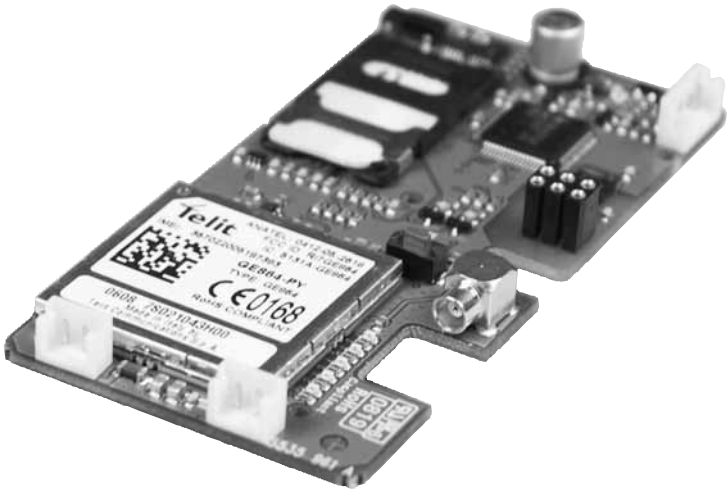
Installation and User Guide for

GSM6H



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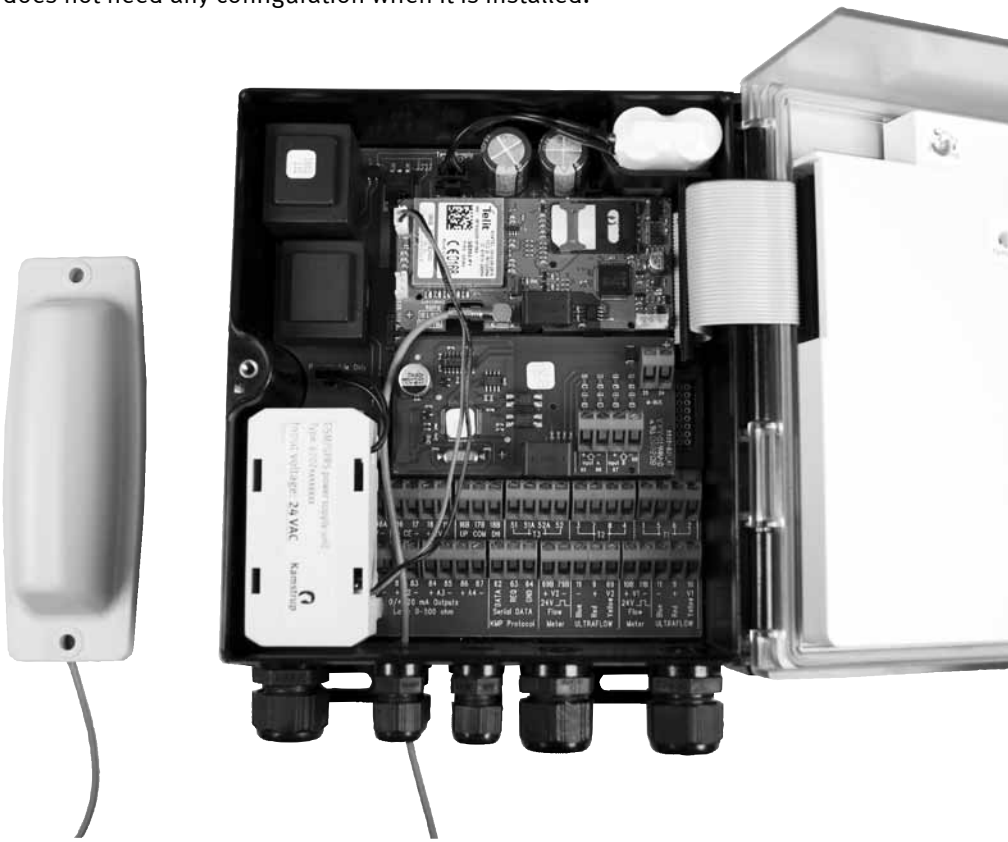
Description of GSM 6H

GSM6H is a GSM modem designed for the MULTICAL® 801 meter. After placing the modem in the module area, you will be able to communicate with /read the meter from a remote location. The module is a plug-and-play component that does not need any configuration when it is installed.



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1. Installation

Fig. 1

1.1. Installation order

1. Make sure the meter is powered off when installing the module.
2. Insert the GSM module into module area 2 *(See Fig. 2 on page 13)*.
3. Insert the SIM card *(See Fig. 3 on page 13)*.
4. Connect the external antenna *(See chapter 5 on page 8)*.
5. Connect the power supply *(See Fig. 2 on page 13)*.
6. Perform a signal test when the GSM modem has started up *(See chapter 4 on page 6)*.
7. Find the best position for the external antenna.
8. Before leaving the installation, check the signal strength by SMS *(See chapter 8 on page 11)*.

Hints

- Always install an external antenna.
- When installing the unit in a metal cabinet, the antenna must be placed outside the cabinet.
- Use dual-band (900 MHz and 1800 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 special directional antennas for areas with very poor signal conditions (please contact Kamstrup A/S for further information).

1.2. Start-up sequence

1. Immediately after start-up, all the *Signal indicator* diodes and the test diode switch on briefly *(See Fig. 3 on page 13)*.
2. The two Signal indicator diodes to the left flash until the module has been initialized correctly (approx. 5 secs.). When the diode to the left stops flashing, the module has been connected to the network (approx. 5-10 secs.).
3. Now, the signal indicator will show the current signal level.
4. 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).
5. All diodes will turn off automatically after 10 mins.

2. SIM card

The unit can be ordered with the SIM card inserted from the factory. Please check that the card has been inserted. The telephone number of the card appears from a label on the unit.

Note that Kamstrup A/S cannot be held responsible for theft and misuse of SIM cards from GSM 6H units.

If the unit is supplied without a SIM card, make sure to insert a card before using the unit. Open the SIM card holder by pushing the bright holder in the direction of the arrow towards "Open" and then carefully tipping up the holder.

Next, place the SIM card with the "cut-off" corner on the top left side and with the contacts facing the print. At last, tip back the SIM card holder and lock it by pushing the bright holder in the direction of the arrow towards "Lock".

The SIM card must fulfil the following requirements:

DATA/SMS-9.6 Kb V110, PIN code must be disabled, no voice and no pre-paid card can be used. Please contact your own telecommunications supplier if you have any questions.

When the SIM card holder is opened, the supply to the SIM card is cut off. When the SIM card has been inserted correctly and the holder is closed, the module will restart automatically.

3. GPRS

Set-up:

Kamstrup A/S recommends creating, at the telecommunications supplier concerned, a closed APN (Access Point Name) which is only accessible via a VPN (Virtual Private Network). GSM6H has to use the APN name to log on the APN via GPRS.

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

- APN name (the name of a closed user group)
- VPN connection (tunnel between the GPRS unit and the reading system with data encryption)
- The network of the telecommunications supplier must be tested by Kamstrup A/S. If the module is configured for communication via GPRS, the GPRS diode will switch 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 will result in a higher resolution than the signal indicator.

1. Activate the push button for approx. 2 secs. *(See Fig. 3 on page 13)*.
2. *The TEST diode now emits light constantly for approx. 10 secs. (See Fig. 3 on page 13), and the signal strength is indicated with flashes on a scale of 0 to 31:*

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

   i.e. a signal strength of 14 is indicated by one long flash and 4 short flashes.
3. The recommended signal strength is minimum 12.

Note that when modems are installed in closed metal cabinets, the external antenna must be mounted outside the cabinet. Always check the signal strength by sending an SMS when the cabinet is closed.

4.1. Diagram for signal conversion

Signal	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**	

- *Note: At a signal strength below 12 we cannot guarantee a stable connection to the unit.*
- *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. Antenna

- Avoid installing the antenna in a place where it can be shielded, covered or mounted in a closed metal cabinet since it might weaken the performance.
- Use only dual-band (900 MHz and 1800 MHz) GSM antennas.
- Avoid placing the antenna right next to power cables, since it might disturb the signal.
- If a long antenna cable is required, please contact Kamstrup A/S to obtain a “super low loss” antenna cable.

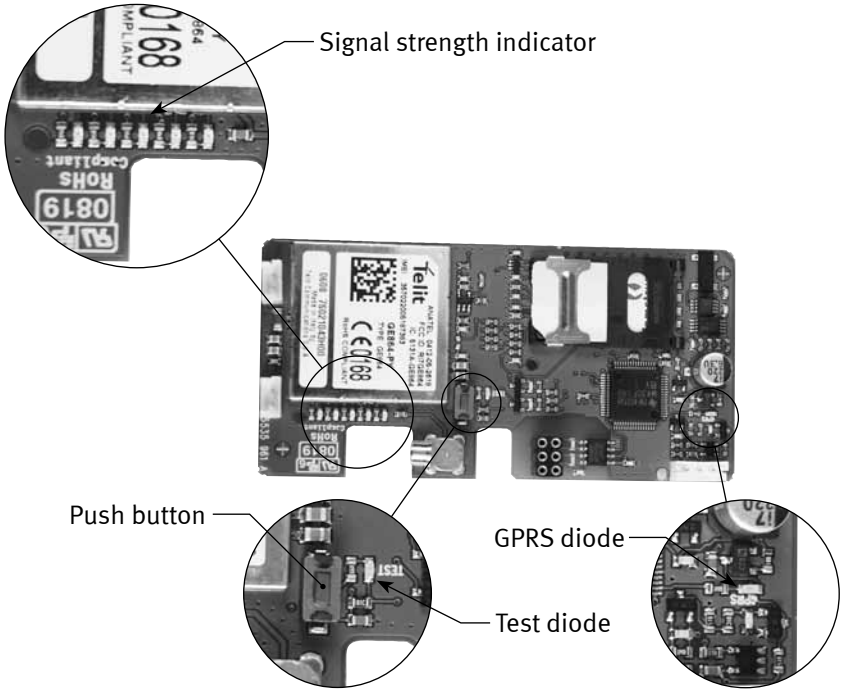
6. Light Emitting Diodes (LEDs)

Note that all light emitting diodes turn off automatically after 10 minutes – no buttons have been activated. The light emitting diodes are activated again by pushing the button.

TEST diode (orange) Indication of signal strength
(See chapter 4 on page 6)

GPRS diode (orange)

LED emits light constantly	The modem is connected to the GPRS network
LED switched off	The modem is not connected to the GPRS network



7. Error Detection Help

NOTE: All light emitting diodes will turn off automatically after 10 minutes. They can be reactivated for another 10 minutes by pressing the push button.

The diodes emit no light	Check that there is supply voltage. Activate the push button to see if the light emitting diodes switch on *(See chapter 6 on page 8)*.
The modem will not run the signal test	Make sure that a SIM card has been mounted and that it is facing the right direction. Check that the SIM card complies with the specifications *(See chapter 2 on page 5)*.
The signal strength is not good enough	Mount an external antenna, which can be ordered at Kamstrup A/S *(See chapter 5 on page 8)*.
The signal strength will not improve after mounting an external antenna	• Place the antenna in different places to find the location with the best signal strength *(See chapter 4 on page 6)*. • Make sure that the antenna connector has been mounted correctly and that it "clicked" when it was inserted. • Check that the antenna that is used is a GSM dual-band 900/1800 MHz antenna. • On special occasions it might be necessary to mount the antenna far away from the modem or outside the building to obtain good signal strength.

The signal strength has become worse since the moment of installation	• If the modem has been mounted in a closed metal cabinet, an external antenna must be mounted outside the cabinet. Otherwise, the signal strength will be attenuated. • Check if any changes have been made in the environment surrounding the modem (a fire door has been closed, the antenna has been moved or covered, etc.). • Ask the telecommunications supplier if any changes have been made to the coverage or if there are any operational problems in the local area.
The GPRS diode does not emit light	The modem is not connected to the GPRS network. • The modem is only connecting to GPRS if this has been ordered and it has a valid APN name *(See chapter 3 on page 6)*. • Check that the SIM card supports GPRS (ask the telecommunications supplier).
Defective modem	Enclose a precise description of the error and return the modem to Kamstrup A/S.

8. SMS commands

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

SIGNAL - for reading the signal strength	
Syntaks, command	=SIGNAL#
Syntax, return answer	Signal: ‹signal strength› (0-31)
Example	=SIGNAL#
Return answer, correct	Signal: 14 (0-31)
Return answer, error	NO ANSWER

READ_HEAT_METER – For reading MULTICAL® 801	
Syntax	=READ_HEAT_METER#
Example 1	=READ_HEAT_METER#
Answer, correct The following values are read Acc. energy: [KWh], [MWh], [GJ] or [GCal] Actual power: [KW] or [MV] Hour counter: Meter number:	12.067GJ, 120.0 kW 6930 Hours, Meter No: 6055524
Return answer, error	NO ANSWER

READ_PRESSURE – For reading MULTICAL® 801	
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 RESPONSE

9. GSM6H Variant structure

□ – □ – □

Function

MULTICAL® 801 _____ M

Features

None _____ 0

Leak alarm for MULTICAL® 801 _____ L

Country

Denmark _____ 10

Norway _____ 40

Sweden _____ 90

Other _____ 00

Accessories:

SIM card

None _____ 0

BillingCom SIM card - Danish _____ 1

BillingCom SIM card - Swedish _____ 2

SIM card delivered by customer _____ 3

Antenna

Mini Triangle antenna 1.5 m cable (6699448) _____ 1

Triangle antenna with variable cable length (6699408) _____ 2

Discos antenna 1m cable (6699458) _____ 3

Connector adapter MCX to SMA (5000292) _____ 5

Connector adapter MCX to FME (5000291) _____ 6

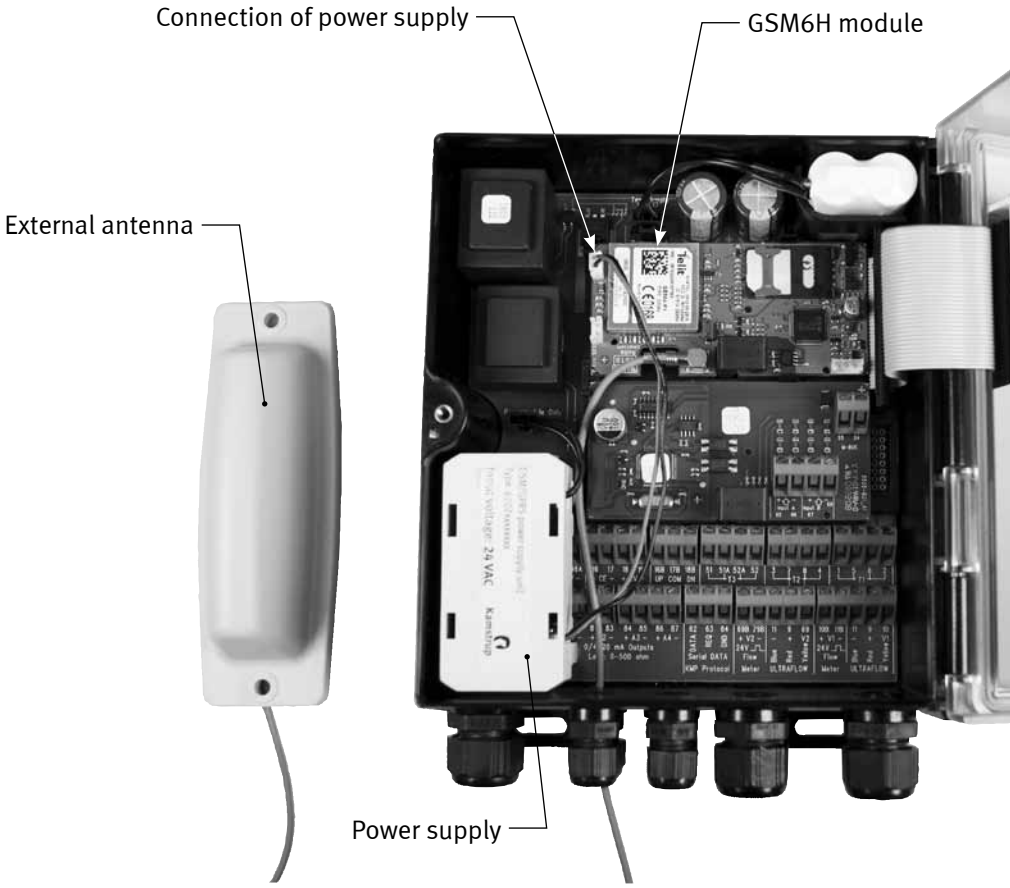

Connection of power supply
GSM6H module
External antenna
Power supply

Fig. 2

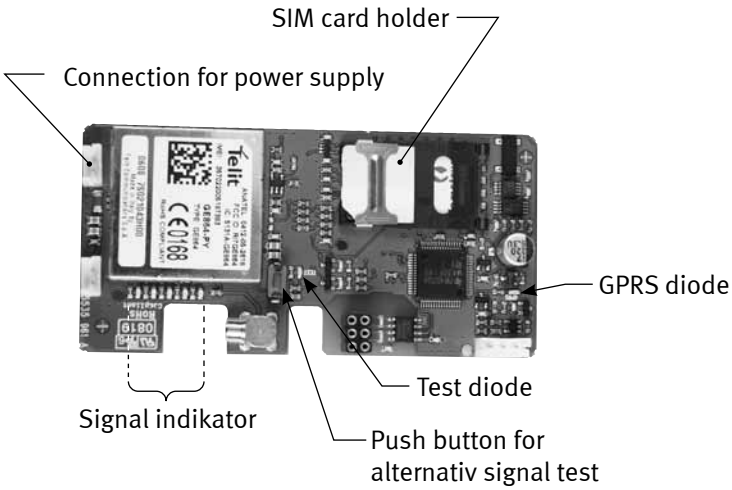

SIM card holder
Connection for power supply
GPRS diode
Test diode
Signal indikator
Push button for
alternativ signal test

Fig. 3

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