BFM-II

BRANCH FEEDER MONITOR

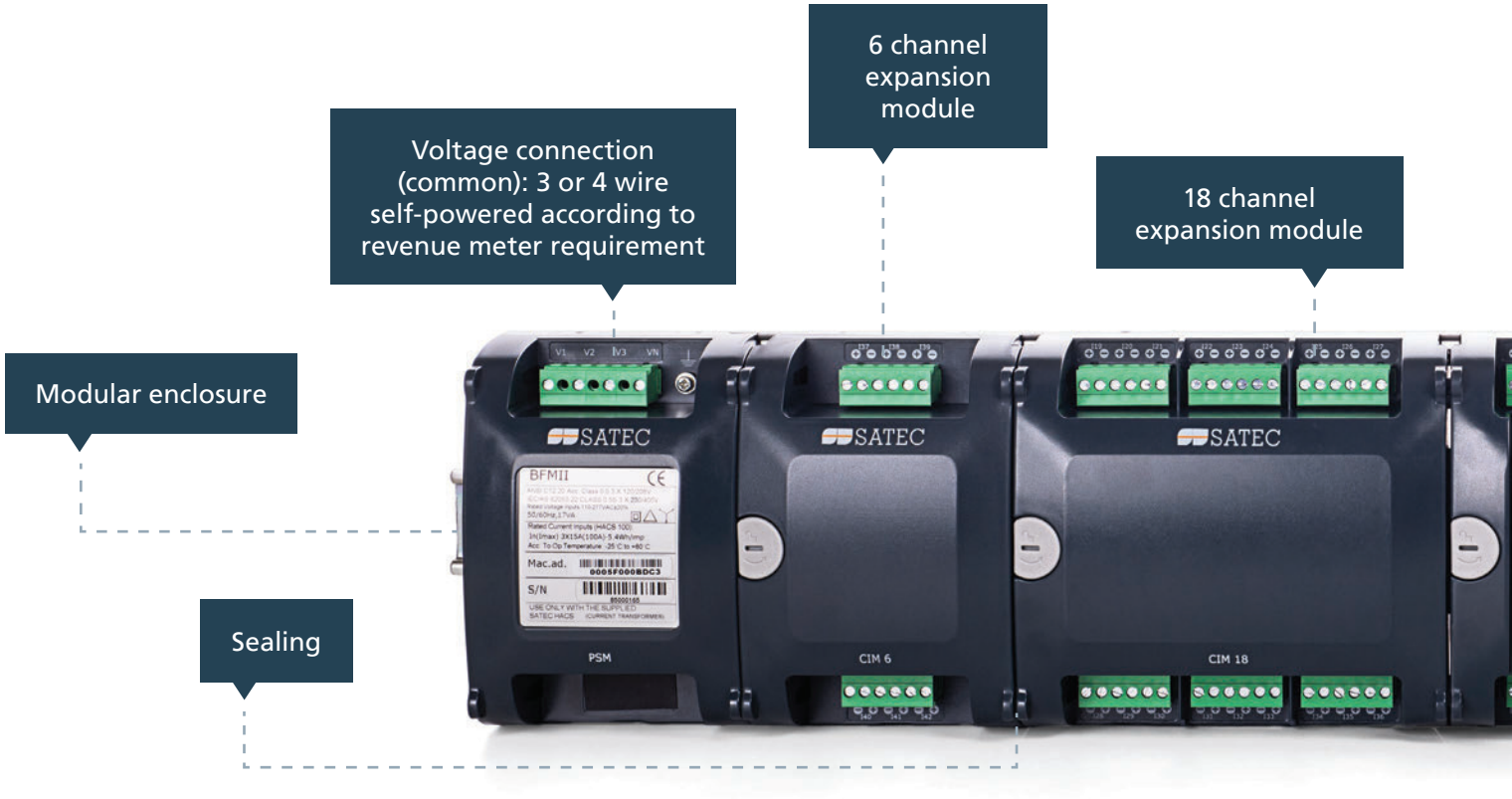
THE PERFECT SOLUTION FOR MULTI-CIRCUIT METERING

- ☑ MODULAR DESIGN
  CUSTOMIZED TO ANY NEED
- ☑ TENANT BILLING & MONITORING
- ☑ MULTI-CIRCUIT ENERGY READING
- ☑ BUILT-IN COMMUNICATION PLATFORMS
- ☑ TIME-OF USE (TOU) METERING
- ☑ DATA LOGGING

SATEC

BFM-II

Branch Feeder Monitor



SATEC's BFM-II is the second generation of Branch Feeder Monitor™, providing energy management for multi-point power solutions. Ideal for both new and retrofit projects, the BFM-II automatically provides metering, demand and energy readings, logging and multi-tariff (TOU) data.

The BFM-II monitors up to 18 three-phase circuits, 54 single-phase circuits, or any combination of single or three-phase circuits. This flexibility makes the BFM-II perfect for multi-tenant facilities such as residential projects, office buildings and shopping malls. Its modular design offers a selection of 18, 24, 30, 36, 42 or 54 channels to fit any requirement and to easily fit into existing panel boards or be flush mounted nearby, thus eliminating the need for expensive retrofit projects or for allocating extra space for the device.

The BFM-II supports power quality monitoring to identify existing and potential operation problems, such as overloading or malfunctioning due to voltage or current harmonics, or voltage sags and swell (contact SATEC for availability).

The BFM-II utilizes High Accuracy Current Sensors (HACS), which measure and report the current consumed by each of the branch circuits at the panel board. For billing purposes, single or multiple circuits can be defined for each customer. This flexibility allows for a simple reassignment of circuit groups without wiring changes, and enables easy changes when tenants move in and out. Main panel board or load center installation makes for a valuable saving of both time and money.

The BFM's user-defined and easily configured alarm system enables users to take predictive maintenance action in order to avoid unnecessary outages.

18 channels module configurable as 18 single-phase or 6 three-phase

Standard Ethernet port

Optional cellular modem & 2nd COM port

4 analog inputs (option)

18 digital inputs (option)

Wall or DIN rail mounting

Built-in RS-485 and USB ports

Optional graphic color touch screen

Built-in TOU

256MB data logging

Higlights & Features

- Multi-channel submetering – up to 54 single-phase, 27 two-phase or 18 three-phase meters in a single device. Any combination of single-, two-, and three-phase consumers can be chosen up to a total of 54 current inputs.
- Automatic totalization energy from different consumers
- Modular design allows selection of 18, 24, 30, 36, 42 or 54 submeters
- Supports high accuracy current transformers with Class 0.5S accuracy
- 3-phase/2-phase/single-phase meters (true RMS, volts, amps, power, power factor, neutral current)
- Ampere/Volt demand meter
- Time-of-Use, 8 energy/demand registers x 8 tariffs, 4 seasons x 4 types of days, 8 tariff changes per day, easy programmable tariff schedule
- Automatic 120-day daily profile for energy and maximum demand readings (total and tariff registers) for each submeter
- Power quality monitoring including voltage and current harmonics (up to the 25th), voltage sags, voltage swells and interruptions (contact SATEC for availability)
- Event recorder for logging internal diagnostic events and setpoint operations
- Data recorders: programmable periodical data logs for each submeter
- Embedded programmable controller (4 control setpoints, programmable thresholds and delays) for each submeter
- Detachable optional 3.5" 320×240 pixels touch screen display with backlight
- Internal clock, keeping the clock running for years without external power
- Standard RS-485, Ethernet and USB ports
- Optional cellular communication port plug-in module
- Optional 9/18 digital inputs or 4 analog inputs module
- Modbus RTU, Modbus TCP, DNP3.0 and DNP/TCP communication protocols
- Easy field upgrading device firmware

HACS

High Accuracy Current Sensors

The BFM-II should be ordered with dedicated High Accuracy Current Sensors (HACS).

All HACS have a built-in automatic protection circuit for maximum safety, eliminating the need to use shorting bars.

*** Note**: CS05S is compatible with the RS5 version only. All other HACS are compatible with the non-RS5 version.

Accuracy:
Solid Core: 0.1% / Split Core: 0.5%

All HACS are supplied with 8ft / 2.5m cable.
Maximum cable length: 650ft / 200m.

P/N	RATING	CORE	OPENING	
			INCH	MM
CS05S*	10A	Split	Ø 0.62	Ø 16
CS1	100A	Solid	Ø 0.47	Ø 12
CS1L	100A	Solid	Ø 0.9	Ø 23
CS1S	100A	Split	Ø 0.63	Ø 16
CS1H	100A	Split	Ø 0.5	Ø 13
CS2	200A	Solid	Ø 0.9	Ø 23
CS2S	200A	Split	0.96x0.9	24.5x23.1
CS2SL	200A	Split	1.69x1.3	43x33

P/N	RATING	CORE	OPENING	
			INCH	MM
CS4	400A	Solid	Ø 1.02	Ø 26
CS4S	400A	Split	1.69x1.3	43x33
CS8	800A	Solid	4x1.28	100x32
CS8S	800A	Split	1.9x3.1	50x80
CS12S	1200A	Split	3.1x4.7	80x120
CS20S	2000A	Split	3.15x6.3	80x160
CS30S	3000A	Split	3.15x6.3	80x160

CS05S CS1 CS1L CS1S CS1H CS2 CS2S CS2SL

CS4 CS4S CS8 CS8S CS12S CS20S CS30S

Tenant Billing & Monitoring

Large and medium facilities, such as commercial buildings, residential complexes, shopping centers, malls, data centers and universities are facing more and more competitive environment in which tenants are seeking for more services in lower costs. Tenant billing and monitoring is a great solution to increase revenues with a permanent revenue stream to the facility owner while providing better service to tenants.

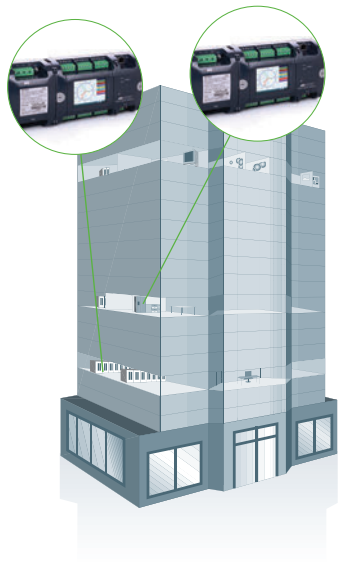
VALUE PROPOSITION

Instead of tenants purchasing electricity from the utility, they purchase it from the facility owner (or energy trader), who purchases the electricity from the utility. Tenant Billing is the best solution as it provides a win-win result for both the tenants and the facility owner (or energy trader), as follows.

ADVANTAGES FOR OWNERS

Tariff differences. Large scale consumers have access to better prices, more tariff schemes as well as markup between medium to low voltage supply. The revenue from this difference can reach 40%. The "what-if function" allows selecting the best tariff schemes to maximize revenues.

Quantity & proportional fee. When electricity is subject to additional charges, such as transportation fee, service fee or taxes, and they are progressive, the owner profits from the economy of scales.



Penalties and demand. When bills include surcharges such as low power factor (PF) or peak demand charges, charging collectively may reduce the total amount (e.g., one tenant has peak demands in the morning and the other in the afternoon).

Fixed charges per tenant. Electric bills contain a fixed amount that covers cost meter, cost of reading etc. Since monitoring with the BFM-II is centralized, the per tenant cost is significantly lower, leaving money for technology (meters, communication), management (issuing bills, maintenance) as well as in the pockets of the owner.

Time Of Use (TOU). SATEC billing system allows charging tenants by TOU, avoiding the risk of subsidizing tenants (in cases where the facility is charged with TOU scheme and charge in flat rate).

Additional services. Tenant billing is an added value for the tenant, increasing customer satisfaction.

Energy savings. Energy management provides a typical 12% saving on the electricity bill. This allows saving in public areas consumption, as well as the offices of the facility management.

Preventing utility errors. Measuring electricity independently of the utility, along with generating energy balancse within the site, allows facility managers to easily detect utility errors and prevent overcharges.

Identifying tenants under charges. The nergy balance procedure ensures that no tenant can use electricity without being charged.

Accurate forecasting. Our award winning proprietary consumption forecasting algorithm helps negotiate prices using short and long term forecasting.

Space and cost Saving. The multi-channel meter consumes up to 75% less space, allowing more area for the main purpose of the facility. The additional space required by utility meters is more expensive than utilizing BFM-II.

Automatic. Everything is done automatically, from collecting the data and sending bills to exporting the information to the accounting software.

ADVANTAGES FOR TENANTS

No change in cost. The charges by the facility owner are the same, or lower, than the utilities'. This means tenants can't lose.

Bills according to consumption. Compared to facilities that charge based on floor area, monitoring is accurate and exactly reflects the real consumption, without any estimation or cross-charges between tenants.

Accuracy. SATEC energy monitors are more accurate than utility meters. The periodic energy balancing ensures correct measurement at all times.

Monitoring of energy expenses. Real time energy monitoring allows energy saving, reducing energy costs and increasing profit.

Improved services. The tenant's energy provider is local, which means any request can be answered by the local team which is on site. This provide better service than the utility, which only has a helpdesk and long service time.

One Bill. A single bill includes rental and electricity, as well as the possibility to add other energies (e.g., water, air conditioning and gas), making it easier to control expenses.

BFM-II VS. 3-PHASE METERS

In comparison with 3-phase meters, the BFM-II offers a great saving of cost, time and space, compared with typical installation:

- A single BFM-II device replaces up to 18 three-phase meters
- Saves 60% of the hardware cost
- Saves 75% installation cost
- Saves 75% of the installation time, including wiring
- Saves 75% of panel space for 3-phase or 90% for single-phase
- The BFM-II uses only 1 TCP/IP address for all submeters, compared with up to 54 addresses when using separate meters, thus making better use of IP Addresses.

Substation Enhancement

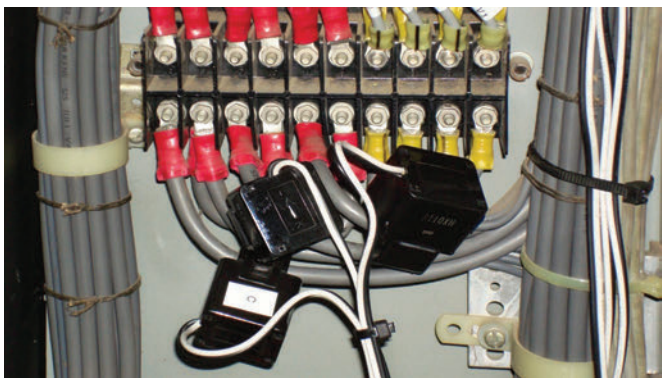
The BFM-II is ideally designed to upgrade existing substations with electro-mechanical relays to provide real-time information and management lacking in these highly reliable devices.

Many Distribution substations include conventional electro-mechanical protection relays with limited or no remote information. Until recently, upgrading such substations was too costly, and time consuming, which prevented upgrade. The introduction of the revolutionary BFM-II makes it simple and low-cost to upgrade, providing very short Return Of Investment (ROI). Implementing the BFM-II allows, without power down, to upgrade the entire substation to fully monitor every load, as well as remote control using the optional digital and analog I/Os (Breaker Status): one BFM-II can monitor up to 18 three-phase circuits that are located up to 200m/650ft away from the meter base. The installation is performed using unique split core High Accuracy Current Sensors (HACS) that simply clamp around the secondary wiring of the existing 5 Amp CTs. This eliminates the need of interfering with your protection circuit. The installation no longer requires a "Trip Test" saving the time and equipment needed for testing. By utilizing our Clip-On Technology the installation is reduced by more than half the time of installing a traditional meter, thereby eliminating the need for a full shutdown or interruption of the substation. The SATEC BFM-II allows upgrading legacy substation to modern digital substation in just a few hours. The BFM-II can be powered from either AC or DC and its local high resolution display allows both programming and monitoring of each circuit.

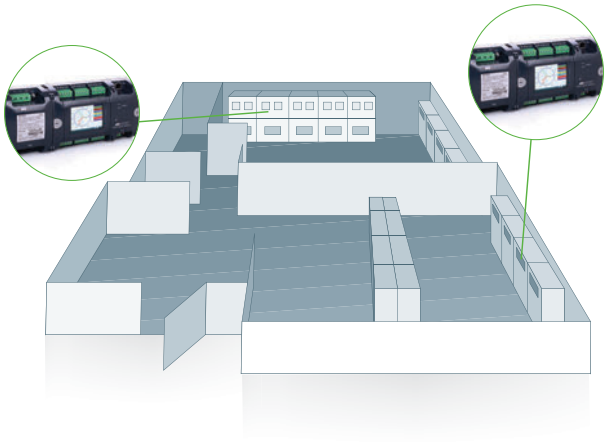
The information monitored by the BFM-II is sent via communication to the substation SCADA using DNP 3.0 or Modbus protocols (via RS-485 or Ethernet) and/or to SATEC ExpertPower Energy Management System (EMS). A local USB communication port allows easy configuration and monitoring using a technician's laptop with the PAS software included with each SATEC device. The information is also sent to a central monitoring site, allowing remote monitoring and control that reduce the requirement for local attendance. By easily providing the data lacking in the electro-mechanical relays you increase network reliability, power quality and customer satisfaction. You extend the value of these highly reliable devices by providing the information needed.

ADVANTAGES

- Ultra-rapid cost-effective substation upgrading without interruption of service
- Local and remote monitoring of relay & breaker operation
- Local and remote supervision using digital and analog inputs of Breaker Status indication
- Advance alerting of possible trips increases network reliability
- Preventive maintenance to reduce maintenance costs
- Long term memory of trend and load profiles
- Min/Max with time stamp of Amp demands
- Power Quality information such as Harmonics



Data Centers

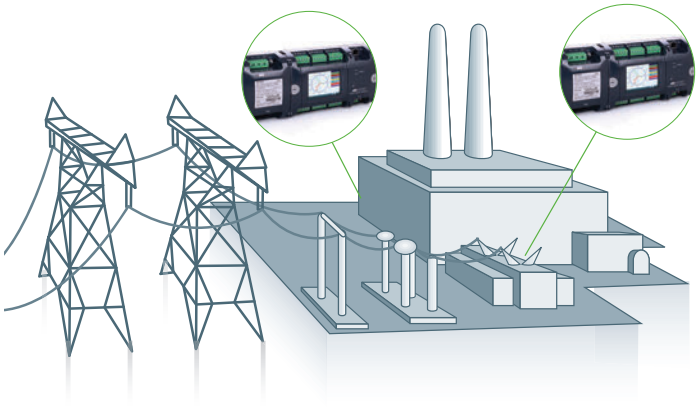


Energy consumption of data centers is constantly rising, following the increase of computing performance. Monitoring the PUE (Power Usage Effectiveness—Total Facility Energy divided by the IT Equipment Energy) is essential. According to the US DoE (Department of Energy), data centers can achieve energy savings of 20-50% by utilizing today's best practices, including "continuously monitor energy" and "monitor energy at all levels."

The practice of monitoring energy is becoming prevalent and modern data centers now include rack level monitoring at the design stage. The BFM-II monitors up to 54 single-phase loads and is ideal for PDU branch circuit monitoring, allowing for energy saving and offering high reliability.

In addition to these above benefits, collocating data centers can benefit substantially from tenant billing (see pages 6-7).

Industrial Plants



Typically, industrial plants have many loads that are fed from the same MCC. It has been proven that online monitoring of the consumption down to a single load level results in energy saving of up to 30%. The BFM-II is the most compact and efficient method to monitor several loads located up to 200m from the device, with incomparable accuracy. The use of a single device rather than separate meters makes it easy to install and maintain as well as providing a single point for communication.

Software Integration

ExpertPower™

For automated monitoring, complete billing service, and more advanced analysis options, SATEC offers ExpertPower™, the web-based energy management system.

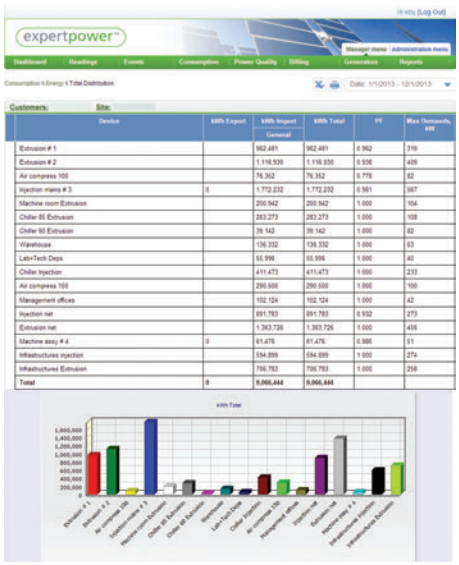
This service provides automatic monitoring, billing and analysis for electric power systems.

ExpertPower™ delivers total visibility for entire power systems over the internet, providing alarms, power diagrams, power profiles and demands, events logging, history and graphs.

For more information on our service, see SATEC ExpertPower™ brochure.

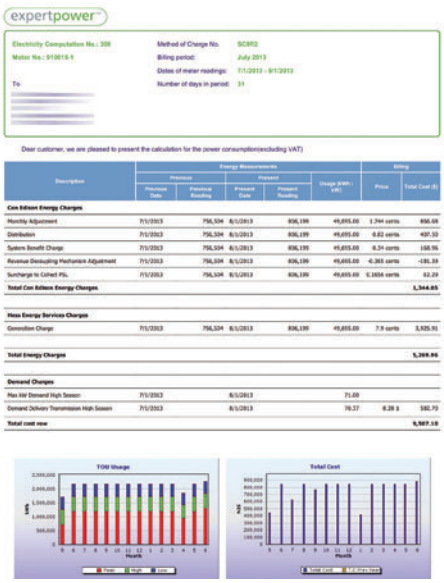
SUMMARY TOU

The summary TOU (Time of Use) page displays energy and cost values for each measured point for a selected site. The pie chart presents a clear view for comparing each measured point behavior.



ENERGY BILLING

The energy billing page details all the data required to generate a bill for a selected period. The bill is constructed based on tariff definitions. Energy and cost indicator graphs are also available.



ENERGY INTELLIGENCE

SATEC's unique Energy Intelligence (EI) module is the ultimate tool to retrieve insights of energy usage. It performs comparisons between various sites, parameters, periods and, most importantly, parameters from external systems. Using the EI module allows understanding the energy usage, thus reducing it.

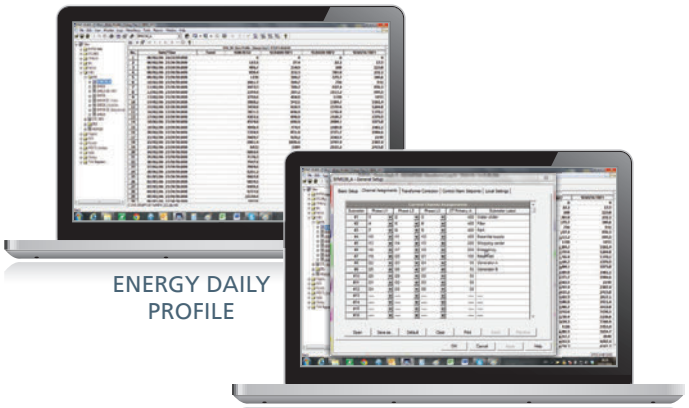
Software Integration

PAS

For remote reading and control, the BFM-II is supported by SATEC PAS software, designed for remote setup and data viewing and analysis.

PAS provides real-time access to data, downloading scheduler and automatic export to .mdb files for MS Access, MS Excel and database integration.

The BFM-II operates as up to 54 separate modbus slaves for simple integration.



ENERGY DAILY PROFILE

BFM-II SETUP: CHANNEL ASSIGNMENTS

BFM-II SETUP

BFM-II SETUP: ENERGY—TOU

Third-Party Software Integration

In addition to SATEC software solutions (ExpertPower™ and PAS), the BFM-II is designed to easily integrate with any 3rd party software. It supports Modbus/RTU, Modbus/TCP, DNP 3.0 and DNP/TCP, which allows easy connection to Building Management Systems (BMS), Supervision, Control and Data Acquisition (SCADA) systems as well as any Energy Management System (EMS).

All the details on the communication is available for the user, including the details of the various logs. Unique technologies have been implemented to make it easier for the system integrator. For example, from communication point of view, each measurement channel is a separated device, which means no special design is required. SATEC proprietary address mapping patent allows reading of any set of 120 parameters in a single reading, which provides the fastest and most reliable communication. The special 16 bit encoding reduces the communication bandwidth by 50% and data compression enables even lower bandwidth usage.

Measurement Parameters*

	Display	Comm.
ENERGY MEASUREMENTS (PER SUBMETER)		
Import/export active energy total	■	■
Import/export reactive energy total	■	■
Apparent energy total	■	■
Active, reactive, apparent energy TOU system (6 tariffs)	■	■
AVERAGE MEASURED VALUES (per feeder)		
Neutral current for 3-phase feeders		■
L-N voltage per phase	■	■
L-L per line	■	■
Current per phase	■	■
Voltage & current angles per phase	■	■
kW per phase		■
kW total per submeter	■	■
kvar per phase		■
kvar total per submeter	■	■
Power factor per phase		■
Power factor total per submeter	■	■
kVA per phase		■
kVA total per submeter	■	■
Frequency	■	■
Neutral current for 3-phase submeter		■

Measurement Parameters*

	Display	Comm.
PRESENT DEMAND		
Volts per phase		■
Amperes per phase		■
Total kW per submeter		■
Total kvar per submeter		■
Total kVA per submeter		■
MAXIMUM DEMAND		
Volts per phase	■	■
Amperes per phase	■	■
Total kW per submeter	■	■
Total kvar per submeter	■	■
Total kVA per submeter	■	■
kW, kvar, kVA per tariff (6 tariffs) per submeter	■	■
SERVICE		
Self-diagnostic test	■	■
Password per meter	■	■
Device serial no.	■	■
Software version	■	■
COM1 & COM2 info	■	■
Current direction	■	

* More measured parameters available.
Contact SATEC Sales for more information

Measurement Specifications

PARAMETER	FULL SCALE@ INPUT RANGE	ACCURACY (1)			RANGE
		% READING	% FS	CONDITIONS	
Voltage	V_L=230V; V_L=120V	0.3	0.05	100 to 300V	0 to Vmax=600 V
Line current	Instrument HACS I_L=100%	0.5	0.05	1 to 100% FS	0 to HACS primary current. Starting current: 0.1% FS
Active power	2 x Vmax x I_L/1000, kW	0.5S/1(2)	0.02	|PF| ≥ 0.5(3)	-120,000 to 120,000 kW
Reactive power	2 x Vmax x I_L/1000, kvar	0.5S/1(2)	0.02	|PF| ≤ 0.9(3)	-120,000 to 120,000 kvar
Apparent power	2 x Vmax x I_L/1000, kVA	0.5S/1(2)	0.02	|PF| ≥ 0.5(3)	0 to 120,000 kVA
Power factor	1.0	-	1.0	|PF| ≥ 0.5, I ≥ 2% FSI	-0.999 to +1.000
Active energy		Class 0.5S under conditions as per IEC 62053-22:2003(2)			0 to 99,999,999.9 kWh
Reactive energy		Class 1 under conditions as per IEC 62053-21:2003, |PF| ≤ 0.9(2)			0 to 99,999,999.9 kvar
Apparent energy		Class 1 under conditions as per IEC 62053-21:2003(2)			0 to 99,999,999.9 kVAh

NOTES

(1) Accuracy is expressed as (percentage of reading + percentage of full scale) ± 1 digit. This does not include inaccuracies introduced by the user's potential and current transformers. Accuracy calculated at 1-second average.

- Specifications assume: voltage and current waveforms with THD ≤ 5% for kvar, kVA and PF; reference operating temperature: 20°C-26°C.
- Measurement error is typically less than the maximum error indicated here.

(2) Class 0.5S accuracy (BFM-II), Class 0.5S (HACS), Class 1 (Total)
(3) @ 80% to 115% of voltage FS and 1% to 100% of current FS
FSV—voltage full scale
FSI—current full scale

Technical Specifications

PARAMETER	VALUE
Environmental Conditions	
Operating temp.	-30°C to +70°C (22°F to 158°F)
Storage temperature	-40°C to +85°C (40°F to 185°F)
Humidity	0 to 95% non condensing
Altitude	≤ 2000m
Construction	
OVERALL DIMENSIONS	
Width	278 mm/10.94" (18 channels) 554 mm/21.81" (54 channels)
Height	128 mm/5.04"
Depth	72.5 mm/2.85"
Weight	1.6kg (36 channels)
MATERIALS	
Enclosure & Panels	Polycarbonate
PCB	FR4 (UL94-V0)
Terminals	PBT (UL94-V0)
Plug-in connectors	Polyamide PA6.6 (UL94-V0)
Packaging case	Carton and Stratocell (Polyethylene Foam) Brackets
Labels	Polyester film (UL94-V0)
Power Supply	
Withstanding Insulation: 4kV AC @ 1min	
3-phase power supply (1, 2 or 3-phase operation) 3 X120/208 – 277/480V AC ±20%	
Burden for 277V	< 17 VA
Wire Size	28-12 AWG (0.1-3 mm^2)
Terminal pitch	10 mm, 4 pins + ground stud
Input Ratings	
AC VOLTAGE INPUTS: V1, V2, V3, VN	
Measuring range	3 x 120/208 – 277/480V AC ±20%
Impedance Input	10MΩ

PARAMETER	VALUE
Burden for 277V	≈ 0.08 VA
Burden for 120V	≈ 0.02 VA
Galvanic Isolation, withstanding insulation	4kV AC @ 1min
Connector Type	Removable, 4 terminals
Wire Size	28-12 AWG (0.1-3 mm^2)
Terminal pitch	10 mm
AC CURRENT INPUTS	
Connector Type	Removable, 6 terminals for 3 current inputs
Wire Size	28-12 AWG (0.1-3 mm^2)
Terminal pitch	5 mm
I1 – I54 – HACS Input via SATEC HACS 100A to 3000A	
Operating range	Maximum continuous 120% I max, i.e 120A for HACS 100A
Nominal measured Current	50A RMS (HACS 100A)
Burden	< 0.15 VA
Overload Withstand	100A RMS continuous
I1 – I54 – RS5 Input via SATEC HACS CS05S	
Operating range	Maximum continuous: 10A (primary current)
Nominal measured Current	5A RMS (primary current)
Burden	< 0.15 VA
Overload Withstand	12A RMS continuous
Communication Ports	
COM1 – STANDARD (MCM)	
Serial EIA RS-485 optically isolated port	
Withstanding Insulation	4kV AC @ 1 min
Connector Type	Removable, 3 terminals
Terminal pitch	5 mm
Wire Size	28-16 AWG (0.1-1.5 mm^2)
Baud Rate	up to 115,200 bps
Supported Protocols	MODBUS RTU/ASCII, DNP 3.0

Technical Specifications

PARAMETER	VALUE
Communication Ports — Cont.	
COM3 – STANDARD	
Serial TTL RS-232 non-isolated port for the GDM	
Baud Rate	up to 460,800 bps
Supported Protocols	MODBUS RTU
USB PORT – STANDARD	
Isolated USB 1.1 port	
Withstanding Insulation	4kV AC @ 1 min
Connector Type	A male, standard USB cable, max. length 2 meters
Supported protocols	MODBUS RTU
ETHERNET PORT – STANDARD	
Transformer-isolated	10/100Base-T port
Withstanding Insulation	4kV AC @ 1 min
Connector Type	RJ45 modular

PARAMETER	VALUE
Supported Protocols	MODBUS TCP (Port 502), DNP3/TCP (port 20000)
Number of simultaneous connections (sockets): 5	
SNTP – time synchronization	

General

REAL-TIME CLOCK	
Accuracy: better than 5 sec/month @ 25°C	
MEMORY LOG	
Standard onboard memory: 256 Mbytes	
GRAPHICAL DISPLAY MODULE – OPTION	
3.5 Inch Touch-Panel LCD graphic TFT display	
Resolution	320 x 240
Operating temperature	-20°C - +70°C
Communication	Serial TTL RS-232 non-isolated port

Add-On Modules

9 OR 18 DIGITAL INPUTS

- Optically isolated input, dry contact sensing (voltage-free)
- Internal power supply 5V DC
- Sensitivity:
  Open @ input resistance >16kOhm,
  Closed @ input resistance <10kOhm
- Scan time: 1cycle.
- Withstanding insulation: 4kV AC@1min
- Wire: 28-16 AWG (0.1-1.5 mm²), 600V isolation
- Terminal pitch: 3.81mm

4 ANALOG INPUTS

- Ranges (upon order):
  - ±1 mA (100% overload)
  - 0-20 mA
  - 4-20 mA
  - 0-1 mA (100% overload)
- Accuracy: 0.5% FS
- Scan time: 2 cycles
- Withstanding Insulation: 4kV AC@1min
- Wire: 28-16 AWG (0.1-1.5 mm²), 600V isolation
- Terminal pitch: 3.81mm

CELLULAR COMMUNICATION

- Cellular Modem
- Technologies (upon order):
  - GSM
  - CDMA
- Withstanding Insulation: 4kV AC@1min
- Connector type: SMA
- Supported Protocols: MODBUS TCP (Port 502), DNP 3.0/TCP (Port 20000)

AUXILIARY POWER SUPPLY

- Withstanding Insulation: 4kV AC@1min
- AC/DC Power Supply: L/+, N/- and GND
- Rated input: 50-290V AC 50/60Hz, 40-290V DC (between -20°C to 60°C. In other temperatures from 90V DC), max. 10W
- Wire: 28-16 AWG (0.1-1.5 mm²), 600V isolation
- Terminal pitch 7.5mm, three pins

Standards Specifications

EMC PER IEC 62052-11, IEC 62053-22, ANSI C12.1 AND ANSI C12.20

- IEC61000-4-2: Electrostatic discharge, 15/– air/contact
- IEC61000-4-3: Electromagnetic RF Fields, 10V/m @ 80MHz – 1000MHz
- IEC61000-4-4: Fast Transients burst, 4KV on current and voltage circuits and 2 KV for auxiliary circuits
- IEC61000-4-5: Surge 6KV on current and voltage circuits and 1 KV for auxiliary circuits
- IEC61000-4-6: Conducted Radio-frequency, 10V @ 0.15MHz – 80MHz
- IEC61000-4-8: Power Frequency Magnetic Field
- IEC61000-4-12: Damped oscillatory waves, 2.5kV CM and 1kV DM
- ANSI C12.1 – 4.7.3.3.1: 100kHz Ring Wave surge, 6kV @ 0.5kA (per IEEE C62.41.2-2002)
- ANSI C12.1 – 4.7.3.3.2: line surge, 1.2/50µs – 8/20µs, 6kV @ 3kA (per IEEE C62.41.2-2002)
- ANSI C12.1 – 4.7.3.11: SWC 2.5kV (per IEEE 37.90.1)
- CISPR 22 – class B

INSULATION

- IEC 62052-11 (per NMI M6-1): Insulation impulse 12 kV/50Ω @ 1.2/50 µs
- IEC 62053-22: AC voltage tests related to ground, 4 kV AC @ 1mn, for power and signal ports (above 40V), or according to UL 61010-1/916 for basic and/or double insulation and Installation Category III

SAFETY

- UL 916
- NMI M6-1

ACCURACY

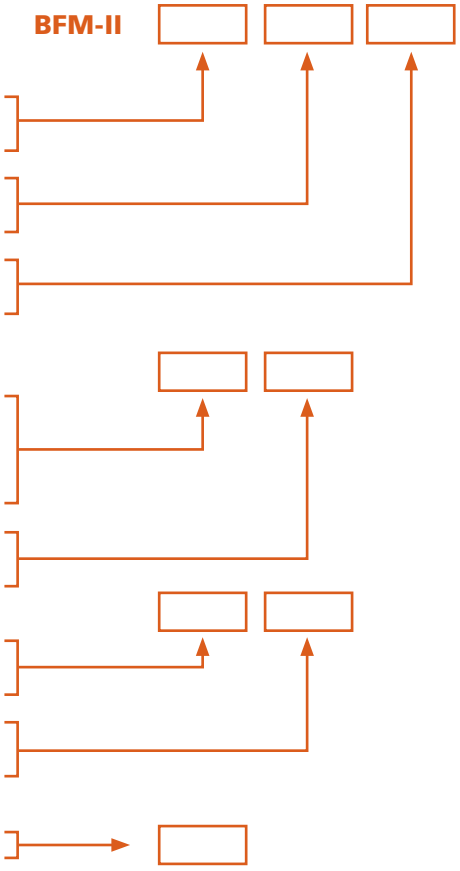
- IEC/AZ 62053-22, class 0.5S
- ANSI C12.20-2010, Class 100, 400, accuracy 0.5%

ATMOSPHERIC ENVIRONMENT

- Accuracy Operational ambient temperature range: –25°C to +60°C
- Operational ambient temperature range: –40°C to +70°C
- Long-term damp heat withstand according to IEC 68-2-3 <95% (non-condensing), +40°C
- Transport and storage temperature range: –40°C to +85°C
- IEC 62052-11 (ref. IEC 60068-2-6): Vibration
  - Frequency range: 10Hz to 150Hz
  - Transition frequency: 60Hz
  - Constant movement amplitude 0.075mm, f < 60Hz
  - Constant acceleration 9.8 m/s2 (1g), f > 60Hz
- IEC 62052-11(ref. IEC 60068-2-27): Shock
  - Half sine pulse
  - Peak acceleration: 30gn (300 m/s2)
  - Additional Transport vibration and shocks:
    - Longitudinal acceleration: 2.0 g
    - Vertical acceleration: 1.2 g
    - Transversal acceleration: 1.2 g
- IEC 60529: IP50

BFM-II ORDER STRING

OPTIONS	
CURRENT (FOR STANDARD 18 CHANNELS)	
100A to 3000A High Accuracy Current Sensors (HACS) *	**HACS**
5A split core Remote High Accuracy Current Sensor (HACS)**	**RS5**
CALIBRATION AT FREQUENCY	
50 Hz	**50HZ**
60 Hz	**60HZ**
DISPLAY OPTIONS	
Graphic Display	**G**
Blank Panel	**X**
OPTIONAL MODULES (ORDERED SEPARATELY)	
CURRENT INPUT MODULE (CIM) (UP TO 2 CIM'S PER DEVICE)***	
6 current input module (CIM 6) - HACS version*	**C6H-BFMII**
6 current input module (CIM 6) - RS5 version**	**C6R-BFMII**
18 current input module (CIM 18) - HACS version*	**C18H-BFMII**
18 current input module (CIM 18) - RS5 version**	**C18R -BFMII**
CALIBRATION AT FREQUENCY	
50 Hz	**50HZ**
60 Hz	**60HZ**
COMMUNICATIONS OPTIONS	
2G/3G GSM modem + 2nd RS-422/485 communication port	**T3G-BFMII**
2G/3G CDMA modem + 2nd RS-422/485 communication port	**T3C-BFMII**
I/O OPTIONS	
9 digital inputs module	**DI9-BFMII**
18 digital inputs module	**DI18-BFMII**
AUXILIARY POWER SUPPLY (MAX 1 MODULE PER DEVICE)	
Auxiliary Power Supply AC/DC 50-290V AC / 40-290V DC	**AUX-ACDC**



* Requires ordering of up to 6/18 HACS
** Requires ordering of up to 6/18 CS05S
*** OK to mix HACS & RS5 versions in a single device

www.satec-global.com

HEADQUARTERS
SATEC INC.
North & South America
10 Milltown Court
Union, NJ 07083, USA

Tel. 1-888-OK-SATEC
Local 908-686-9510
Fax. 908-686-9520
sales@satec-global.com

SATEC LTD.
Europe & Africa
P.O. Box 45022
Jerusalem 9145001, Israel

Tel. 972-2-541-1000
Fax. 972-2-581-2371

satec@satec-global.com

SATEC CHINA
Asia
No. 25 Ganluyuan Nanli
Beijing, China 100123

Tel. +86-10-8559-0609
Fax. +86-10-8559-0609

china@satec-global.com

SATEC (AUSTRALIA) PTY LTD
Oceania
P.O. Box 82
Mulgoa, NSW 2745, Australia

Tel. 61-2-4774-2959
Fax. 61-2-4774-0249

sales@satec-global.com.au