantly.	Cannot connect to the mobile network. This can be caused by no coverage or problems with the SIM card. Mount an external antenna.
The GPRS diode does not emit light after start-up	Ask the telecom supplier if there is a GPRS subscription for the SIM card.
The 3G diode does not emit light after start-up	Ask the telecom supplier if there is a 3G subscription for the SIM card.
Weak mobile signal	Mount an external antenna. Reposition the antenna to find the optimal position, if required. Note that GSM8H 3G must ALWAYS have mounted an external antenna of the type 6699407 or 6699408.
Try to call the unit.	If there is no connection or if the SIM card is not activated, there will typically be a message from the operator
Send an SMS to the modem, e.g. = =SIGNAL#.	The unit must respond with the signal strength of the module.
Always complete by performing a control reading from the main station.	Call the utility to make sure that meter data has been received.
Defective modem	Return the modem to Kamstrup with a precise description of the error.

8 SMS commands

SMS commands must be sent in either capital letters or small letters.
Capital and small letters must not be mixed in the same SMS command.

SIGNAL - til aflæsning af signalstyrken	
Syntax, command	=SIGNAL#
Example	=SIGNAL#
Return reply, correct Displays the modem's current signal strength on a scale from 0-4 where 4 is best. The signal strength must be minimum 2.	Signal: 2(0-4)LEDS, UMTS
Return reply, error	NO ANSWER
Return reply, error	NO ANSWER

READ_HEAT_METER – for reading MULTICAL® 801 / MULTICAL® 602 /MULTICAL® 62	
Syntax	=READ_HEAT_METER#
Example 1	=READ_HEAT_METER#
Response, correct The following values are read: Acc. energy: KWh, MWh, GJ or GCal Current power: kW or MW Acc. water consumption: m^3 Current water consumption: l/h or m^3/h Meter number: Temperature: C Info code: Hour counter:	114931.6 MWh, 25.99 MW 1657074 m^3, 379.8 m^3/h, Meter No.: 5300279, T1: 93.15 C, T2: 32.00 C, Info code: 0, 7373 Hours
Return response, command error	NO ANSWER
Retur-svar, kommandofejl	INTET SVAR

READ_PRESSURE - for reading MULTICAL® 801 / MULTICAL® 602/ MULTICAL® 62	
Syntax	=READ_PRESSURE#
Example 1	=READ_PRESSURE#
Response, correct The following values are read: Pressure: bar Meter number:	2.34 bar, 2.23 bar, Meter No.: 6349933
Return response, meter error	No meter response
Return response, command error	NO ANSWER

9 Variant structure for GSM8H 3G

Top number

As a separate module for MULTICAL® 801	670XXXXX.801
As a separate module for MULTICAL® 602	602XXXXX
As a separate module for M-Bus Master	670XXXXX.MBM
As a separate module for MULTICAL® 62	602XXXXX

Function

MULTICAL® 801
MULTICAL® 602
MULTICAL® 62
M-Bus Master

Features

None 0

Country

Denmark	10
Norway	40
Sweden	90
Other countries	00

Accessories:

SIM card

None	0
BillingCom SIM card - Danish	1
BillingCom SIM card - Swedish	2
SIM card supplied by the customer	3

Antenna

Mini Triangle antenna, 1.5 m cable (6699448)	1
Triangle antenna with variable cable length (6699408)	2
Discos antenna, 1 m cable (6699458)	3
Connector adapter MCX to SMA (5000292)	5
Connector adapter MCX to FME (5000291)	6

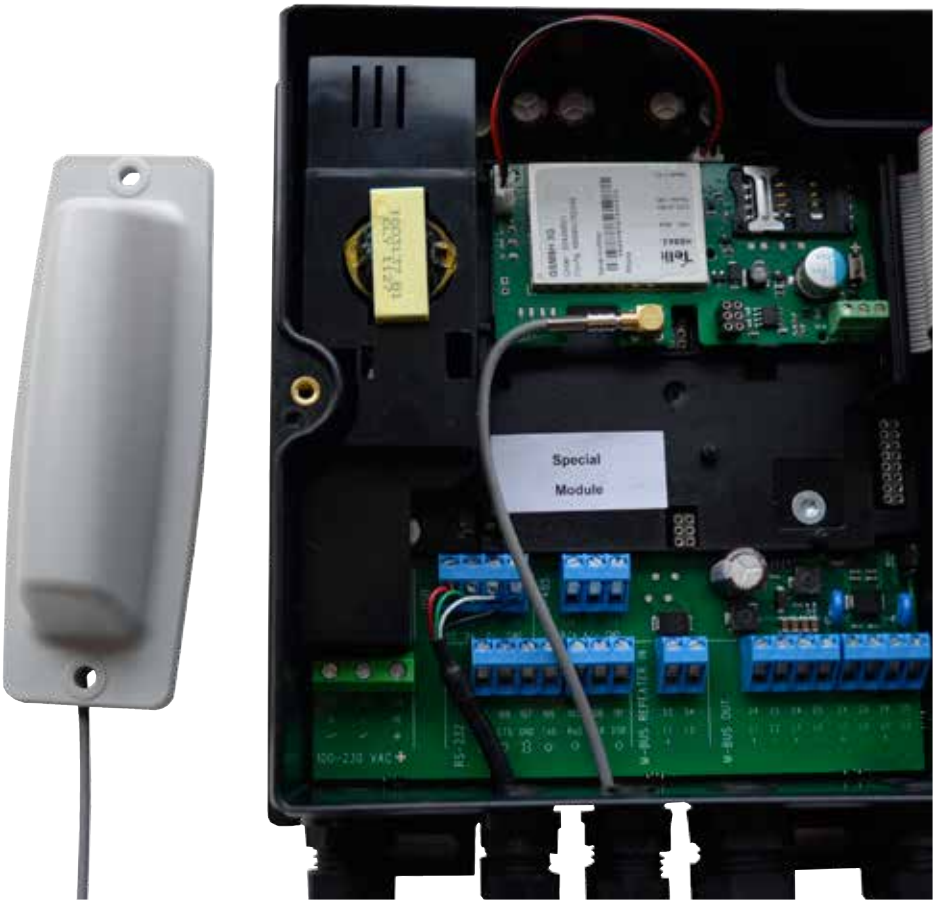

Figure 2. M-Bus Master Multiport 250D

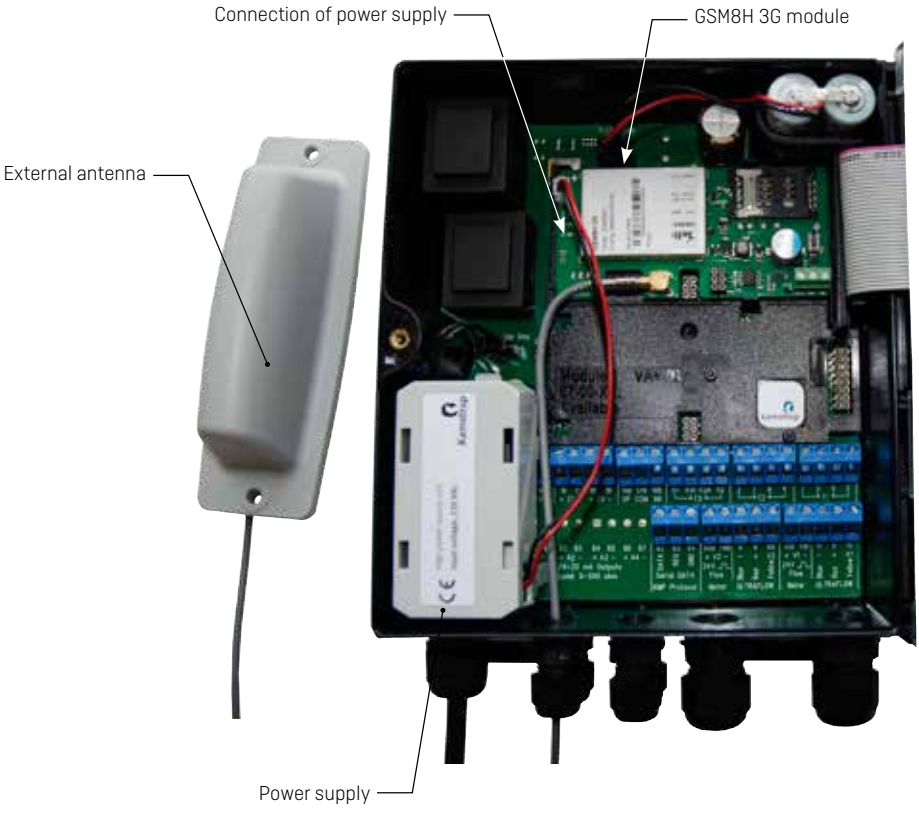

Figure 3. MULTICAL® 801

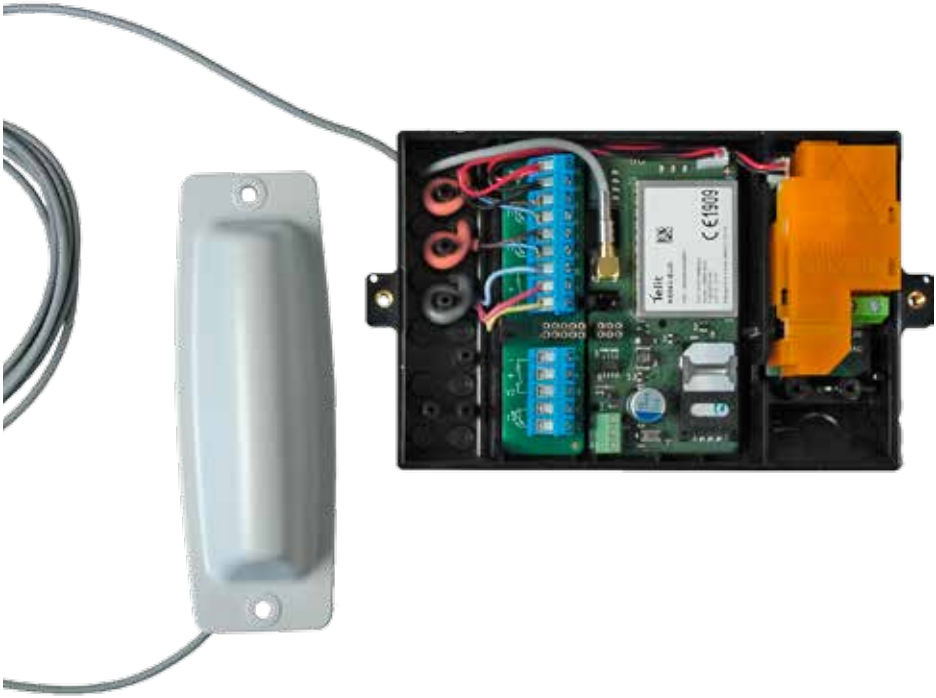

Figure 4. MULTICAL® 602

Figure 5.