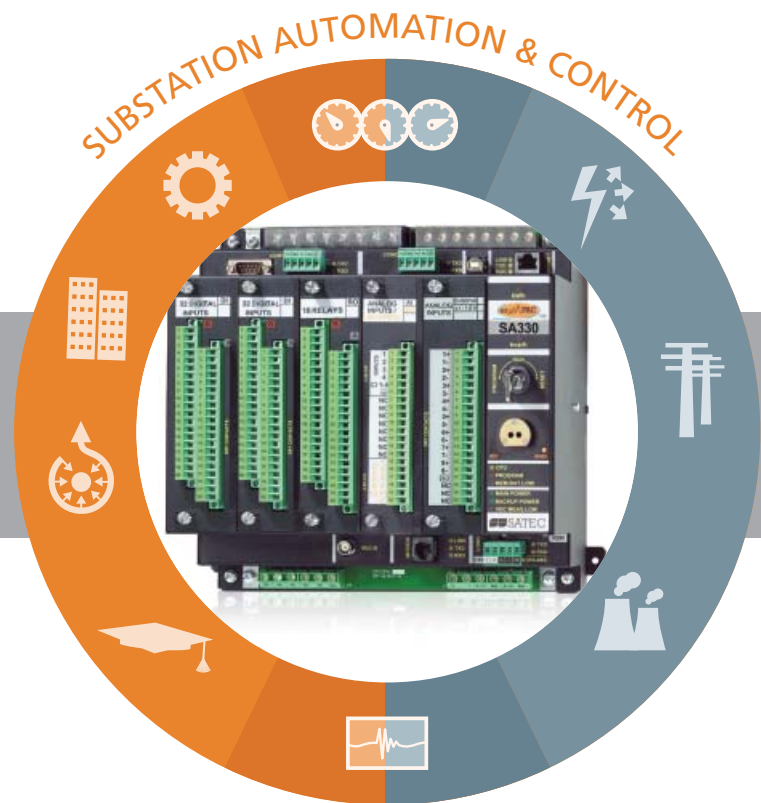


# ezPAC™

## SA300

 **SATEC**  
*Powerful Solutions*



POWER QUALITY ANALYZER

FAULT RECORDER

SEQUENCE OF EVENTS

PROTECTION, CONTROL & ALARM FUNCTIONS

REVENUE GRADE METER



# ezPAC™ SA300 Series

The ezPAC™ SA300 is a part of SATEC's Power Intelligence Unit (PIU) Family Series, combining an advanced power analysis and control device.

The SA300 Series is a fusion of many Intelligent Electronic Devices (IEDs) incorporated into a single powerful unit. It consolidates 6 functions to provide a complete solution for both substations and industrial automation:

- Revenue Grade Metering
- Power Quality Analyzer
- Distributed Fault Recorder
- Sequence of Events (SoE)
- Backup Protection equipment
- Device Control

The unique modular expansion chassis of the ezPAC™ SA300 series ensures meeting the needs of today and the future by selecting different plug-in options for multiple applications. The modular I/O design enables a custom-made product according to each customer's specific needs.

## A Unique Solution for Utilities & Industrial Sector

- Substation Automation (IEC 61850)
- Power Quality Analyzer (IEEE1159 / EN50160 / GOST 13109)
- Disturbance Fault Recording
- Distance to Fault Calculations
- Precise Sequence Of Events (SoE) Recorder

## Models

The ezPAC™ has two models with different current transformers connection:

### SA320

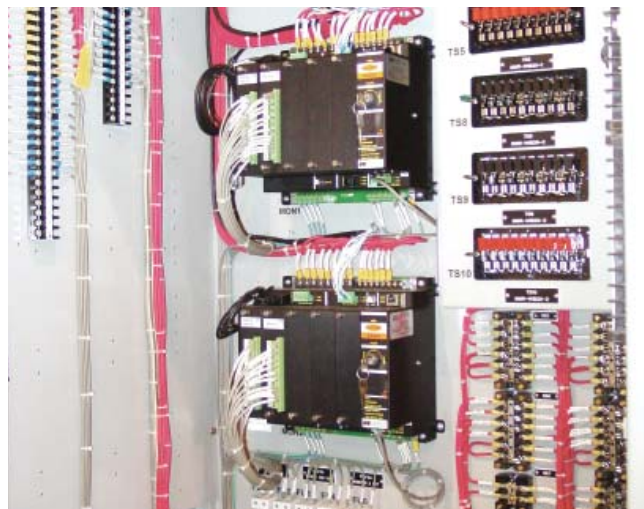
Four dual purpose current inputs (3 phase + Neutral)—1A/5A for measurement CTs with Class 0.2S revenue grade accuracy to 10A/20A and 150A for protection CTs (30x)

### SA330

Two independent CTs connections:

- 4 inputs 1A/5A for measurement CTs with Class 0.2S revenue grade accuracy to 10A/20A
- 4 inputs for protection CTs—150 A (CT secondary max. 1 sec.) or 100A with SATEC unique split core Remote CTs

## Substation Automation



SATEC's ezPAC™ SA300 Power Intelligence Unit is an ideal cost effective means of automating an electrical substation. The ezPAC™ can be installed at a fraction of the cost and time involved in replacing protection relays. By adding one ezPAC™ device on each feeder circuit, ALL the information needed for substation automation is provided. The ezPAC™ extends the life expectancy of electromechanical relays for many years by providing the information lacking in electromechanical devices without interfering in the protection scheme.

The ezPAC™ is a low cost upgrade, with minimal panel and wiring adjustments. The modular I/O design guarantees a custom-made product fitting any application need.

### Relay Target Information

Get all of the information available from a digital relay without replacing the electromechanical one.

### Add-On Protective Relaying Backup

- Under / over frequency relay
- Automatic load shed & restore (0.01Hz with adjustable time delay)
- Time overcurrent relay backup
- Communication protocols
  - Modbus, DNP3.0
  - IEC 61850

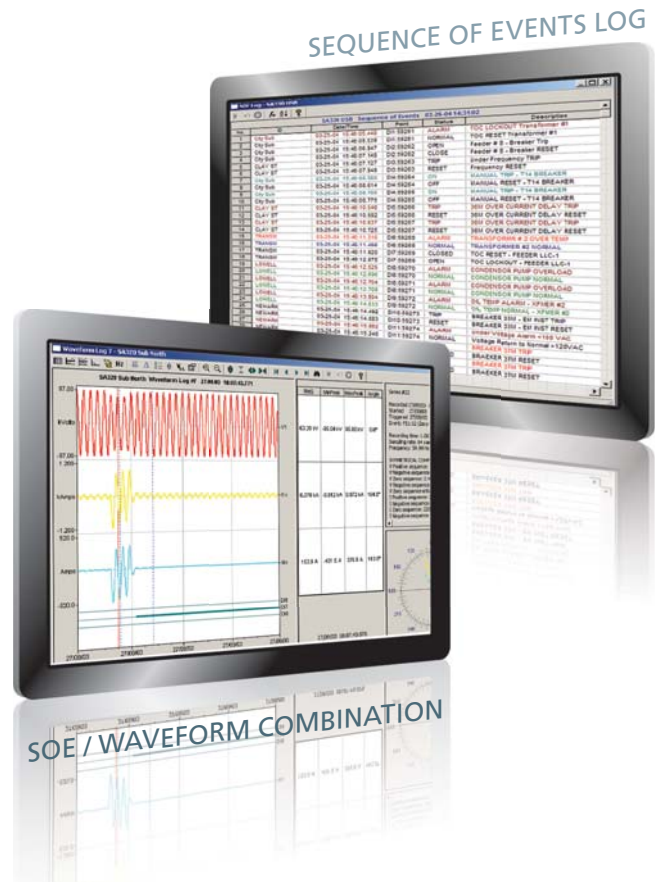
# Sequence of Events

Designed for an electrical utility substation or industrial environment, to record contact openings or closings of field devices such as electromechanical and microprocessor controlled relays.

The Sequence of Events (SoE) Recorder can log four types of events: digital input events, relay output events, fault events and setpoint events.

When displaying the SoE Log reports, PAS (see pg. 7) establishes links between the event and other database records where it finds a relationship between the recorded data and the event. Comprehensive display and analysis tools allow accurate display of SoE. Color coding of programmable status enables focusing on the important faults at a glance.

Each input point is programmable to be normally open or normally closed. Programmable status words and a 96 alphanumeric character descriptor for each input point is provided. De-bounce times for nuisance chattering of contacts are programmable from 1 to 100 msec in groups of eight. Wet or dry contacts can be mixed for up to 128 digital inputs.



# Fault Recorder

FAULT WAVEFORM ANALYSIS



The fault recorder provides 4 measured and recorded currents (including measured neutral current). The event log is complemented by waveform recording.

- IRIG-B time synchronization
- 256 MB memory
- Programmable fault thresholds and hysteresis
- Up to 150 amps fault currents (30 x In)
- Zero-sequence currents and voltages
- Current and voltage unbalance
- Under-voltage, neutral current
- Ready-for-use fault reports—fault currents magnitude and duration, coincident volts magnitude, fault waveforms and RMS trace
- Distance to fault calculation
- Waveforms from multiple separate locations (via PAS)

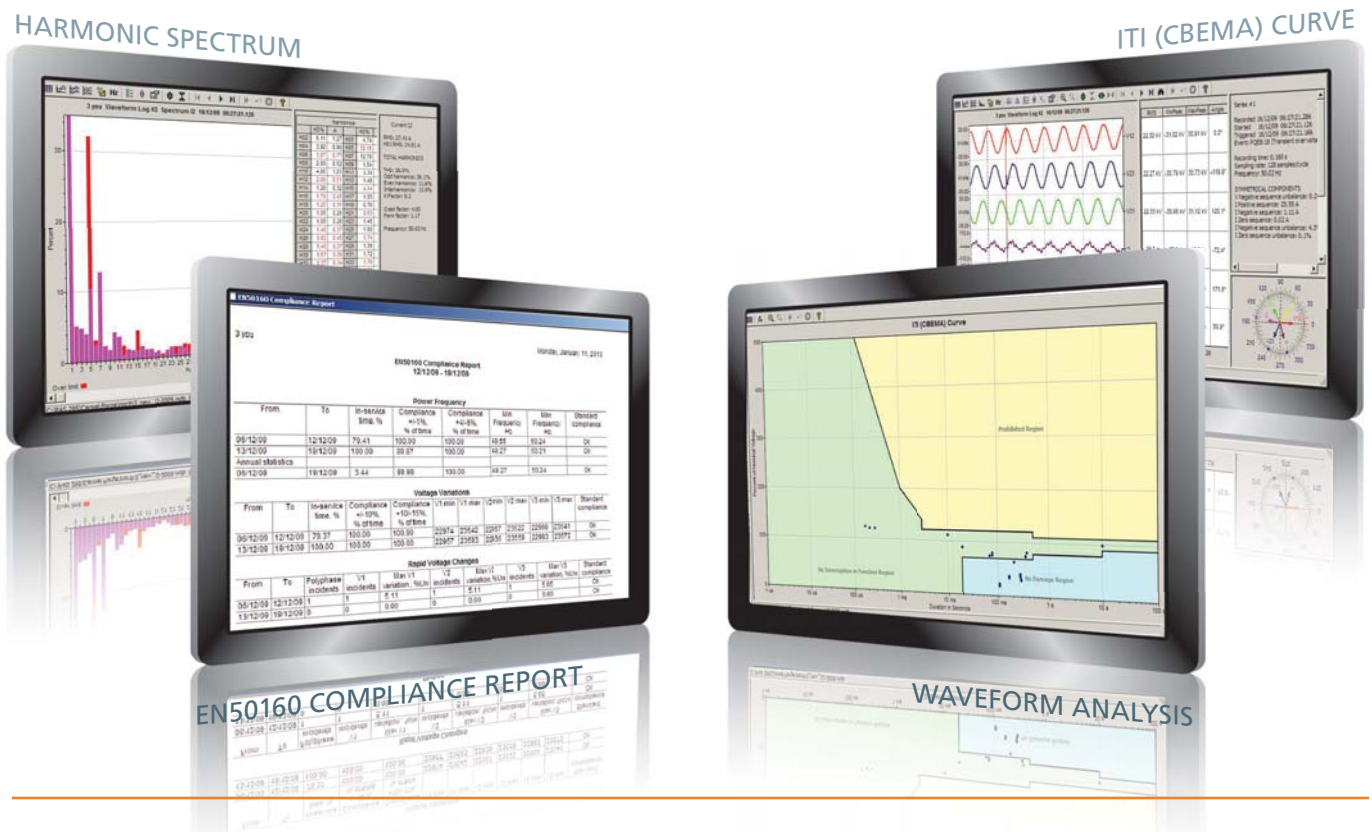


# Power Quality Recorder

## Cutting Edge Power Quality Analyzer & Recorder

The ezPAC™ is the most advanced power quality analyzer and recorder on the market. The instrument is a product of SATEC's 25 years of experience in the creation of power quality instruments. The ezPAC™ is designed to fully comply with the most demanding industry standard, IEC 61000-4-30 Class A. It provides power quality reports and statistics according to EN50160, complimented by comprehensive power quality event/data log with waveforms available for

detailed Power Quality event analysis. Redundant power supply allows full readiness for any power quality event, including major dips and interruptions. The individual harmonics and inter-harmonics are analyzed according to IEC 61000-4-7. The instrument also supports directional power harmonics analysis. Flicker is measured and analyzed according to IEC 61000-4-15.



- ▣ Power Quality analysis and reading according to IEC 61000-4-30 Class A
  - ▣ Sags/swells (dips/overvoltages), interruptions, frequency variations, voltage variations
  - ▣ Flicker, voltage unbalance, harmonic and interharmonic voltages and currents
  - ▣ Programmable thresholds and hysteresis
- ▣ Built-in EN50160 statistics & reports
- ▣ Redundant auxiliary power supply for recording major dips & interruptions
- ▣ Harmonics & interharmonics according to IEC 61000-4-7
- ▣ Directional power harmonics
- ▣ Voltage and current THD coefficients
- ▣ Currents TDD coefficients and K-Factors
- ▣ Waveform, Power factor and Phasor data recorder
- ▣ Symmetrical components
- ▣ Flicker measurement according to IEC 61000-4-15
- ▣ Waveform recording
  - ▣ Selectable sampling rate up to 256 samples/cycle
- ▣ Power Quality event recorder
- ▣ Event recorder for logging internal diagnostic events, control events and I/O operations

# Transient Recorder

The ezPAC™ provides state-of-the-art fast transient recording capability. Transient pulses as short as 78µs at 50Hz (65µs at 60Hz) can be reliably recorded and analyzed. The ezPAC™ can record such short pulses by a separate

electronic channel with a sampling rate of 256 samples/cycle. The instrument can measure transient pulses with an amplitude of up to 2 kV (withstands up to 6 kV) and waveforms recording.

## SHORT TRANSIENT EVENTS VIA PAS



## eXpertpower™

### POWER QUALITY LOG



The ezPAC™ SA300 is supported by eXpertpower™, SATEC's web-based energy management service.

eXpertpower™ collects, archives, and analyzes energy and Power Quality data while allowing multiple users to view this data in reports, tables, graphs, waveforms, and charts. eXpertpower™ introduces a mechanism for identifying, following-up and solving power system problems, from anywhere, anytime—via the web. It also enables effective creation and implementation of the customer's energy saving plan.

On the basis of raw data provided by the ezPAC™, eXpertpower™ provides the following features:

- Automatic billing
- Bill comparison
- Power Quality event log and waveforms
- Power Quality reports and statistics (complies with EN50160)
- Weekly/monthly analysis to follow up energy saving plans
- Reports and trend monitoring
- Real time data monitoring
- Alarms via cellular phone, pager and e-mail
- Export to PDF for reports and billing

# HMI Remote Display Modules

The ezPAC™ SA300 series offers you a choice of three display options: the new color TFT Touch Panel LCD graphical display for local monitoring and setup, a multi-parameter LED display or a standard LED display.

## RGM180—TFT Touch Panel



The eXpertmeter™ Series high-resolution graphical display enables viewing all online data, stored data, and real-time waveforms.

### Intelligent Remote Console—IRC

- Smart console—5.7 inch TFT Color Display with Touch Panel, combining conservative and up-to-date technologies
- Multiple-device monitoring, interactive menu
- Heavy duty graphic display, withstanding wide temperature range environment

The ezPAC™ display modules have a fast RS485 port and communicate with the SA300 series through the Modbus RTU protocol. Remote displays can be located at distances of up to 1.2 km from the device. Dual panel mounting: Round 4"; Square 96x96 DIN.

## RDM—LED Remote Consoles

Both modules have digital six-digit windows with bright LEDs well suited for direct sunlight applications.

### RDM300—3 Windows Super-Bright LED Display



This module allows the user to view real-time RMS and Harmonics measurements, status indication parameters, and perform basic setup operations when installing and servicing the device.

### RDM312—12 Windows Super-Bright LED Display

The RDM312 is a panel mounted module allowing the user to simultaneously view 12 real-time RMS measurements: 3 phase volts and amps, neutral current, active, reactive and apparent power, power factor and frequency.



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# PAS—Power Analysis Software

PAS is SATEC's application and set-up software tool for use with all SATEC instruments. The multi-purpose PAS software provides the following features:

- Direct data access for status monitoring and analysis
- Simple off-line and on-line instrument set-up
- Automatic polling of devices
- Power Quality characterization
- Automatic Power Quality reports
- EN50160 Power Quality statistics
- Waveforms from 2 separate locations
- Flexible TOU settings
- Control / alarm setpoints
- Extensive graphic and report capabilities
- Sophisticated analysis functions: event/data logs, trends, waveforms, harmonic spectrum, harmonics power direction, phasor diagrams
- Easy export to spreadsheets, Word and Excel
- Export to COMTRADE and PQDIF formats
- Instrument firmware upgrade

# Technical Specifications

## Fast Data Logging Recorder

- From ½ cycle RMS to 2-hour envelopes
- Programmable post fault on any internal and/or external trigger condition

## Waveform Capture

- Provides simultaneous capture for all voltage and current channels with choice of samples rate, up to 256 with transient option. Selectable pre-fault / post-fault recording length. Disturbance capture recording up to several minutes
- Transient capture (>78µs)

## Harmonic Analyzer

- Total Harmonic Distortion for Voltage and Current and up to the 63rd individual harmonic for V, I, P, Q
- Including directional power harmonics (Load or Source)
- V-I angle, TDD and K factors

## Multi-Function Power & Energy Meter

- Real time cycle-by-cycle measurement of high accuracy, true RMS voltage, current, power, demand and energy
- Revenue accurate meter
- Exceeding Class 0.2S (IEC62053-22 / ANSI C12.20)
- Advanced Time Of Use (TOU) feature (16 Energy sources include external digital pulses, up to 4 seasons, 4 daily profiles, 8 Tariffs, flexible automatic calendar) for any complex billing scheme.
- KYZ or KY output and LED indication for calibration and test
- Vector diagram and symmetrical components

## External Time Synchronization

- Provides 1 msec time resolution via IRIG-B time code input or satellite clock for common time base
- As an SNTP client, it can accept periodic synchronization of the meter clock from an SNTP server
- 1ms digital input

## Wide Range Voltage Inputs

- Four impulse galvanic isolated AC voltage inputs
- Impulse dielectric withstand 6kV
- Wide range application up to 828V
- DC voltage input—station battery monitoring (up to 300VDC)

## Wide Range Current Inputs

- Up to 8 galvanic isolated AC current inputs
- **SA320 Model:** 4 dual purpose current inputs (3 phase + Neutral)—1A/5A for measurement CTs with Class 0.2S revenue grade accuracy to 10A/20A and 150A for protection CTs (30x)
- **SA330 Model:** 2 independent CT connections: 4 inputs 1A/5A for measurement CTs with Class 0.2S revenue grade accuracy to 10A/20A; or 4 inputs for protection CTs - 150 A (CT secondary max. 1 sec.) or 100A with SATEC unique split core Remote CTs

## Communication Platforms for Any Need

- 5 independent built-in Com Ports plus two optional:
  - RS232/422/485
  - RS422/485
  - RS485 for Display
  - USB 1.1 (up to 12Mbps)
  - 10/100 Base-T Ethernet
  - Optional IR port
  - Optional 56K Modem
- Communication Protocols: Modbus RTU, ASCII, DNP 3.0, Modbus/TCP, DNP3/TCP,

IEC 62056-21/61 (OBIS), IEC 61850

## Digital & Analog I/O Options

5 expansion slots for a wide range of plug-in modules:

- 16/32 high speed digital inputs, total up to 128 DIs
- 8/16 dry contact relay outputs, total up to 64 ROs
- 8 analog inputs / 8 fast analog input, total up to 16 AOs
- Mixed 4 analog inputs and 4 outputs, total up to 16 AIOs

## Logging, Recording and Programming

- Programmable controller—up to 64 control setpoints, up to 8 conditions OR, AND, arithmetical functions logic, extensive triggers, programmable thresholds and delays, relay control, event-driven data recording
- 8 fast waveform recorders—simultaneous 8-channel AC, one DC: up to 48 digital inputs in a single plot
- Waveform sampling rate 32, 64, 128 or 256 samples per cycle; up to 20 pre-fault cycles
- Up to 3.5 min. of continuous waveform recording
- 1-ms resolution for digital inputs
- 16 fast Data Recorders (16 parameters on each data log): From ½ cycle RMS to 2 hour RMS envelopes; up to 20 pre/post-fault cycles; programmable data logs on a periodic basis and on internal or external trigger
- Precise Energy and Power Demand Meter. Flexible multi-tariff TOU, 16 summary energy and demand registers for substation energy management, accumulation of energy pulses from external kWh meters, block and sliding demands
- 32 digital internal counters
- 16 internal programmable timers (1/2 cycle to 24 hours)



# Inputs / Outputs

## Input Ratings

### 3 Voltage Inputs: V1, V2, V3, VN

- Direct input and input via PT up to 828V AC line-to-line, up to 480V AC line-to-neutral
- Burden for 400V: <0.35 VA
- Burden for 120V: <0.03 VA
- Overvoltage withstand: 1000V AC continuous, 2500V AC for 1 sec.
- Galvanic isolation: 3500V AC / 1 min.
- Impulse dielectric withstand 6kV

### Auxiliary Voltage Inputs: V4, V4N

- Direct input and input via PT up to 480V AC
- Burden for 400V: <0.35 VA
- Burden for 120V: <0.03 VA
- Overvoltage withstand: 1000V AC continuous, 2500V AC for 1 sec.
- Galvanic isolation: 3500V AC / 1 min.
- Impulse dielectric withstand 6kV

### Current Inputs: I1, I2, I3, I4

- Selectable 5A or 1A (upon order)
- Operating range: continuous 4xIn ANSI (20A/4A) or 2xIn IEC (10A/2A)
- Fault currents: up to 30xIn (150A/30A), max 1 sec.
- Burden for 5A: <0.15 VA; Burden for 1A <0.02 VA
- Overload withstand: 4xIn RMS continuous (20A/4A)
- Max. Wire size: 10 AWG/6mm<sup>2</sup>
- Terminals pitch: 13mm

### Current Inputs: I5, I6, I7, I8

- Input via CT with 5A or 1A secondary
- Operating range and burden as standard AC current input
- Wire size: 12 AWG / 3.5mm<sup>2</sup>
- Terminals pitch: 10mm

## VDC Voltage Input

- Operating range: 2-290V DC
- Burden: <0.2 W
- Accuracy: ±Class 0.2S
- Galvanic isolation: 2500V AC / 1 min.
- Wire size: 10 AWG / 6mm<sup>2</sup>
- Terminals pitch: 9.5 mm
- Scan time: ½ cycle

## Power Supplies

- Two redundant galvanically isolated power supplies
- Selection of power supplies:
  - 120/230V AC-110/220V DC
  - 12V DC (9.6-19V DC)
  - 24V DC (19-37V DC)
  - 48V DC (37-72V DC)

## Communication Ports

### COM1

- Serial EIA RS232 optically isolated port
  - Connector type: DB9 male
- Serial EIA RS422/RS485 optically isolated port
  - Connector type: removable, captured wire, 5 terminals
  - Max. Wire size: 12 AWG / 2.5 mm<sup>2</sup>
- Baud rate: up to 115,200 bps
- Supported protocols: Modbus RTU/ASCII, DNP3.0

### COM2/3

- Serial EIA RS422/RS485 optically isolated port
  - Connector type: removable, captured wire, 5 terminals
- Wire size: up to 12 AWG / 2.5mm<sup>2</sup>
- Baud rate: up to 115,200 bps.
- Supported protocols: Modbus RTU/ASCII, DNP3.0
- COM3 with 12V DC supply voltage for the remote display
- 

## USB Port

- Non-isolated USB 1.1 port
- Wire type: standard USB cable, max. length 2 meters
- Supported protocols: Modbus RTU

## Ethernet Port

- Transformer-isolated 10/100 Base-T port
- Connector type: RJ45 modular
- Supported protocols: Modbus TCP (port 502), DNP3.0/TCP (port 20000), IEC 61850 (including GOOSE & MMS)
- Number of simultaneous connections (sockets): 5

## Modem Port

- Transformer-isolated internal 56K modem
- Connector type: RJ11
- Supported Protocols: Modbus RTU/ASCII, DNP 3.0

## Infrared Port

- Optional optical IEC/ANSII head
- Baud rate: up to 115,200 bps
- Supported protocols: Modbus RTU/ASCII, DNP 3.0

## Real-Time Clock

- Accuracy: maximum error 5 seconds per month @ 25°C

## Log Memory

- Standard onboard memory: 256 MB

## IRIG-B Port

- Optically isolated IRIG-B Port
- Time code signal: unmodulated (pulse-width coded)
- Level: unbalanced 5V
- Connector type: BNC
- Recommended cable: 51 Ohm low loss – RG58A/U (Belden 8219 or equivalent), TNC connector
- Recommended GPS time code generator: Masterclock GPS-200A

# Measurement Specifications

Parameter	Full Scale@ Input Range	Accuracy			Range
		% Reading	% FS	Conditions	
Voltage V1-V4	120V x PT ratio @ 120V 400V x PT ratio @ 690V	0.2	0.01	10% to 120% FS	0 to 999.99 kV Starting 0.6% FSU
Fault current I1- I4	CT	2.0		400%-3000% FS	0 to 9999.99A
SA300 Line current I5- I8	CT	0.2 0.2 0.2	0.01 0.01	ANSI C12.20: 1%-120% FS 120%-400% FS IEC 62053-22: 1%-200% FS	0 to 9999.99A
DC Voltage	125V / 220V		0.3	10% - 120% FS	0 to 290V DC
Active power	0.36 x PT x CT @ 120V 1.2 x PT x CT @ 690V	0.2 0.2	0.002 0.002	PF  ≥ 0.5 and ⊕	-2,000,000 kW to +2,000,000 kW
Reactive power	0.36 x PT x CT @ 120V 1.2 x PT x CT @ 690V	0.3 0.3	0.002 0.002	PF  ≤ 0.9 and ⊕	-2,000,000 kvar to +2,000,000 kvar
Apparent power	0.36 x PT x CT @ 120V 1.2 x PT x CT @ 690V	0.2 0.2	0.002 0.002	PF  ≥ 0.5 and ⊕	0 to 2,000,000 kVA
Power factor	1.000		0.35	PF  ≥ 0.5, I ≥ 2% FSI	-0.999 to +1.000
Frequency		0.02			40.00 up to 70.00Hz
Total Harmonic Distortion, THD V(I), %V <sub>f</sub> (%I <sub>f</sub> )	100	1.5	0.2	THD ≥ 1% FS, V ≥ 10% FSV I ≥ 10% FSI	0 to 999.99
Total Demand Distortion, TDD, %	100		1.5	TDD ≥ 1% FS, I ≥ 10% FSI	0 to 100
Active Energy Import & Export		Class 0.2 ANSI C12.20-1998, Current class 20 Class 0.2s IEC62053-22:2003			0 to 999,999.999 MWh
Reactive Energy Import & Export		Class 0.2 under conditions as per ANSI C12.20-1998 Class 0.2 under conditions as per IEC62053-22:2003			0 to 999,999.999 Mvarh
Apparent Energy		Class 0.2 under conditions as per ANSI C12.20-1998 Class 0.2 under conditions as per IEC62053-22:2003			0 to 999,999.999 MVAh
Volt-Hours		Class 0.2		20%-120% FS	0 to 999,999.999 kWh
Ampere-Hours		Class 0.2		10%-200% FS	0 to 999,999.999 kAh
Symmetrical Components	Voltage FS	1.0		10%-120% FS	As voltage
	Current FS	1.0		10%-200% FS	As current
	Current FS	3.0		200%-300% FS	
Phasor angles		1 degree			

## Key:

PT	External potential transformer ratio
CT	Primary current rating of external current transformer
FSV	Voltage full scale
FSI	Current full scale
Vf	Fundamental voltage
If	Fundamental current
⊕	@ 80% to 120% of voltage FS and 1% to 200% of current FS

## Notes:

1. Accuracy is expressed as ± (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.
2. Specifications assumed: voltage and current waveforms with THD ≤ 5% for kvar and PF; reference operating temperature: 20°C-26°C.
3. Measurement error is typically less than the maximum error indicated here.

## Environmental Conditions

- Operating temperature: -20°C-60°C / -4°F-140°F
- Storage temperature: -25°C-80°C / -13°F-80°F
- Relative humidity: 0-95% non-condensing

## Overall Dimensions

- Height 284.00 mm / 11.181"
- Width 255.24 mm / 10.05"
- Depth 185.00 mm / 7.28"
- Weight 5.0 kg / 11.02 Lb

# Plug-In Modules



The unique modular design of the 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.



**DIGITAL INPUTS**  
**DI16 or DI32**  
 (Total up to 128 DI)  
 Optically isolated  
 dry/wet contact  
 Scan time: 1ms @ 60Hz,  
 1.25ms @ 50Hz  
 24/48/125/250V DC



**RELAY OUTPUTS**  
**RO8 or RO16**  
 (Total up to 64 RO)  
**RO8**

- ▣ 6 relays rated at 10A/250V AC, 5A/125V DC (SPST Form A)
- ▣ 2 relays rated at 8A/250V AC, 5A/30V DC (SPDT Form C)

**RO16**

- ▣ 2x8 relays rated at 8A/250V AC, 0.25A/250V DC (SPST Form A)



**ANALOG INPUTS/OUTPUTS**  
**4AI and 4AO**  
 (Total up to 16 AI / 16 AO)  
 Ranges:

- ▣ ±1mA (with 100% overload)
- ▣ 0-20mA
- ▣ 0-1mA (with 100% overload)
- ▣ 4-20mA

Accuracy Class 0.25 FS  
 Scan/update time: 2 cycles  
**8AI**  
 (Total up to 16 AI)

- ▣ Range: 4-20mA



**FAST ANALOG INPUT**  
**8 Fast AI**  
 (Total up to 16 Fast AI)  
 Options:

- ▣ 0-50mA
- ▣ 0-75mA
- ▣ ±10V

Sampling at 32 samples/cycle

## Standards Compliance

EMC: 89/336/EEC as amended by 92/31/EEC and 93/68/EEC  
 LVD: 72/23/EEC as amended by 93/68/EEC and 93/465/EEC  
 Harmonized standards to which conformity is declared:  
 EN55011:1991; EN50082-1:1992; EN61010-1:1993; A2/1995  
 ANSI C37.90.1 1989 Surge Withstand Capability (SWC)  
 EN50081-2 Generic Emission Standard - Industrial Environment  
 EN50082-2 Generic Immunity Standard - Industrial Environment

EN55022:1994 Class A  
 EN61000-4-2  
 ENV50140:1983  
 ENV50204:1995 (900MHz)  
 ENV 50141:1993  
 EN61000-4-4:1995  
 EN61000-4-8:1993

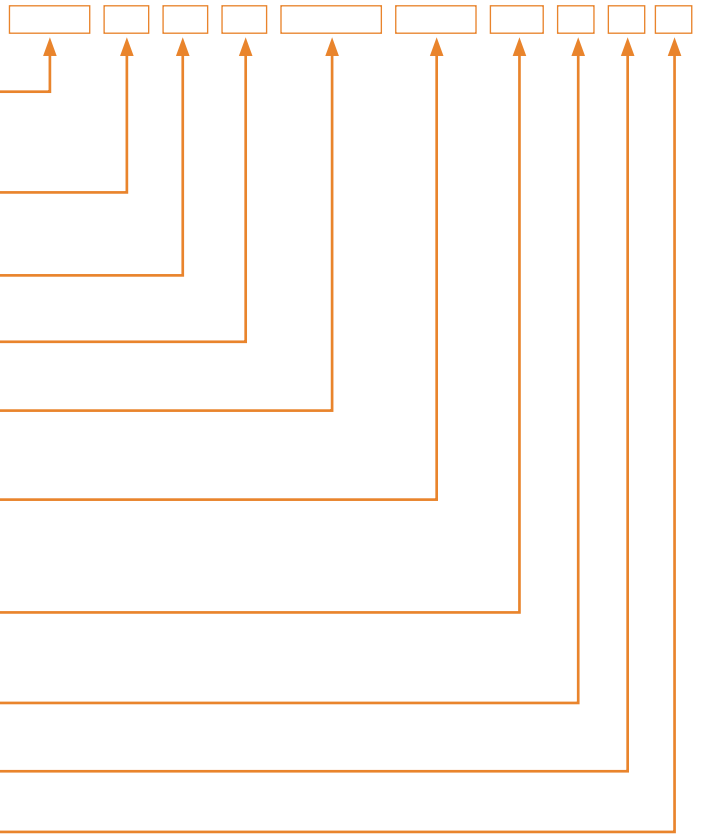
## ezPAC™ SA300 SERIES ORDER STRING

### MODELS

SA320 - Power Quality model	SA320
SA330 - Dual metering & protection CT model	SA330

### OPTIONS

<b>ACCURACY AND POWER QUALITY STANDARD</b>	
ANSI C12.20— USA Standard IEEE1159 Full Power Quality	A
IEC 62053-22— European Standard EN50160 Full Power Quality	E
GOST 13109 Russian Standard	G
<b>FREQUENCY</b>	
50Hz	50
60Hz	60
<b>MEASUREMENT CURRENT INPUTS</b>	
5 Ampere	5
1 Ampere	1
<b>PROTECTION CURRENT INPUTS (SA330 ONLY)</b>	
150 Ampere	150
100A Split Core Remote CTs	3xCT1S
<b>POWER SUPPLY—MAIN</b>	
85-265V AC and 88-290V DC (default)	ACDC
9.6-19V DC	1DC
19-37V DC	2DC
37-72V DC	3DC
<b>POWER SUPPLY—BACKUP</b>	
85-265V AC and 88-290V DC (default)	BACDC
9.6-19V DC	B1DC
19-37V DC	B2DC
37-72V DC	B3DC
<b>MODEM</b>	
No Modem	-
Modem	MOD
<b>INFRA-RED PORT</b>	
No IR Port	-
IR Port	IR
<b>COMMUNICATION STANDARD</b>	
IEC61850 (SISCO)	IEC



## OPTIONAL PLUG-IN MODULES

Maximum 5 modules per instrument

### DIGITAL INPUTS (MAX. 128 DIGITAL INPUTS)

DI 16 DRY CONTACTS	DI-DRC
DI 16 24V DC	DI-V24
DI 16 48V DC	DI-V48
DI 16 125V DC	DI-V125
DI 16 250V DC	DI-V250
DI 32 Dry Contacts	DI-BDRC
DI 32 24V DC	DI-B24
DI 32 48V DC	DI-B48
DI 32 125V DC	DI-B125
DI 32 250V DC	DI-B250

x

### RELAY OUTPUTS (MAX. RELAY OUTPUTS)

8 Relays	RLY-R8
16 Relays	RLY-R16

x

### 4 ANALOG INPUT/4 ANALOG OUTPUT MODULE (MAX. 16AI.16AO)

± 1mA (0±1)	4AIO1
0-20mA (0-10-20)	4AIO2
0-1mA (0-0.5-1)	4AIO3
4-20mA (4-12-20)	4AIO4

x

### 8 ANALOG INPUTS (MAX. 16 ANALOG INPUTS)

4-20mA	AI1
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x

### FAST ANALOG INPUT (MAX. 16 FAST ANALOG INPUTS)

0-50mA	AIF-5
0-75mA	AIF-7
±10V	AIF-V

x



## HEADQUARTERS

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