

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

Firmware version	V2.0
Product function	
• Voltage measurement	Yes
• Voltage measurement with voltage transformers	Yes
• Current measurement	Yes
• Phase current measurement without current transformers	No
• Phase current measurement with current transformers	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

<ul style="list-style-type: none"> • STEP 7 TIA Portal configurable/integrated as of version 	V13 SP1
Operating mode	
<ul style="list-style-type: none"> • cyclic measurement • acyclic measurement • Acyclic measured value access • Fixed measured value sets • Freely definable measured value sets 	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
Configuration control	
via dataset	Yes
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	Supply via voltage measurement channel L1
Type of supply voltage	AC 100 - 277 V
permissible range, lower limit (AC)	90 V
permissible range, upper limit (AC)	293 V
Line frequency	
<ul style="list-style-type: none"> • permissible range, lower limit • permissible range, upper limit 	<p>47 Hz</p> <p>63 Hz</p>
Power loss	
Power loss, typ.	0.6 W
Address area	
Address space per module	
<ul style="list-style-type: none"> • Address space per module, max. 	124 byte; 112 byte input / 12 byte output
Time of day	
Operating hours counter	
<ul style="list-style-type: none"> • 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	
<ul style="list-style-type: none"> • Diagnostic alarm • Limit value alarm • Hardware interrupt 	<p>Yes</p> <p>Yes</p> <p>No</p>

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

Operating mode for measured value acquisition

— automatic detection of line frequency	No; Parameterizable
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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.	90 V
— Measurable line voltage between phase and neutral conductor, max.	293 V
— Measurable line voltage between the line conductors, min.	155 V
— Measurable line voltage between the line conductors, max.	508 V
— 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
— Internal resistance line conductor and neutral conductor	3.4 MΩ
— Power consumption per phase	20 mW
— Impulse voltage resistance 1,2/50μs	1 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 V·A
— 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
— Zero point suppression	Parameterizable: 2 ... 250 mA, default 50 mA
— Surge strength	10 A; for 1 minute

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)

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 (without packaging) 165 g

Other

Data for selecting a current transformer

- Burden power current transformer x/1A, min.
- Burden power current transformer x/5A, min.

As a function of cable length and cross section, see device manual

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last modified:

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