

Multi-Circuit & Branch Circuit Monitoring System



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



DESCRIPTION

The EM-Estimator 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™ 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 comparisons for chains)
- Activity-based costing in commercial and industrial facilities
- More informative than 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, and analog, discrete and pulse inputs.

Easily Access Data

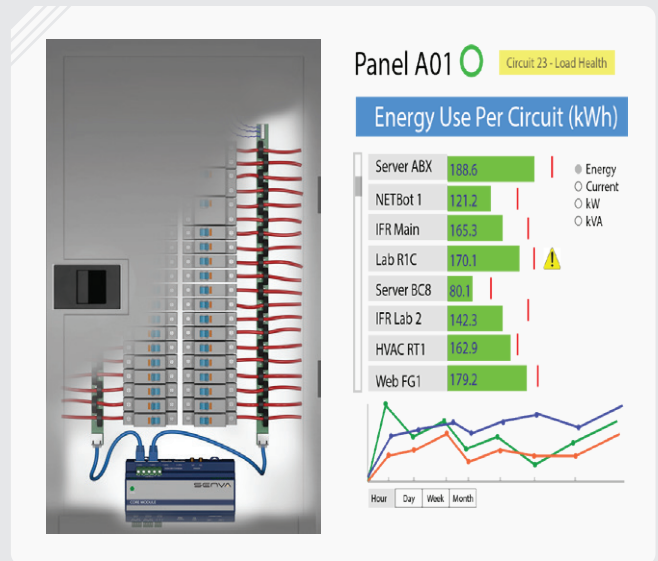
- On-board web server provides immediate access to real-time and logged data
- Integrated data logging supports up to 64 GB storage; remotely accessible or manually exportable
- Available Cloud monitoring service
- Customizable alarming features

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

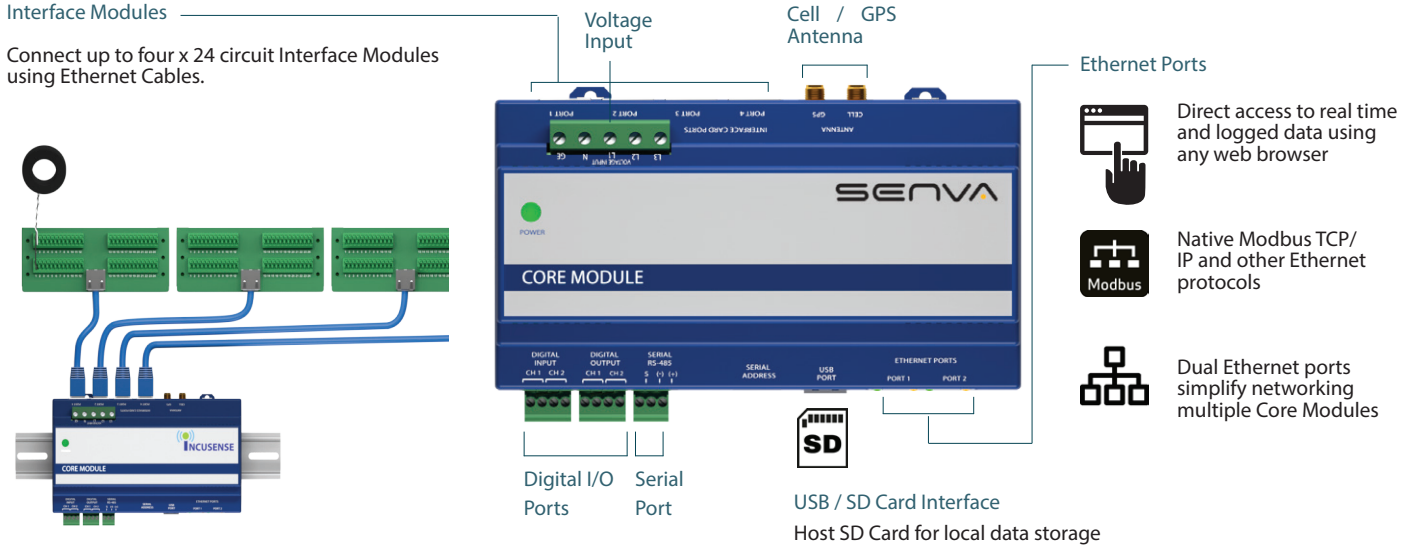
- Presence of Voltage detection accurately indicates breaker status even under no load conditions
- True-Circuit Display mapping function presents data according to actual circuit configurations
- Detailed power and energy monitoring per circuit including Waveform capture and THD

MODULAR SYSTEM DESIGN

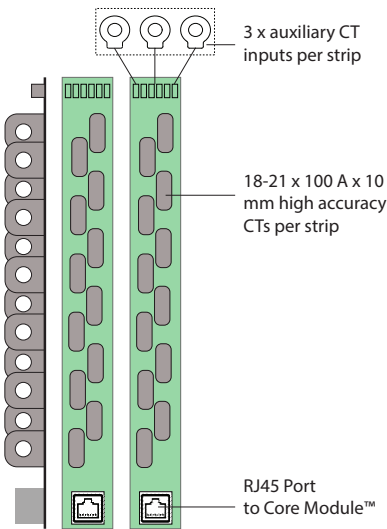
The versatile and compact Core Module™ functions as a Gateway that can host up to four Interface Modules monitoring a total of 96 circuits. Interface modules connect via Ethernet cables and are available for new and retrofit branch circuit and multi-circuit applications.

Interface Modules

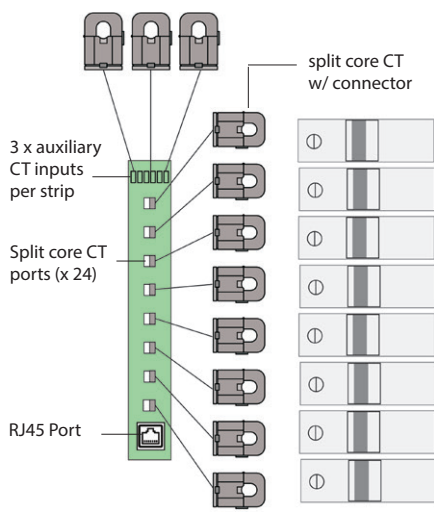
Connect up to four x 24 circuit Interface Modules using Ethernet Cables.



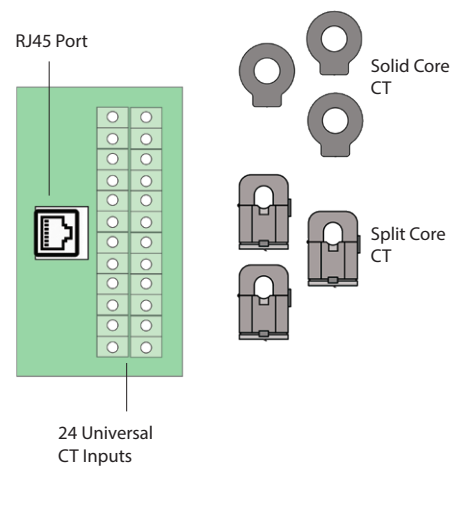
SOLID CORE PANEL CT STRIP



SPLIT CORE PANELBOARD MODULE



MULTI-CIRCUIT CT MODULE



- 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

- 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

- 24 CTs / circuits per module (96 Total)
- Supports 0.33 V solid core and split core CTs
- Optional presence of voltage sensing for breaker status per circuit

Consult Interface Module data sheet for specifications and additional modules



Warning: Refer to installation instructions that accompany product and heed all safety instructions.

CONNECTIVITY SOLUTIONS

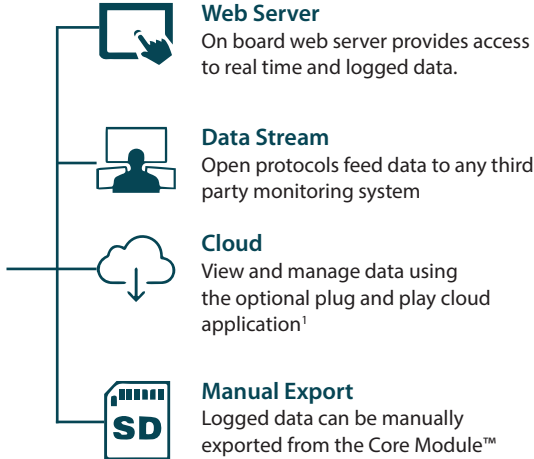
Serva makes it easier than ever to connect and access data in a user friendly format with a range of connectivity solutions including low cost CAT1 cellular links.

Connectivity Options

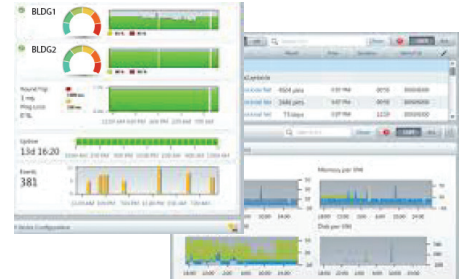
- Modbus TCP/IP and RTU
- HTML
- BACnet¹ TCP/IP



Data Acquisition Options



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

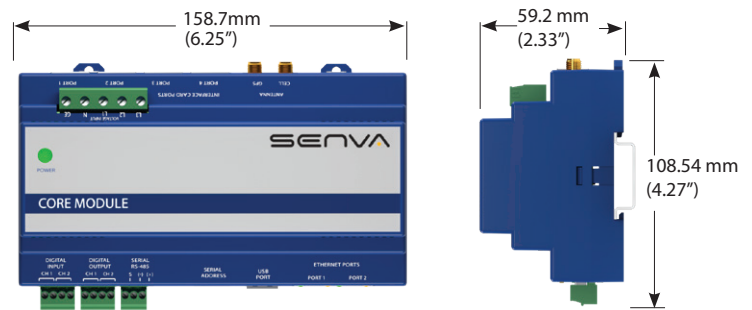
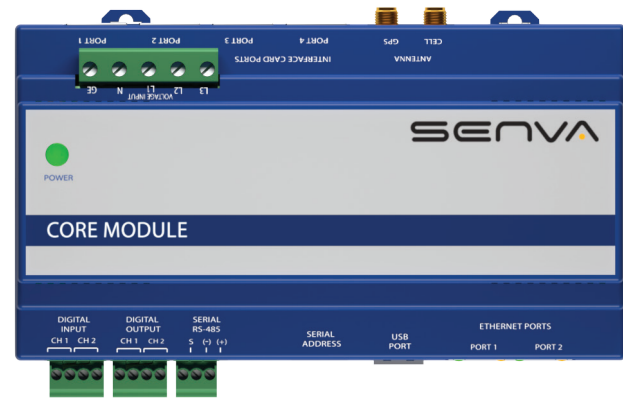


High-End Residential
High end residential automation systems can utilize branch circuit sub-metering to enhance reliability and efficiency

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	●



Warning: Refer to installation instructions that accompany product and heed all safety instructions.

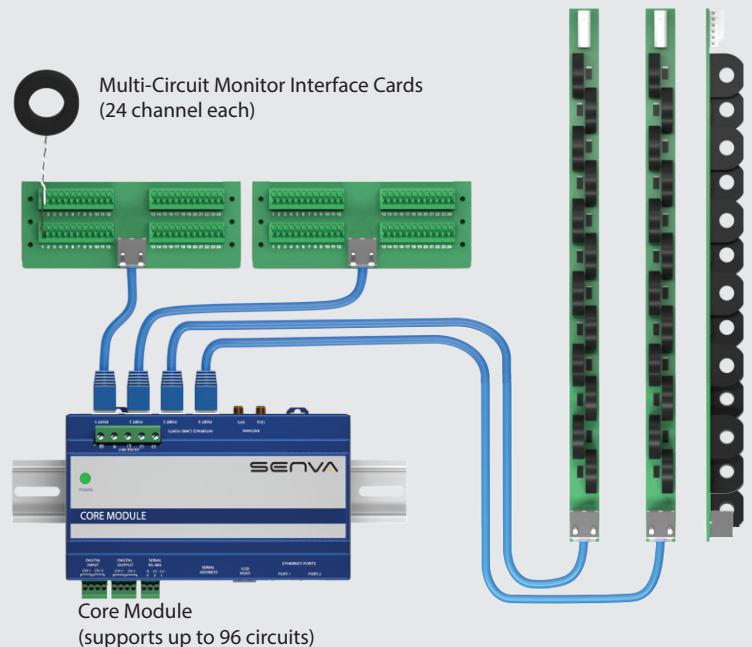
Installation Overview

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.

Solid Core Branch Circuit Monitor



PRODUCT SELECTION GUIDE

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

Core Module Monitoring Systems

CM02SV	Enhanced Core Module, 90-300 VAC L-N, 50/60 Hz (combined sensing and power supply input); supports 277V L-N / 480V 4W with neutral sources and 240 VAC / 415V 4W sources; use alternate models for 3W sources that do not have a neutral
CM02SV-480	Enhanced Core Module, 160-480 VAC L-L / 0.1A, 50 Hz (combined sensing and power supply input); used for 3W applications where neutral is not available
CM02SV-DC	Enhanced Core Module with 12-24VDC control power required; supports 3W and 4W sources; 90-300 VAC L-N / 160-480VAC L-L, 50/60 Hz sensing voltage
CTS-ENCL1	NEMA 1 Core Module Enclosure

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

CT02101A	Standard 0.75" CT center 1 x 21 100A solid core CT strip
CT02101B	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

1.0" c-c CT strips

CTS121A	Standard 1.0" CT center 1 x 21 100A solid core CT strip
CTS121B	Enhanced 1.0" CT center 1 x 21 100A solid core CT strip (w/presence of voltage detection to detect if circuit is energized)

18mm c-c CT strips

CTS218A	Standard 18mm CT center 1 x 18 100A solid core CT strip
CTS218B	Enhanced 18mm CT center 1 x 18 100A solid core CT strip (w/presence of voltage detection to detect if circuit is energized)
CTS221A	Standard 18mm CT center 1 x 21 100A solid core CT strip
CTS221B	Enhanced 18mm CT center 1 x 21 100A solid core CT strip (w/presence of voltage detection to detect if circuit is energized)
CTS223B	Enhanced 18mm CT center 1 x 23 100A solid core CT strip (w/presence of voltage detection to detect if circuit is energized)

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

CTS321A	24 channel Floating Strip split core CT interface board; utilizes branch CTs with connectors
CTSC01050	50 A x 10mm window split core current transformer, 250mm 300V AWG24 lead with Molex connector
CTSC01075	75 A x 10mm window split core current transformer, 250mm 300V AWG24 lead with Molex connector
CTSC010100	100 A x 16mm window split core current transformer, 250mm 300V AWG24 lead with Molex connector

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.

IOC24A1	24 Channel Digital Input Card
CTC24A1	24 channel Multi-Circuit Monitoring CT interface board; utilizes CTs with bare leads

Current Transformers

see Current Transformer selection guide for details

Current Transformer Range: 10-5,000 A; 10mm (3/8") to 254mm (10") 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	ETL Listed, 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 angle	●	●
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



Warning: Refer to installation instructions that accompany product and heed all safety instructions.