

**Overview**

- Energy management based on SIMATIC S7-1200
- Data acquisition of electrical characteristics in 1 and 3-phase networks up to 480 V AC
- Direct connection of voltage inputs
- Current measurement performed by 1 A and 5 A current transformers
- Can be used in TN and TT networks
- Data backup of measurement data in the event of a power failure

**Technical specifications**

Article number	<b>6ES7238-5XA32-0XB0</b> SM 1238 Energy Meter 480V AC
<b>General information</b>	
Product type designation	SM 1238 AI Energy Meter 480 VAC
<b>Product function</b>	
• 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
<b>Engineering with</b>	
• STEP 7 TIA Portal configurable/integrated as of version	V13 SP1
<b>Operating mode</b>	
• cyclic measurement	Yes
• acyclic measurement	Yes
• Acyclic measured value access	Yes
• Fixed measured value sets	Yes
• Freely definable measured value sets	Yes
<b>CiR – Configuration in RUN</b>	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	Yes
<b>Installation type/mounting</b>	
Mounting position	Horizontal, vertical
<b>Supply voltage</b>	
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
<b>Line frequency</b>	
• permissible range, lower limit	47 Hz
• permissible range, upper limit	63 Hz

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<b>Power loss</b>	
Power loss, typ.	0.6 W
<b>Address area</b>	
<b>Address space per module</b>	
• Address space per module, max.	124 byte; 112 byte input / 12 byte output
<b>Analog inputs</b>	
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes
• Hardware interrupt	No
<b>Diagnostics indication LED</b>	
• 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
<b>Integrated Functions</b>	
<b>Measuring functions</b>	
• 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
<b>Operating mode for measured value acquisition</b>	
- automatic detection of line frequency	No; Parameterizable
<b>Measuring range</b>	
- Frequency measurement, min.	45 Hz
- Frequency measurement, max.	65 Hz

# SIMATIC S7-1200 Basic Controllers

I/O modules

Analog modules

## SM 1238 Energy Meter 480 V AC analog input modules

### Technical specifications (continued)

Article number	6ES7238-5XA32-0XB0
	SM 1238 Energy Meter 480V AC
<b>Measuring inputs for voltage</b>	
- 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
<b>Measuring inputs for current</b>	
- 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

Article number	6ES7238-5XA32-0XB0
	SM 1238 Energy Meter 480V AC
<b>Accuracy class according to IEC 61557-12</b>	
- 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
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes; 3 700V AC (type test) CAT III
<b>Isolation</b>	
Isolation tested with	2 300V AC for 1 min. (type test)
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C
<b>Dimensions</b>	
Width	45 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight (without packaging)	165 g
<b>Data for selecting a current transformer</b>	
• 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

### Ordering data

#### SM 1238 Energy Meter 480 V AC analog input

Energy measurement module for data acquisition in 1 and 3-phase networks (TN, TT) up to 480 V AC; current range: 1 A, 5 A; recording of voltage, current, phase angles, power ratings, energy values, frequencies; with channel diagnostics

### Article No.

6ES7238-5XA32-0XB0

#### Extension cable for two-tier configuration

For connecting digital/analog signal modules; length 2 m

6ES7290-6AA30-0XA0

### Article No.

#### Terminal block (spare part)

For voltage input (top), 7-pole, tinned, coded in middle

6ES7292-1AG40-0XA2

For current input (bottom), 7-pole, tinned

6ES7292-1AG30-0XA0

#### Front flap set (spare part)

For modules with a width of 45 mm

6ES7291-1BA30-0XA0