



SIMATIC S7-1200, Analog input, SM 1238 Energy Meter 480 V AC, power measurement module for data acquisition in 1- and 3-phase supply systems (TN, TT) up to 480 V AC; Current range: 1 A, 5A; acquisition of voltage, current, phase angles, power, energy values, frequencies; Channel diagnostics

| General information | |
|--|-----------------------------------|
| Product type designation | SM 1238, AI energy meter 480 V AC |
| HW functional status | From FS02 |
| Firmware version | V2.0.1 |
| Product function | |
| • Voltage measurement | Yes |
| — with voltage transformer | Yes |
| • Current measurement | Yes |
| — without current transformer | No |
| — with current transformer | Yes |
| • Energy measurement | Yes |
| • Frequency measurement | Yes |
| • Power measurement | Yes |
| • Active power measurement | Yes |
| • Reactive power measurement | Yes |
| • I&M data | Yes; I&M 0 |
| • Isochronous mode | No |
| Engineering with | |
| • STEP 7 TIA Portal configurable/integrated from version | V13 SP1 |
| Operating mode | |
| • cyclic measurement | Yes |
| • acyclic measurement | Yes |
| • Acyclic measured value access | Yes |
| • Fixed measured value sets | Yes |
| • Freely definable measured value sets | No |
| CiR - Configuration in RUN | |
| Reparameterization possible in RUN | Yes |
| Calibration possible in RUN | Yes |
| Installation type/mounting | |
| Mounting position | Horizontal, vertical |
| Supply voltage | |
| Design of the power supply | from CPU |
| Type of supply voltage | DC |
| Input current | |
| Current consumption, max. | 180 mA |
| Power loss | |
| Power loss, typ. | 0.75 W |
| Address area | |
| Address space per module | |

| | |
|---|---|
| • Address space per module, max. | 124 byte; 112 byte input / 12 byte output |
| Time of day | |
| Operating hours counter | |
| • present | Yes |
| Analog inputs | |
| Cycle time (all channels), typ. | 50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data) |
| Interrupts/diagnostics/status information | |
| Alarms | |
| • Diagnostic alarm | Yes |
| • Limit value alarm | Yes |
| • Hardware interrupt | No |
| Diagnostics indication LED | |
| • Monitoring of the supply voltage (PWR-LED) | Yes |
| • Channel status display | Yes; green LED |
| • for channel diagnostics | Yes; red Fn LED |
| • for module diagnostics | Yes; green/red DIAG LED |
| Integrated Functions | |
| Measuring functions | |
| • Measuring procedure for voltage measurement | TRMS |
| • Measuring procedure for current measurement | TRMS |
| • Type of measured value acquisition | seamless |
| • Curve shape of voltage | Sinusoidal or distorted |
| • Buffering of measured variables | Yes |
| • Parameter length | 74 byte |
| • Bandwidth of measured value acquisition | 2 kHz; Harmonics: 39 / 50 Hz, 32 / 60 Hz |
| Measuring range | |
| — Frequency measurement, min. | 45 Hz |
| — Frequency measurement, max. | 65 Hz |
| Measuring inputs for voltage | |
| — Measurable line voltage between phase and neutral conductor | 277 V |
| — Measurable line voltage between the line conductors | 480 V |
| — Measurable line voltage between phase and neutral conductor, min. | 0 V |
| — Measurable line voltage between phase and neutral conductor, max. | 293 V |
| — Measurable line voltage between the line conductors, min. | 0 V |
| — Measurable line voltage between the line conductors, max. | 508 V |
| — Internal resistance line conductor and neutral conductor | 3.4 MΩ |
| — Power consumption per phase | 20 mW |
| — Impulse voltage resistance 1,2/50μs | 1 kV |
| — Measurement category for voltage measurement in accordance with IEC 61010-2-030 | CAT II; CAT III in case of guaranteed protection level of 1.5 kV |
| Measuring inputs for current | |
| — measurable relative current (AC), min. | 1 %; Relative to the secondary rated current 5 A |
| — measurable relative current (AC), max. | 100 %; Relative to the secondary rated current 5 A |
| — Continuous current with AC, maximum permissible | 5 A |
| — Apparent power consumption per phase for measuring range 5 A | 0.6 VA |
| — Rated value short-time withstand current restricted to 1 s | 100 A |
| — Input resistance measuring range 0 to 5 A | 25 mΩ; At the terminal |
| — Surge strength | 10 A; for 1 minute |
| — Zero point suppression | Parameterizable: 2 ... 250 mA, default 50 mA |
| Accuracy class according to IEC 61557-12 | |
| — Measured variable voltage | 0,2 |
| — Measured variable current | 0,2 |

| | |
|-------------------------------------|-----------------------------------|
| — Measured variable apparent power | 0.5 |
| — Measured variable active power | 0.5 |
| — Measured variable reactive power | 1 |
| — Measured variable power factor | 0.5 |
| — Measured variable active energy | 0.5 |
| — Measured variable reactive energy | 1 |
| — Measured variable neutral current | 0.5; calculated |
| — Measured variable phase angle | ±1 °; not covered by IEC 61557-12 |
| — Measured variable frequency | 0.05 |

Potential separation

Potential separation channels

- between the channels and backplane bus Yes; 3 700V AC (type test) CAT III

Isolation

Isolation tested with 2 300V AC for 1 min. (type test)

Standards, approvals, certificates

| | |
|-----------------------|-----|
| CE mark | Yes |
| CSA approval | Yes |
| UL approval | Yes |
| cULus | Yes |
| FM approval | Yes |
| RCM (formerly C-TICK) | Yes |
| KC approval | Yes |
| Marine approval | Yes |

Ambient conditions

Ambient temperature during operation

- horizontal installation, min. -20 °C
- horizontal installation, max. 60 °C
- vertical installation, min. -20 °C
- vertical installation, max. 50 °C

Dimensions

| | |
|--------|--------|
| Width | 45 mm |
| Height | 100 mm |
| Depth | 75 mm |

Weights

Weight, approx. 165 g

Other

Data for selecting a current transformer

- Burden power current transformer x/1A, min. As a function of cable length and cross section, see device manual
- Burden power current transformer x/5A, min. As a function of cable length and cross section, see device manual

Classifications

| | Version | Classification |
|--------|---------|----------------|
| eClass | 14 | 27-24-22-01 |
| eClass | 12 | 27-24-22-01 |
| eClass | 9.1 | 27-24-22-01 |
| eClass | 9 | 27-24-22-01 |
| eClass | 8 | 27-24-22-01 |
| eClass | 7.1 | 27-24-22-01 |
| eClass | 6 | 27-24-22-01 |
| ETIM | 10 | EC001420 |
| ETIM | 9 | EC001420 |
| ETIM | 8 | EC001420 |
| ETIM | 7 | EC001420 |
| IDEA | 4 | 3562 |
| UNSPSC | 15 | 32-15-17-05 |

Approvals / Certificates

General Product Approval



[Miscellaneous](#)

[Manufacturer Declaration](#)

[China RoHS](#)



General Product Approval

EMV

For use in hazardous locations



[EM](#)

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