SATEC

Powerful Solutions

The Experts in Energy Management

Technological excellence, innovation, quality and a commitment to customer service place SATEC at the forefront of the energy industry. SATEC has been a proven solutions-oriented global leader in the research, development and manufacturing of energy management systems since 1987. With two decades of rich experience in energy management, SATEC provides total solutions for customer applications worldwide. Our greatest strength lies in our deep technological expertise and our ability to provide flexible solutions for a wide range of customer applications.

Application-Based Solutions

SATEC's device product line serves both energy utilities and energy consumers in various fields. Our application-based product line includes devices spanning from basic power meters up to high performance revenue meters with advanced power quality capabilities. All SATEC devices comply with world-acknowledged regulations and are supported by our energy management software.

Our cutting-edge power quality capabilities provide a rewarding solution enabling energy utilities to take timely corrective action and permitting energy consumers to prevent equipment failures.

Customer Satisfaction

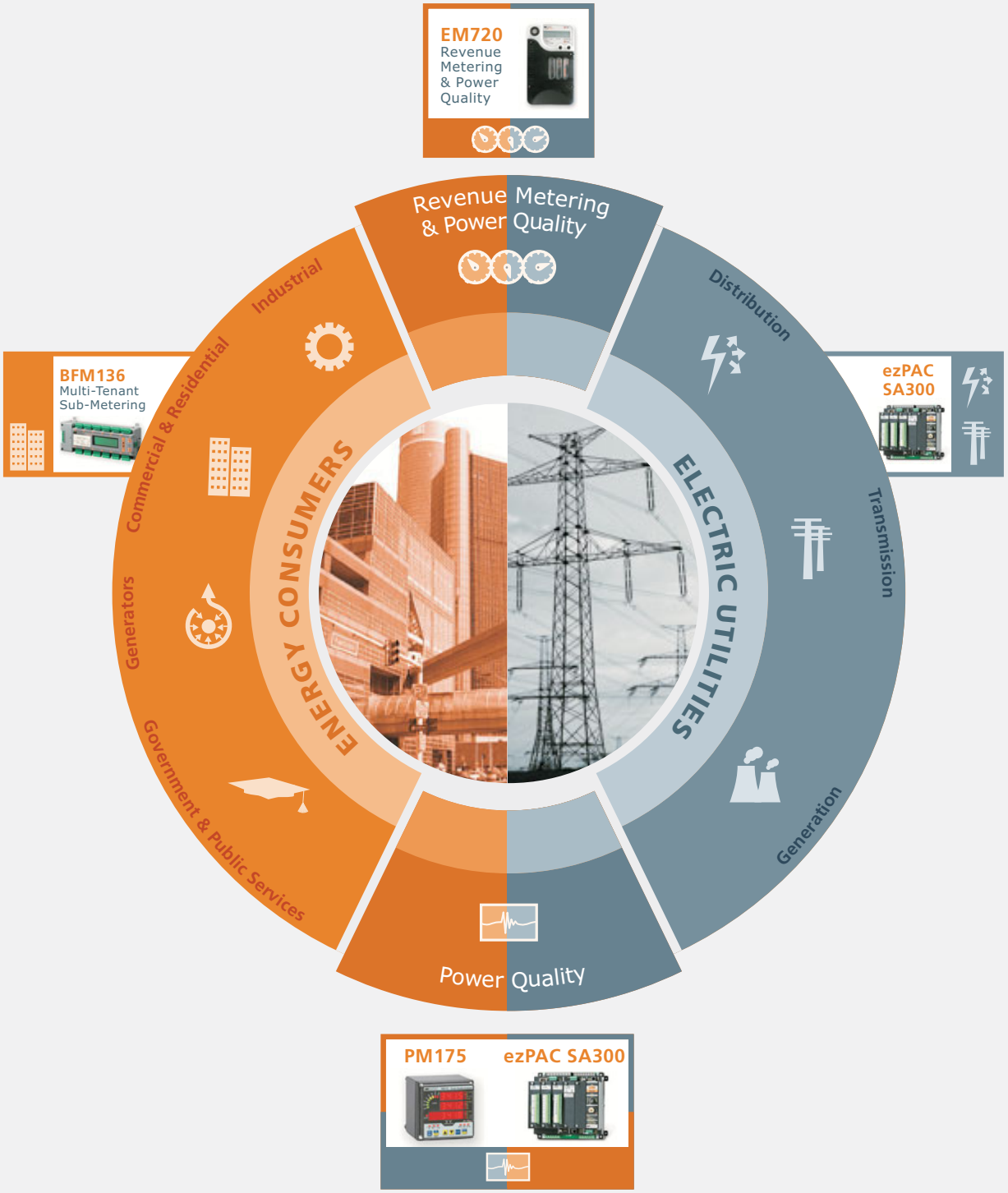
We at SATEC regard our clients as our most valuable asset. We consider excellence of products and service as a key to gaining customer loyalty and satisfaction. Our customer base consists of industrial facilities, commercial enterprises, government and public services, and major power utilities. SATEC takes pride in catering to the unique needs of our varied customer base. As a leader in the field, we at SATEC set the standard by continuously developing and upgrading our products and services, to perfect our clients' energy management systems. Our products are user-oriented and designed for easy installation and operation. We at SATEC pay special attention to quality and reliability of our products, by thorough verification of each product and system at every stage of the products' lifetime. Our quality system is ISO9001:2000 certified.

Global Distribution

SATEC exports to over 40 countries worldwide throughout Europe, North and South America, Asia and Africa. Our worldwide distribution network provides local marketing service and prompt professional support.

Our Expertise at Your Service

Our team of scientists and industry experts are available to dispense expert technical support, and provide technical solutions to questions ranging from generic to complex. SATEC's support team is closely involved in the development process, to assure a product of the highest quality that is also tailored to our customer's needs.



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PM130 PLUS Series


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PM174 / PM175


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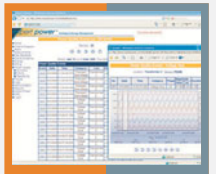
eXpertmeter EM720

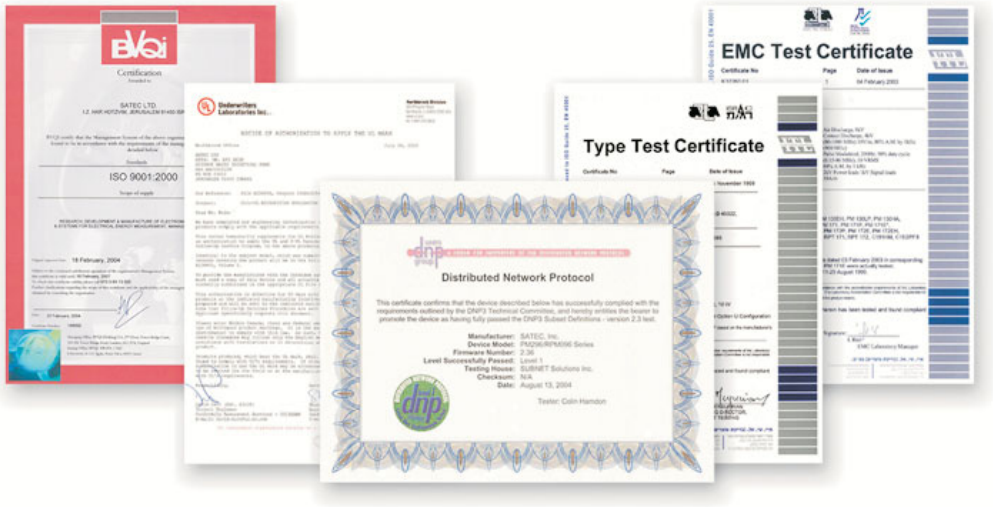
ENERGY MANAGEMENT WEB SERVICE


eXpertpower™

Test & Quality Approvals & Standards Compliance

SATEC is committed to uncompromising compliance with the highest requirements in the energy field.

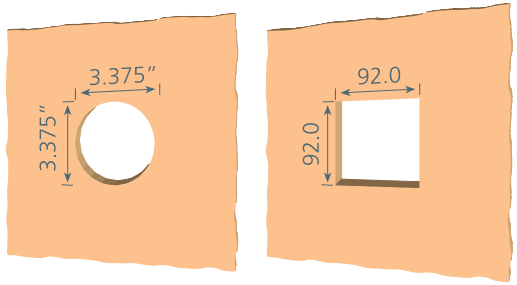
SATEC devices comply with the most demanding international standards. Standard compliance is tested by world acknowledged independent labs.



Panel Cutouts

Dual panel mounting: round & square

4" & DIN 96x96
PM130 PLUS Series
PM172 Series
PM175 / RPM075
PM174 / RPM074



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Application-Based Solutions

SATEC's device product line serves both energy utilities and energy consumers in various fields. Our application-based product line includes devices spanning from basic power meters up to high performance revenue meters with advanced power quality capabilities. All SATEC devices comply with world-acknowledged regulations and are supported by our energy management software.

Our cutting-edge power quality capabilities provide a rewarding solution enabling energy utilities to take timely corrective action and permitting energy consumers to prevent equipment failures.

Customer Satisfaction

We at SATEC regard our clients as our most valuable asset. We consider excellence of products and service as a key to gaining customer loyalty and satisfaction. Our customer base consists of industrial facilities, commercial enterprises, government and public services, and major power utilities.

SATEC takes pride in catering to the unique needs of our varied customer base. As a leader in the field, we at SATEC set the standard by continuously developing and upgrading our products and services, to perfect our clients' energy management systems. Our products are user-oriented and designed for easy installation and operation.

We at SATEC pay special attention to quality and reliability of our products, by thorough verification of each product and system at every stage of the products' lifetime. Our quality system is ISO9001:2000 certified.

Global Distribution

SATEC exports to over 40 countries worldwide throughout Europe, North and South America, Asia and Africa. Our worldwide distribution network provides local marketing service and prompt professional support.

Our Expertise at Your Service

Our team of scientists and industry experts are available to dispense expert technical support, and provide technical solutions to questions ranging from generic to complex. SATEC's support team is closely involved in the development process, to assure a product of the highest quality that is also tailored to our customer's needs.

Multifunctional Power Meter

	130P PLUS	130EH PLUS
Basic Measurements		
V		
A, A_N		
Hz (50, 60)		
Unbalance: V, A	■	■
Max. Amp Demand		
Max/Min V-Demand		
Max/Min: V, A, A_N, Hz		
Hz (25, 400)	■	■
Power		
kW, kVAR, kVA, PF	■	
kW, kVA Demands: Accum; Sliding		
kW, kVA Demands: Predicted; Max		■
kVAR: Accum; Slid; Pred; Max		
Max/Min: kW, kVAR, kVA	■	
Energy Import / Export		
kWh, kVARh, kVAh		
Total, Per Phase		■
KYZ Pulse Outputs		■*
KYZ Pulse Inputs		■*
Total: Absolute, Net		■
Time of Use (TOU)		■*
Pulse Inputs	■*	■*
Revenue Metering IEC 62053-22/ANSI C12.20		Class 0.5S
Total Harmonic		
THD(U), THD(I)		
TDD(I)		■
K-Factor		
Displacement PF		
I/O Programmable		
High Speed Programmable Relay	■*	■*
Digital Output (Relay Output, Alarm, Trip)	2*	2*
Digital Inputs	4*	4*
Analog Outputs	4*	4*
Expander Analog Output AX-8		
Analog Inputs		
Basic Communication		
RS485	■	■
RS232/485		
RS422/485		
RS232/422/485		
Number of Ports	1+1*	1+1*
Comm. Protocol		
Modbus RTU + ASCII		
DNP3.0 + Modbus RTU		
DNP3.0 + ASCII + Modbus RTU	■	■
C.B.		
Capacitor Bank Control		

The **PM130 PLUS** series provides a cost-effective substitute for numerous analog meters used by industrial, commercial and utility customers for basic power metering. The PM130 PLUS devices are multifunctional three-phase power meters. The **PM130EH PLUS** model also offers basic revenue metering.

The **PM130 PLUS** is widely integrated in panel boards and SCADA systems. With the addition of the unique TOU module, the **PM130EH PLUS** answers the needs of revenue metering applications. It is also suitable for utility substation automation because of its support of the industry standard DNP V3.0 and Modbus RTU protocols, as well as its I/O capabilities (using DI/DO module).

The **PM130 PLUS** series consists of two basic models providing digital measurements of more than 80 electrical parameters locally, and more than 100 electrical parameters via RS485 interface.

The **PM130 PLUS** modular approach enables users to assemble a system meeting their specific needs. The wide choice of plug-in modules includes digital I/O, analog output, TOU, Ethernet and Profibus.

[* Available with PM130 PLUS plug-in modules (1 module per device)]

PM130EH PLUS Power Meter

PM130P PLUS Power Meter

MULTIFUNCTIONAL 3- PHASE POWER METER

- Voltage, current (including neutral current), power, energy, power factor, frequency, voltage/current unbalance
- Current range up to 200%

REVENUE METER

- Meets class 0.2S precision
- Class 0.5S certified
- Time Of Use (TOU) tariffs

BASIC POWER QUALITY CONTROL

- Harmonics (up to the 40th)
- Voltage and current THD coefficients
- Time labeled max/min values

REAL TIME CLOCK

- Built-in clock and calendar functions

ALARM AND CONTROL FUNCTIONS

- 16 programmable set points
- 4 counters

POWER SUPPLY

- Multipurpose power supply AC/DC (85-265 VAC, 88-290 VDC)
- Special versions (12, 24-48-72 VDC)

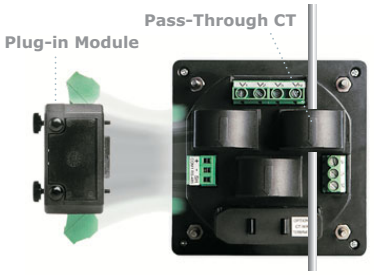
ADD-ON MODULES

- 4 digital inputs + 2 relay outputs
- Ethernet or Profibus
- 4 analog outputs
- TOU—high precision clock + 4 digital inputs + Time-of-Use tariffs for revenue metering

Dual panel mounting:
Round 4”; Square 96x96 DIN

Plug-in Modules

PM130 PLUS Rear View



	130P PLUS	130EH PLUS
Power Quality Analysis—PQA		
Non-Volatile Memory		
Real Time Clock	■	■
Event Log		
Time Stamps Resolution		
Data Log		
Historical Log		
Waveform Log		
Voltage and Current Captures		
Transient Record		
Dips, Sags, Swell Record		
Symmetrical Components		
Voltage Variations EN50160 Log		
Accd. to IEEE1159 and IEEE519		
Or EN50160		
Fault Current up to 150A RMS		
1/2 Cycle RMS Calculation	■	■
Harm. Energy		
Harmonic Powers kW, kVA		
Harmonic Energies kWh, kVAh		
Harmonic Spectrum		
Voltages & Currents HD		■
Directional Harm. Flows [kW]; [kvar]		
Voltages HD [V]		
Currents HD [A]		
Interharmonic Calculation		
Aux. Inputs		
Auxiliary AC Current Inputs		
Auxiliary AC Voltage Inputs		
Auxiliary DC Voltage Inputs		
Special Communication		
Built-in Modem		
Ethernet Port	■	■
USB Port		
GPS Time Synchronization		
Profibus DP	■	■
IRIG-B		
Add		
Dual Power Supply (Main / Backup)		

Advanced Power & Revenue Meter with Event/Data Log

		172E	172P
Basic Measurements	V		
	A, A_N		
	Hz (50, 60)		
	Unbalance: V, A	■	■
	Max. Amp Demand		
	Max/Min V-Demand		
	Max/Min: V, A, A_N, Hz		
	Hz (25, 400)	■	■
Power	kW, kVAR, kVA, PF		■
	kW, kVA Demands: Accum; Sliding		
	kW, kVA Demands: Predicted; Max	■	
	kVAR: Accum; Slid; Pred; Max		
	Max/Min: kW, kVAR, kVA		■
Energy Import / Export	kWh, kVARh, kVAh Total, Per Phase	■	
	KYZ Pulse Outputs	■	
	KYZ Pulse Inputs	■	
	Total: Absolute, Net	■	
	Time of Use (TOU)	■	
	Pulse Inputs	■	
	Revenue Metering IEC 62053-22/ANSI C12.20	Class 0.2S	
Total Harmonic	THD(U), THD(I)		
	TDD(I)	■	■
	K-Factor		
	Displacement PF		
I/O Programmable	High Speed Programmable Relay	■	■
	Digital Output (Relay Output, Alarm, Trip)	2	
	Digital Inputs	2	
	Analog Outputs	2	
	Expander Analog Output AX-8	■	
	Analog Inputs	2	
Basic Communication	RS485		
	RS232/485		
	RS422/485		
	RS232/422/485	■	
	Number of Ports	2	
Comm. Protocol	Modbus RTU + ASCII		
	DNP3.0 + Modbus RTU		
	DNP3.0 + ASCII + Modbus RTU	■	
C.B.	Capacitor Bank Control		

PM172E Power Meter

The **PM172E** is a high performance feeder monitoring instrument that includes revenue class measurements and logging capability. With over 100 electrical measurements, long term memory logging capability and breaker contact status inputs, this series is an economical approach to distribution automation for utilities.
The **PM172** series is widely integrated in panel boards and SCADA systems by commercial and industrial facilities. It is also successfully used for electric generator applications.
Revenue class metering and built-in TOU function provide a solid background for commercial and industrial sub-metering applications. Event and data log on the basis of programmable set points is a differentiating feature of the **PM172** series. This capability facilitates a wide range of commercial and industrial applications demanding data analysis as well as corrective actions for specific recorded events. The recorded data is a valuable asset for energy management.
The **PM172** series includes a choice of built-in communication platforms, such as modem, Ethernet, Profibus DP, and serial communication.

MULTIFUNCTIONAL THREE-PHASE POWER METER

- Voltage, current (including neutral current), power, energy, power factor, frequency, voltage/current unbalance, load profile

MULTI-TARIFF REVENUE METER

- Class 0.2S precision, compliant with ANSI and IEC specifications
- Built-in Time of Use (TOU) tariffs to meet any billing requirements
- Sealing option

REAL TIME CLOCK

- Built-in clock and calendar functions with back-up battery
- Time synchronization via communication port or digital input
- Logging parameters with real-time stamps

EVENT/DATA LOG

- Logging capability for more than 100 parameters

ALARM AND CONTROL FUNCTIONS

- 16 programmable set points
- 2 programmable relay outputs 3A, 250V
- 2 digital inputs
- 2 optional analog inputs or outputs

COMMUNICATION

- 2 independent communication ports (RS232, RS422, RS485, modem, Ethernet, Profibus DP)
- Protocols: Modbus RTU, ASCII, DNP 3.0

ISOLATION

- Full galvanic isolation of voltage and current measuring circuits—6 kV Impulse

Dual panel mounting:
Round 4"; Square 96x96 DIN

PM172P Power Meter

RPM072
Remote Power Meter
The RPM072 Remote Power Meter is a non-display power meter providing a solution for cases where there is no available space for display panels. Can be connected anywhere, via panel/wall and DIN rail mounting.

RDM172
Remote Display
The RPM072 can be interfaced with Remote Display RDM172 via an RS485 communication port, or added as a second display port for the PM172 series.

		172E	172P
Power Quality Analysis—PQA	Non-Volatile Memory	1 Mb	1 Mb
	Real Time Clock	■	■
	Event Log	■	■
	Time Stamps Resolution	■	■
	Data Log	■	■
	Historical Log	■	■
	Waveform Log		
	Voltage and Current Captures		
	Transient Record		
	Dips, Sags, Swell Record		
	Symmetrical Components		
	Voltage Variations EN50160 Log		
	Accd. to IEEE1159 and IEEE519		
	Or EN50160		
	Fault Current up to 150A RMS		
	1/2 Cycle RMS Calculation	■	■
Harm. Energy	Harmonic Powers kW, kVA		
	Harmonic Energies kWh, kVAh		
Harmonic Spectrum	Voltages & Currents HD		
	Directional Harm. Flows [kW]; [kvar]		
	Voltages HD [V]		
	Currents HD [A]		
	Interharmonic Calculation		
Aux. Inputs	Auxiliary AC Current Inputs		
	Auxiliary AC Voltage Inputs		
	Auxiliary DC Voltage Inputs		
Special Communication	Built-in Modem	■	■
	Ethernet Port	■	■
	USB Port		
	GPS Time Synchronization		
	Profibus DP	■	■
	IRIG-B		
Add	Dual Power Supply (Main / Backup)		

		175/075
Basic Measurements	V	
	A, A_N	
	Hz (50, 60)	
	Unbalance: V, A	■
	Max. Amp Demand	
	Max/Min V-Demand	
	Max/Min: V, A, A_N, Hz	
	Hz (25, 400)	
Power	kW, kVAR, kVA, PF	
	kW, kVA Demands: Accum; Sliding	
	kW, kVA Demands: Predicted; Max	■
	kVAR: Accum; Slid; Pred; Max	
	Max/Min: kW, kVAR, kVA	
Energy Import / Export	kWh, kVARh, kVAh	
	Total, Per Phase	■
	KYZ Pulse Outputs	■
	KYZ Pulse Inputs	■
	Total: Absolute, Net	■
	Time of Use (TOU)	■
	Pulse Inputs	■
	Revenue Metering IEC 62053-22/ANSI C12.20	Class 0.2S
Total Harmonic	THD(U), THD(I)	
	TDD(I)	■
	K-Factor	
	Displacement PF	
I/O Programmable	High Speed Programmable Relay	
	Digital Output (Relay Output, Alarm, Trip)	2
	Digital Inputs	2
	Analog Outputs	2
	Expander Analog Output AX-8	■
	Analog Inputs	2
Basic Communication	RS485	
	RS232/485	
	RS422/485	
	RS232/422/485	■
	Number of Ports	2
Comm. Protocol	Modbus RTU + ASCII	
	DNP3.0 + Modbus RTU	
	DNP3.0 + ASCII + Modbus RTU	■
C.B.	Capacitor Bank Control	

IEC Advanced Power Quality Analyzer

PM175 Power Quality Analyzer

The Advanced Power Quality Analyzer **PM175** is a compact, multifunctional three- phase power and revenue meter equipped with advanced power quality analysis capabilities. The **PM175** has been developed to answer the needs of a wide range of users within the IEC Market: substation operators, electrical energy system integrators, generator users, industrial and commercial energy consumers. This analyzer covers the entire range of applications demanding high performance power quality monitoring and root cause analysis. The **PM175** provides the full range of power quality monitoring capabilities with built-in EN50160 statistics and reports. The **PM175** allows both suppliers and consumers to monitor the quality of outgoing or incoming electric power. This enables power suppliers to prepare timely corrective action, and helps consumers prevent equipment damages caused by power quality issues.
Two communication ports allow local and remote data acquisition.

MULTIFUNCTIONAL THREE-PHASE POWER METER

- Voltage, current (including neutral current), power, energy, power factor, frequency, voltage/current unbalance, load profile

MULTI-TARIFF REVENUE METER

- Class 0.2S precision according to IEC 62053-22
- Built-in Time of Use (TOU) tariffs to meet any billing requirements
- Sealing option
- Built-in clock and calendar functions with back-up battery
- Time synchronization via communication port or digital input

ADVANCED POWER QUALITY ANALYSIS

- Monitoring, statistics & reports according to EN50160 specifications
- Event statistics complemented by waveform recording
- Waveform recording with 6 channels (3 voltage inputs, 3 current inputs)
- Harmonics & inter-harmonics according to IEC 61000-4-7
- Directional power harmonics
- Voltage and current THD coefficients
- Flicker according to IEC 61000-4-15

EVENT/DATA LOG

- Power quality event/data logging
- Logging capability for more than 100 parameters
- Logging parameters with real-time stamps

ALARM AND CONTROL FUNCTIONS

- 16 programmable set points
- 2 programmable relay outputs 3A, 250V
- 2 digital inputs
- 2 optional analog inputs or outputs

COMMUNICATION

- 2 independent communication ports (RS232, RS422, RS485, modem, Ethernet, Profibus DP)
- Protocols: Modbus RTU, ASCII, DNP 3.0

ISOLATION

- Full galvanic isolation of voltage and current measuring circuits—6 kV Impulse

Dual panel mounting:
Round 4"; Square 96x96 DIN

RPM075
Remote Power Meter

The **RPM075** Remote Power Meter is a non-display power meter providing a solution for cases where there is no available space for display panels. Can be connected anywhere, via panel/wall and DIN rail mounting.

RDM175
Remote Display

The **RPM075** can be interfaced with Remote Display RDM175 via an RS485 communication port, or added as a second display port for the **PM175**.

		175/075
Power Quality Analysis—PQA	1 Mb Non-Volatile Memory	
	Real Time Clock	
	Event Log	
	(FULL PQA) Time Stamps Resolution	
	Data Log	
	Historical Log	
	Waveform Log	■
	Voltage and Current Captures	
	Transient Record	
	Dips, Sags, Swell Record	
	Symmetrical Components	
	Voltage Variations EN50160 Log	
	Accd. to IEEE1159 and IEEE519	
	Or EN50160	■
	Fault Current up to 150A RMS	
	1/2 Cycle RMS Calculation	■
Harm. Energy	Harmonic Powers kW, kVA	
	Harmonic Energies kWh, kVAh	■
Harmonic Spectrum	Voltages & Currents HD	■
	Directional Harm. Flows [kW]; [kvar]	
	Voltages HD [V]	■
	Currents HD [A]	
	Interharmonic Calculation	
Aux. Inputs	Auxiliary AC Current Inputs	
	Auxiliary AC Voltage Inputs	
	Auxiliary DC Voltage Inputs	
Special Communication	Built-in Modem	■
	Ethernet Port	■
	USB Port	
	GPS Time Synchronization	
	Profibus DP	■
	IRIG-B	
Add	Dual Power Supply (Main / Backup)	

		174/074
Basic Measurements	V	
	A, A_N	
	Hz (50, 60)	
	Unbalance: V, A	■
	Max. Amp Demand	
	Max/Min V-Demand	
	Max/Min: V, A, A_N, Hz	
	Hz (25, 400)	
Power	kW, kVAR, kVA, PF	
	kW, kVA Demands: Accum; Sliding	
	kW, kVA Demands: Predicted; Max	■
	kVAR: Accum; Slid; Pred; Max	
	Max/Min: kW, kVAR, kVA	
Energy Import / Export	kWh, kVARh, kVAh	
	Total, Per Phase	■
	KYZ Pulse Outputs	■
	KYZ Pulse Inputs	■
	Total: Absolute, Net	■
	Time of Use (TOU)	■
	Pulse Inputs	■
	Revenue Metering IEC 62053-22/ANSI C12.20	Class 0.2S
Total Harmonic	THD(U), THD(I)	
	TDD(I)	■
	K-Factor	
	Displacement PF	
I/O Programmable	High Speed Programmable Relay	
	Digital Output (Relay Output, Alarm, Trip)	2
	Digital Inputs	2
	Analog Outputs	2
	Expander Analog Output AX-8	■
	Analog Inputs	2
Basic Communication	RS485	
	RS232/485	
	RS422/485	
	RS232/422/485	■
	Number of Ports	2
Comm. Protocol	Modbus RTU + ASCII	
	DNP3.0 + Modbus RTU	
	DNP3.0 + ASCII + Modbus RTU	■
C.B.	Capacitor Bank Control	

ANSI Advanced Power Quality Analyzer

PM174 Power Quality Analyzer

The Advanced Power Quality Analyzer **PM174** is a compact, multifunctional three- phase power and revenue meter equipped with advanced power quality analysis capabilities. The **PM174** has been developed to answer the needs of a wide range of users within the ANSI Market: substation operators, electrical energy system integrators, generator users, industrial and commercial energy consumers. This analyzer covers the entire range of applications demanding high performance power quality monitoring and root cause analysis. The extensive features of the **PM174** make it ideal for applications such as feeder, switch gear monitor, revenue metering and billing, power quality and utility SCADA. It is also highly suitable for substation automation because of its support of industrial standard DNP 3.0 and Modbus RTU protocols.
The PM174 provides the full range of power quality monitoring capabilities, implemented with the IEEE1159 specifications in mind. The **PM174** allows both suppliers and consumers to monitor the quality of outgoing or incoming electric power. This enables power suppliers to prepare timely corrective action, and helps consumers prevent equipment damages caused by power quality issues. Two communication ports allow local and remote data acquisition.

MULTIFUNCTIONAL THREE-PHASE POWER METER

- Voltage, current (including neutral current), power, energy, power factor, frequency, voltage/current unbalance, load profile

MULTI-TARIFF REVENUE METER

- 0.2% precision according to ANSI C12.20, Class 10
- Built-in Time of Use (TOU) tariffs to meet any billing requirements
- Sealing option
- Built-in clock and calendar functions with back-up battery
- Time synchronization via communication port or digital input

ADVANCED POWER QUALITY ANALYSIS

- Monitoring, statistics & reports according to IEEE1159 specifications
- Event statistics complimented by waveform recording
- Waveform recording with 6 channels (3 voltage inputs, 3 current inputs)
- Harmonics & inter-harmonics
- Directional power harmonics
- Voltage and current THD coefficients
- Flicker according to IEC 61000-4-15

EVENT/DATA LOG

- Power quality event/data logging
- Logging capability for more than 100 parameters
- Logging parameters with real-time stamps

ALARM AND CONTROL FUNCTIONS

- 16 programmable set points
- 2 programmable relay outputs 3A, 250V
- 2 digital inputs
- 2 optional analog inputs or outputs

COMMUNICATION

- 2 independent communication ports (RS232, RS422, RS485, modem, Ethernet, Profibus DP)
- Protocols: Modbus RTU, ASCII, DNP 3.0

ISOLATION

- Full galvanic isolation of voltage and current measuring circuits—6 kV Impulse

Dual panel mounting:
Round 4"; Square 96x96 DIN

RPM074
Remote Power Meter

The RPM074 Remote Power Meter is a non-display power meter providing a solution for cases where there is no available space for display panels. Can be connected anywhere, via panel/wall and DIN rail mounting.

RDM174
Remote Display

The **RPM074** can be interfaced with Remote Display **RDM174** via an RS485 communication port, or added as a second display port for the **PM174**.

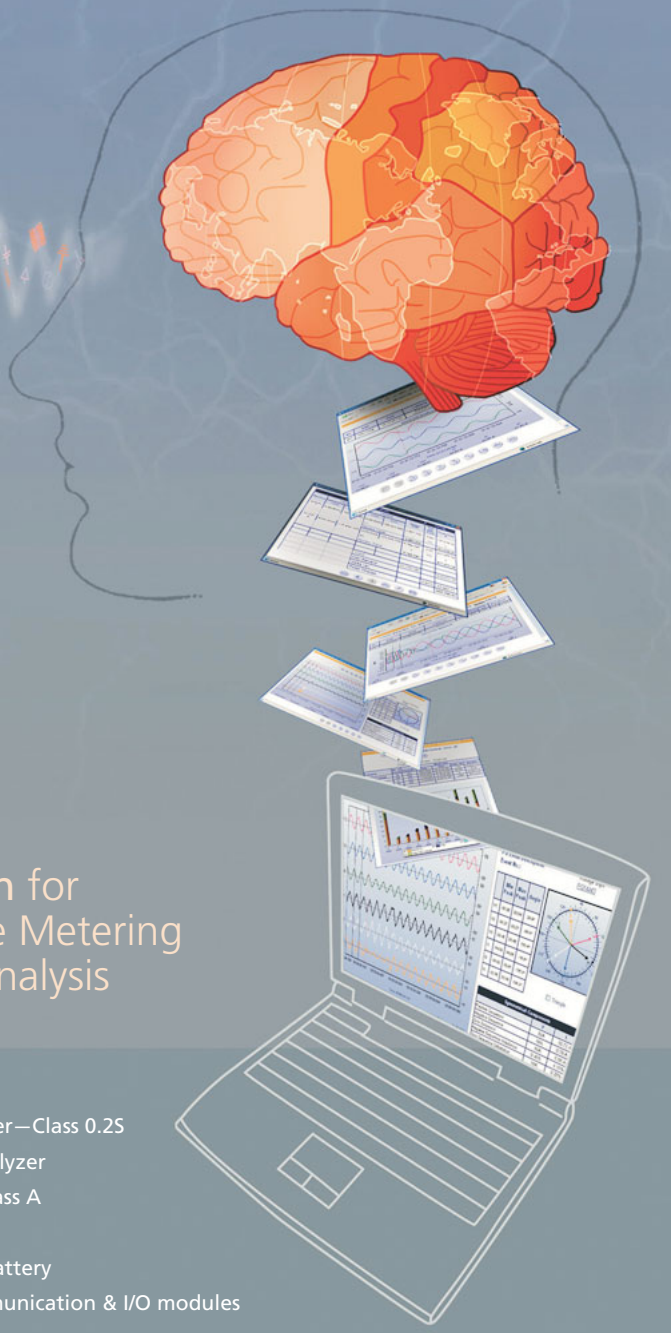
		174/074
Power Quality Analysis—PQA	Non-Volatile Memory	1 Mb
	Real Time Clock	
	Event Log	
(FULL PQA)	Time Stamps Resolution	
	Data Log	
	Historical Log	
	Waveform Log	■
	Voltage and Current Captures	
	Transient Record	
	Dips, Sags, Swell Record	
	Symmetrical Components	
	Voltage Variations EN50160 Log	
	Accd. to IEEE1159 and IEEE519	■
	Or EN50160	
	Fault Current up to 150A RMS	
	1/2 Cycle RMS Calculation	■
Harm. Energy	Harmonic Powers kW, kVA	■
	Harmonic Energies kWh, kVAh	
Harmonic Spectrum	Voltages & Currents HD	■
	Directional Harm. Flows [kW]; [kvar]	
	Voltages HD [V]	■
	Currents HD [A]	
	Interharmonic Calculation	
Aux. Inputs	Auxiliary AC Current Inputs	
	Auxiliary AC Voltage Inputs	
	Auxiliary DC Voltage Inputs	
Special Communication	Built-in Modem	■
	Ethernet Port	■
	USB Port	
	GPS Time Synchronization	
	Profibus DP	■
	IRIG-B	
Add	Dual Power Supply (Main / Backup)	

eXpertmeter™
High Performance Revenue Meter

High Performance Revenue Meter & Cutting Edge Power Quality Analyzer & Transient Recorder

The **eXpertmeter™** is a unique and cost-effective combination of several Intelligent Electronic Devices (IED) in one. It incor-porates a multifunctional power meter, high performance revenue meter, cutting-edge power quality analyzer and a unique transient recorder. The power quality statistics and reports are implemented according to EN50160. A rechargeable back-up battery allowing for accurate logging of major dips and inter-ruptions is a unique feature of this instrument.

The **eXpertmeter™** all-in-one solution has been developed to comply with the most demanding customer requirements in energy generation and distribution (power stations, electric companies, substation operators, electric energy system integrators) and in energy consumer segments (industrial and commercial). The **eXpertmeter™** can serve as a main revenue meter or test meter to manage advanced energy supply contracts that include a commitment to the most demanding power quality standards. The **eXpertmeter™** can be used to resolve disputes between electric energy suppliers and consumers regarding power quality standard violations. This device provides the most advanced communication capabilities, such as built-in infra-red port, serial communication (RS-232/RS-485), Ethernet and USB. With its hot swapping field replaceable modules, the **eXpertmeter™** can be tailored to specific needs by adding additional communication capabilities, I/O capabilities or auxiliary power supply.



The **Total Solution** for Advanced Revenue Metering & Power Quality Analysis

expertmeter™

- High performance revenue meter—Class 0.2S
- Cutting-edge power quality analyzer
- Complies with IEC61000-4-30 Class A
- Fault & transient recorder
- Unique rechargeable back-up battery
- Multiple field-replaceable communication & I/O modules

expertpower™

- Energy management web service offering billing, power quality analysis & more*

* See pages 13-14 for more information.

expertmeter™ High Performance Revenue Meter

		720
Basic Measurements	V	
	A, A_N	
	Hz (50, 60)	
	Unbalance: V, A	■
	Max. Amp Demand	
	Max/Min V-Demand	
	Max/Min: V, A, A_N, Hz	
	Hz (25, 400)	
Power	kW, kVAR, kVA, PF	
	kW, kVA Demands: Accum; Sliding	
	kW, kVA Demands: Predicted; Max	■
	kVAR: Accum; Slid; Pred; Max	
	Max/Min: kW, kVAR, kVA	
Energy Import / Export	kWh, kVARh, kVAh	
	Total, Per Phase	■
	KYZ Pulse Outputs	■
	KYZ Pulse Inputs	■
	Total: Absolute, Net	■
	Time of Use (TOU)	■
	Pulse Inputs	■
	Revenue Metering IEC 62053-22/ANSI C12.20	Class 0.2S
Total Harmonic	THD(U), THD(I)	
	TDD(I)	
	K-Factor	■
	Displacement PF	
I/O Programmable	High Speed Programmable Relay	■
	Digital Output (Relay Output, Alarm, Trip)	2
	Digital Inputs	4
	Analog Outputs	
	Expander Analog Output AX-8	
	Analog Inputs	
Basic Communication	RS485	
	RS232/485	■
	RS422/485	
	RS232/422/485	
	Number of Ports	2
Comm. Protocol	Modbus RTU + ASCII	
	DNP3.0 + Modbus RTU	
	DNP3.0 + ASCII + Modbus RTU	■
C.B.	Capacitor Bank Control	

EM720 Revenue Meter

Field Replaceable Hot Swap Modules

IRIG-B
RS232/485

Ethernet
USB
RS232/485

MULTI-TARIFF REVENUE METER

- Meets 0.1% accuracy
- Class 0.2S Precision according to IEC 62053-22
- Time Of Use (TOU) tariffs to meet any billing requirements (8 tariffs, 4 seasons)
- Unique anti-vandalism & anti-tampering features
- Transformer and transmission line losses calculation
- Built-in self accuracy test

ADVANCED POWER QUALITY ANALYSIS

- Power Quality Analysis according to IEC 61000-4-30 Class A
- Built-in EN50160 statistics & reports
- Back-up battery and/or auxiliary power supply for recording major dips & interruptions
- Harmonics & Inter-harmonics according to IEC 61000-4-7
- Directional power harmonics
- Voltage and current THD coefficients
- Flicker measurement according to IEC 61000-4-15
- Waveform recording, up to 1024 samples/cycle

TRANSIENT RECORDER

- Records fast transients overvoltages >17 ms
- Transients measured relative to ground
- Measures up to 2 kV pulses

MULTIFUNCTIONAL THREE-PHASE POWER METER

- Voltage, current (including Neutral current), power, energy, power factor, frequency, voltage/current unbalance, load profile

EVENT/DATA LOG

- Event statistics complimented by waveform recording
- 3 voltage & 4 current inputs for waveform records
- Logging capability for more than 100 parameters with real-time stamps
- Logging memory 8 Mb built-in
- GPS time synchronization
- 4 measured and recorded currents up to 50 A (10In)
- Chargeable backup battery — 2.5 hours retention
- Auxiliary power supply (optional module)

ALARM AND CONTROL FUNCTIONS

- 16 programmable set points
- 4 digital inputs with 1 ms sample rate
- 2 programmable relay outputs (2 DI/2DO optional hot swap module)

COMMUNICATION

- Built-in infra-red port
- **Hot swap modules**
  - Ethernet (100Mb/s), USB & RS232/485
  - IRIG-B & RS232/485
  - GSM/GPRS (Class 10)
- **Protocols**
  - Master/Slave Modbus Binary & ASCII
  - Modbus RTU
  - DNP 3.0 over IP
  - TCP/IP
  - SMTP (outgoing mail)
  - Optional IEC 61850 protocol

ISOLATION

- Dielectic withstand: 6 kV impulse, 4 kV AC @ 1min
- I/O and ComPorts—4 kV AC

		720
Power Quality Analysis—PQA	Non-Volatile Memory	8 Mb
	Real Time Clock	
	Event Log	
	Time Stamps Resolution	
	Data Log	(FULL PQA)
	Historical Log	
	Waveform Log	■
	Voltage and Current Captures	
	Transient Record	
	Dips, Sags, Swell Record	
	Symmetrical Components	
	Voltage Variations EN50160 Log	
	Accd. to IEEE1159 and IEEE519	
	Or EN50160	■
	Fault Current	50A
	1/2 Cycle RMS Calculation	■
Harm. Energy	Harmonic Powers kW, kVA	
	Harmonic Energies kWh, kVAh	■
Harmonic Spectrum	Voltages & Currents HD	■
	Directional Harm. Flows [kW]; [kvar]	
	Voltages HD [V]	■
	Currents HD [A]	
	Interharmonic Calculation	■
Aux. Inputs	Auxiliary AC Current Inputs	
	Auxiliary AC Voltage Inputs	
	Auxiliary DC Voltage Inputs	■
Special Communication	Built-in Modem	
	Ethernet Port	■
	USB Port	■
	GPS Time Synchronization	■
	Profibus DP	
	IRIG-B	■
Add	Dual Power Supply (Main / Backup)	

Advanced Control & Power Quality Analysis

		ezPAC
Basic Measurements	V	
	A, A_N	
	Hz (50, 60)	
	Unbalance: V, A	■
	Max. Amp Demand	
	Max/Min V-Demand	
	Max/Min: V, A, A_N, Hz	
	Hz (25, 400)	
Power	kW, kVAR, kVA, PF	
	kW, kVA Demands: Accum; Sliding	
	kW, kVA Demands: Predicted; Max	■
	kVAR: Accum; Slid; Pred; Max	
	Max/Min: kW, kVAR, kVA	
Energy Import / Export	kWh, kVARh, kVAh	
	Total, Per Phase	■
	KYZ Pulse Outputs	■
	KYZ Pulse Inputs	■
	Total: Absolute, Net	■
	Time of Use (TOU)	■
	Pulse Inputs	■
	Revenue Metering IEC 62053-22/ANSI C12.20	Class 0.2S
Total Harmonic	THD(U), THD(I)	
	TDD(I)	
	K-Factor	■
	Displacement PF	
I/O Programmable	High Speed Programmable Relay	■
	Digital Output (Relay Output, Alarm, Trip)	32
	Digital Inputs	48
	Analog Outputs	16
	Expander Analog Output AX-8	
	Analog Inputs	16
Basic Communication	RS485	
	RS232/485	
	RS422/485	
	RS232/422/485	■
	Number of Ports	7
Comm. Protocol	Modbus RTU + ASCII	
	DNP3.0 + Modbus RTU	■
	DNP3.0 + ASCII + Modbus RTU	
C.B.	Capacitor Bank Control	■

The Total Solution for Add-On Substation Automation

The SATEC **ezPAC™ SA300** Series Power Intelligence Unit is an advanced power analysis and control device unmatched in the utility and industrial environments. The **ezPAC™ SA300** Series is a fusion of many Intelligent Electronic Devices (IED) combined into a single powerful unit. **ezPAC™** unites advanced control and automation functions, intelligent fault-recorder, power quality and sequence of events (SOE) with automatic analysis and reports. It also offers revenue metering, back-up protection equipment and control devices to provide a complete solution for substation and industrial automation. The **ezPAC™** is suitable for retrofit as well as for new utility projects.

This instrument is an ideal cost-effective means to automating an electrical substation with existing electro mechanical (EM) relays. The **ezPAC™** Series extends the life expectancy of EM protection relays for many years by providing the information lacking from these highly reliable devices without interfering with the protection scheme.

This instrument is an ideal cost-effective means to automating an electrical substation with existing electro mechanical (EM) relays. The **ezPAC™** Series extends the life expectancy of EM protection relays for many years by providing the information lacking from these highly reliable devices without interfering with the protection scheme.

ezPAC™ SA300 Series
Power Intelligence Unit–IED

Display Modules

RDM LED
Remote Display Module

RDM312
Multi-window Display Module

ezPAC		
4 Mb+ 128 Mb	Non-Volatile Memory	Power Quality Analysis—PQA
(FULL PQA)	Real Time Clock	
	Event Log	
	Time Stamps Resolution	
	Data Log	
	Historical Log	
■	Waveform Log	
	Voltage and Current Captures	
	Transient Record	
	Dips, Sags, Swell Record	
	Symmetrical Components	
	Voltage Variations EN50160 Log	
■	Accd. to IEEE1159 and IEEE519	
	Or EN50160	
150A	Fault Current	
■	1/2 Cycle RMS Calculation	
	Harmonic Powers kW, kVA	Harm. Energy
	Harmonic Energies kWh, kVAh	
■	Voltages & Currents HD	Harmonic Spectrum
	Directional Harm. Flows [kW]; [kvar]	
■	Voltages HD [V]	
	Currents HD [A]	
■	Interharmonic Calculation	
5	Auxiliary AC Current Inputs	Aux. Inputs
1	Auxiliary AC Voltage Inputs	
1	Auxiliary DC Voltage Inputs	
	Built-in Modem	Special Communication
	Ethernet Port	
■	USB Port	
	GPS Time Synchronization	
	Profibus DP	
	IRIG-B	
■	Dual Power Supply (Main / Backup)	Add

		ezPAC
Basic Measurements	V	
	A, A_N	
	Hz (50, 60)	
	Unbalance: V, A	■
	Max. Amp Demand	
	Max/Min V-Demand	
	Max/Min: V, A, A_N, Hz	
	Hz (25, 400)	
Power	kW, kVAR, kVA, PF	
	kW, kVA Demands: Accum; Sliding	
	kW, kVA Demands: Predicted; Max	■
	kVAR: Accum; Slid; Pred; Max	
	Max/Min: kW, kVAR, kVA	
Energy Import / Export	kWh, kVARh, kVAh	■
	Total, Per Phase	
	KYZ Pulse Outputs	■
	KYZ Pulse Inputs	■
	Total: Absolute, Net	■
	Time of Use (TOU)	■
	Pulse Inputs	■
	Revenue Metering IEC 62053-22/ANSI C12.20	Class 0.2S
Total Harmonic	THD(U), THD(I)	
	TDD(I)	■
	K-Factor	
	Displacement PF	
I/O Programmable	High Speed Programmable Relay	■
	Digital Output (Relay Output, Alarm, Trip)	32
	Digital Inputs	48
	Analog Outputs	16
	Expander Analog Output AX-8	
	Analog Inputs	16
Basic Communication	RS485	
	RS232/485	
	RS422/485	
	RS232/422/485	■
	Number of Ports	7
Comm. Protocol	Modbus RTU + ASCII	
	DNP3.0 + Modbus RTU	■
	DNP3.0 + ASCII + Modbus RTU	
C.B.	Capacitor Bank Control	■

Advanced Control & Power Quality Analysis

MULTI-FUNCTIONAL THREE-PHASE POWER METER

- Voltage, current (including neutral), power, energy, power factor, demands, frequency, voltage/current unbalance, load profile
- 1 DC voltage input (up to 300 VDC)
- 4 additional revenue grade AC current inputs (option)

FAULT RECORDER

- Up to 150A fault currents
- Fault distance calculations
- Fault reports
- Up to 48 fast (1 ms) digital inputs or 16 fast (1 ms) analog inputs
- Sequence of events with 1 ms accuracy

EVENT/DATA LOG

- 4 voltage and 4 current inputs for fast waveform recording
- Up to 57 channel simultaneous recording (8 AC, 1 VDC, and 48 digital input channels)
- Synchronized waveforms from multiple devices in a single plot
- Multiple parameter logging with real-time stamps
- Built-in 4 Mb logging memory, up to 128 Mb (option)

MULTI-TARIFF REVENUE METER

- Class 0.2S Precision according to IEC 62053-22
- Time of Use (TOU) tariffs

ADVANCED POWER QUALITY ANALYSIS

- Power quality according to IEC 61000-4-30 Class A
- Power quality analysis, statistics & reports according to IEEE 1159 or EN50160
- Sags/swells detection
- Interruptions detection
- Pulsed transients detection (pulse width >150 μs)
- Harmonics & inter-harmonics according to IEC 61000-4-7
- Directional power harmonics
- Voltage and current THD, current TDD, and K-factor
- Flicker measurement according to IEC 61000-4-15

CONTROL & ALARM FUNCTIONS

- 32 programmable set points
- 5 slots for plug-in I/O modules
- Up to three modules of 16-channel digital inputs
- Up to four 8-channel relay output modules
- Up to four combined 4-channel analog input/output modules (4AI and 4AO per module)
- Up to two 8-channel fast (1 ms) analog input modules

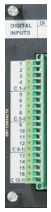
COMMUNICATION

- Three independent serial communication ports (RS232 & RS422/485)
- Infrared port
- Built-in modem
- Ethernet
- USB port
- Protocols: Modbus RTU & ASCII, DNP 3.0, TCP/IP
- Optional IEC 61850 protocol

ezPAC™ SA300 Series
Power Intelligence Unit–IED

Plug-In Modules

The unique modular design of **ezPAC™ SA300** ensures its adaptation to the changing needs of today and tomorrow, through a selection of numerous plug-in options for multiple customer applications.



DI
Digital Inputs

DO
Relay Outputs

AI/AO
Mixed Analog Input/Output

PAS/AI
Fast Analog Input

Expanded Memory

ezPAC		
4 Mb+ 128 Mb	Non-Volatile Memory	Power Quality Analysis—PQA
(FULL PQA)	Real Time Clock	
	Event Log	
	Time Stamps Resolution	
	Data Log	
	Historical Log	
■	Waveform Log	
	Voltage and Current Captures	
	Transient Record	
	Dips, Sags, Swell Record	
	Symmetrical Components	
	Voltage Variations EN50160 Log	
■	Accd. to IEEE1159 and IEEE519 Or EN50160	
150A	Fault Current	
■	1/2 Cycle RMS Calculation	Harm. Energy
	Harmonic Powers kW, kVA	
	Harmonic Energies kWh, kVAh	
■	Voltages & Currents HD	Harmonic Spectrum
	Directional Harm. Flows [kW]; [kvar]	
■	Voltages HD [V]	
	Currents HD [A]	
■	Interharmonic Calculation	
5	Auxiliary AC Current Inputs	Aux. Inputs
1	Auxiliary AC Voltage Inputs	
1	Auxiliary DC Voltage Inputs	
	Built-in Modem	Special Communication
	Ethernet Port	
■	USB Port	
	GPS Time Synchronization	
	Profibus DP	
	IRIG-B	
■	Dual Power Supply (Main / Backup)	Add

Multi-Tenant Sub-Metering

SATEC's new offering for the commercial market answers customer needs in multi-tenant sub-metering applications. This solution is based on the new generation multi-tenant Branch Feeder Monitor and supported by the groundbreaking web application **eXpertpower™**.

Ideal for both new and retrofit projects, the **BFM136** can monitor energy (on multi-tariff TOU basis), demands and data logging. The device can monitor up to 12 three-phase channels or 36 single-phase channels, or any other combination of both. This flexibility and cost-efficiency make the **BFM136** especially suitable for multi-tenant facilities, such as office buildings, shopping malls, residential buildings, hotels, government facilities, universities, etc. Cost-efficiency is also achieved by the considerable installation and infrastructure cost savings.

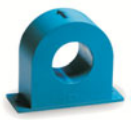
This compact instrument is designed to easily fit into existing panel boards, thus eliminating the need for expensive retrofit projects or for allocating extra space. For billing purposes, single or multiple circuits can be defined for each customer. This flexibility allows to reassign circuit groups to changing customers without complicated electrical procedures, and allows for easy changes when tenants move in and out.

The **BFM136** user-defined and easily configured alarm system enables preventive maintenance to avoid unnecessary outages.

Combined with SATEC's **eXpertpower™**, a comprehensive web service enabling users to access energy, power quality and real-time data, the **BFM136** completes the total solution for multi-tenant energy mangement.

Current Transformers Options

Ø 26mm, 1.02"
400A



Ø 23mm, 0.91"
100A

Ø 12mm, 0.47"
100A

Split Core CT
Ø 16mm, 0.63"
100A

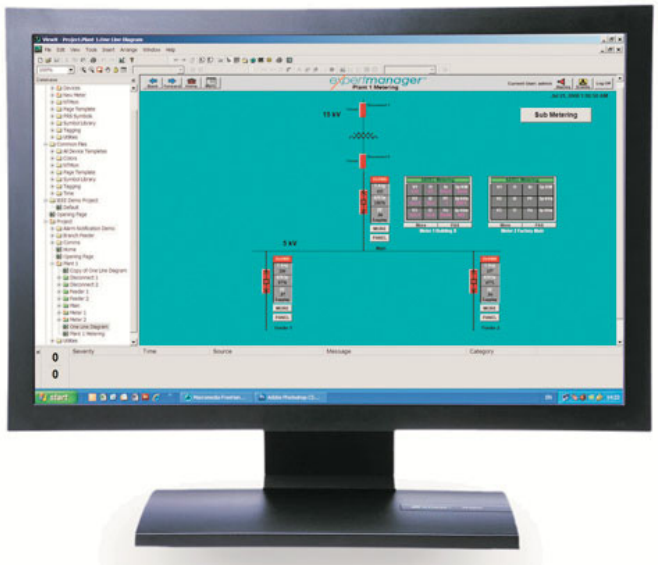
BFM136 Branch Feeder Monitor

FEATURES AND BENEFITS

- Provides a complete set of energy and demand data on multi-tariff basis for billing purposes
- Class 0.5S precision in revenue metering
- Meter sealing option for voltage and current inputs
- Current and voltage monitoring
  - 12 3-phase channels
  - 18 2-phase channels
  - 36 1-phase channels
  - Any combination of the above
- Compliant with ANSI and IEC specifications
- LCD display for on-site access, providing 30 channels of consumption readings for each tenant
- Data access and TOU via PAS software
  (see pg. 15 for more information about PAS)
- Web-based energy management with **eXpertpower™** providing online data access
- Compact design for easy installation within existing or new electric panelboards
- Durable design for tamper resistance
- Communication platforms
  - Built-in serial RS485
  - Optional: modem, Ethernet, wireless
- Real Time Clock
- Event and data logging
- Flash memory 8 Mb

Integrated Solutions

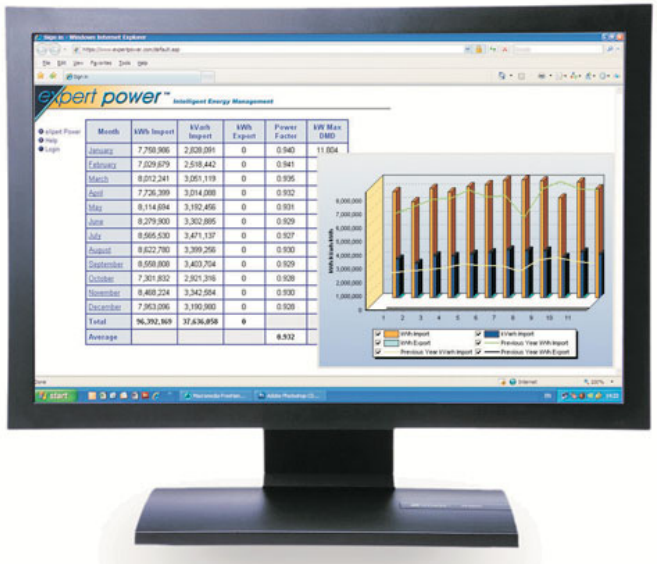
eXpertManager™



eXpertManager™ powered by the Power Rich System from BCI Technologies, is an integrated power quality SCADA system for commercial, industrial, and utility power monitoring and control. **eXpertManager™** is a real time SCADA monitoring and control system with predictive demand metering, advanced power quality, demand response and carbon monitoring capabilities. **eXpertManager™** is an add-on automation solution that supports a wide range of SATEC and third party products, to minimize installation and operational costs. The **eXpertManager™** system provides commercial and industrial customers a tool to successfully monitor power quality, individually meter tenants or production areas, reduce energy demand and reduce energy costs.

The **eXpertManager™** system is a Windows-based SCADA system specifically designed to use industry standard open protocols like OPC, Modbus, and DNP3.0. The **eXpertManager™** system also features a scalable architecture with built-in mirrored redundancy. The expansion capability ranges from a single server with 500 data points to multiple servers with more than 1,000,000 data points, distributed over a wide area communicating with thousands of devices. The system's inherent communication ability enables status changes from the field to reach an operator's display in less than 2 seconds. SATEC's predictive demand metering capability combined with **eXpertManager™**'s system performance provide customers an opportunity to reduce electrical demand before the end of a utility demand period. **eXpertManager™** also provides an integrated web server option for customers who wish to leverage their Intranet or the Internet for data access and system control.

expertpower™



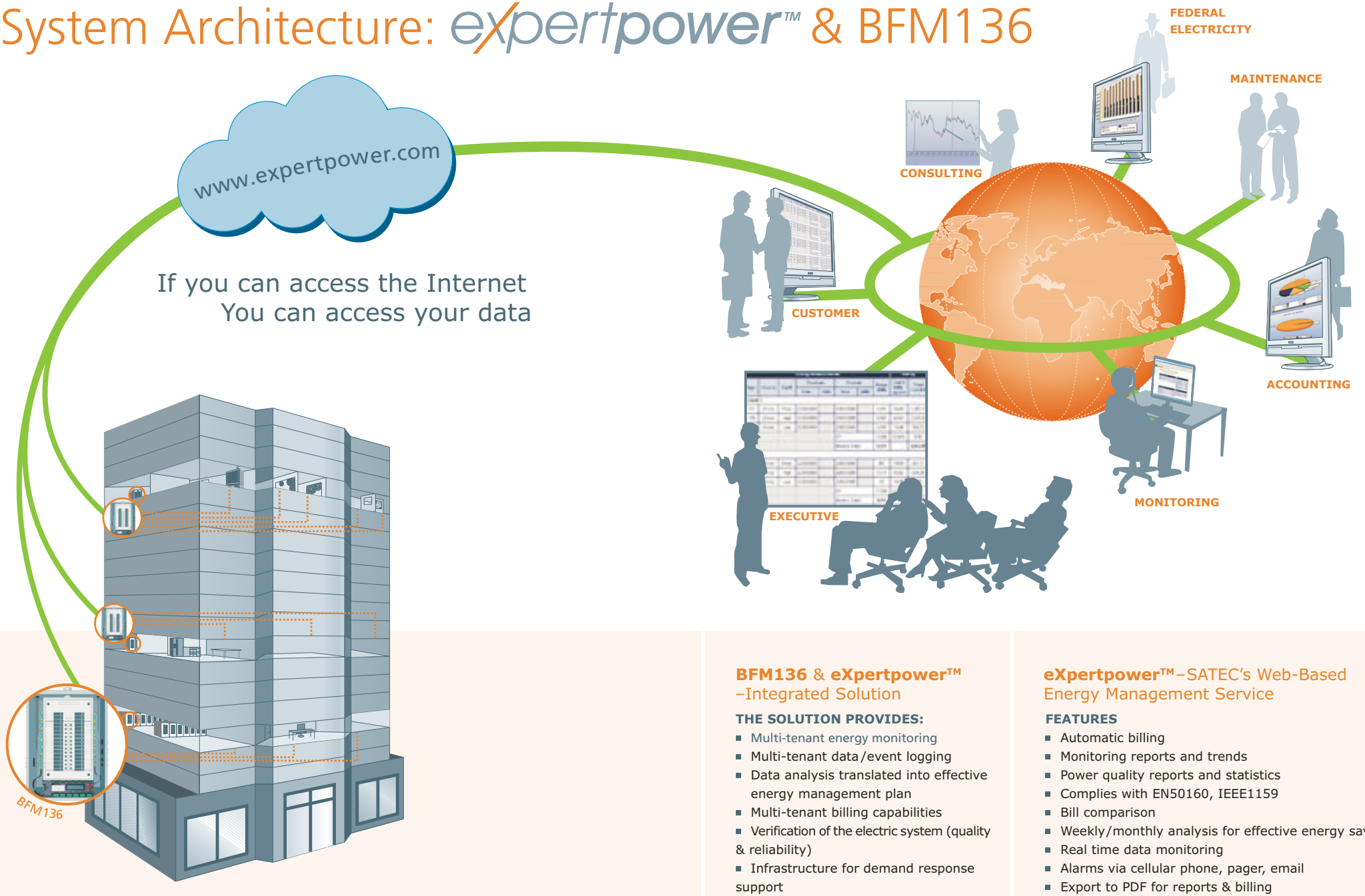
eXpertpower™, SATEC's web-enabled analysis and data management system, has revolutionized the field of energy management by providing a cost-effective solution which allows users to access comprehensive on-line data in real-time. **eXpertpower™** introduces a mechanism for detailed analysis to identify and solve power system problems, from anywhere, anytime, via the Web. While software packages provide data from individual instruments, **eXpertpower™** delivers aggregate data analysis and corporate overview. **eXpertpower™** is a total power management system complete with all the necessary tools to monitor and manage the power system under one virtual roof.

eXpertpower™ requires no heavy up-front capital investment, no downloads or updates, no maintenance or hardware issues and no employee training or software implementation. We do all that for you. This means significant savings of both time and money.

eXpertpower™ is a revolutionary approach to total power management that utilizes sophisticated yet user-friendly software adhering to the growing Application Service Provider (ASP) model. It collects, archives and analyzes power system data automatically while allowing multiple users to view this data in reports, tables, graphs, waveforms or charts. Thanks to many unique advantages, **eXpertpower™** minimizes expenses and promotes better energy management and power quality monitoring.

Integrated Solutions for Energy Consumers

System Architecture: eXpertpower™ & BFM136



BFM136 & **eXpertpower™**
–Integrated Solution

THE SOLUTION PROVIDES:

- Multi-tenant energy monitoring
- Multi-tenant data/event logging
- Data analysis translated into effective energy management plan
- Multi-tenant billing capabilities
- Verification of the electric system (quality & reliability)
- Infrastructure for demand response support

eXpertpower™–SATEC's Web-Based Energy Management Service

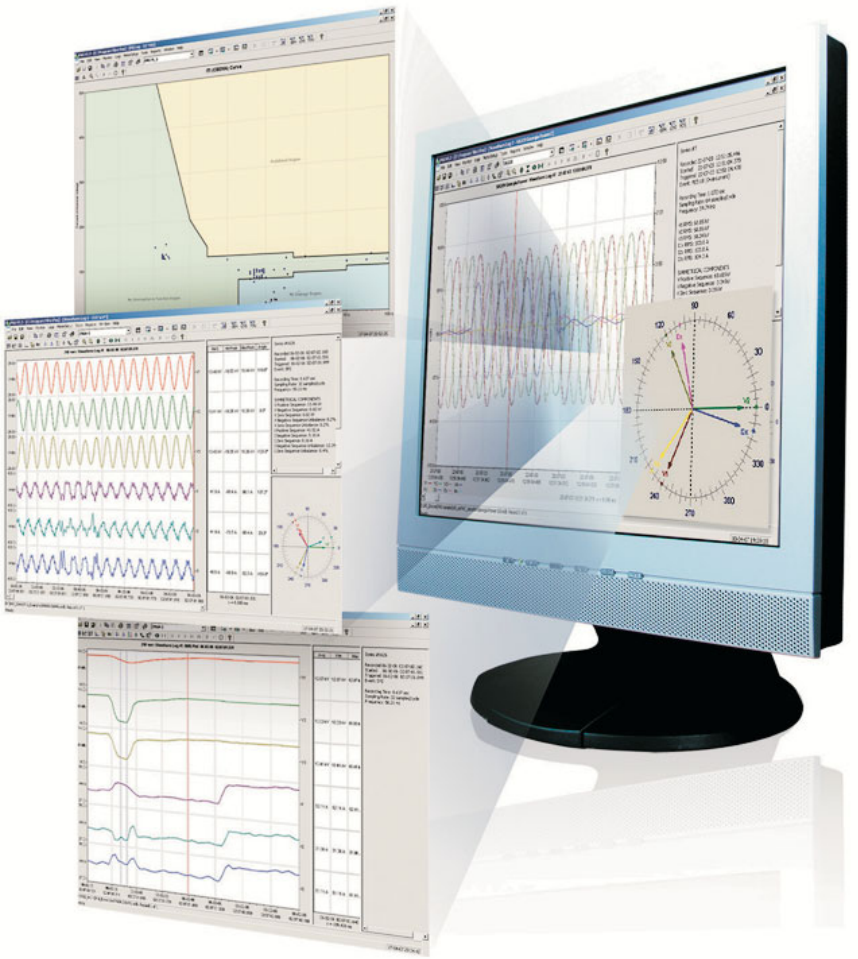
FEATURES

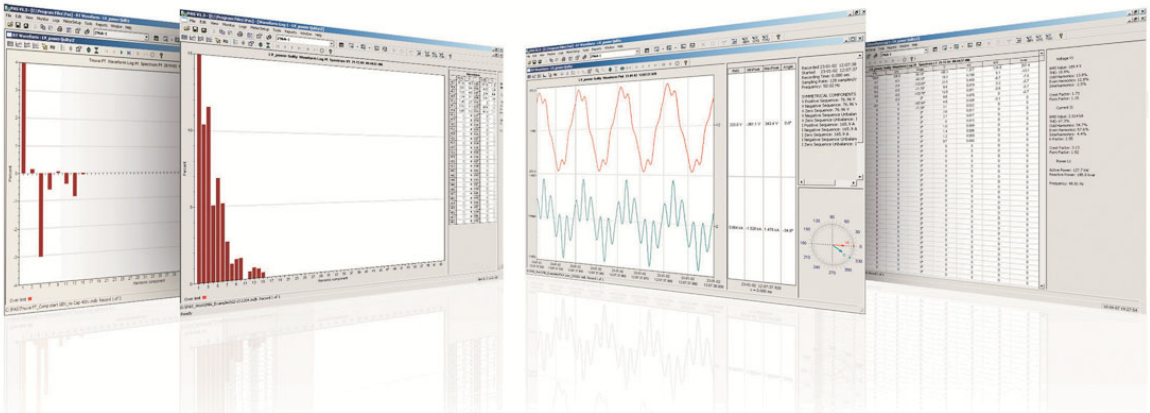
- Automatic billing
- Monitoring reports and trends
- Power quality reports and statistics
- Complies with EN50160, IEEE1159
- Bill comparison
- Weekly/monthly analysis for effective energy savings
- Real time data monitoring
- Alarms via cellular phone, pager, email
- Export to PDF for reports & billing

PAS—Power Analysis Software

PAS is SATEC's setup and application tool for use with all SATEC instruments.
Its versatility stems from its numerous features:

- Automatic power quality reports for EN50160 & IEEE 1159
- Automatic polling of devices
- Simple off-line instrument setup
- Direct data access for status monitoring or analysis
- **Wide range of communication platforms:**
  - RS standard serial lines
  - TCP/IP
  - USB
  - Telephone/Modem
- **Sophisticated analysis:**
  - Data logs—historical or current
  - Trends—individual or 3 phases together
  - Trend over time data log or waveform
  - Trend based on user-selected parameters or limits
  - Harmonic spectrum
  - Harmonics power direction
  - EN50160 comparison tables for HV and LV applications
  - G5/4 comparison tables for HV and LV applications
  - Vector analysis/phasor diagram
  - Automatic power quality and fault categorization
  - Waveform comparison between sites
  - ITI (CBEMA) curve
  - Automatic sort and filter capabilities
  - Uploading TOU settings
  - Uploading with variable setpoints
  - Alarms with variable setpoints
  - Delta measurement
- Self-test
- Easy export to spreadsheet, Word, Excel or database
- Extensive graphic and report capabilities for waveforms, harmonics & billing
- Export COMTRADE (IEEE standard common format for transient data exchange).
  - Export PQ





Intelligent Communication Device

The **ETC2002** Network Communicator opens a new era for energy management by enabling users to advance from serial network (RS485) and exploit the advantages of the Internet and Intranet. The **ETC2002** offers full control of entire power systems, from anywhere, anytime, via an Internet/Ethernet connection and supports various protocols. Its compact design and easy DIN/wall mounting allow for ease of use.

ETC2002 Network Communicator

Four Main Functions

1. Transparent (from serial communication to TCP/IP communication, in any of these protocols: Modbus TCP/IP software, DNP TCP/IP and ASCII TCP/IP)

2. Protocol Converter for all third-party instruments, such as protection, relay, frequency driver and PLC.
(from serial communication to TCP/IP communication, in any of these protocols: Modbus TCP/IP software, DNP TCP/IP and ASCII TCP/IP)

3. Data Server Applications
The **ETC2002** Data Server provides the user with a mechanism that allows data accumulation from instruments in a background mode, using Modbus protocol (Modbus master). The instruments and register range for polling are defined in the polling tables. A total of 64 address ranges can be defined. The data is stored in a buffer, where 120 16-bit registers are reserved for each server address range. Users can specify up to 120 contiguous registers (per address range) in the connected instrument that would be continuously polled and updated in the server register array. Any number of device register ranges can be defined for each instrument.
Important features include:

- Memory logging
- Reduction of network traffic
- Backup memory for Internet and other applications

4. Web-Based Energy Management Service
See **eXpertpower™** on pages 13-14.

FEATURES

- Ethernet 10 Base-T port
- 2 RS422/RS485 ports (Modbus, ASCII, DNP 3.0 protocols)—Master
- 1 RS232 port—Slave
- Modem port (optional)
- Provides support for communication protocols (TCP/IP Modbus, TCP/IP ASCII and TCP/IP DNP 3.0)
- Serial slave mode (Modbus, ASCII, DNP 3.0 protocols) for the entire range of SATEC products
- 4 Digital inputs
- IRIG-B port
- Real Time Clock
- Large non-volatile memory
- Terminal connection
- Telnet service
- Field setup
- Wide range of power supply options
- Compact design
- Table top (DIN rail and wall mounting option)

Communication Devices

The **RSC232** communications converter, with a built-in power supply, is designed to handle up to 31 IEDs connected via RS485 up to 1200 meters/4000 feet. It can be powered from AC/DC power supply, and permits easy conversion of **RS232** PC signals into full duplex (RS422) or half duplex (RS485) communication. Din/Wall Mounting.

RSC232 Communications Converter

The **AX-8** Analog Expander enables power meters to interface with other devices that require analog signals. The **AX-8** can be connected to any power meter equipped with an RS422 communication port and an analog expander option. 8 channels are provided for high-resolution analog output. Two units can be connected in sequence, providing as many as 16 analog outputs with the use of one power meter. A wide range of operations offers current output or voltage output.

AX-8 Analog Expander

Portable Analyzer

The Ideal Tool for Power Quality Tests

The **EDL** Portable Analyzer is a multifunction power meter, from 3-phase AC to power quality to fault recorder. This power meter uses a large setpoint programming suitable for all AC nework applications, to meet any analysis requirement. The portable analyzer complies with IEC61000-4-30 standard class A, as well as with EN50160, with built-in automatic compliance reports.
The **EDL** Portable Analyzer measures, records and analyzes events and data of electrical network parameters. The **EDL** meets the requirements of a wide range of applications, from events analysis to energy auditing and load profile recording over a period of time. This instrument incorporates all the measurement, logging and power quality capabilities of the **PM175**/**PM174** power meters (see pages 6-7) in a convenient portable package, and includes the PAS software package which provides graphic data display and analysis capabilities. The **EDL** includes a data backup battery and offers a selection of current measuring probes.

EDL175 / EDL174XR Portable Analyzer

Current Clamps & Accessories Offered by SATEC

Clamp-On Current Probes

Flexible AC Current Probe

Device Comparison Table

Device	Basic Measurements (V, A, Max Amp Demand, Max/Min V-Demand)						Power Measurements				Revenue Metering						Total Harmonic Distortion				RTC
	V, A, Hz (50/60)	25/400 Hz	Max/Min V, A, Hz	Max Amp Demand	Max/Min V-Demand	Unbalance V/A	kW, kVAR, kVA	kW/kVAR/kVA Demands	Max/Min kW, kVAR, kVA	PF	IEC62053-22/ANSI C12.20 (Class)	kWh, kVARh, kVAh	KYZ Pulse Outputs	KYZ Pulse Inputs	Pulse Inputs	TOU Tariffs	THD (U), %	THD (I), %	TDD (I), %	K-Factor	Real Time Clock
 PM130P PLUS	■	■	■	■	■	■	■		■	■											■
 PM130EH PLUS	■	■	■	■	■	■	■	■	■	■	0.5S	■	■*	■*	■*	■*	■	■	■	■	■
 PM172P	■	■	■	■	■	■	■		■	■							■	■	■	■	■
 PM172E	■	■	■	■	■	■	■	■	■	■	0.2S	■	■	■	■	■	■	■	■	■	■
 PM175	■		■	■	■	■	■	■	■	■	0.2S	■	■	■	■	■	■	■	■	■	■
 PM174	■		■	■	■	■	■	■	■	■	0.2S	■	■	■	■	■	■	■	■	■	■
 BFM136	■		■	■	■	■	■	■	■	■	0.5S	■				■					■
 eXpertmeter™	■		■	■	■	■	■	■	■	■	0.2S	■	■	■	■	■	■	■	■	■	■
 ezPAC™ SA300	■		■	■	■	■	■	■	■	■	0.2S	■	■	■	■	■	■	■	■	■	■

Device	Power Quality Analysis — PQA														Individual Harmonics						Capacitor
	Non-Volatile Memory (Mb)	Event Log	Data Log	Historical Log	Time Stamps	Waveform Log	V & I Captures	Transient Recording	Dips, Sags, Swell Recording	Symmetrical Components	EN50160 Reports	Accd. to IEEE 1159 & IEEE 519	Fault Current	1/2 Cycle RMS Calculation	Voltage / Current HD, %	Voltages HD, V	Currents, HD, A	Directional Harm. kW, kVAR	Interharmonic Calculation	Harmonic Powers kW, kVA	Capacitor Bank Control
PM130P PLUS					■									■							
PM130EH PLUS					■									■	■						
PM172P	1	■	■	■	■									■							
PM172E	1	■	■	■	■									■							
PM175	1	■	■	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	
PM174	1	■	■	■	■	■	■	■	■	■		■		■	■	■	■	■	■	■	
BFM136	8	■	■	■	■									■							
eXpertmeter™	8	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	
ezPAC™ SA300	4/128	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Device	I/O Programmable					Basic Comm.				Protocols			Auxiliary Inputs			Special Communication							Additions
	Relay Output (SS/EM)	Analog Outputs	Digital Inputs	Analog Inputs	Analog Output Expander	RS485	RS232 / 485	RS232 / 224 / 485	No. of Ports	Modbus RTU + ASCII	DNP3.0 + Modbus RTU	DNP3.0 + Modbus (RTU + ASCII)	AC Current	AC Voltage	DC Voltage	Built-in Dial-up Modem	Ethernet Port TCP/IP	USB	IR	Profibus DP	GSM / GPRS	IRIG-B	Backup Power Supply
PM130P PLUS	2*	4*	4*			■			1+1*			■					■*			■*			
PM130EH PLUS	2*	4*	4*			■			1+1*			■					■*			■*			
PM172P	2	2	2	2	■			■	2			■				■	■			■			
PM172E	2	2	2	2	2			■	2			■				■	■			■			
PM175	2	2	2	2	■			■	2			■				■	■			■			
PM174	2	2	2	2	■			■	2			■				■	■			■			
BFM136								■	2	■						■	■						
eXpertmeter™	2*		4 +2*				■		2			■					■*	■*	■		■*	■*	■*
ezPAC™ SA300	32	16	48	16				■	7		■		4	1	1	■	■	■	■	■		■	■

* Available with plug-in module

SATEC

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