



# Data Sheet

2016 v1.0

## SMARTRAIL X45M-MID DIN Rail Multifunction Power Meter

- MID B&D Approved
- Class B (kWh) EC Directive 2004/22/EC
- Certificate Number 0120/SGS0221
- Dual Pulsed Outputs
- RS485 Modbus RTU Comms
- Digital Backlit Display



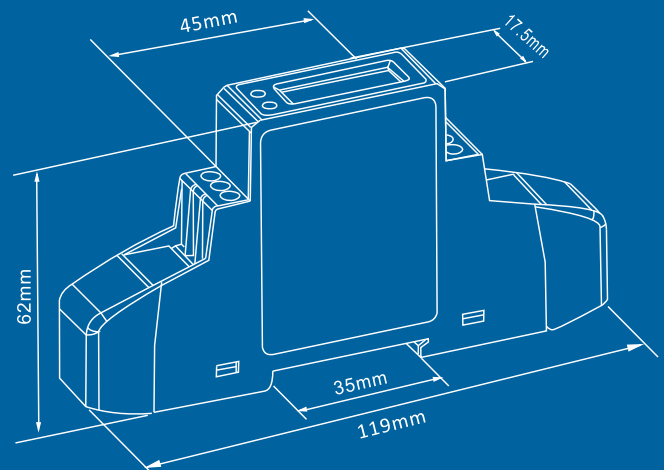
## SMARTRAIL X45M-MID Single Phase kWh Meter

The SMARTRAIL X45 family of meters have been produced to offer a low-cost solution to metering low Amp circuits. The SMARTRAIL X45 range work directly connected to a maximum load 45A AC circuit.

This particular version of the SMARTRAIL X45 has Dual Pulsed Outputs as well as Built In RS485 Modbus RTU comms. The X45M measures a vast range of parameters, including Voltage, Current and Power Factor.

All SMARTRAIL X45 meters are housed in a 1 Module DIN rail-mounted housing. They also come complete with sealable terminal covers to stop any tampering with the connections.

## Dimensions



## Measured Parameters

The SMARTRAIL X45M monitors and displays the following parameters of a single phase two wire (1p2w) system:

- Voltage (V)
- Current (A)
- Active Power (kW)
- Reactive Power (kVAr)
- Apparent Power (kVA)
- Power Factor (PF)
- Frequency (Hz)
- Import Active Energy (kWh)
- Export Active Energy (kWh)
- Total Active Energy (kWh)
- Import Reactive Energy (kVArh)
- Export Reactive Energy (kVArh)
- Total Reactive Energy (kVArh)

## Voltage and Current

- Phase to Neutral Voltage - 176 to 276V AC
- Phase Current - Imin-Ib(I<sub>max</sub>) 0.25-5(45)A AC

## Power factor and Frequency and Max. Demand

- Frequency in Hz
- Instantaneous power:
- Power 0 to 3600 MW
- Reactive power 0 to 3600 MVA
- Volt-amps 0 to 3600 MVA
- Maximum demanded power since last Demand reset Power factor

## Energy Measurements

Imported/Exported active energy	0 to 99999.99 kWh
Imported/Exported reactive energy	0 to 99999.99 kVArh
Total active energy	0 to 99999.99 kWh
Total reactive energy	0 to 99999.99 kVArh

## Measured Inputs

Nominal Voltage Input	(Ph+N) 176 to 276V
Max Continuous Voltage	120% of nominal
Nominal Input Current	5(45)A
Max Continuous Current	120% of nominal
Frequency	50Hz (±10%)

## Accuracy

Voltage	0-5% of range maximum
Current	0-5% of nominal
Frequency	0-2% of mid-frequency
Power factor	1% of unity (0.01)
Active power (W)	±1% of range maximum
Reactive power (VA)	±1% of range maximum
Apparent power (VA)	±1% of range maximum
Active energy (Wh)	Class 1 IEC 62053-21
Reactive energy (VArh)	±1% of range maximum

## Interfaces for External Monitoring

Two interfaces are provided:

- RS485 communication channel that can be programmed for Modbus RTU protocol
- Relay output indicating real-time measured energy.(configurable)

The Modbus configuration (baud rate etc.) and the pulse relay output assignments (kW/kVArh, import/export etc.) are configured through the set-up screens.

## Pulse Output

The meter provides two pulsed outputs, both pulsed outputs are passive type. The first pulsed output is configurable. The pulsed output can be set to read total / import / export/ kWh / kVarh. The pulse constant can be set to generate 1 pulse per: 0.001(default) /0.01/0.1/1kWh/kVarh. The second pulsed output is non-configurable. It is fixed to read total kWh.

**Rate** can be set to generate 1 pulse per:

0.001 = 1 Wh/VArh (default)

0.01 = 10 Wh/VArh

0.1 = 100 Wh/VArh

1 = 1 kWh/kVArh

**Pulse width** 200/100/60 ms.

## RS485 Output for Modbus RTU

For Modbus RTU, the following RS485 communication parameters can be configured from the set-up menu:

**Baud rate** 1200, 2400, 4800, 9600.

**Parity** none (default) / odd / even

**Stop bits** 1 or 2

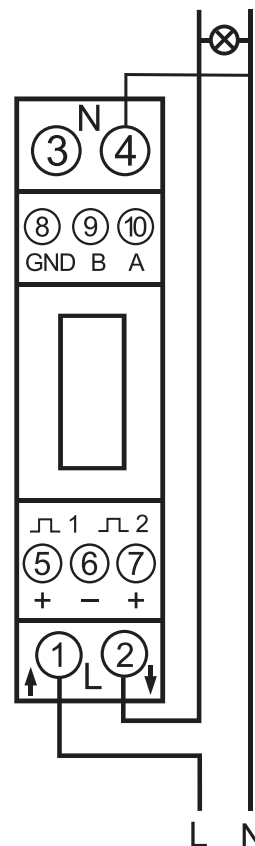
**RS485 network address** 3-digit number, 1 to 247

## Reference Conditions of Influence Quantities

Influence Quantities are variables that affect measurement errors to a minor degree. Accuracy is verified under nominal value (within the specified tolerance) of these conditions.

Ambient temperature	23°C ±1°C
Input waveform	50 or 60Hz ±2%
Input waveform	Sinusoidal (distortion factor < 0.005)
Auxiliary supply voltage	Nominal ±1%
Auxiliary supply frequency	Nominal ±1%
Auxiliary supply waveform (if AC)	Sinusoidal (distortion factor < 0.05)
Magnetic field of external origin	Terrestrial flux

## Wiring Diagram



## Environment

Operating temperature	-25°C to +55°C*
Storage temperature	-40°C to +70°C*
Relative humidity	0 to 95%, non-condensing
Altitude	Up to 3000m
Warm up time	1 minute
Vibration	10Hz to 50Hz, IEC 60068-2-6, 2g
Shock	30g in 3 planes

\*Maximum operating and storage temperatures are in the context of typical daily and seasonal variation.

## Mechanics

DIN rail dimensions	36mm x 90mm (WxH) per DIN 43880
Mounting	DIN rail (DIN 43880)
Sealing	IP51 indoor
Material	Self-extinguishing UL 94 V-0

Specifications are subject to change without notice.