

# The BlackBox

## PURE

Single and 3 Phase  
Power Quality Analyzer



# BlackBox Pure

## 3/1 Phase Power Quality Analyzer

The Pure BlackBox, an advanced Class A power quality analyzer embedded with PQZIP Technology, is an easy to use plug and play device that continuously records all power quality parameters without thresholds setting or recording configuration.

The device is available in 2 versions: Single Phase, 3-Phases



## It's Handy and Ready

When using the Pure BlackBox, any installation errors such as a wrong phase order can be fixed during post-processing. The Pure BlackBox includes a ride through super capacitors technology to enable continuous recording during short supply interruptions.

Power quality post recording processing and analysis are available using the free SCADA Sapphire Express Edition software. Use it via drag and drop of recorded data for immediate analysis, PQ trending, events and reports.

Recorded informations are saved in a non-volatile memory SD card which can be accessed as a standard external memory either via the device USB slot connected to a PC, or by inserting the SD card in a reader connected to a PC.

## Features

- ▶ Continuous Waveform recording at 256 Sample/Cycle
- ▶ Class A devices IEC30-4-61000
- ▶ Configuration FREE Device
- ▶ Fast USB connectivity to PC
- ▶ SD card slot hot swap
- ▶ Optional battery bank and communication extension for remote data collection over LAN network, wireless Wifi or cellular communication
- ▶ IP40 for rugged environments
- ▶ Light weight, hand-held portable PQ recorder
- ▶ Easy to use
- ▶ Two sided mounting clip for convenient installation of a din rail, magnet or nail mounting.



**The PQZIP continuous recording enables to easily predict, prevent and troubleshoot issues without the need to set up triggers or thresholds in order to capture a specific event. With PQZIP the installation is straight forward!**

# BlackBox Pure

Get Much More than a Box!

## Plug & Play Power Quality Analyzer

The BlackBox Pure is a plug and play analyzer. After plugging the Pure begins recording voltage and current waveforms then stores them in a proprietary PQZ format. No pre-configuration or thresholds are required.

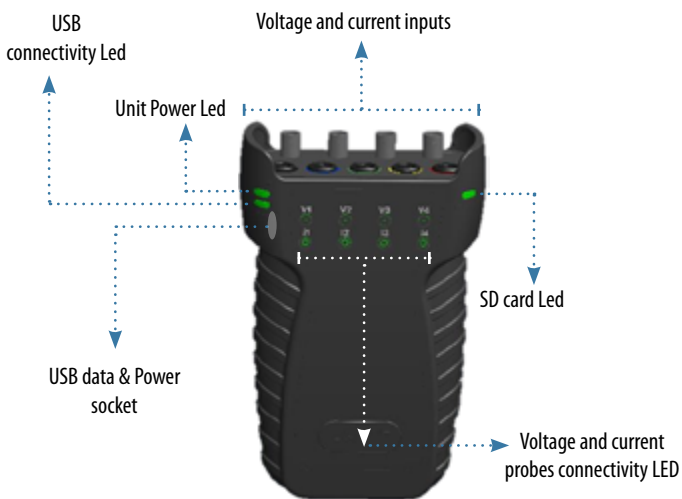
## Rugged & Compact

The Pure BlackBox designed for an easy and safety installation. It equipped with dedicated mounting clip-on to facilitate convenient installation to Din Rail, Magnet or nail mounting.

## Power Output

The 3 phases Pure BlackBox includes DC power output port with selectable voltage level to energized external accessories such as clamps.

## 3 Phases



## Voltage Inputs

- **3 Phase:** The 3 Phase Pure BlackBox equipped with 4 AC voltage channels (3 Phases + Neutral) to measure any available power configuration.
- **1 Phase:** the Single Phase Pure BlackBox equipped with 2 AC voltage channels (1 phase + neutral)

## Current Inputs

- **3 Phase:** The 3 Phase Pure BlackBox equipped with 4 AC current channels to measure 3 phase + neutral
- **Single Phase:** the Single Phase Pure BlackBox equipped with 1 AC current channel to measure single phase load power and energy consumption.

## Single Phase



# Discover

## Outstanding Features

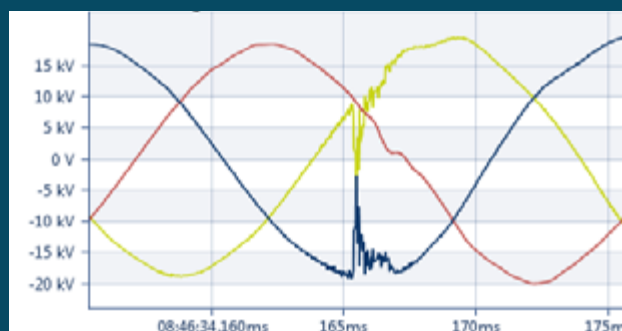
### Extended Harmonics Recording

The BlackBox Pure records and store 128 harmonics components at 50Hz resolution and 512 inter-harmonics components at 5Hz resolution for both voltage and current.



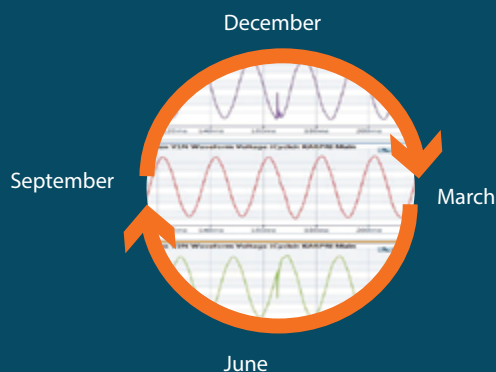
### Get the most accurate information

The BlackBox Pure records voltage and current waveform sampled at a rate of 256 Sample/Cycle at 50/60Hz, which provides information at a very high resolution, enabling to detect and analyze the slightest change.



### Continuous Waveform Recordings

The BlackBox Pure is the only hand held analyzer able to record and store all electrical parameters, at any given time for more than a year with no gaps in the data. It provides a clear and comprehensive view of network conditions at all times, offering the most advanced power quality analysis capabilities.



### Supreme Trend Resolution

More than 5,000 power quality parameters such as RMS, THD, powers, power factor, unbalance and harmonics are logged continuously for more than a year at 1/2 cycle, 10/12 Cycles, 150/180 Cycles, and 2 hours resolution.



# 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.

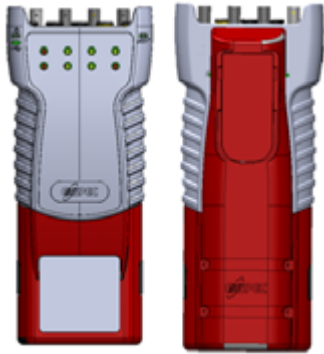
## Features

- ▶ 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

## Extension Module



AC power supply  
LAN port (RJ45)  
USB - data & DC power supply or wireless communication WiFi/ 3G dongle  
Battery power/backup source of up to 4 hours

## Protective Case



Protects the device from scratches and shocks.  
Available for both models.

### 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")



\*Selectable software range

# Specifications

Product Seiries	3 Phase	Single Phase
<b>General</b>		
Voltage input	4 channels, 110-690VAC Nominal Measuring up to 1.5kV RMS	2 channels, phase and neutral through power socket 110/240VAC Nominal Measuring up to 0.5kV RMS
Current Channels	4 channels Voltage output CTs (0-10V peak)	1 channel, between source and load up to 10A Peak
Line Frequency	40-70Hz	40-70Hz
Sampling Rate	256 samples per cycle	256 samples per cycle
LED Indicators	11 Bi-color LED: Voltage clips status - 4 Current clamps status - 4 SD card status - 1ww PQZ Recording status - 1 General status - 1	3 Bi-colors LED SD card status - 1 PQZ Recording status - 1 General status - 1
Accuracy	IEC 61000-4-30 Class A	IEC 61000-4-30 Class A
<b>Communication</b>		
LAN	Available in extension module	N/A
USB	PQZ file download, FW upgrade & clock setting	PQZ file download, FW upgrade & clock setting
<b>Power</b>		
Power Supply	100-240VAC 50/60Hz 10W 140-300VDC 5VDC over USB	100-240VAC 50/60Hz 10W 5VDC over USB
Ride Through	30sec	30sec
Battery	5h with extension module	N/A
<b>Mechanical</b>		
Weight	0.4kg	0.25kg
Dimensions	180 x 115 x 60	146 x 82 x 48
<b>Synchronization</b>		
External synchronization	NTP available in extension module	N/A
Internal Synchronization	10ppm	10ppm
<b>Environmental</b>		
Operating Temperture	-20 to +70°C*	-20 to +70°C*
Humidity	5% to 95% non-condensing	5% to 95% non-condensing
IP Protection	IP 40	IP 40
<b>Storage</b>		
Nonvolatile Memory	SD card supporting hot swap*	

(\*) T>60°C requires an external power supply

(\*\*) see SD card specifications in user manual

Disclaimer: Specifications subject to changes without prior notice

# Worldwide Innovator in Power Quality

Since 1988 Elspec has developed, manufactured and marketed proven power quality solutions far exceeding our clients' needs and expectations. Our innovations not only simplify the understanding of the quality of power itself, but are also highly compatible, making it suitable for any business and/or application. Elspec's international team of professionals with extensive experience in electrical engineering, are ready to provide a tailor-made strategy that will enable a sustainable and efficient use of your electrical energy.



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