kamstrup

Installation and user's guide

GSM modem 8 3G

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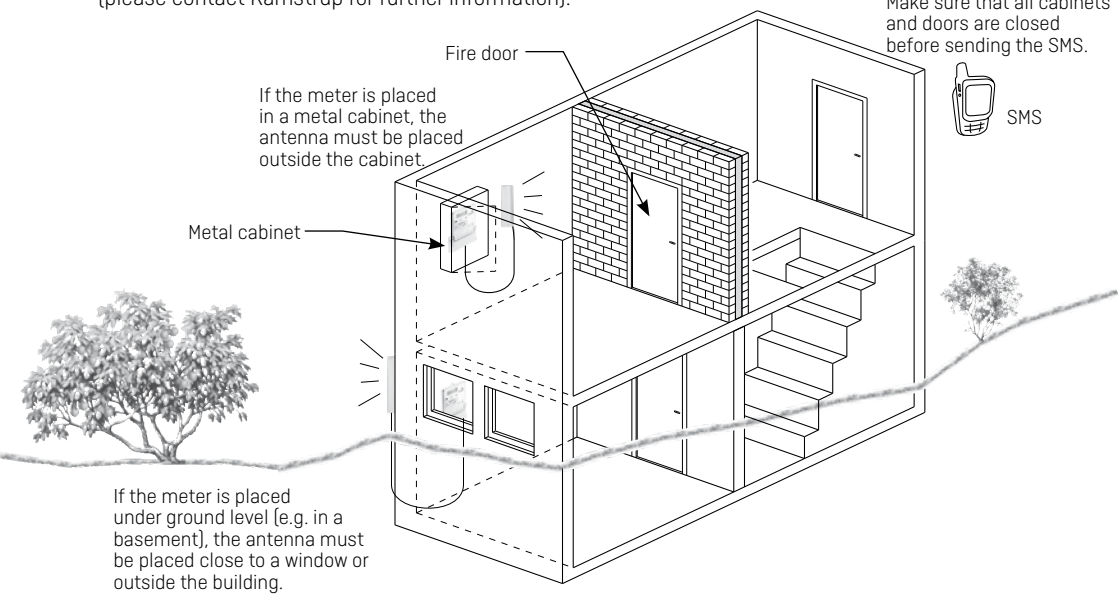
Quick guide

1. Make a signal test by activating the test button on the modem.
2. **If the signal strength is below 12 (2), the external antenna must be placed at a location that optimises the signal reception. Change the position of the external antenna until the best position has been found. Run several signal tests while trying to find the best position.**
3. NetMonitor or a similar tool can help to find the best position of the external antenna.
4. Before leaving the installation, test the signal strength by SMS. Make sure that all cabinets and doors are closed before sending the SMS.

Tips

- Always install an external antenna when installing the unit in a metal cabinet. The antenna must be placed outside the cabinet.
- Use dual-band GSM antennas to optimise the performance.
- Note that fire doors as well as 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 for further information).



Contents

1 Mounting

GSM modem 8, article number 68G8XXXXX, can both be 110/230 VAC and 24 VAC supplied.
An external antenna must always be mounted.

1.1 Mounting order

1 The modem must be without current when starting the mounting.
2 Insert SIM card.
3 Connect the external antenna.
4 Connect the required equipment in accordance with paragraph 6.3.
5 Connect power supply to the modem (note that there are two variants: either 110/220 VAC or 24 VAC).
6 Perform a signal test when the GSM module has started.
7 Find the best position for the external antenna.
8 Before leaving the installation, check the signal strength by sending a text message.

Tips

- Always mount 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 as well as 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 Description

2.1 Description of GSM Modem 8

GSM Modem 8 is a GSM modem unit of general use.

It is designed for meter reading and is also available in a variant with integrated M-Bus interface and corresponding data logger.

2.2 Technical data

- Quad-band GSM/GPRS modem for meter reading, M-Bus and standard RS232.
- Standard IP 54 class with integrated 110/230 VAC or 24 VAC power supply.
- Communication up to 9600 bauds.
- Built-in real time clock (RTC) with backup for 10 days.
- 2 serial ports (1 pc. of Kamstrup 3- wire and 1 pc. of RS232/Kamstrup 3-wire)
- Signal indicator LEDs for GSM signal strength
- Push button for GSM signal test

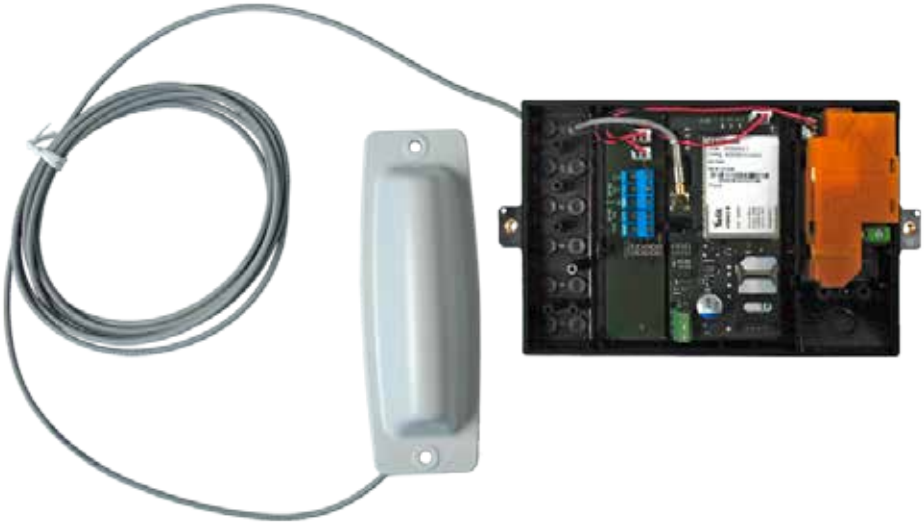


Figure 1

NOTE! Installation to be carried out by authorized personnel only as it can be highly dangerous to touch connections and internal parts.

2.3 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 and misuse of SIM cards from GSM8i 3G units.

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

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

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

2.4 SIM card requirements

The SIM card must fulfil the following requirements:

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

3 GPRS

Setup

Kamstrup A/S recommends that a closed APN (Access Point Name) is created by the telecom supplier concerned, which can only be accessed via a VPN (Virtual Private Network). GSM8H must apply the APN name to log on the 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/ 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 seconds after start-up).

Remember always to contact Kamstrup A/S before ordering GPRS.

4 Signal test

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

1 Press the push button for approx. 2 seconds (see Figure 2, page 10).

2 The TEST diode now emits light constantly for approx. 10 seconds (see Figure 2, page 10), and the signal strength is indicated with flashes on a scale from 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 4 short flashes.

3 The recommended signal strength is minimum 12.

When modules are mounted in closed metal cabinets, the external antenna must be placed outside the cabinet.
Always check the signal strength by sending a text message when the cabinet is closed.

4.1 Diagram of signal conversion

-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!

Connect the external antenna to the connector on the module. (Figure 2, page 10).

Be careful to hear a "click" to ensure that the two connectors are connected correctly. It is NOT allowed to use any tools for mounting the antenna connector.

Place the antenna cable inside the plastic frame of the module, and lead the cable out through the cable channel at the bottom of the meter.

IMPORTANT

To ensure that the external antenna is mounted in such a way that it optimises the reception conditions, the signal indicator on the module must be observed (paragraph 4, page 7).

Change the position of the external antenna until the best position has been found.

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 minutes.
They can be reactivated by pushing the test button.

6.1 Positioning of LEDs

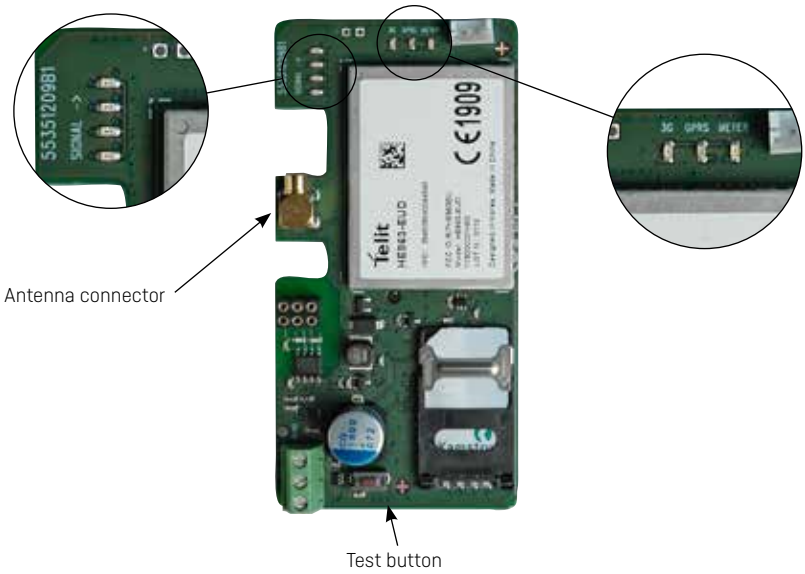


Figure 2

6.2 Start-up

6.2.1 Check of the SIM card

Flashing
Flashing

6.2.2 Creation of connection to the network

Flashing

6.2.3 Connection to 2G/3G network and meter

The network to which the module is connected, 2G and/or 3G, appears from the diodes at the bottom of the module. 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.

3G GPRS METER

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 a PIN

6.3 Connecting meters and M-Bus Master

GSM Modem 8 can be connected to and read both electricity meters, heat meters, and M-Bus Master.

The meter or M-Bus Master is connected to either port A1 (the upper blue terminal) or port B (the lower green terminal) via the 3-wire cable that can be delivered together with the GSM unit.

Figure 3

Meters or M-Bus Master are connected as follows:

Kamstrup 162/382 Kamstrup 351/351 Combi M-Bus Master MULTICAL® RF Concentrator	GSM modem 8 3G **Port A1 or Port B** (Kamstrup RS232)	Electricity meters Heat meters M-Bus Master and RF Concentrator
	DATA	62 Brown
	REQ	63 White
	GND	64 Green

P/L precision electricity meter	GSM modem 8 3G **Port A2** (Genuine RS232)	P/L electricity meter *	
	Rx	Tx	brown (23 or 24)
	Tx	Rx	white (24 or 23)
	GND	GND	green (25)

* Always check the inside of the terminal cover of the P/L meter as the connections of the different types might differ.

For the connection of the two P/L precision meters for the same GSM modem, a standard cable must be mounted on port A as described above and a special P/L cable on port B (Order no. 5915097)

7 M-Bus data logger (variant)

GSM Modem 8 can be provided with an M-Bus data logger that can log values via an M-Bus interface. The M-Bus data logger is a top module that is mounted in the lid of GSM Modem 8. It can be ordered to be factory-mounted.

Order number: 68G8X2XXXXXXX

This module enables connection and data logging of consumption meters complying with the M-Bus standard EN13757.

The M-Bus logger reads hourly data and event log from the connected meter and at the same time it functions as supply unit for the M-Bus module in the meter. The M-Bus logger has an integrated RTC (Real Time Clock), providing all data with a time stamp.

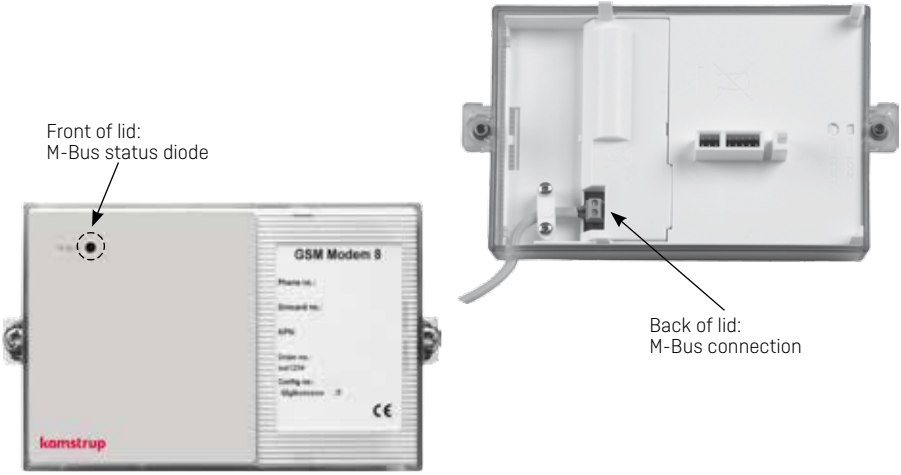
The logger's depth is 1080 logs which corresponds to 45 days' hourly data.

It is possible to log the following data (if available in the meter):

Energy – Volume – T_{flow} – T_{return} – Delta T – Power – Flow

7.1 Connecting M-Bus unit

The two units are connected with the enclosed two-wire cable. On the front plate of GSM modem 8 3G, it is possible to see immediately if communication between the two units is accomplished without problems as the M-Bus diode will flash quickly in case of errors.



8 Error detection help

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

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

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.
In case of weak mobile signal	Mount an external antenna. Reposition the antenna to find the optimal position, if required. Note that GSM8i RF 3G must ALWAYS have an external antenna of the type 6699407 or 6699408 mounted.
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 a text message 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 have been received.
Defective modem	Enclose a precise description of the error and return to Kamstrup.

9 SMS commands

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

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 reply, meter error	No reply from meter
Return reply, command error	NO ANSWER

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 reply, meter error	No reply from meter
Return reply, command error	NO ANSWER

10 Variant structure of GSM Modem 8