

G4500/G3500 Portable Power Quality Analyzer

# BLACKBOX

Don't be left in the dark



# G4500/G3500 Portable

Power Quality in High Definition

- No Missed Events
- Quick & Simple Setup
- Remote Connectivity

“ ABSOLUTELY IDENTIFY  
ALL POWER QUALITY EVENTS ”

“ PLUG IT IN  
AND NEVER MISS ANOTHER EVENT ”

# The Perfect Portable Solution

Tailored for PQ Analysis at any location, the portable G4500 and G3500 BLACKBOX device series has been especially designed to address the needs of:

- Site Engineers
- Electrical Consultants
- Utilities

## All Inclusive

Everything you need in a Portable Power Quality Solution and more:

- Four Flexible AC Current Clamps (Automatically Detected)
- Seven Voltage Leads<sup>1</sup> (Automatically Detected)
- Durable Carrying Case
- Rechargeable Power Supply (2 Hours Standby)
- Wireless Network<sup>2</sup>
- PQSCADA / Investigator Software CD
- Mobile Analysis Lab

## PQZIP - Compression Technology

The unique patented PQZIP compression technology enables you to store up to 1000 times more information than typical file formats.

PQZIP allows storage of complete and precise data over extended periods of time.



<sup>1</sup> Only 5 Voltage Leads Supplied with G3500    <sup>2</sup> G4500 Unit Only

# Unique Features

## No Missed Events

The BLACKBOX Portable, coined POWER QUALITY IN HIGH DEFINITION, records all the parameters, all the time. Capture everything for more than a year<sup>1,2</sup>: trends, Volts/Amps/Hz, events, harmonics, THD, flicker, power and energy to get down to the root cause of all Power Quality issues. It is the only measurement device capable of FFT (Fast Fourier Transform) computation, for every cycle, simultaneously recording both IEC 61000-4-30 and Cycle-By-Cycle measurements.

## Quick and Simple Setup

Specifically designed for a quick and easy portable setup, simply connect the Portable BLACKBOX, record and measure all electrical information. The device doesn't rely on any pre-programmed triggers, events or thresholds. If so required, the device may also include individual pre programmed parameters.

## Remote Connectivity

Built-in web server allows remote monitoring using standard web browsers. With a 802.11 access point and Ethernet router b/g<sup>1</sup>, the BLACKBOX Portable enables remote analysis:

- **Intuitive:** Graphical Web Screens, that are easy to operate
- **Accessible:** Internet access from any location via a variety of communication gateways
- **Manageable:** Monitor and analyze all your network data
- **Control:** System administration made easy via three user-levels

## Plug-and-Play

The Portable BLACKBOX is equipped with a plug-and-play probe interface that allows it to automatically detect probes and clamps during setup.

## Full Compliance with IEC 61000-4-30 Class A

Far surpassing the highest standards set by the industry, the Portable BLACKBOX complies with standards for: aggregations, time clock uncertainty, flagging, and transient influence quantities.

<sup>1</sup> G4500 Unit Only    <sup>2</sup> Depending on the Selected Resolution & on the Individual Network Condition

# Advanced PQSCADA

By effectively processing enormous amounts of recorded network data, PQSCADA Software provides an immediate, and understandable picture of everything that happened within the network, anywhere, anytime.



## Automated Reports

Generate automated reports set to any customized pre-scheduled period. Event data is exportable to either COMTRADE or PQDIF, and all other data to PDF, EXCEL and HTML.

# 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 synchronizes time at any remote site location.



## Multi Frequency 3.5G Wireless Modem

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, and the modem is fully compatible with GSM/GPRS/EDGE.

Elspec's unique calibration procedure calculates both clamp and device inaccuracy, thereby eliminating clamp uncertainty and yielding a superior power measurement accuracy.

### 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 - 6 A Mini Clamp

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



### 100 A Mini Clamp

Ordering Information (Part Number)	SOA-0180-5000
Measurement Range	Up to 100A <sub>PK</sub> 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")



### Custom Clamp 1-Flexible Current Probe

Ordering Information (Part Number)	SOA-3000-0270
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")



## IEC 61000-4-30 Class A Test Reports

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

# Product Selection Guide

## Product Series

## G3500

## G4500

### Product Specifications

Voltage Sampling Rate, Maximum Samples/Cycle	512	1024
Voltage Harmonics (Individual, Even, Odd, Total) Up to -	255 <sup>TH</sup>	511 <sup>TH</sup>
Type of Analog to Digital Converter	16/20 <sup>1</sup> bit	16/20 <sup>1</sup> bit

### Storage Capacity

Internal Memory	256 MB/256GB <sup>2</sup>	32 GB/32TB <sup>2</sup>
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### Power Quality Analysis

Transient Detection, Microseconds (50Hz/60Hz)	39/32.5µs	19.5/16.3µs
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### Communication Ports

Ethernet Ports	1	3
Wi-Fi Communications (802.11g)	—	1
Power Over Ethernet (PoE- Out)	—	✓
Digital Input	4	4

### Measurements

Voltage Channels	4 (3 Phases + Neutral)	4 (3 Phases + Neutral) + 1 DC
Current Channels	4 (3 Phases + Neutral)	4 (3 Phases + Neutral) + 1Gm/DC

### Physical

Dimensions	314mm X 84mm X 269mm	314mm X 84mm X 271 mm
Weight	3.7kg	3.7kg

## Specifications

### Applicable Measurement Standards

EN50160, IEEE1159, IEEE519, IEC61000-4-15, IEC61000-4-7, IEC61000-4-30 Class A

### Control

Comprehensive web server for local and remote real-time monitoring and control

### Applicable 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

### Applicable Environmental Standards

IEC60068-2-1, 2, 6, 27, 30, 75

### Applicable Safety Standards

EN61010-1:2001 2<sup>nd</sup> Edition

### Serial Ports

RS-232  
RS-485

### Voltage

Nominal Full Scale	1000V
Maximum Peak Measurement	8000V
Input Impedance	3MΩ
Uncertainty	0.1% of Nominal

### Current

Current Channels Receive	11-14: 0-10 V <sub>pk</sub> 15: 0-3 V <sub>pk</sub> From Clamp
Uncertainty	0.1% ±0.1 mV

### Power Supply

Operating Range	100-260 VAC: 50/60 Hz 100-300 VDC
Auxiliary DC Supply	48 Vdc
Auxiliary Supply – PoE In	According to 802.3af
Battery Backup	2 Hours

### Time

Real Time Clock	±1 Second per 24 Hours
Synchronization Device	Accuracy
GPS	100-200µs
IRIG B	100-200µs
DCF-77	±15ms
SNTP Server	50-100µs

### Frequency

Fundamental Frequency	42.5 Hz to 69 Hz
Frequency Resolution	10 mHz
Frequency Accuracy	±10 mHz

### Environmental Conditions

Operation Temperature	0°C – 50°C (32°F – 122 °F)
Storage Temperature	-20°C – 60°C (-4°F – 140 °F)

<sup>1</sup> Effective bits.

<sup>2</sup> Equivalent memory size needed without compression.

Disclaimer: Specifications subject to change 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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