



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	
<ul style="list-style-type: none"> • Voltage measurement <ul style="list-style-type: none"> — with voltage transformer • Current measurement <ul style="list-style-type: none"> — without current transformer — with current transformer • Energy measurement • Frequency measurement • Power measurement • Active power measurement • Reactive power measurement • I&M data • Isochronous mode 	<ul style="list-style-type: none"> Yes Yes Yes No Yes Yes Yes Yes Yes Yes Yes; I&M 0 No
Engineering with	
<ul style="list-style-type: none"> • STEP 7 TIA Portal configurable/integrated from 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 	<ul style="list-style-type: none"> Yes Yes Yes Yes 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
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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

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