

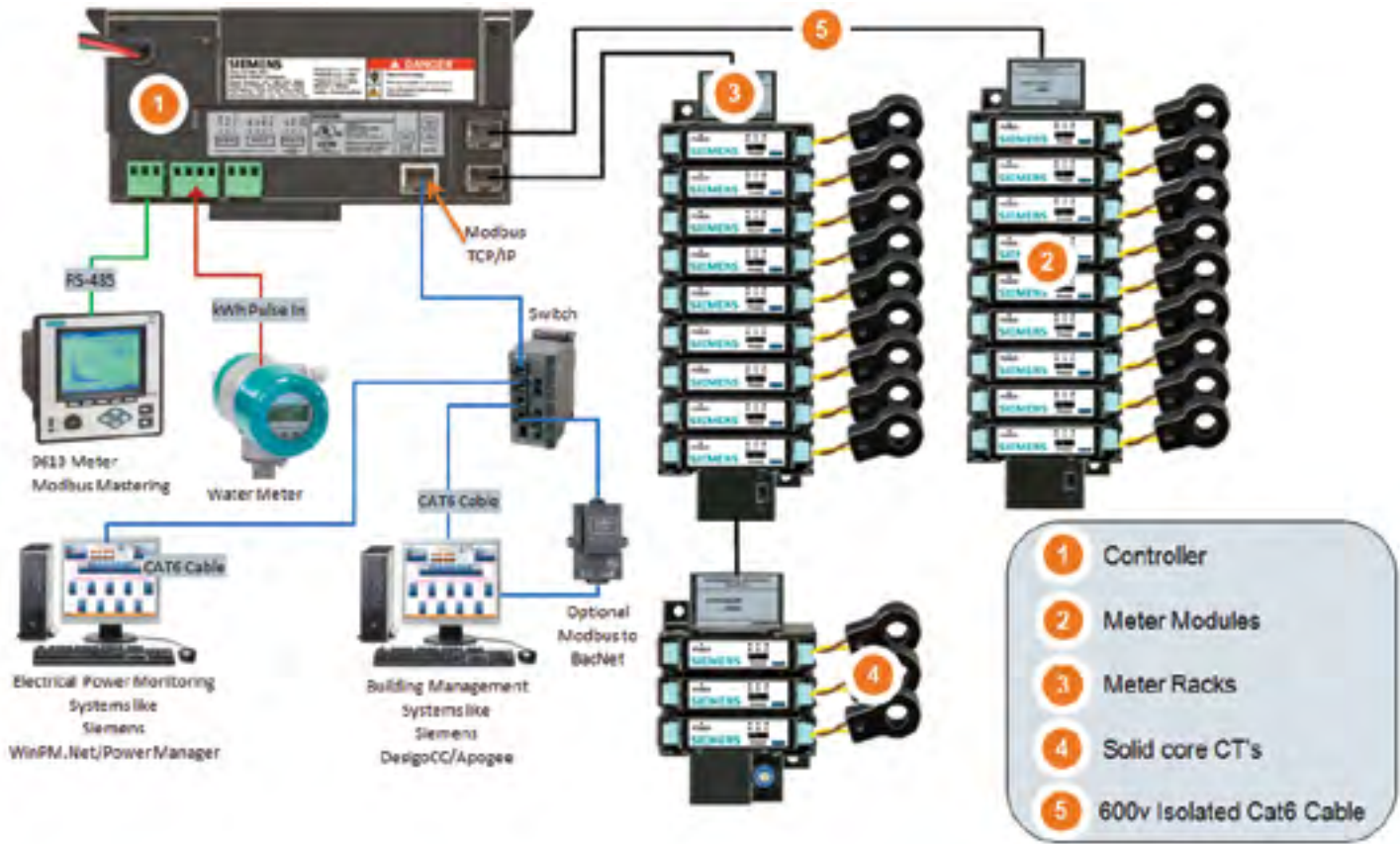
SEM3™ - Embedded Micro Metering Module™

Data Sheet

The Siemens Embedded Micro Metering Module (SEM3) is a modular metering solution for energy monitoring, data analysis, and sub billing applications. The flexible design allows for low, medium, and high density metering requirements to be met

efficiently and economically using only a few standardized components integrated into Siemens Panelboard and Switchboard products.

SEM3 Sample Configuration



The SEM3 system is made up of the following components and options:

1. **Controller** – The controller is used to communicate the metered values to outside systems by way of a web page interface, Modbus RTU or Modbus TCP. One controller can manage up to 45 meter modules.① The controller also has the system digital inputs for receiving pulse inputs from other metering devices as well as a digital output for the combined KWh output of the system being metered.
2. **Meter modules** – There are two choices for the meter modules that are differentiated by accuracy specification. The accuracies are 1% for the standard accuracy modules and 0.2% for the high accuracy modules. The accuracy is tested in accordance to ANSI C12.20/0.2.

3. **Meter racks** – The meter modules are designed to snap into the rack assemblies. The rack assemblies are sized by how many modules will fit into each and come in 3, 9, 15 and 21 module configurations.
4. **CT or current transformers** – The SEM3 systems has solid core CTs for use with the system in the following maximum amperage ranges 50, 125, 250, 400, 600, 800 and 1200 amps. These are maximum amperage ranges for normal usage but will measure accurately down to 1% of the maximum range.
5. **Communication cables** – The communication cables are designed like CAT 5 cables but are insulated for use in systems up to 600 volts. The cables are for two way communication from the controller to the rack/meter modules.

① Some applications will allow for more than 45 poles in one enclosure by adding a second controller. Two controllers can monitor up to 90 poles.

SEM3 Functional Features

Instantaneous values		
Voltage	Phase-Phase (2,3 Phase) Phase-Neutral (1 phase)	✓
Currents	Per Phase	✓
Active, Reactive, and Apparent power (kW, kVAR, kVA)	Per Phase and Total	✓
Power Factor	Per Phase and Total	✓
Frequency	45...64 Hz	✓
Phase Angle		✓
Current Demand - kW demand	Per Phase and Total	✓
Max Values	Current Demand	✓
	Current	✓
	kW Demand	✓
	kW	✓
Average Values	Voltage	✓
	Current	✓
Energy Measurement		
Active Energy (kWh)		✓
Reactive Energy (kVARh)		✓
Apparent Energy (kVAh)		✓
Alarming / Monitoring Functions		
Phase Loss		✓
Over Current Warning		✓
Over Current Alarm		✓
Over kW Demand Alarm		✓
Under/Over Voltage Alarm		✓
Communications		
Ethernet/Modbus TCP	Integrated RJ45 port as standard (can support two masters simultaneously)	10/100 base-T (100 Mbit/sec)
Modbus RTU	Integrated RS485 port	Support of baud rates of 9600, 19.2K and 38.4K
kWhr Pulse Input1/2	Monitors Meters (Water, Gas, etc.)	Form A / C 28 VDC (± 4)
kWhr Pulse Output1		Form A / C max 30 VDC
General		
Password Protection		✓
Technical Data		
Measurement Types		1, 2, or 3 phase
Measurement Accuracy - Standard		ANSI C12.16/1
Measurement Accuracy - High		ANSI C12.20/0.2
Measured Voltage without Transformer	Delta/Wye	480V max
Current Inputs	100 mA output CTs	50-1200A CTs
Power Supply	AC	120-480 VAC (±10%)
Degree of Protection	Front / Rear	IP52 - NEMA 12 IP20 - NEMA 1A
Operating Temperature	°C / °F	-10°C to 65°C 14°F to 149°F
Safety Standards and Compliance		
CSA C22.2 No. 1010-1 Safety Requirements for Electrical Equipment for Measurement		
UL916 Energy Management Equipment		
UL61010-1 (IEC 61010-1) Test and Measurement Equipment		

Certifications

Standards Compliance



- Approvals and certifications

- Accuracy
 - ANSI C12.1
 - ANSI C12.20/0.2
- Safety/Construction
 - CSA C22.2 No. 1010-1 Safety Requirements for Electrical Equipment for Measurement
 - UL916 Energy Management Equipment
 - UL61010-1 (IEC 61010-1) Test and Measurement Equipment

- Electromagnetic Compatibility

- IEC 61000-4-2 Electrostatic Discharge (B)
- IEC 61000-4-3 Radiated Immunity (A)
- IEC 61000-4-4 Electric Fast Transient (B)
- IEC 61000-4-5 Surge Immunity (B)
- IEC 61000-4-6 Conducted Immunity
- FCC Part 15 subpart B, Class A Digital Device, Radiated Emissions

- Environmental Conditions

- Altitude up to 3000 meters
- Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C
- Pollution Degree 3

Dimensions

Catalog number	Part Description	Packaged Weight		Part Dimensions	
		(lbs)	(grams)	(in)	
SEM3CONTROLLER	Controller	0.96	436	7.38 x 3.38 x 2.20	
SEM3RACK3	3 Position Meter Rack	0.21	96	3.57 x 2.41 x 1.83	
SEM3RACK9	9 Position Meter Rack	0.34	155	7.07 x 2.41 x 1.83	
SEM3RACK15	15 Position Meter Rack	0.51	232	10.61 x 2.41 x 1.83	
SEM3RACK21	21 Position Meter Rack	0.67	304	14.15 x 2.41 x 1.83	
SEM3HAMETER	Meter - High Accuracy 0.2%	0.09	41	2.18 x 1.59 x 0.49	
SEM3LAMETER	Meter - Standard Accuracy 1%	0.09	41	2.18 x 1.59 x 0.49	
SEM3SCCT50	50:01 Solid Core CT	0.33	150	0.75 x 1.49 x 2.26	
SEM3SCCT125	125:01 Solid Core CT	0.33	150	0.75 x 1.49 x 2.26	
SEM3SCCT250	250:01 Solid Core CT	0.42	191	0.81 x 2.00 x 2.85	
SEM3SCCT400	400:01 Solid Core CT	0.49	223	0.79 x 2.72 x 3.64	
SEM3SCCT600	600:01 Solid Core CT	0.71	323	0.79 x 3.77 x 4.70	
SEM3SCCT800	800:01 Solid Core CT	0.79	359	0.99 x 4.16 x 5.10	
SEM3SCCT1200	1200:01 Solid Core CT	0.99	450	0.99 x 4.62 x 5.59	

Siemens Canada Limited
 Low Voltage & Products
 Energy Management Division
 1577 North Service Road East
 Oakville, Ontario L6H 0H6

Customer Interaction Centre
 (888) 303 3353
 cic.ca@siemens.com

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