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Data Sheet

2017 v1.0

SMART X96-5-MID

96mm² Panel Mounted Multifunction Power Meter (MID Certified)



Easy Click

- MID B+D Certified by SGS UK
- Class B (1.0 % kWh) EC Directive 2004/22/EC
- Certified for Single & Three Phase
- Certified for Import / Export kWh
- Phase Summary Screen

SMART X96-5 Multifunction Power Meter

The SMART X96-5 is a new generation modern design power monitor that will measure and display electrical power quality parameters. It has been engineered to cover most applications (Single Phase and Three Phase networks / Built in Pulsed and RS485 Modbus / Import and Export kWh), replacing the need for several different models of this power meter.

As the demand for MID certified meters has increased, we have obtained annex B and D of the EC Directive 2004/22/EC. This power meter has been tested and certified for single or three phase networks and import and export active energy (kWh).

The SMART X96-5 is produced to the highest quality and utilizes the latest microprocessor and technology. It has a backlit display and 16 different measuring parameters. This includes a negative power reading to indicate reversal of CT installation or connection. With built in pulsed outputs and RS485 Modbus RTU it is fully compatible for integration with BMS and remote monitoring systems.

Parameters

- Phase to Neutral Voltage (V)
- Phase to Phase Voltage (V)
- Phase Current (A)
- Voltage Total Harmonic Distortion (U%THD)
- Current Total Harmonic Distortion (I%THD)
- Frequency (Hz)
- Power Factor (PF)
- Current Max Demand (MD A)
- Power Max Demand (MD kW)
- Active Power (kW)
- Reactive Power (kVAr)
- Apparent Power (kVA)
- Import Active Energy (kWh)
- Export Active Energy (kWh)
- Total Active Energy (kWh)
- Import Reactive Energy (kVArh)
- Export Reactive Energy (kVArh)
- Total Reactive Energy (kVArh)

SmartConnect "Plug In" System

Our meter is designed to heavily reduce labour costs!

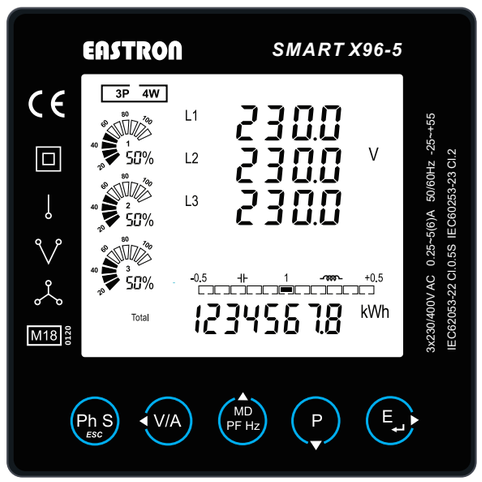
The SMARTPANEL X835-MID meter features cleverly engineered Plug-in terminals, allowing for a quicker, simpler installation process. The unit comes supplied with Terminal plugs for traditional wiring as standard, alternatively the unit can be supplied with wiring looms for a quick, error-free installation. Wiring looms are available in a variety of different lengths, and also can be custom-made to order in the UK for a quick turnaround.

Once the meter has been mounted within a 92mm^2 panel cut-out, and all plugs have been connected to the meter, the clip in terminal covers can be attached the the back of the meter and sealed. This ensures that once the installation is completed, the wiring is tamper-proof and cannot be accessed again without breaking the seals.

Backlit Display

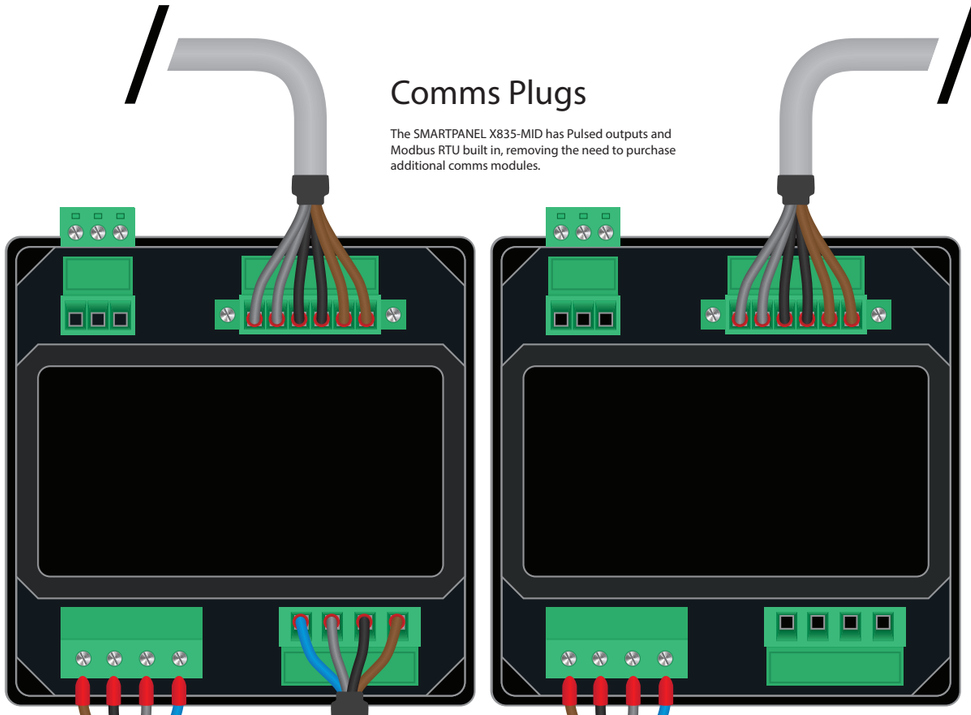
Ensuring the meter can be read at all times!

The display on the SMARTPANEL meter features a backlight, ensuring it can be clearly seen even in poor lighting conditions. The display also features graphs for visual representation of current load, clearly indicating if the system is under-performing, or if it is exceeding a safe load.



Comms Plugs

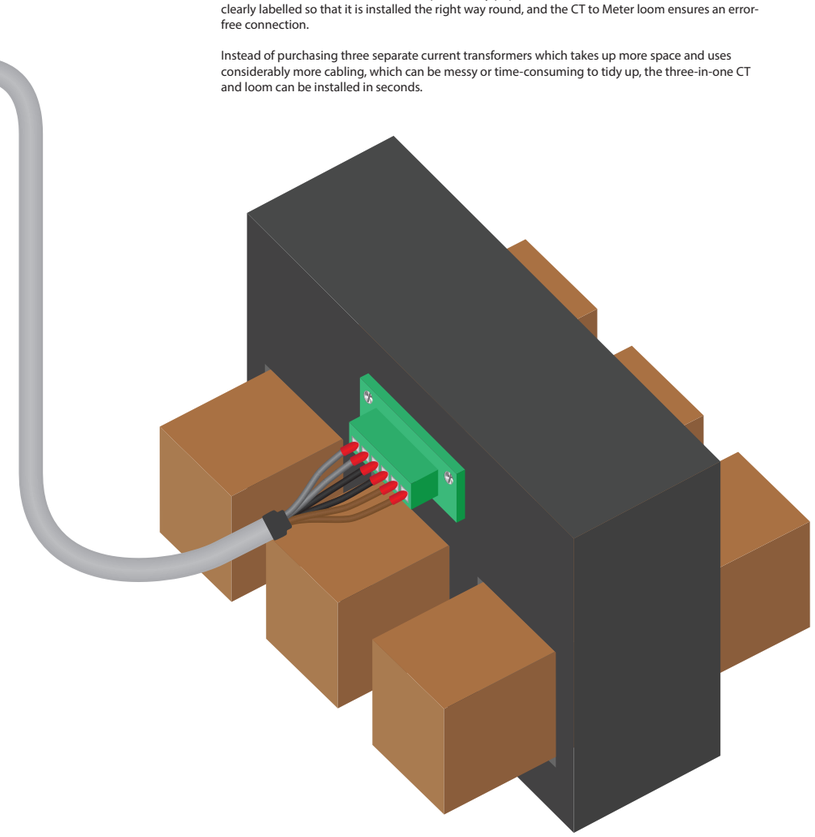
The SMARTPANEL X835-MID has Pulsed outputs and Modbus RTU built in, removing the need to purchase additional comms modules.



Meter to CT Loom

Pre-wired looms ensure an error-free install!

Instead of using traditional terminals, the pre-wired loom is a proven method of connecting the meter to the current transformer significantly quicker; using a loom eridicates human error.



Plug In Current Transformers

Three-in-one Current Transformers save space and money!

Three-in-one Current Transformers are particularly popular due to the ease of installation. The CT is clearly labelled so that it is installed the right way round, and the CT to Meter loom ensures an error-free connection.

Instead of purchasing three separate current transformers which takes up more space and uses considerably more cabling, which can be messy or time-consuming to tidy up, the three-in-one CT and loom can be installed in seconds.

Touch-sensitive Buttons

The touch-sensitive buttons of the SMARTPANEL X835-MID make it easy to navigate through the various parameter screens. The meter also has a programming menu to configure the meter, this saves time in comparison to alternatives that require programming through modbus interogation.

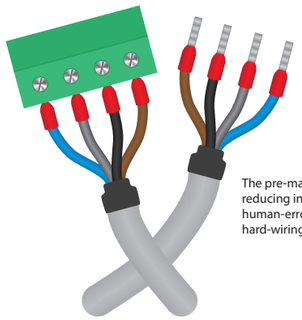


Voltage to Fuse Loom

Quick and easy to connect, no auxiliary!

The pre-wired plug of the Voltage to Fuse loom clicks into the SMARTPANEL X835 meter and has open tails on the other end for connection to the appropriate fused breaker.

The SMARTPANEL X835-MID has an intelligent self-supplying auxiliary which draws power from any available phase connected, this guarantees that the meter stays powered and recording if one of the connected phases fails.



Voltage Daisy Chain

Cut down on fused terminals!

By using the Voltage to Voltage loom, you can reduce the number of fused terminals used on the installation. Up to 32 SMARTPANEL meters can be daisy chained from a single set of fuses.

The pre-made looms are a proven method of dramatically reducing installation time, as well as eradicating potential human-error. The looms are a cost-effective alternative to hard-wiring the units.

Specifications

Measured Parameters

The unit can monitor and display the following parameters of a Single Phase Two Wire (1P2W), Three Phase Three Wire (3P3W) or Three Phase Four Wire (3P4W) system.

Voltage and Current

- Phase to Neutral Voltages 100 to 276V AC (not for 3P3W supplies).
- Phase to Phase Voltages 174 to 480V AC (3 Phase supplies only).
- Percentage total Voltage Harmonic Distortion (U THD%) for each Phase to N (not for 3P3W supplies).
- Percentage Voltage THD% between Phases (3 Phase supplies only).
- Percentage total Current Harmonic Distortion (I THD%) for each Phase.

Power factor and Frequency and Max. Demand

- Frequency in Hz (45~66Hz)
- Instantaneous power:
- Power 0 to 999MW
- Reactive power 0 to 999MVAr
- Volt-amps 0 to 999MVA
- Maximum demanded power since last Demand reset
  Power factor
- Maximum neutral demand current, since the last Demand reset (for 3 Phase supplies only)

Energy Measurements

Imported/Exported active energy	0 to 9999999.9 kWh
Imported/Exported reactive energy	0 to 9999999.9 kVArh
Total active energy	0 to 9999999.9 kWh
Total reactive energy	0 to 9999999.9 kVArh

Measured Inputs

Voltage inputs through 4-way fixed connector with 2.5mm² stranded wire capacity. Single Phase Two Wire (1P2W), Three Phase Three Wire (3P3W) or Three Phase Four Wire (3P4W) unbalanced. Line frequency measured from L1 Voltage or L3 Voltage. Three Current inputs (six physical terminals) with 2.5mm² stranded wire capacity for connection of external CTs. Nominal rated input Current 5A or 1A AC RMS.

Nominal Voltage Input	100-276V AC (Ph+N) or 174-480V AC (Ph+Ph)
Max Continuous Voltage	120% of Nominal
Nominal Input Current	0.25-5A(6)A AC RMS
Max Continuous Current	120% of Nominal
Nominal Input Current Burden	0.5VA
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 (VAr)	±1% of range maximum
Apparent Power (VA)	±1% of range maximum
Active Energy (Wh)	Class 1 IEC 62053-21 or Class 0.5 IEC 62053-22
ReactiveEnergy (VARh)	Class 2 IEC 62053-23
Total Harmonic Distortion	1% up to 63rd harmonic

Auxiliary Supply

This unit does not require a separate auxiliary supply; the unit draws the necessary power from the voltage input connections. If a three phase supply is connected, and the phase that is powering the unit fails, it will change the phase supply to avoid shutting down.

Interfaces for External Monitoring

Three interfaces are provided:

- RS485 communication channel that can be programmed for Modbus RTU protocol
- Relay output indicating real-time measured energy.(configurable)
- Pulse output 3200imp/kWh (not 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.

Pulsed Outputs

The pulsed outputs are "passive type" and comply with Class A IEC 62053-31. The pulse output can be set to generate pulses to represent kWh or kVArh.

The Pulse Rate can be set as follows:
0.001 = 1 pulse per 1 Wh/VArh (1000 pulses per kWh/kVArh)
0.01 = 1 pulse per 10 Wh/VArh (100 pulses per kWh/kVArh)
0.1 = 1 pulse per 100 Wh/VArh (10 pulses per kWh/kVArh)
1 = 1 pulse per 1 kWh/kVArh
10 = 1 pulse per 10 kWh/kVArh
100 = 1 pulse per 100 kWh/kVArh
1000 = 1 pulse per 1000 kWh/kVArh

The Pulse width can we set as 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 2400, 4800, 9600, 19200, 38400

Parity none (default) / even / odd

Stop bits 1 or 2

RS485 network address three digit number, 001 to 247

Response Time <100mS

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

Environment

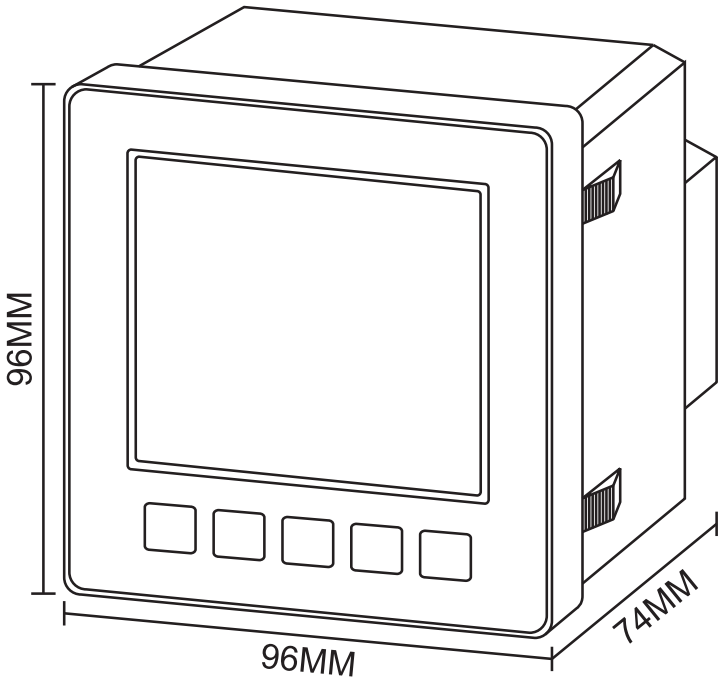
Operating temperature	-25°C to +55°C*
Storage temperature	-40°C to +70°C*
Relative humidity	0 to 95%, non-condensing
Altitude	Up to 3000m
Warm up time	1 minute
Vibration	10Hz to 50Hz, IEC 60068-2-6, 2g
Shock	30g in 3 planes

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

Mechanics

Dimensions	96 x 96 x 74mm (WxHxD)
Mounting	DIN 96 (92mm² Cutout)
Sealing	IP51 indoor
Material	Self-extinguishing UL 94 V-0

Dimensions



Installation

