SUMMAA energía

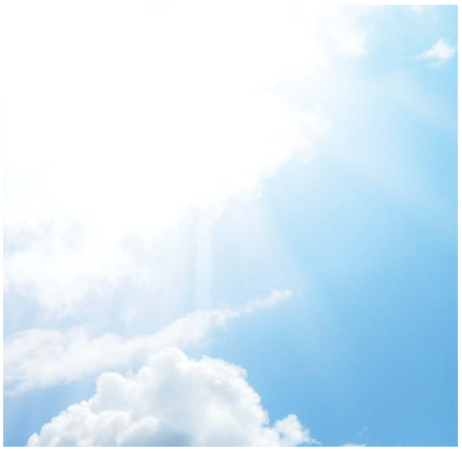
The BlackBox

G4500

3 Phase Power Quality Analyzer








ELSPEC
When Power Meets Quality

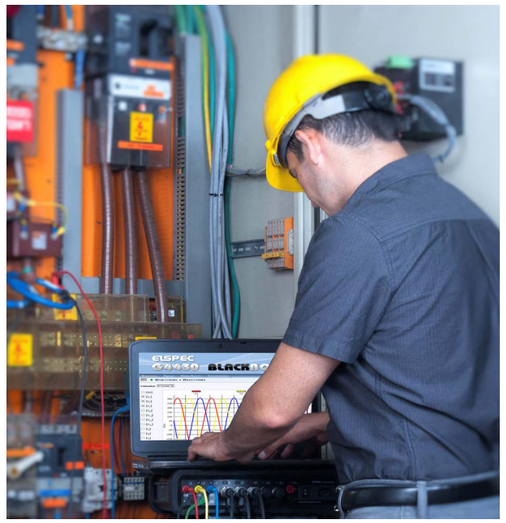
BlackBox G4500

The 3 Phases Portable Power Quality Analyzers

The **BlackBox portable series** power quality analyzer takes power quality monitoring to a whole new level by using the revolutionary **PQZIP** patent algorithm. The unique algorithm Enables you to measure, store & analyze (continuously) waveform signals regardless their size

With the G4500 each event, no matter its size, is recorded

When it comes to power, you don't want to leave it to the unexpected. In our field, we are looking for solutions allowing us to better measure, store and analyze power quality. We want to make sure that all the information gathered are accurate, in high resolution and without the need of configuring an event.



The Issue:

Event or Incidence?

While an event is configured by the user based on statistics and knowledge, an incident is a real occurrence. Take for instance a production line failure.

The correlation between an event and an incidence depends on the level of statistics and knowledge held by the user. Indeed, to avoid recurring incidences, the user needs to analyze them. If the event is not well configured, the incidence will not be interpreted correctly or will be missed. In another case, too many events may be randomly recorded which may result in over storage of useless information in the memory's device.

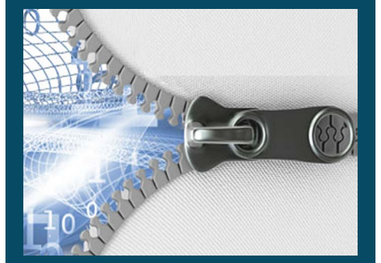
The Solution:

Elspec's PQZIP's unique Patent

With Elspec's PQZIP You Will Get the Unique Advantage of Continuous Waveform Recordings

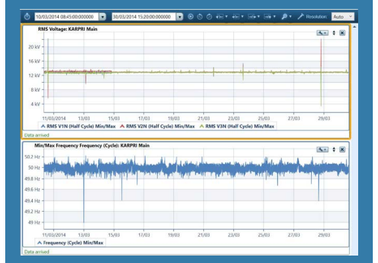
Discover

Outstanding Features



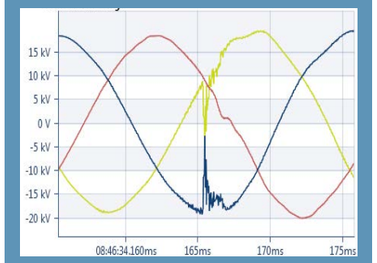
PQZIP Compression Technology

The unique patented PQZIP compression technology enables to store up to 1000 times more information than any typical file formats. PQZIP allows storage of complete and precise data over extended periods of time.



Supreme Trend Resolution

RMS, THD, active/reactive power, power factor, unbalance, harmonics and all other PQ parameters are logged continuously over a year at ½ cycle resolution in order to characterize electrical system dynamics.



Waveform Capture

4V AC, 5I AC waveform signals are continuously logged at 1,024/256 S/c respectively allowing highly accurate results without the need to set up any trigger or threshold. With the G4500, no event will be missed!

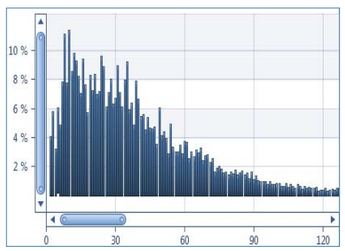
Fully Comply to Class A

The BLACKBOX portable series complies fully with IEC 61000-4-30 most updated edition Class A standard. Other parameters, not included in the standard (i.e. current and power), are calculated with comparable methods required by the standard.

Harmonics Recording

The BLACKBOX is equipped with two FFT engines for harmonics analysis:

- **Cycle by Cycle:** performs FFT at 1 cycle resolution for extended bandwidth. This engine provides 512 harmonics component at 50/60Hz resolution.
- **10/12 Cycles:** performs FFT at 10/12 cycles resolution for an extended resolution and a sub-grouping calculation. This engine provides the amplitude and angle of 512 harmonic components at a 5Hz resolution.



G4500

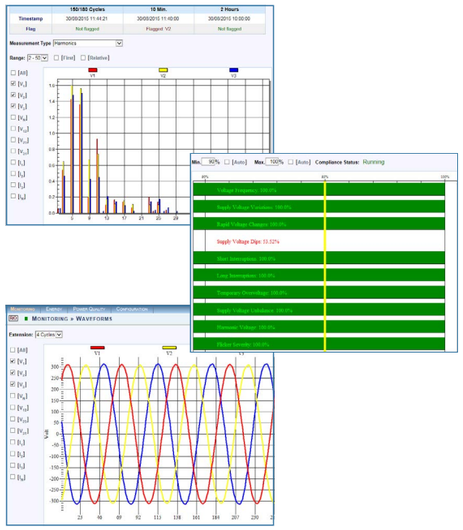
Get Much **More than a Box!**

I/O

The I/O Ports of the portable BLACKBOX extend the monitoring capabilities of the device by using additional digital & relay ports.

Web Interface

No need for software! Connect directly to any PC and get real time measurements and results. A user friendly and easy way to get precise information and data.



Battery

Battery life of up to 2 hours allowing continuous measurement and recording.

Clamps

Elspec's unique calibration procedure calculates both the clamp and device inaccuracy, allowing to eliminate clamps uncertainty, and to yield superior power measurement accuracy.

VDC/IDC

The G4500 offers VDC/IDC input

Wi-Fi

No need for cables. Easy to use everywhere.

Plug-and-Play

The Portable BLACKBOX is equipped with a plug-and-play probe interface allowing automatic detection of probes and clamps during setup.

Voltage inputs

The BlackBox is equipped with 4 AC and 2 DC voltage channels to measure any available power configuration.

Current Inputs

The BLACKBOX is equipped with 4 AC current channels in order to measure a 3-phase + Neutral and an additional 1 AC/DC channel for earth/DC signal.

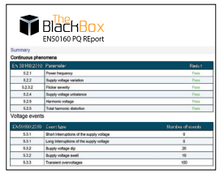
USB

For cellular communication.

PQSCADA Sapphire

Accurate Data Anywhere, Anytime

PQSCADA Sapphire is a comprehensive, yet easy to use, analysis and engineering software designed to manage and monitor power quality analyzers, digital fault recorders, revenues meters and other IED. The PQSCADA Sapphire express edition is complimentary with all Elspec devices.



Extensive Charts Capabilities

- **Trend chart:** View electrical parameters for a selected time range as one or more graphs
- **Grid chart:** View selected parameters for selected time range in a table.
- **Spectrum chart:** View selected parameters for selected time range in a column graph. This allows viewing and investigating frequency domain phenomenon.
- **Event chart:** View system, power quality, I/O and custom events in a table for a selected time range. This table provides valuable information regarding occurrence, duration and severity of those events.
- **Statistics chart:** View selected parameters for a selected time range. It shows two sub charts: a "relative chart"and a "cumulative chart" .
- **Scatter Parameter chart:** View selected parameters for a selected time range. It allows reviewing scattered dots of a specific parameter in relation to another parameter.
- **Scatter Event chart:** View events for a selected time range according to standards or custom definition (such as CBEMA)
- **Phasor chart:** View the phasor's amplitude and angle for a selected time range.
- **Cyclic Histogram chart:** View overlaid voltage waveform cycles for a selected time range. It is made possible thanks to the unique continuous recording mechanism of Elspec BlackBox analyzers. The histogram shows the deviation from the expected ideal waveform by overlaying the waveforms.
- **Summary chart:** View parameters for a selected time range. This chart displays the minimum, maximum and average value of each parameter.

Features

- Easily read COMTRADE, PQDIF & PQZIP files
- Comprehensive power quality module
- Geographical map view*
- Automatic power quality report for EN50160, IEEE1159, FOL, GOST.
- Configurable report module to design your own report template
- Power quality grid line code configuration
- Export to Excel, word, JPG & PDF
- API to Matlab for advance post processing analysis*
- Export data to COMTRADE, PQDIF, Excel & CSV
- Multiple Site investigation

*** Available on the Enterprise & Professional plan only**

Optional Accessories

GPS (Global Positioning System)

The GPS provides an optimal mobile time synchronization solution for accurate time data via satellite signal. In the absence of many other technologies, it enables time synchronization at any remote site location.

Multi Frequency Modem

USB modem with a SIM card can be connected to USB port to allow cellular communication. The wireless GPRS modem provides fast mobile communication access and offers the perfect solution in industrial data communication. It is fitted with a SIM card drawer structure, and it may be connected with any standard RS-422 interface. Data is transmitted at 3.5G. The modem is fully compatible with GSM/GPRS/EDGE.

Class A Test Reports

Elspec can provide upon request, a comprehensive functionality and calibration test report for each analyzer. Fully automated calibration software is also available for customer's in-house use.

DC Current Clamp

Ordering Information (Part Number)	SOA-0270-1400
Current Measurement	1,500A DC / 1,000A AC
Output Signal	1m V/A, 10m V/A
Operating Temperature	- 20°C to + 60°C
Cable Length	1.4m

1 - 6A Mini Clamp

Ordering Information (Part Number)	SOA-0010-0500
Measurement Range	Up to 6A AC (1A Nominal) Up to 60A AC (10A Nominal) *
Output Signal	100m V/A
Operating Temperature	- 20°C to + 60°C
Cable Length	1.2m

100A Mini Clamp

Ordering Information (Part Number)	SOA-0180-5000
Measurement Range	Up to 100APK AC
"Hole" Dimensions	10mm Max
Operating Temperature	- 20°C to + 60°C
Cable Length	1.2m

Custom Clamp 3-Flexible Current Probes

Ordering Information (Part Number)	SOA-3003-0270
Current Range	30A/300A/3000A AC RMS
Operating Temperature	- 20°C to + 65°C
Probe Cable Length	610mm (24")
Probe Cable Diameter	194mm (7.5")

3000A or 300A Flexible Current Clamps

	3000A	300A
Ordering Information (Part Number)	SOA-9045-3001	SOA-9045-3000
Current Range	90A - 4,200A	9A - 1,050A
Operating Temperature	- 20°C to + 60°C	- 20°C to + 60°C
Cable Length	2m	2m
Loop Diameter	80cm	45cm

*Selectable software range

Specifications

Waveform Sampling	
Voltage Sampling Rate	1024 Samples/Cycle
Current Sampling Rate	256 Samples/Cycle
Voltage Harmonics (Individual, Even, Odd, Total) Up to -	511Th
Current Harmonics (Individual, Even, Odd, Total) Up to -	127Th
Type of Analog to Digital Converter	16/20[1] bit
Storage Capacity	
Internal Memory	32 GB/32TB[2]
Power Quality Analysis	
ransient Detection, Microseconds (50Hz/60Hz)	19.5/16.3µs
Communication Ports	
Ethernet Ports	3
Wi-Fi Communications (802.11g)	1
Power Over Ethernet (PoE- Out)	1
Digital Input	4
RS-232	1
RS-485	1
Physical	
Dimensions mm	314 X 84 X 271
Weight	3.7kg
Control	
Comprehensive web server for local and remote real-time monitoring and control	
Applicable Standards	
Measurement Standards	EN50160, IEEE1159, IEEE519, IEC61000-4-15, IEC61000-4-7, IEC61000-4-30 Class A
EMC Standards	EN61326, CFR47FCC, CISPR11 Group 1, FCC PART 15 Subpart B, EN61010-2, IEC61000-3-3, IEC61000-4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-11
Environmental Standards	IEC60068-2-1, 2, 6, 27, 30, 75
Safety Standards	EN61010-1:2001 2nd Edition

Power Supply		Voltage	
Operating Range	100-260 VAC: 50/60 Hz 100-300 VDC	Voltage Channels	4 (3 Phases + Neut.)+ 1 DC
		Nominal Full Scale	1000V
Auxiliary DC Supply	48 Vdc	Maximum Peak Measurement	8000V
Auxiliary Supply	PoE In According to 802.3af	Input Impedance	3MΩ
Battery Backup	2 Hours	Uncertainty	0.1% of Nominal
Time		**Current**	
Real Time Clock	±1 Second per 24 Hours	Current Channels	4 (3 Phases + Neut.)+ 1Grn/DC
Synchronization Device	Uncertainty	Current Channels Receive From Clamp	I1-I4: 0-10 VPk I5: 0-3 VPk
GPS	100-200µs		
IRIG B	100-200µs	Uncertainty	0.1% ±0.1 mV
SNTP Server	50-100µs	**Frequency**	
DCF-77	±15ms	Fundamental Frequency	42.5 Hz to 69 Hz
Environmental Conditions		Frequency Resolution	10 mHz
Operation Temperature	0°C – 50°C (32°F – 122 °F)	Frequency Accuracy	±10 mHz
Storage Temperature	-20°C – 60°C (-4°F – 140 °F)	Disclaimer: Specifications subject to changes without prior notice	

[1] Effective bits
[2] Equivalent memory size needed without compression

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