SMARTRAIL X835-100-MID
DIN Rail Multifunction Power Meter - 100A Direct Connected (MID Certified)

- MID B&D Certified by SGS UK
- Certified for Single & Three Phase
- Certified for Import / Export kWh
- Certificate Number 0120/SGS0232
- Built in Pulse & Modbus Comms

SMARTRAIL X835-100-MID
Multifunction Power Meter

The SMARTRAIL X835-100-MID 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 SMARTRAIL X835-100-MID is produced to the highest quality and utilizes the latest microprocessor and technology. It has a blue backlit display and 16 different measuring parameters. This meter supports a maximum 100A Direct connection. Available 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 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)
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 100-289V AC (not for 3P3W supplies).
- Phase to Phase Voltages 173-500V AC (3 Phase supplies only).
- Percentage Total Voltage Harmonic Distortion (U% THD) for each Phase to N (not for 3P3W supplies).
- Percentage Voltage Total Harmonic Distortion (U% THD) between Phases (3 Phase supplies only).
- Percentage Current Total Harmonic Distortion (I% THD) for each Phase.

**Power factor and Frequency and Max. Demand**
- Frequency in Hz
- Instantaneous power:
  - Power 0-3600 MW
  - Reactive Power 0-3600 MVar
  - Volt-Amps 0-3600 MVA
- Maximum Demand Power since last reset
- Power factor
- Maximum neutral Demand Current, since the last reset (for Three Phase supplies only)

**Energy Measurements**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imported/Exported active energy</td>
<td>0 to 9999999.9 kWh</td>
</tr>
<tr>
<td>Imported/Exported reactive energy</td>
<td>0 to 9999999.9 kVAr</td>
</tr>
<tr>
<td>Total active energy</td>
<td>0 to 9999999.9 kWh</td>
</tr>
<tr>
<td>Total reactive energy</td>
<td>0 to 9999999.9 kVAr</td>
</tr>
</tbody>
</table>

**Measured Inputs**
Voltage inputs through 4-way fixed connector with 25mm² 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Voltage Input</td>
<td>100-289V AC (Ph+N) or 173-500V AC (Ph+Ph)</td>
</tr>
<tr>
<td>Max Continuous Voltage</td>
<td>120% of Nominal</td>
</tr>
<tr>
<td>Nominal Input Current</td>
<td>0.5-10(100)A AC</td>
</tr>
<tr>
<td>Max Continuous Current</td>
<td>120% of Nominal</td>
</tr>
<tr>
<td>Frequency</td>
<td>50Hz ±10%</td>
</tr>
</tbody>
</table>

**Accuracy**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>0.5% of range maximum</td>
</tr>
<tr>
<td>Current</td>
<td>0.5% of nominal</td>
</tr>
<tr>
<td>Frequency</td>
<td>0.2% of mid-frequency</td>
</tr>
<tr>
<td>Power Factor</td>
<td>1% of unity (0.01)</td>
</tr>
<tr>
<td>Active Power (W)</td>
<td>±1% of range maximum</td>
</tr>
<tr>
<td>Reactive Power (VAr)</td>
<td>±1% of range maximum</td>
</tr>
<tr>
<td>Apparent Power (VA)</td>
<td>±1% of range maximum</td>
</tr>
<tr>
<td>Active Energy (Wh)</td>
<td>Class 1 IEC 62053-21</td>
</tr>
<tr>
<td>ReactiveEnergy (VArh)</td>
<td>±1% of range maximum</td>
</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>1% up to 31st harmonic</td>
</tr>
<tr>
<td>Response time to step input</td>
<td>1s, typical, to &gt;99% of final reading, at 50 Hz.</td>
</tr>
</tbody>
</table>
**Auxiliary Supply**
This unit does not require a separate auxiliary supply as it is self-powered from the Voltage Inputs.

**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.

**Pulse Output**

Opto-coupler with potential free SPST-NO Contact (Contact rating - Voltage: 5-27V DC, Current: Imin 2mA and Imax 27mA DC).

The pulse output can be set to generate pulses to represent kWh or kVArh.

Rate can be set to generate 1 pulse per:

- 0.01 = 10 Wh/VArh
- 0.1 = 100 Wh/VArh
- 1 = 1 kWh/kVArh
- 10 = 10 kWh/kVArh
- 100 = 100 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:** 2400, 4800, 9600, 19200, 38400
- **Parity:** None (default) / Odd / Even
- **Stop Bits:** 1 or 2
- **RS485 Network Address:** 3 Digit Number - 001 to 247

**Modbus™ Word order** Hi/Lo byte order is set automatically to normal or reverse. It cannot be configured from the set-up menu.

**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.

<table>
<thead>
<tr>
<th>Influence Quantity</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>23°C ± 1°C</td>
</tr>
<tr>
<td>Input waveform</td>
<td>50 or 60Hz ± 2%</td>
</tr>
<tr>
<td>Input waveform</td>
<td>Sinusoidal (distortion factor &lt; 0.005)</td>
</tr>
<tr>
<td>Auxiliary supply voltage</td>
<td>Nominal ± 1%</td>
</tr>
<tr>
<td>Auxiliary supply frequency</td>
<td>Nominal ± 1%</td>
</tr>
<tr>
<td>Auxiliary supply waveform (if AC)</td>
<td>Sinusoidal (distortion factor &lt; 0.05)</td>
</tr>
<tr>
<td>Magnetic field of external origin</td>
<td>Terrestrial flux</td>
</tr>
</tbody>
</table>

**Environment**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>-25°C to +55°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40°C to +70°C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>0 to 95%, non-condensing</td>
</tr>
<tr>
<td>Altitude</td>
<td>Up to 3000m</td>
</tr>
<tr>
<td>Warm up time</td>
<td>1 minute</td>
</tr>
<tr>
<td>Vibration</td>
<td>10Hz to 50Hz, IEC 60068-2-6, 2g</td>
</tr>
<tr>
<td>Shock</td>
<td>30g in 3 planes</td>
</tr>
</tbody>
</table>

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN rail dimensions</td>
<td>72mm x 100mm (WxH) per DIN 43880</td>
</tr>
<tr>
<td>Mounting</td>
<td>DIN rail (DIN 43880)</td>
</tr>
<tr>
<td>Sealing</td>
<td>IP51 indoor</td>
</tr>
<tr>
<td>Material</td>
<td>Self-extinguishing UL 94 V-0</td>
</tr>
</tbody>
</table>

### Dimensions

![Dimension Diagram]

- Dimensions: 72mm x 100mm (WxH) per DIN 43880
- Sealing: IP51 indoor
- Material: Self-extinguishing UL 94 V-0

### Installation

#### Single phase two wires

- L1
- N
- B
- A
- G
- 10
- 11
- 12
- 13
- 14
- 15
- RS485
- PULSE

#### Three phase three wires

- L1
- L3
- L2
- B
- A
- G
- 10
- 11
- 12
- 13
- 14
- 15
- RS485
- PULSE

#### Three phase four wires

- L1
- L2
- L3
- N
- B
- A
- G
- 10
- 11
- 12
- 13
- 14
- 15
- RS485
- PULSE

Specifications are subject to change without notice.