kamstrup

Installation and user manual

OMNICON®
data concentrator V2/V3

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Content

1 Description

1.1 OMNICON® data concentrator - in short

- Standardised wireless technology
- Easy plug and play installation
- Prepared for smart grid
- Multi-utility integration
- Automatic collection of metering data
- Support of firmware upgrade for the entire system
- Linux-based open source platform
- Integrated security and tamper detection
- Integrated VPN.

1.2 Metering data collection

OMNICON® data concentrator automatically starts collecting relevant data and events (called conventional data) when the encryption keys from the OMNIPOWER® meter have been received by the head-end system OMNISOFT® UtiliDriver®.

1.3 Network maintenance

OMNICON® data concentrator knows the network within its responsibility area and monitors and maintains a reliable and stable communication.

1.4 Detection and alarm

OMNICON® data concentrator detects events and alarms from the meters, Multi-Utility Controller (MUC) and other communication units and sends these to the head-end system OMNISOFT® UtiliDriver®.

1.5 Storage at WAN interruptions

If no WAN connection is available, conventional data is collected for one day, and when the WAN connection has been re-established, the concentrator sends these values to the head-end system OMNISOFT® UtiliDriver®.

1.6 Data security

OMNICON® data concentrator is part of the complete end-to-end data encryption scheme for OMNIA® Suite.

This means that important commands are end-to-end encrypted as well as transport encrypted.

Conventional data is transport encrypted with AES128 and AES255, respectively.

OMNICON® data concentrator uses an AES128 encryption algorithm towards the radio mesh network (Neighbourhood Area Network) with individual keys for each meter and other communication units.

OMNICON® data concentrator uses an AES256 encryption algorithm towards the head-end system OMNISOFT® UtiliDriver® (Wide Area Network) with individual keys for each concentrator.

In addition, it is possible to select VPN as secure tunnel ændres til: All HES protocols are protected by a secure VPN tunnel.

2 Installation of concentrator

2.1 Mechanical data

Dimensions (L x W x H) [mm]	261 x 145 x 58
Weight	740 g

Protection class
IP20

2.2 Mounting order

1 Connect to 230 V (Start with 2-5 before "1" connect to 230V). Remember earth connection.

2 Connect the IP cable (Ethernet/IP plug no. 2 seen from the left).

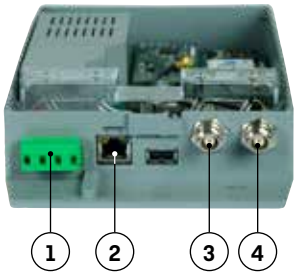
3 Connect a radio antenna (no. 2 plug from the right).

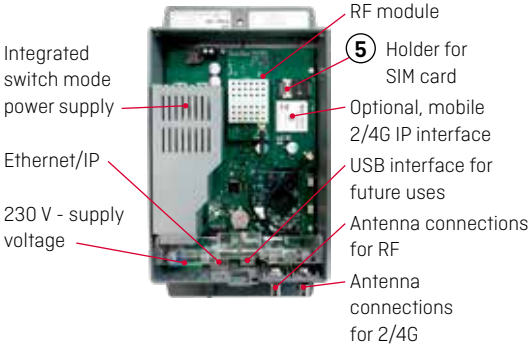
4 Connect a 2/4G antenna if 2/4G is required (the plug to the right).
The antennas are mounted at least 30 cm from the concentrator and from each other.

- In cities, antennas are mounted at low height.
- In the countryside, antennas are mounted at high height.
- In metal cabinets/basements, the antenna must be mounted outdoors.

5a Mount any SIM card in the SIM card holder.

5b Open the holder, mount the SIM card, and close the holder again.





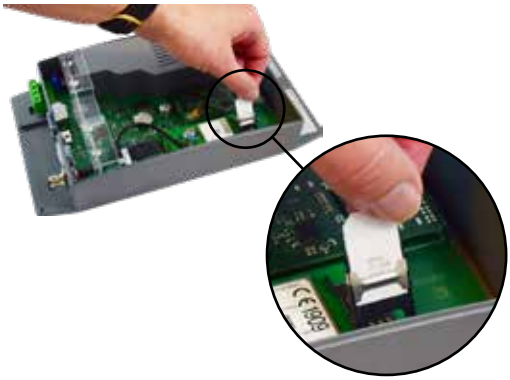
2.3 Mounting of SIM card

The unit can be ordered with SIM card mounted at delivery. Check that the card has been inserted. The phone number of the card appears from a label on the side of the module. Kamstrup A/S cannot be made responsible for theft or misuse of SIM cards.

When the SIM card holder is opened, the voltage 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 delivered without a SIM card, such a card must be inserted before the unit is put into use.

The SIM card holder is opened by pushing the bright holder back and carefully tipping up the holder. Then, the SIM card is inserted with the "cut" corner in the upper left side and the contacts facing the PCB.



2.4 Light-emitting diodes

2.4.1 With FW until R3 august 2021

Decision (P11 2016-Sep):

- **Red:** HW-related
- **Yellow:** Config.-related
- **Green:** OK

Flashing: OMNICON® data concentrator is trying to change the state...

Steady: "Steady" state...

		Power	OMNIA®	RF Mesh	WAN (Eth or Cell)
Off		Off			
Red			Booting	Module not detected	WAN down
Flash Red			Provisioning		
Orange			Non-operational		WAN up
Flash Orange			Operational - not connected	Module stalled	WAN no activity
Green		Power	Operational	Mesh up	WAN with VPN up
Flash Green				Mesh no activity 15 min.	WAN with VPN no activity 15 min.

2.4.2 With FW from R5 from september 2021

Power	System	RF Mesh	WAN status
Off	Off	Off	Off
Green	Off	Off	Off
Green	Green blinking	Off	Off
Green	Green blinking	Red	Off
Green	Green blinking	Off	Off

Power System RF Mesh WAN status

Power: Hardware status

Green: Switch-mode power supply (SMPS) 5V output is good.

Red: N/A

LED is controlled by hardware.

System: Linux + systemd status

Green: Linux heartbeat + systemd status is starting or running.

Red: Linux heartbeat + systemd status is degraded.

Heartbeat shows that the Linux kernel is running and the speed of it is given by CPU load. This LED turns on when the Barebox bootloader has loaded the Linux kernel into the DDR memory from the eMMC flash and has started it.

System service manager is systemd and it ensures that all services that are needed by a given target are running. If one or more services fail, the status changes to degraded.

RF Mesh network status

Current status of the neighborhood area network (NAN) interface.

Green: Flashes for 5 s when receiving an RF Mesh package.

Red: Frontend module restarting/error/missing.

RF Mesh packages can be broadcast (e.g. beacon) or unicast to concentrator (e.g. reply on request or alarm).

During normal boot, the mesh frontend module is restarted and thus it is expected that the LED is red for approx. 25 s.

Everything is good when turned off.

WAN - System connection status

Current status of the wide area network (WAN) interface.

Green: Flashes for 5 s when receiving a TCP/UDP package from the system.

Red: WAN interface issues as VPN IPsec is not connected.

Everything is good when turned off.

2.5 Service/IT requirements

1. On delivery, the concentrator is configured by Kamstrup (see the order form on the website).
2. Changes to the concentrator can be done with the Field Technican Toolkit and Network Manager concentrator provisionering.
3. For setting up VPN, see the white paper 55121661.
4. For setting up provisioning services, see white paper 55121833.
5. Also see the getting started guide: 55121794.

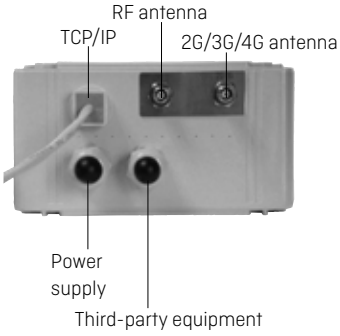
3 OMNICON® data concentrator in outdoor box

- Designed for outdoor installation
- Robust design
- Easy installation
- Antenna plugs for RF and 2G/3G/4G
- Built-in breaker and fuse
- Room for extra lightning protection

3.1 Mechanical data

Size [mm]	200 x 400 x 135
Weight	3.5 kg
– incl. installation kit	5.0 kg
IP class	IP54
Antenna plug type [RF and 2G/3G]	TNC (f)

3.2 Inputs



3.3 Accessories

RF antennas	
Box with 12 x external antennas, 4.5 m cable, TNC connector	6880 007
Box with 12 x external antennas, 7.5 m cable, TNC connector	6880 001
Box with 9 x external antennas, 4.5 m cable, TNC connector and fitting	6880 008
Box with 9 x external antennas, 7.5 m cable, TNC connector and fitting	6880 002
Triangle antenna without cable and connector	6699 408
Triangle antenna, 30 cm cable with SMA connector for extension up to 30 m (*1)	6699 496

Antenna cable	
7.5 m cable with TNC connector	6880 003
15 m cable with TNC connector	6880 004

2G/3G/4G antennas	
Mini-Triangle, 30 cm cable, TNC connector	688 0016
Mini-Triangle, 2.5 m cable, TNC connector	688 0012
Mini-Triangle, 10 cm cable, SMA connector (*1)	688 0013
Directional, external antenna, SMA connector (*1)	688 0014

Antenna cable/accessories: (*1)	
Antenna cable SMA (F) to SMA (M), 5 m	5000429
Antenna cable SMA (F) to SMA (M), 10 m	5000441
Antenna cable SMA (F) to SMA (M), 15 m	5000442
Adapter SMA to TNC	1643313

Mounting kit for OMNICON® data concentrator	6699 469