

KUHSE Network Gateway KNG – Slave station modem



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2. Version information

Version	Date	Comment	Abbreviation
0.0	10/10/2008	Draft	MA
0.1	31/10/2008	First issue	MA

3. Introduction

3.1. Remarks about the following documentation



The information symbol highlights important remarks about operation or commissioning and connection, which must be adhered to.



The caution symbol makes you aware of dangers that could lead to destruction of the device, or equipment and devices connected to it. The remarks must be adhered to and the relevant precautions must be taken.

3.2. Safety notices



- Installation and commissioning may only be carried out by personnel with sufficient qualifications.
- Usable specifications (in particular, the VDE specifications) must be adhered to.
- Before commissioning, refer to the remarks in these instructions.

3.3. General device description

The KNG (KUHSE Network Gateway) is a multi-interface converter for various data couplings.

In the variant as a slave station modem (SM), the KNG of the TeleControl slave station serves as a modem replacement and creates the connection to the TeleControl master server via an existing Ethernet network and the internet. (see diagram)

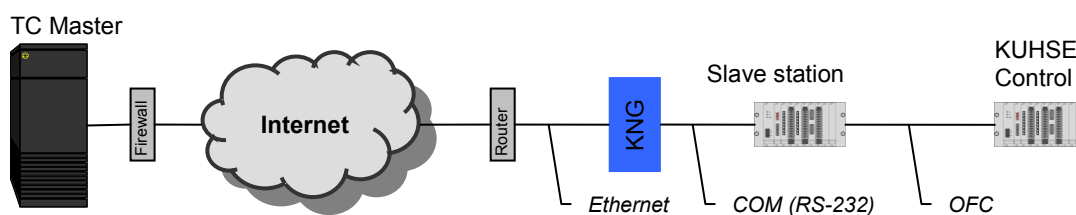


Diagram 1: Figure showing KNG use

4. Device installation and connection

4.1. Overview of the connections and displays

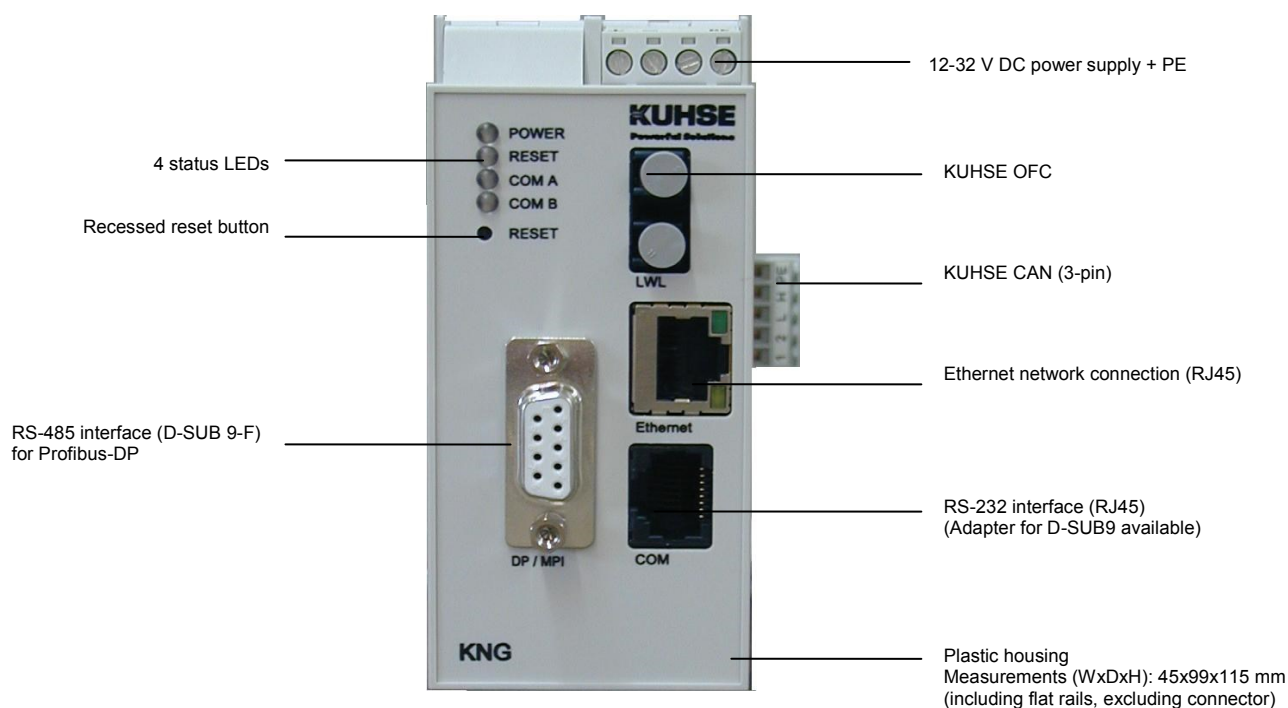


Diagram 2: Overview of the displays and connections

4.2. Power supply and earthing

Terminal	Connection
+ (1)	Power supply (12-32 V DC)
- (2)	Ground
(3)	Not connected
PE (4)	Functional earth

Table 1: Connections, power supply and earthing



To ensure interference resistance for the KNG, the device must be connected with the protective earth (PE).

4.3. Ethernet interface

The KNG is equipped with a normal RJ45 Ethernet connection. This can be used to connect the KNG to a network using a patch cable (not included).

4.4. Serial interfaces

4.4.1. Optical fibre conductor interface

The KNG is equipped with a KUHSE OFC (optical fibre conductor) interface, which is used for data coupling with KUHSE devices.

4.4.2. RS-232 interface

The RS-232 interface of the KNG is designed as an RJ45 connection. The maximum cable length is 15 metres.

Pin	Connection (signal)
1	Not connected
2	DCD
3	DTR
4	Ground (signal ground)
5	RXD
6	TXD
7	Connected internally (connection identification)
8	

Table 2: RS-232 interface connections

An adapter cable on the D-SUB9 connector is available for the RS-232 interface. This is included with all device variants that require this connection.

Pin	Connection (signal)
1	DCD
2	TXD
3	RXD
4	DTR
5	Ground (signal ground)
6	Not connected
7	
8	Connected internally via KNG
9	Not connected

Table 3: Configuring adapter cable RS-232 on D-SUB9

4.4.3. RS-485 interface

The serial RS-485 interface of the KNG is designed as a three-pin connector. In the corresponding device variants, it serves as a Profibus or an MPI interface. The RS-485 bus must be terminated on both sides. The resistor to bus termination (220 ohm) is integrated into the KNG and is active by default. The maximum bus length is 30 metres.

Terminal	Connection (signal)
B (1)	Signal line B (TX/RX-)
A (2)	Signal line A (TX/RX+)
PE (3)	Functional earth (screen)

Table 4: RS-485 interface connections

4.5. CAN bus

A bus connection for the CAN bus is provided on the underside of the housing. This bus can be used to connect individual modules or external devices to the KNG for data coupling purposes.

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The CAN bus must be connected using the provided bus connector for corresponding device variants. The CAN bus must be terminated on both sides. The resistor to bus termination (120 ohm) is integrated into the KNG and is active by default. The maximum bus length is 30 metres.

Pin	Connection (signal)
1	Ground (ground, optional)
2	+5V DC (optional)
L (3)	CAN bus low
H (4)	CAN bus high
PE (5)	Protective earth (CAN bus screen)

Table 5: Configuring bus connection (CAN bus ())



Diagram 3: KNG bus connection with connector

4.6. Connecting the slave station modem

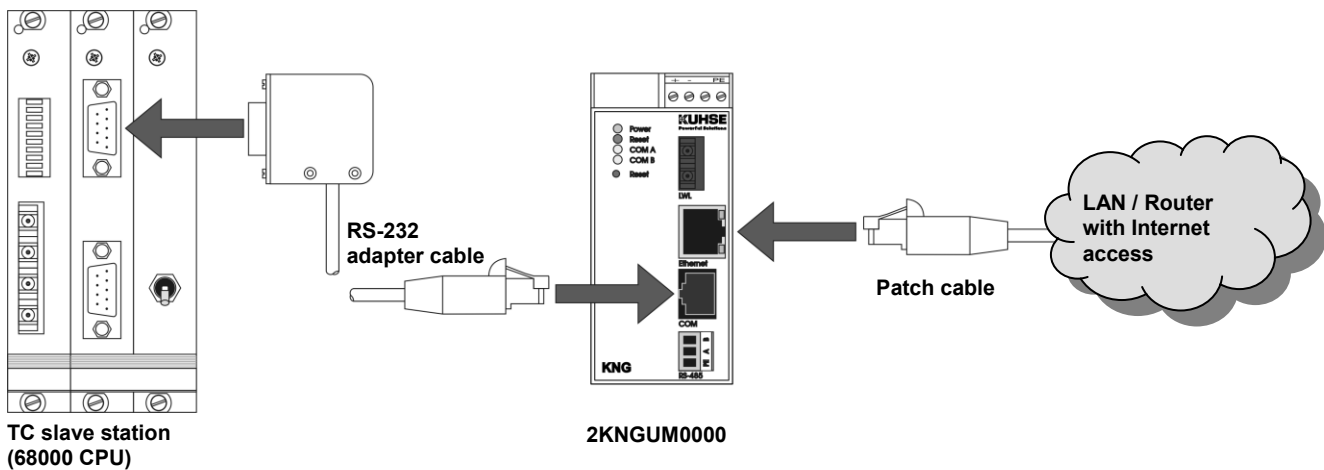


Diagram 4: Connecting the slave station modem

As shown in the diagram, the KNG slave station modem (2KNGUM0000) is connected to the TeleControl slave station via the RS-232 adapter cable (article number 3420000131) that is included. An interface card is required for this. In slave stations with

external modems, this is already built in for the modem connection. In these installations, the external modem can be directly replaced by the KNG.

In slave stations that have an internal KUHSE modem card, this must be replaced by an interface card. An adjustment to the installation software is not required here either.

In addition, the service switch must be replaced or upgraded in both cases. A special front panel (4TE) with a switch is available for this (article number 4120001121). The panel must be placed to the right of the interface card in the slave station frame and connected to this. (see diagram)

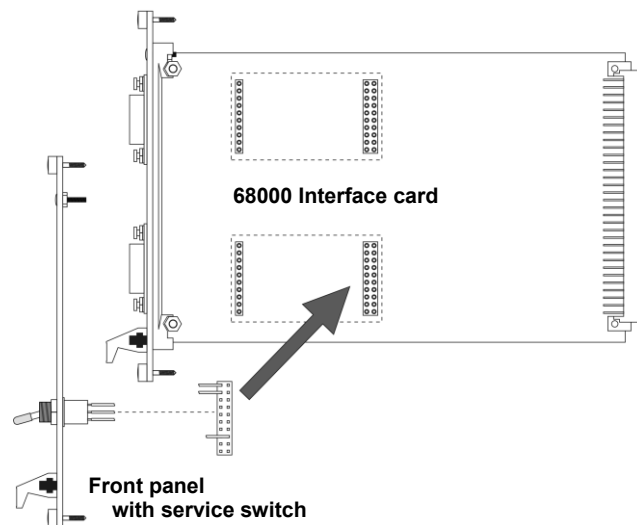


Diagram 5: Connecting the service switch to the interface card

The service switch is connected to the lower interface. This is used for the switch response and is no longer available for communication purposes.

If a sub-board already exists in the bottom slot, this must be removed.

The network connector (Ethernet) must be used to either connect the KNG directly to a router or to a network with internet access. After the KNG is switched on, it attempts to obtain the valid network settings (IP address, gateway address) via DHCP. Therefore, the router or the network must be configured in such a way that address assignment via DHCP is possible.



The KNG only uses an internet connection that is provided because it cannot establish a connection itself. Therefore, it is the operator's responsibility to ensure the reliability of this connection.

5. Operating modes and displays

5.1. Starting process

In the first ten seconds after connecting the power supply or after a reset, a start program (boot loader) runs in the KNG. The KNG performs internal tests and loads the actual operating program (known as the firmware). While the boot loader is active, the COM A LED flashes. After the ten seconds is over, the firmware is executed automatically. If no firmware is installed in the device, the boot loader remains active even after the ten seconds. Basic parameters can be set or the firmware can be updated using the boot loader.

5.2. Device status

The status of the device is shown using four LEDs on the housing cover. The green power LED lights up when the internal operating voltage (5V / 3.3V) is available. The red reset LED shows the reset status while the device is being restarted. The yellow communication LEDs (COM A + B) show the status of individual interfaces or data connections depending on the device variant. In addition, the COM A LED flashing shows the boot loader status.

5.2.1. Boot loader status

If the boot loader of the KNG is active, the communication LED COM A shows the boot loader status, regardless of which device variant exists:

LED	Behaviour	Meaning	Frequency
COM A	On/off	Transitional phase If the device remains in this status for longer than 4 seconds, a device error exists. In this case, please contact Kuhse.	n/a
	Flashing	Boot loader is active, waiting time is elapsing.	10 Hz
	Flashing	Boot loader is in device test mode.	100 Hz

Table 6: Boot loader status (COM A LED)

5.2.2. Communication status (slave station modem)

In the slave station modem variant of the KNG, the communication LEDs show the following status:

LED	Behaviour	Meaning	Frequency
COM A	Off	No online connection	n/a
	On	"Online"	n/a
COM B	n/a	Not used	n/a

Table 7: Status of communication LEDs



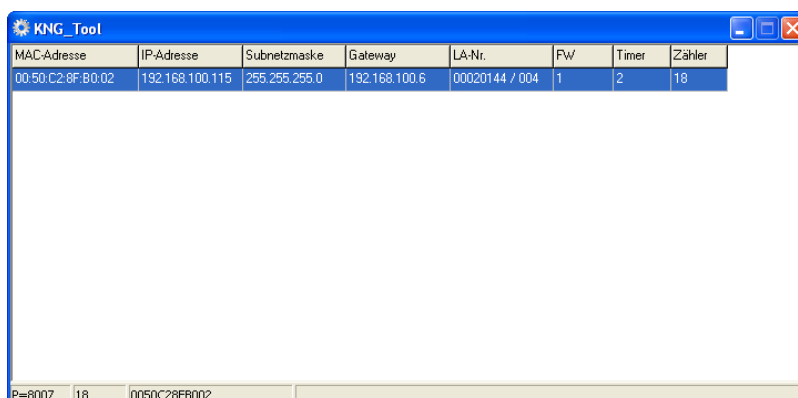
In the displayed status, "Online" means that an online connection was established for the slave station program. This display does not indicate whether a usable internet connection is actually available via the Ethernet network.

5.3. Device reset

If the KNG is in an unclear operating status, it can be reset using a narrow, pointed object to press the reset button. During the reset process, the red reset LED lights up for confirmation.

6. "KNG Tool" service program

The "KNG Tool" service program is required for parametrisation of the KNG and for updating the firmware. The software runs on all Microsoft Windows operating systems. The connection to the device takes place via a network or directly via a crossover patch cable between the PC and the KNG. Therefore, a network-compatible PC is required. The network connection of the PC must be configured for dynamic address assignment (DHCP) or have a fixed IP address that is suitable for the network. After calling the KNG tool, the program lists all accessible devices.



MAC-Adresse	IP-Adresse	Subnetzmaske	Gateway	LA-Nr.	PW	Timer	Zähler
00:50:C2:8F:80:02	192.168.100.115	255.255.255.0	192.168.100.6	00020144 / 004	1	2	18

P=8007 18 0050C28FB002

Diagram 6: "KNG Tool" service program

The device with which the program is to communicate must first be selected from the list. The corresponding MAC address is then displayed in the lower status bar. All functions are available via the context menu (right mouse button).

6.1. Parametrisation

The options for parametrisation differ depending on the device variant that exists. For more information, see the "Parametrisation" chapter.

6.2. Firmware update

The update to the firmware is started via the "Firmware Update" context menu entry. A dialogue follows in which the firmware file that is to be loaded is selected. The update progress is then shown. After the operation is complete, a result dialogue window is displayed.

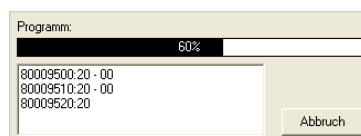


Diagram 7: Firmware update status

To ensure that the KNG uses the new firmware, a reset is required.

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6.3. Security

The KNG can be protected against unauthorised accesses by setting a user-defined password. The protection comprises both the parametrisation and the firmware. This cannot be updated without entering the password after setting up password protection.

To set up password protection, select the "Change Password" context menu entry. Several dialogues appear. First, the current password and then the new password twice are requested; this is to identify and catch possible typing errors. A blank input field always means "No password". At the end, a result dialogue displays whether the password change was successful or not.



The KNG is delivered without a password set up. We strongly recommend that you set up a password when commissioning. KUHSE does not take responsibility for damage caused by inadequate security.



A forgotten password can only be reset by KUHSE. In this case, the KNG must be sent in or a service technician must be requested.

7. Parametrisation



The slave station modem variant of the KNG does not require parametrisation.

8. Technical data

8.1. Housing

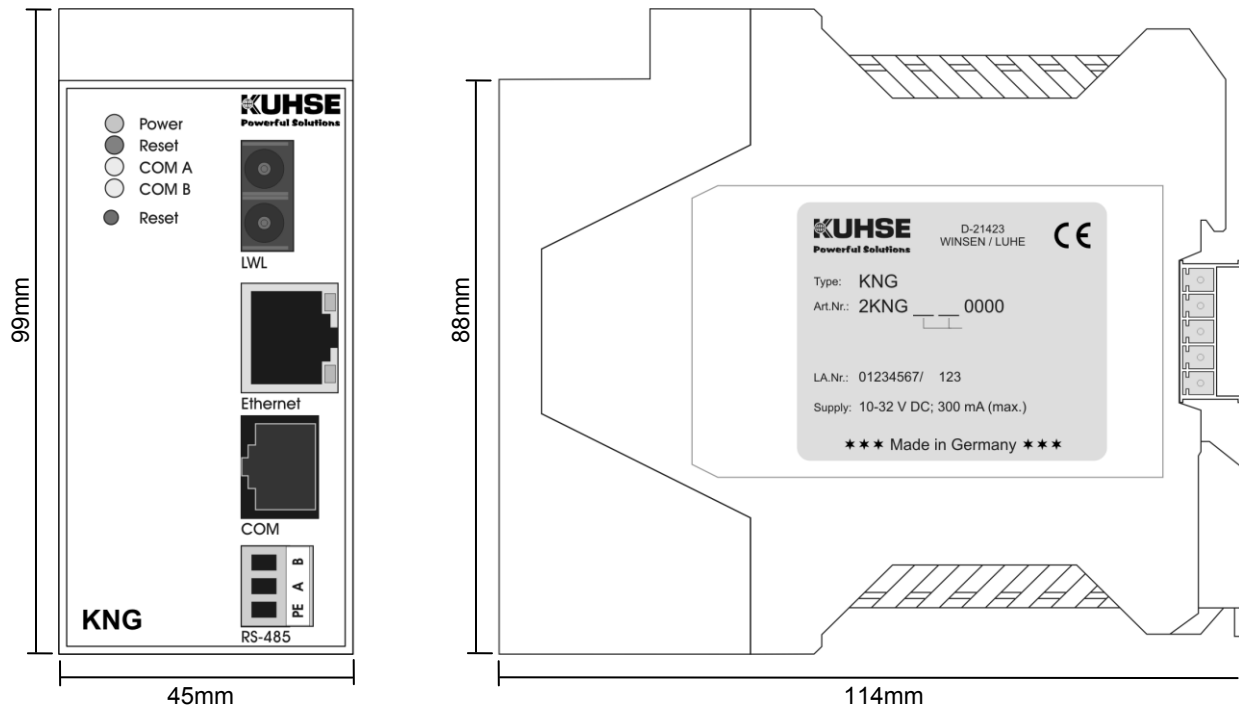


Diagram 8: KNG housing with measurements

Parameter		Unit
Width (without connector and cable)	45	mm
Width (with TBUS connector)	52	mm
Depth (without connector and cable)	99	mm
Height (without connector and cable)	114	mm
Weight	300	g

Table 8: Measurements and weight

The KNG is intended to be mounted on a 35 mm DIN rail (EN50022). For ease of assembly, free space of at least 10 mm must be provided for below the device. When considering the height specification, bear in mind that certain connectors and cables will stick out. Therefore, a corresponding amount of free space must be left above the device.

8.2. Nominal/threshold values

Parameter	Symbol	Conditions	min	type	max	Unit
Power supply						
Voltage	U_{cc}		10	24	32	V_{DC}
Power input	I_{cc}	$U_{cc} = 24V$	80	100	120	mA
		$U_{cc} = 12V$	160	200	240	mA
Power consumption	P				3	W
Environment values						
Temperature	T_A		-10		55	$^{\circ}C$
Humidity		Non-condensing				%
Storage temperature	T_S		-20		70	$^{\circ}C$

Table 9 Nominal/threshold values