

G4500/G3500 Portable Power Quality Analyzer

BLACKBOX

FLEXIBLE CUSTOM CURRENT CLAMPS

V 1.2

DATASHEET



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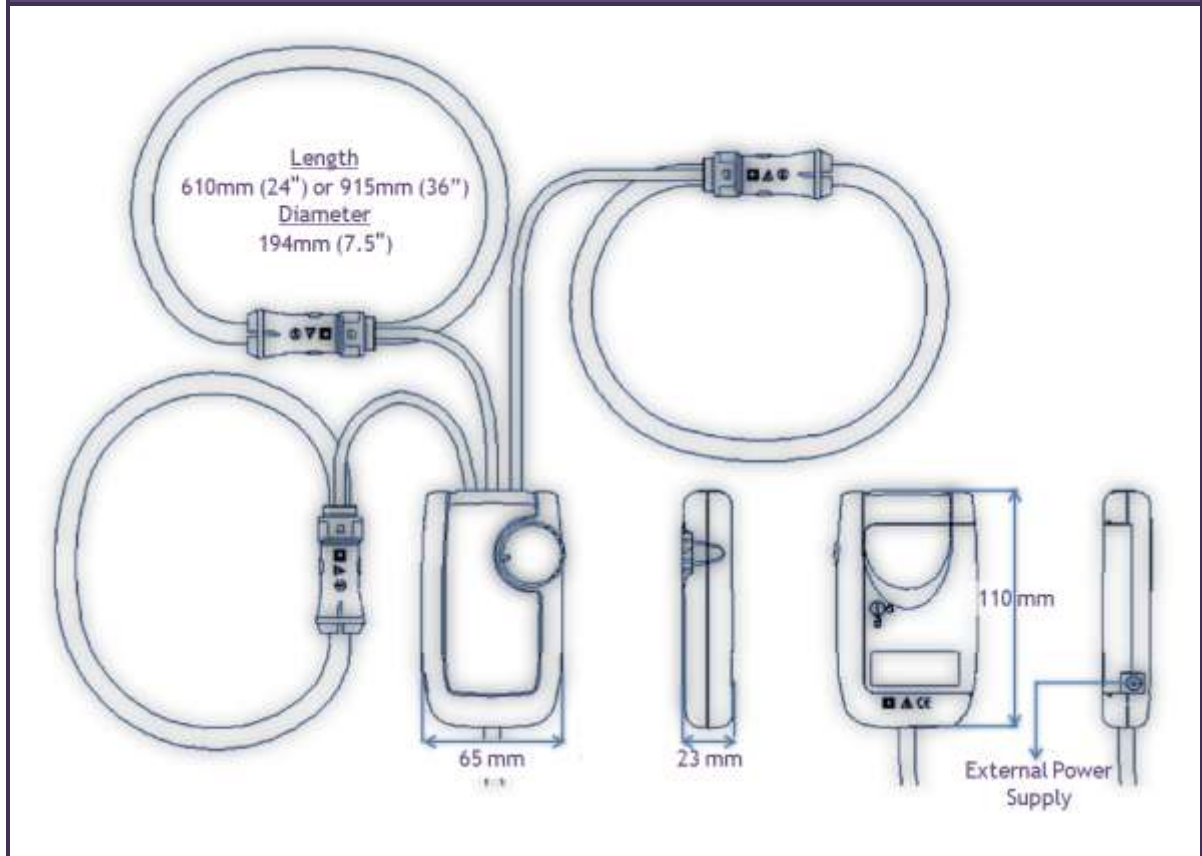
SPECIFICATIONS - CUSTOM CLAMP 3-FLEXIBLE CURRENT PROBES



ELECTRICAL	
Measuring Ranges	30A / 300A / 3000A AC RMS (Set by Rotary Switch)
Output Sensitivity	100mV / 10mV / 1mV per A (AC Coupled)
Accuracy (at 45-65Hz)	± 1% of Reading ± 0.1A (30A Range) ± 1% of Reading ± 1A (300A / 3000A Range)
Minimum Load Impedance	100kΩ For Specified Accuracy
Frequency Range	10Hz to 10kHz (-1dB)
Phase Error	± <1° (45 – 65Hz)
Position Sensitivity	± 2% of Reading
External Field	± 0.2% of Range with Cable > 200mm (8”) from the Probe
Linearity	± 0.2% of Reading (10% to 100% of Range)
Noise	80mA rms in 30A range; 400mA rms in 300A / 3000A Range
Bandwidth	10Hz to 10kHz (-1dB)
Temperature Coefficient	± 0.1% of Reading / °C
Power Supply	Two AA MN1500 LR6 Alkaline Batteries (Low Battery Indicator) or External Power Supply (+3V/100mA)
Battery Life	2000 Hours Typical (1~) 1000 Hours Typical (3~)
Overload Indication	Red LED ON Indicates the Range Overload
Low Battery Indication	Orange LED ON Indicates Low Battery
Working Voltage	1000V AC RMS or DC (Probe & Rotary-Switch) 30V max (Output)
External Power	Via 2.1mm (0.08”) mini power connector

ENCLOSURE	
Material	ARNITE T06-200SNF, UL94 V0
Degree of Protection	IP40
Dimensions	110 (L) x 65 (W) x 23 (D) mm
Output Connection	0.5m (1~)/1.0m (3~) cable terminated with Binder MFG P/N- 99-0437-14-05
PROBE	
Probe Lengths	610mm (24"), Double Insulated 915mm (36"), Double Insulated
Probe Diameter	9.9mm (0.39 ")
Output Cable	2m (78.7") (Probe to Rotary-Switch)
Material	Alcryn 2070 NC, LATI LATENE 7H2W V0
Degree of Protection	IP65 Probe, IP40 Rotary-Switch
GENERAL	
Operating Temperature Range	-20 to +65°C (-4 to +149°F)
Storage Temperature Range	-40 to +75°C (-40 to + 167°F)
Operating Humidity	15% to 85% (Non Condensing)
STANDARDS	
Safety	EN 61010-1: 2010 EN 61010-2-031: 2002 + A1: 2008 EN 61010-2-032: 2002
EMC	EN 61326-2-2:2006
1000 V _{RMS} , Category III, 600 V _{RMS} , Category IV, Pollution Degree 2 (Probe & Rotary-Switch) 30V Maximum Between Output & Earth	
LIMITATIONS	
Use of the probe on uninsulated conductors is limited to 1000 V AC RMS or DC & Frequencies below 1 kHz.	
COMPLIANCE	
ROHS & WEEE	
ORDERING INFORMATION – PART NUMBER	
610mm (24")	SOA-3003-0270
915mm (36")	SOA-3013-0270

PHYSICAL



SPECIFICATIONS - CUSTOM CLAMP 1-FLEXIBLE CURRENT PROBE





Datasheet: G4500/G3500 Portable BLACKBOX Flexible Custom Current Clamps V1.2

ELECTRICAL	
Measuring Ranges	30A / 300A / 3000A AC RMS (Set by Rotary Switch)
Output Sensitivity	100mV / 10mV / 1mV per A (AC Coupled)
Accuracy (at 45-65Hz)	± 1% of Reading ± 0.1A (30A Range) ± 1% of Reading ± 1A (300A / 3000A Range)
Minimum Load Impedance	100kΩ For Specified Accuracy
Frequency Range	10Hz to 10kHz (-1dB)
Phase Error	± <1° (45 – 65Hz)
Position Sensitivity	± 2% of Reading
External Field	± 0.2% of Range with Cable > 200mm (8") from the Probe
Linearity	± 0.2% of Reading (10% to 100% of Range)
Noise	80mA rms in 30A range; 400mA rms in 300A / 3000A Range
Bandwidth	10Hz to 10kHz (-1dB)
Temperature Coefficient	± 0.1% of Reading / °C
Power Supply	Two AA MN1500 LR6 Alkaline Batteries (Low Battery Indicator) or External Power Supply (+3V/100mA)
Battery Life	2000 Hours Typical (1~) 1000 Hours Typical (3~)
Overload Indication	Red LED ON Indicates the Range Overload
Low Battery Indication	Orange LED ON Indicates Low Battery
Working Voltage	1000V AC RMS or DC (Probe & Rotary-Switch) 30V max (Output)
External Power	Via 2.1mm (0.08") mini power connector
ENCLOSURE	
Material	ARNITE T06-200SNF, UL94 V0
Degree of Protection	IP40
Dimensions	110 (L) x 65 (W) x 23 (D) mm
Output Connection	0.5m (1~)/1.0m (3~) cable terminated with Binder MFG P/N- 99-0437-14-05
PROBE	
Probe Lengths	610mm (24"), Double Insulated 915mm (36"), Double Insulated
Probe Diameter	9.9mm (0.39 ")
Output Cable	2m (78.7") (Probe to Rotary-Switch)
Material	Alcryn 2070 NC, LATI LATENE 7H2W V0
Degree of Protection	IP65 Probe, IP40 Rotary-Switch

GENERAL	
Operating Temperature Range	-20 to +65°C (-4 to +149°F)
Storage Temperature Range	-40 to +75°C (-40 to + 167°F)
Operating Humidity	15% to 85% (Non Condensing)
STANDARDS	
Safety	EN 61010-1: 2010 EN 61010-2-031: 2002 + A1: 2008 EN 61010-2-032: 2002
EMC	EN 61326-2-2:2006
1000 V _{RMS} , Category III, 600 V _{RMS} , Category IV, Pollution Degree 2 (Probe & Rotary-Switch) 30V Maximum Between Output & Earth	
LIMITATIONS	
Use of the probe on uninsulated conductors is limited to 1000 V AC RMS or DC & Frequencies below 1 kHz.	
COMPLIANCE	
ROHS & WEEE	
ORDERING INFORMATION – PART NUMBER	
610mm (24")	SOA-3000-0270
915mm (36")	SOA-3010-0270
PHYSICAL	
<p>Length 610mm (24") or 915mm (36") Diameter 194mm (7.5")</p> <p>65 mm</p> <p>23 mm</p> <p>110 mm</p> <p>External Power Supply</p>	

INTRODUCTION

The 3-Phase AC flexible current clamps are now obtainable from Elspec as optional accessories with the BLACKBOX Portable. The clamps are capable of measuring currents up to 3000 Amps at very high frequencies of 10 kHz. The clamps are supplied either as 3-flexible current probes / 1-flexible current probe. Controlled by a Rotary-Switch with 1000 hour battery life, the probes provide a linear voltage output replicating input waveforms current ranges (determined by the user) of 30, 300, or 3000 Amperes.

CONNECTING THE FLEXIBLE CURRENT CLAMPS

The BLACKBOX Portable will automatically recognize the current probes as custom clamps once it will be plugged in to the Power Quality Analyzer, thereby simplifying the procedure.

STEP 1 ATTACH THE CLAMPS

1. Connect the flexible current probes to the appropriate current input on the Portable BLACKBOX (I1 for I1; I2 for I2; I3 for I3). The blue indicator light will light up to confirm a solid connection:



Figure 1: Connection Confirmation (Blue Light Indicator On)

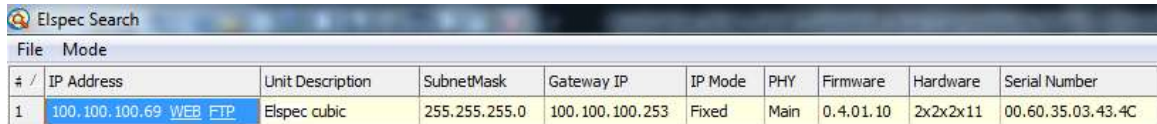
2. Place clamp around the applicable measured power source.
3. Set the appropriate current range on the Rotary-Switch:



Figure 2: Current Settings on Rotary-Switch

STEP 2 CONFIGURE ELSPEC'S WEBSITE

1. Open the Elspec's Search Utility. Search for your BLACKBOX via the devices' serial number, & access your device via the WEB:



#	IP Address	Unit Description	SubnetMask	Gateway IP	IP Mode	PHY	Firmware	Hardware	Serial Number
1	100.100.100.69 WEB FTP	Elspec cubic	255.255.255.0	100.100.100.253	Fixed	Main	0.4.01.10	2x2x2x11	00.60.35.03.43.4C

Figure 3: Access via Elspec Search

2. Login to the Internal Website as the administrator (**Default - Password: 12345**) in order to set the configuration options. Select **"Login"**.



Figure 4: Internal Website – Login Administrator

3. Open the **"Configuration"** Tab, select **"Currents"** option:



Figure 5: Internal Website – Select "Configure" "Currents"

4. Define your:
 - **Primary & Secondary Transformation Ratios** for all the Current channels (a & b)
 - **Nominal Ampere Values** for all the Current Channels (c) (Nominal is set for the current measurements that will define PQZIP threshold / tolerance value & it is also used for event settings)
 - Either **Reverse** the polarity / maintain it at **Normal** from the drop-down selection (d) (Polarity toggling is used to correct incorrect wiring)
 - Clamp's Current / Voltage Ratio (e & f) (Measurement Guide as per Table 1) &
 - Select **"Apply Changes"** (g):

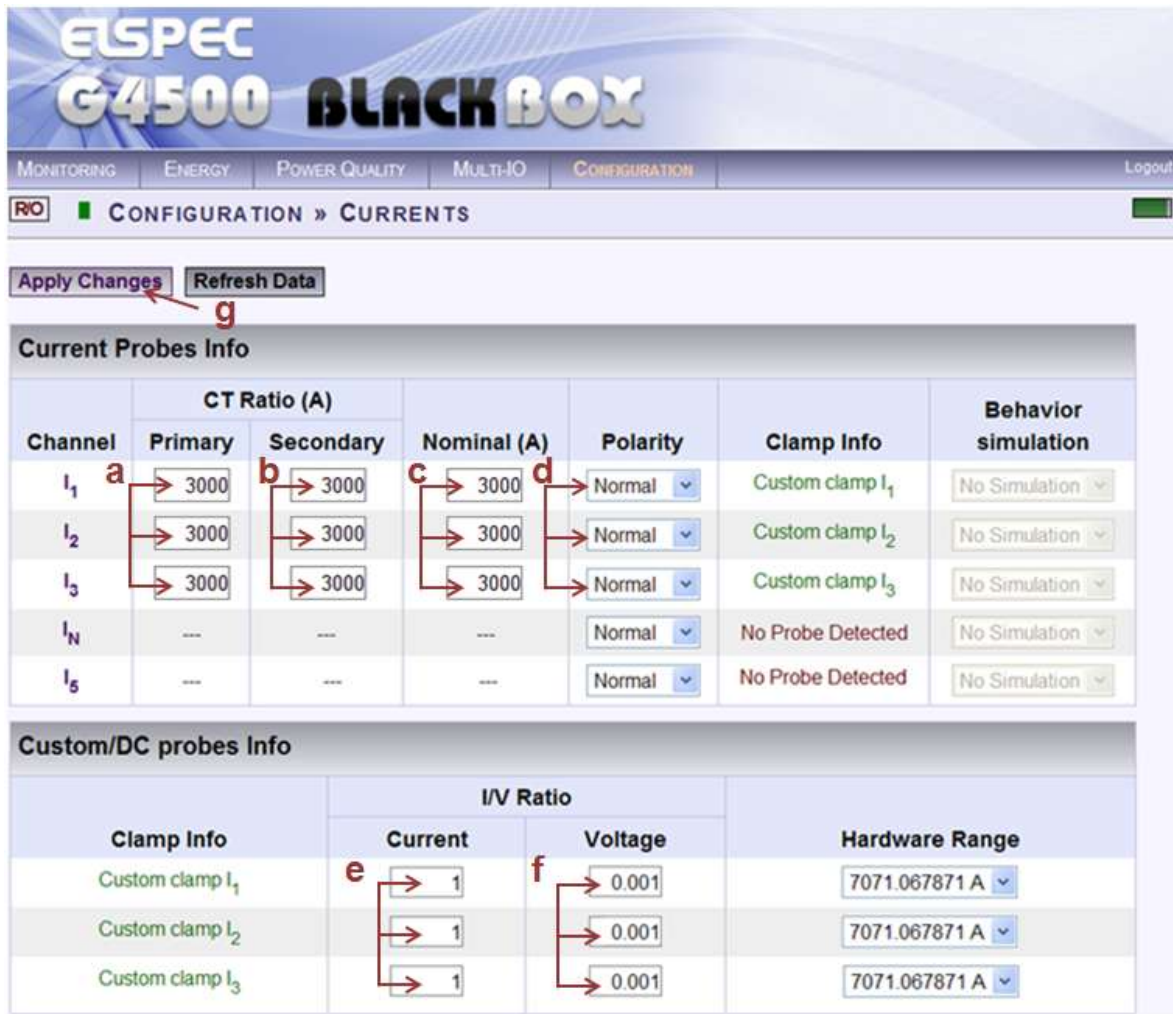


Figure 6: Internal Website – Current Custom Clamp Configuration

Clamp	Rotary-Switch Current Setting	I/V Ratio
Flexible Custom Clamp	30 A	100 m V/A
Flexible Custom Clamp	300 A	10 m V/A
Flexible Custom Clamp	3000 A	1 m V/A

Table 1: Current Voltage Ratio - Custom Clamp

5. Select “OK” to conclude the configuration (Fig.7a). The following configuration success messages (F7b & c) will appear on the screen:-

