Multi-Circuit & Branch Circuit Monitoring System

Monitors up to 96 circuits
On board webserver and data logging
Customizable alarming features

DESCRIPTION

The EM-Estimater gives you assumed power based on accurate rogowski current transformers and installer set circuit power and power factor.

Simplify installation and connectivity while providing instant access to data in a user friendly format. The versatile Core Module TM system is a single monitoring solution with peripherals optimized for Branch Circuit and Multi-Circuit Monitoring applications designed to reduce the cost and complexity associated with legacy multi-circuit monitors.

APPLICATIONS

- Ideal for baseline consumption in premises (e.g. store to store comparisions for chains
- Activity-based costing in commercial and industrial facilities
- More informative that an amperage measurement only.

FEATURES

Rapid Installation

- Optimized for new and retrofit installations with no disruption to critical loads
- Monitors up to 96 circuits
- Options for solid core, split core CTs, Rogowski coils1 and analog, discrete and pulse inputs.

Easily Access Data

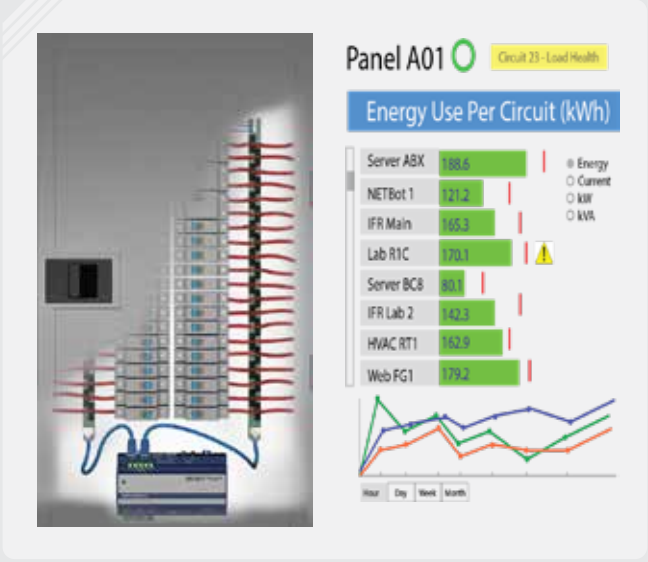
- On-board web server provides immediate access to real-time and logged data
- Integrated data logging supports up to 64 GB storage; remotely accessible or manually exportable
- Available Cloud monitoring service
- Customizable alarming features

Easy Connectivity

- Select from multiple connectivity options including Modbus TCP/IP, RTU
- Open protocols allows connection with any third party monitoring system

Accurate

- True 0.5% accuracy suitable for billing applications



Intelligent Features

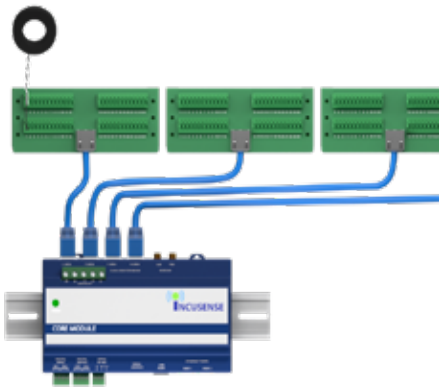
- Presence of Voltage detection accurately indicates breaker status even under no load conditions
- True-Circuit Display mapping function presents data according to actual circuit configurations
- Detailed power and energy monitoring per circuit including Waveform capture and THD

MODULAR SYSTEM DESIGN

The versatile and compact Core Module™ functions as a Gateway that can host up to four Interface Modules monitoring a total of 96 circuits. Interface modules connect via Ethernet cables and are available for new and retrofit branch circuit and multi-circuit applications.

Interface Modules

Connect up to four x 24 circuit Interface Modules using Ethernet Cables.

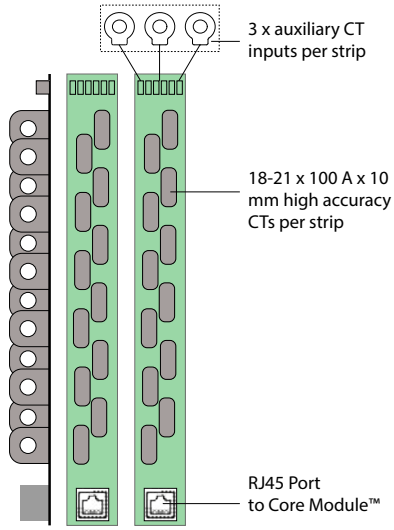


Direct access to real time and logged data using any web browser

Native Modbus TCP/ IP and other Ethernet protocols

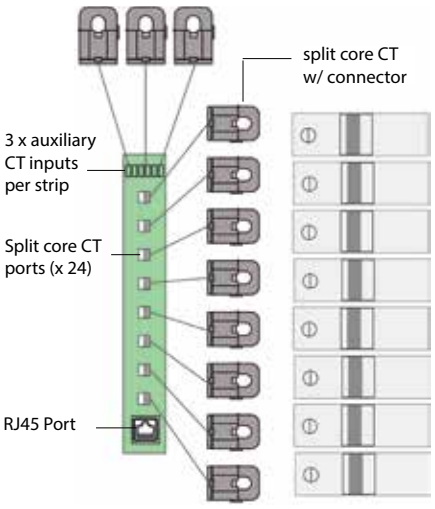
Dual Ethernet ports simplify networking multiple Core Modules

SOLID CORE PANEL CT STRIP



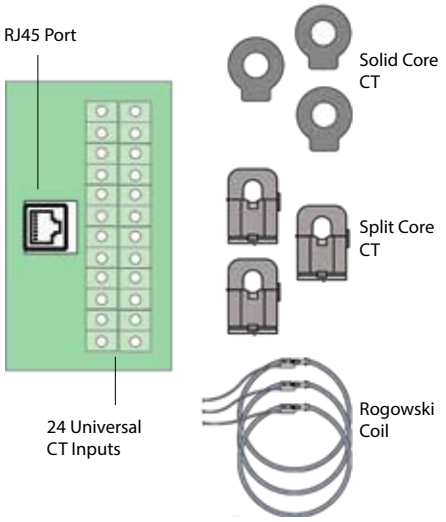
- Used for new installations on panelboard branch circuit monitoring
- Up to 21 circuits per strip + 3 auxiliary CT inputs (96 total)
- 0.75″ and 18mm C-C versions
- 10mm CT window w/ 100 A range
- Optional presence of voltage sensing for breaker status per circuit

SPLIT CORE PANELBOARD MODULE



- Used for retrofit installations on panelboard branch circuit monitoring
- Floating CT interface strip with quick connect 10mm split core CTs sits on top of existing conductors
- 24 circuits per module (96 Total)
- Optional presence of voltage sensing for breaker status per circuit

MULTI-CIRCUIT CT MODULE



- 24 CTs / circuits per module (96 Total)
- Supports 0.33 V solid core and split core CTs as well as available native Rogowski coil version available
- Optional presence of voltage sensing for breaker status per circuit

Consult Interface Module data sheet for specifications and additional modules

CONNECTIVITY SOLUTIONS

Senva makes it easier than ever to connect and access data in a user friendly format with a range of connectivity solutions including low cost CAT1 cellular links.

Connectivity Options

- Modbus TCP/IP and RTU
- HTML
- BACnet[1]

Data Acquisition

Web Server
On board web server provides access to real time and logged data.

Data Stream
Open protocols feed data to any third party monitoring system

Cloud
View and manage data using the optional plug and play cloud application[1]

Manual Export
Logged data can be manually exported from the Core Module™

Data Presentation

The available cloud monitoring service provides all the functionality of advanced monitoring systems at a fraction of the cost and with no programming.

- Report Generation
- Predictive Analysis
- Trending
- Report Generation
- Alarming

Smart Technology that Makes a Big Difference

Presence of Voltage Detection detects circuit breaker status even under no load conditions using a proprietary voltage field detection system identifying failed circuits that may go unnoticed on conventional monitoring systems.

Predictive Circuit Health Analysis uses proprietary algorithms to analyze circuit signatures over time and detect changes indicative of common failure modes in power supplies and other critical loads.

Waveform Capture: High resolution power quality data from all circuits is stored for any power quality deviation providing invaluable data for evaluating power disturbances.

True Circuit Display allows data to be expressed according to the actual panelboard configuration by indicating pole position, circuit type, friendly names and more to each circuit.

Applications

Collocation Data Centers
Collocation data center often must monitor the health and energy usage of each branch circuit

Lighting / HVAC Energy Optimization
Sub-metering is required to provide the needed resolution to initiate and verify most energy efficiency upgrades

Demand Management
Sub-metering identifies energy use by specific loads allowing them to be managed to avoid peak demand charges

Tenant Sub-Metering
Commercial facilities are increasingly using sub-metering to allocate costs

Switchgear / Power Distribution
Economically identify energy and power use per breaker

Circuit / Load Health
Facilities use sub-metering to verify performance of critical loads

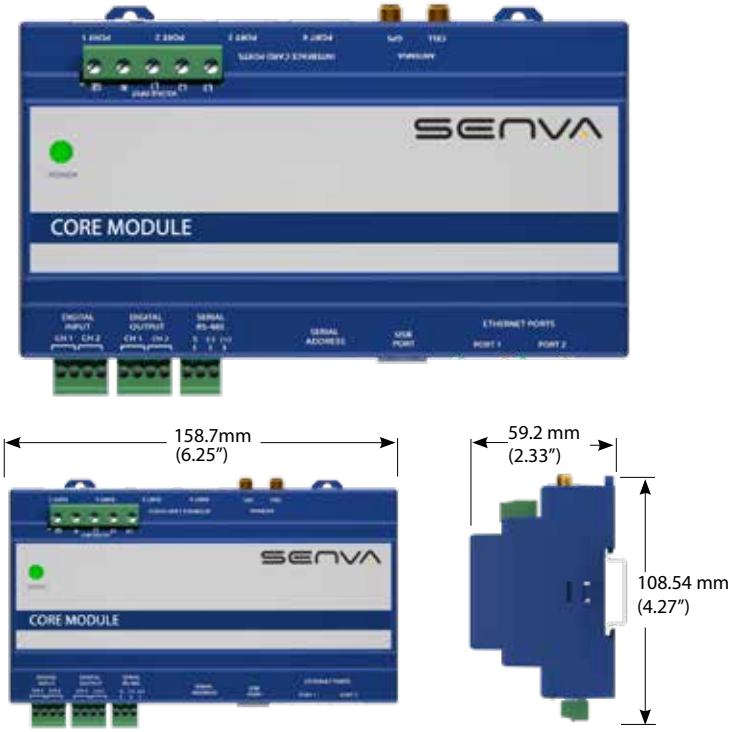
Energy Use Allocation
Larger buildings and campuses require a means of allocating energy usage for costing purposes

High-End Residential
High end residential automation systems can utilize branch circuit sub-metering to enhance reliability and efficiency

PRODUCT SELECTION GUIDE

Core Module Monitor Feature Set

FEATURE	ENHANCED
Local Network Access	●
Integrated Web Server	●
Field Upgradeable Feature Set	●
SD Card and Network Configuration	●
Modbus TCP/IP output	●
Modbus Serial Output	●
HTML web server console	●
Presence of Voltage Detection	●
BACnet Protocol	●
Waveform Capture	●
True Circuit Display	●
SD Card Data Storage	●
Newtork Data File Export	●
Alarming	●



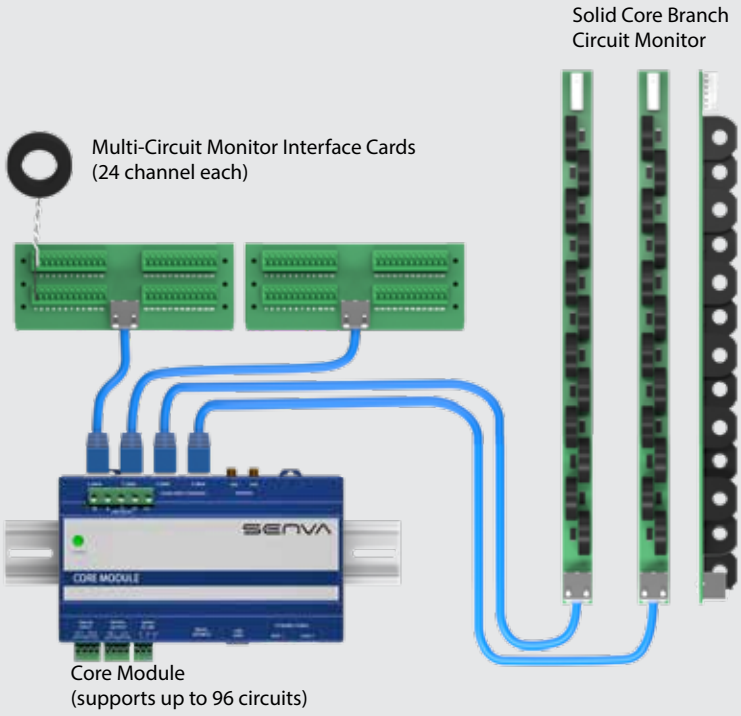
Installation Overview

FROM INSTALLATION TO MONITORING IN MINUTES

Senva reduces the cost of monitoring by simplifying installation and providing instant access to real time and logged data without programming requirements.

1. Mount the compact Core Module onto DIN rail; fits inside most existing enclosures
.
2. Mount CT interface cards in most convenient location to minimize CT cable length and connect to monitor using standard network cables.

3. Connect to network and acquire real time and logged data from the monitor or utilize optional embedded cellular modem for affordable wireless connectivity at a cost lower than most network connections.



PRODUCT SELECTION GUIDE

See product selection guide on-line for complete product offering and detailed ordering instructions.

Core Module Monitoring Systems	
CM01	Standard Core Module monitoring system; expandable up to 96 channels
CM02	Enhanced Core Module monitoring with enhanced firmware; expandable up to 96 channels
Solid Core CT Strip monitoring system for installations on new panelboards All systems include 10mm x 100 A solid core CTs and + 3 auxiliary CT terminals per strip for main input CTs	
0.75" c-c CT strips (21 CTs + 3 auxillary CT inputs per strip) and Core Module monitor	
EMMCBCS42-A	42 pole system with 2 x 21 x 100 A solid core CT strips with 0.75" C-C spacing; includes presence of voltage detection
EMMCBCS84-A	84 pole (2 panel) system with 4 x 21 x 100 A solid core CT strips with 0.75" C-C spacing; includes presence of voltage detection
18mm c-c CT strips (18 CTs + 3 auxiliary CT inputs per strip) and Core Module monitor	
EMMCBCS-36A	36 pole system with 2 x 18 x 100 A solid core CT strips with 0.75" C-C spacing; includes presence of voltage detection
EMMCBCS-72A	72 pole system with 4 x 18 x 100 A solid core CT strips with 0.75" C-C spacing; includes presence of voltage detection
Retrofit Panelboard CT Interface Module (Floating Strip CT interface module) and Core Module monitor Floating Strip CT interface boards reside in raceway and interface with 10mm x 75 A or 100 A split core CTs using plug-in quick connects; each Core Module accommodates up to four interface modules (96 circuits)	
EMMBCC-24	24 channel split core CT monitoring system with 24 split core CTs
EMMBCC-48	48 channel split core CT monitoring system with 48 split core CTs
EMMBCC-72	72 channel split core CT monitoring system with 72 split core CTs + 12 aux. CT inputs
EMMBCC-96	96 channel split core CT monitoring system with 96 split core CTs
CT10	24 channel expansion Panelboard CT Interface Module ; Core Modules can accommodate up to 4 x 24 modules
Multi-Circuit Monitoring Systems and Core Module monitor The Multi-Circuit Monitoring system supports up to 4 x 24 CT Interface Cards (96 circuits) and accommodates any 0.33 Vout current transformers or native Rogowski coils. All iMCM systems include the Core Module as well as CT Interface Card specified.	
EMMBC-6C	6 Channel Multi-Circuit Monitoring System (single CT Interface Card)
EMMBC-12C	12 Channel Multi-Circuit Monitoring System (single CT Interface Card)
EMMBC-24C	24 Channel Multi-Circuit Monitoring System (single CT Interface Card)
EMMBC-48C	48 Channel Multi-Circuit Monitoring System (two CT Interface Cards)
EMMBC-72C	72 Channel Multi-Circuit Monitoring System (three CT Interface Cards)
EMMBC-96C	96 Channel Multi-Circuit Monitoring System (four CT Interface Cards)
BCC-24	24 Channel Expansion Card (each Core Module can accommodate up to four x 24 channel cards)
Wireless Communication Connectivity Options	
BCCM	Embedded CATM1 cellular modem; must specify region; connectivity plans purchased separately
Current Transformers and Rogowski Coils see Current Transformer selection guide for details	
	Current Transformer Range: 10-5,000 A; 10mm (3/8") to 254mm (10") diameter window Rogowski Coil Range: 200-5,000 A; 2" to 12" diameter window

TECHNICAL SPECIFICATIONS

INPUTS	
Input power (standard)	90-277 VAC (480 VAC 4W+G) 50/ 60 Hz
Input power (enhanced)	480-600 VAC (3W or 4W+G) 50/ 60 Hz
Voltage connection terminals	22 - 14 AWG
Overload protection	Internally fused
Power consumption	<5W / 0.1 A @ 240 VAC
Channels / circuit capacity	24 x 4 channels (96 circuits total)
PERFORMANCE	
Accuracy	0.50%
Sampling rate	> 3 kHz
COMMUNICATIONS	
Data protocols	Modbus TCP/IP (Ethernet), Modbus RTU (RS-485 2 wire), HTML (web server)
Modbus serial specifications	9600, 19200, 38400 Baud (selectable)
Ethernet ports	2 x RJ-45 10/100 Mbit
USB port	USB 2.0 Type A
Web server	HTML via standard browser
WiFi option	802.11 g/n ; requires WiFi option
Cellular option	CAT 1 / CAT M1; requires subscription
ENVIRONMENTAL	
Operating temperature	0 to 60 °C (32 to 140 °F) (<95% RH non-condensing)
Storage temperature	-40 to 70 °C (-40 to 158 °F)
Enclosure versions	NEMA 1/IP20 (indoor use); NEMA 4 / IP67 (outdoor use)
APPROVALS	
Agency approvals	UL Listed to EN61010-1, Cat. III, pollution degree 2, CE

MONITORED PARAMETERS

Monitored Parameter	Circuit Level	Input Level[1]
Current per phase	●	●
Max. current per phase	●	●
Current demand (avg. current) per phase	●	●
Current phase anagle	●	●
Voltage phase angle	●	●
Real power (kW) per phase	●	●
Real power (kW) demand per phase	●	●
Real power (kW) demand max	●	●
Energy (kWh) per phase	●	●
Power factor	●	●
Power factor vector	●	●
Apparent power (kVA)	●	●
Reactive power (kVA)	●	●
THDI	●	●
THDV	●	●
Voltage, L-L and average		●
Voltage, L-N and average		●
Voltage, L-N and per phase		●
Waveform capture	●	●
Presence of Voltage[3]	●	●
Ground current[2]	●	●

1 - Input level data can be calculated by summing up branch CT measurements or directly measured using CTs.

2 - Required optional ground current CT connected to auxiliary CT input

3 - Optional feature