G4600 DATASHEET

Power Quality Analyzer & Grid Stability with Continuous Waveform Recording

G4610 | G4620 | G4630



- Continuous waveform recording up to 1024 samples/cycle
- IEC 61000-4-30 Class A (Ed. 3.1) power quality
- PQM, DFR, PMU, SER, DSM and EBM in one device
- Energy accuracy Class 0.1S active / Class 0.5S reactive (NMi certified)

October 2026 | V1

ELSPEC
When Power Meets Quality
www.elspec-ltd.com

Introduction

The G4600 is a modular, expandable multi-functional power system recorder. It continuously measures and records all voltage and current waveforms at up to 1024 samples per cycle, without manual triggers or threshold settings, and records auxiliary signals at 128 samples per cycle.

Integrated Functions

- DFR – Digital Fault Recorder
- PMU – Phasor Measurement Unit
- PQM – Power Quality Monitoring
- SER – Sequence of Event Recording
- DSM – Dynamic System Monitoring
- EBM – Energy Billing Measurement

Core Modules

MODULES	
Central Processing Unit (CPU)	Data compression, file handling and communication. Two Ethernet ports (LAN1, LAN2), two USB ports, RS485/RS422 port. LAN2 provides PoE PSE output.
Digital Signal Processing (DSP)	24-bit A/D conversion; simultaneous 8-channel sampling (4 voltage + 4 current) at 256, 512 or 1024 samples/cycle; full-scale range 8× nominal; ±0.1% of reading. PT100 temperature sensor input.
Power Supply (PS)	AC/DC supply and DC/DC converter; automatic source selection between main input and 24 VDC auxiliary input; ultracapacitor hold-up up to 30 s after power-off.
Multi I/O Module (MI/O) – optional	Per card: 8 digital inputs, 4 digital outputs, 4 analog inputs (4–20 mA), 4 analog outputs (4–20 mA), 3 relays, RS-232 for GPS / IRIG-B time synchronization. Up to 3 cards.

I. Input Characteristics

VOLTAGE INPUTS	G4610	G4620	G4630
Number of Inputs	AC/DC: 4 (3 Phase & Neutral)	AC/DC: 4 (3 Phase & Neutral)	AC/DC: 4 (3 Phase & Neutral)
Maximum Input Voltage	1000 VRMS	1000 VRMS	1000 VRMS
Nominal Voltage Range	110 to 690 V_{RMS}	110 to 690 V_{RMS}	110 to 690 V_{RMS}
Maximum Peak Measurement Voltage (V_{PK})	8 kV	8 kV	8 kV
Input Impedance (V to Earth)	>10 MΩ	>10 MΩ	>10 MΩ
Capacitance	320 pF	320 pF	320 pF
Overvoltage Category	600 V CAT IV / 1000 V CAT III	600 V CAT IV / 1000 V CAT III	600 V CAT IV / 1000 V CAT III
Bandwidth	6.25 kHz	12.5 kHz	25 kHz
Nominal Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz

CURRENT INPUTS	G4610	G4620	G4630
Number of Inputs	AC: 4 (3 Phase & Neutral)	AC: 4 (3 Phase & Neutral)	AC: 4 (3 Phase & Neutral)
Nominal Full Scale (I_{RMS})	0.1 – 50 A	0.1 – 50 A	0.1 – 50 A
Maximum Peak Measurement (I_{PK})	112 A	112 A	112 A
Range	0.01 – 79 A	0.01 – 79 A	0.01 – 79 A
Burden	0.0008 VA @ 5 A	0. 0008 VA @ 5 A	0. 0008 VA @ 5 A
Bandwidth	6.25 kHz	12.5 kHz	25 kHz

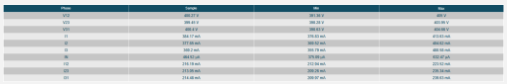
SAMPLING SYSTEM	G4610	G4620	G4630
Maximum Sampling Rate for Each Channel Simultaneously:			
Voltage	256 Samples/Cycle	512 Samples/Cycle	1024 Samples/Cycle
Current	256 Samples/Cycle	512 Samples/Cycle	1024 Samples/Cycle
DI	128 Samples/Cycle	128 Samples/Cycle	128 Samples/Cycle
AI	64 Samples/Cycle	64 Samples/Cycle	64 Samples/Cycle
Analog to Digital Converter Resolution	24 Bit	24 Bit	24 Bit
Highest Harmonic Order	H128	H256	H511
PLL Synchronization	1024 Samples on Cycle According IEC61000-4-7		

II. G4600 Web Interface Display

REAL-TIME DATA

RMS

Available in Real Time >> RMS

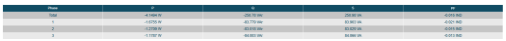


Sample, Minimum & Maximum Values of:

- Phase-to-phase voltages (V12, V23, V31) or phase-to-neutral voltages, according to topology
- Phase currents (I1, I2, I3) and neutral current (IN)
- Phase-to-phase current differences (I12, I23, I31)
- Half-cycle resolution; minimum / maximum since last reset

Power

Available in Real Time >> Power

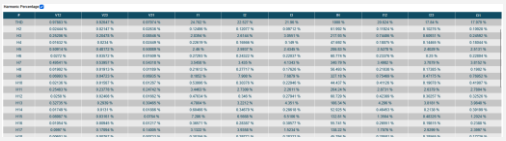


Per Phase & Total:

- Active Power (P)
- Reactive Power (Q)
- Apparent Power (S)
- Power Factor (PF) with IND / CAP indication
- Automatic unit scaling (W/kW/MW, VAr/kVAr/MVAr, VA/kVA/MVA)

Harmonics

Available in Real Time >> Harmonics

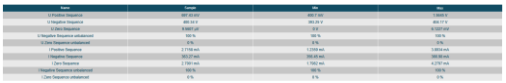


According to IEC 61000-4-7, per voltage & current channel:

- THD (Voltage & Current)
- Individual harmonics H2 to H100
- Includes IN and phase-to-phase current differences (I12, I23, I31)
- Harmonics Display: Real Values or Percentage of Fundamental
- Update every 3 seconds

Unbalance

Available in Real Time >> Unbalance

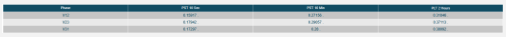


Sample, Minimum & Maximum Values of (Voltage & Current):

- Positive, Negative and Zero Sequence components
- Negative Sequence Unbalance ($u_2 = U_2/U_1 \times 100\%$)
- Zero Sequence Unbalance ($u_0 = U_0/U_1 \times 100\%$)

Flicker

Available in Real Time >> Flicker



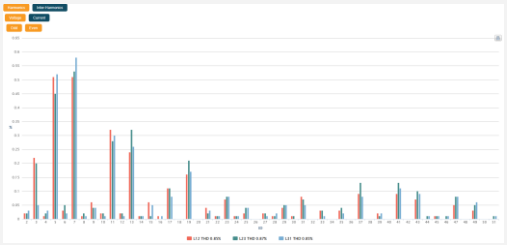
Per phase:

- PST 10 Sec (fast real-time indication, not an IEC 61000-4-15 aggregation interval)
- PST 10 Min (according to IEC 61000-4-15, Short Term Flicker Evaluation)
- PLT 2 Hours (according to IEC 61000-4-15, Long Term Flicker Evaluation)

HARMONICS, PHASORS & WAVEFORMS

Harmonics & Inter-Harmonics Graph

Available in Harmonics

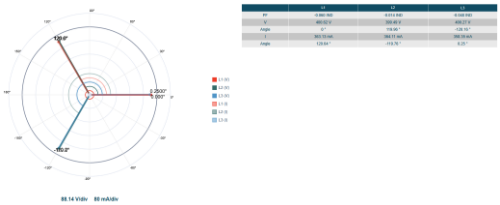


Bar graph per channel:

- Harmonics & Inter-Harmonics
- Voltage or Current
- Odd and / or Even orders
- THD per channel shown in legend
- Printable

Phasors

Available in Phasors

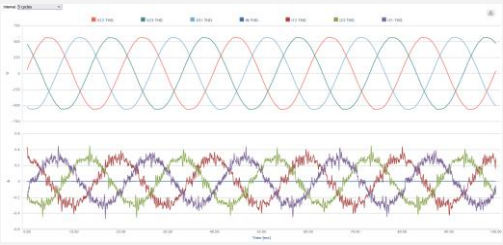


Real-Time Phasor Diagram & Table (L1, L2, L3):

- Voltage & Current amplitude
- Angle (relative to V1 / V12)
- Power Factor per phase (IND / CAP)
- Auto-scaled diagram (V/div, A/div)
- Show / hide individual channels

Waveforms

Available in Waveforms



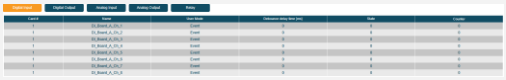
Voltage & current waveforms (separate V and A graphs):

- Selectable interval (e.g. 5 cycles)
- Voltage channels: V1N, V2N, V3N, VNG, V12, V23, V31 (according to topology)
- Current channels: I1, I2, I3, IN, I12, I23, I31 (according to topology)
- THD per channel in legend
- Show / hide channels; printable

MULTI I/O DATA

Digital Input

Available in Multi I/O >> Digital Input

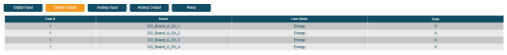


Per card & channel:

- User mode (e.g. Event)
- Debounce delay time [ms]
- State
- Counter

Digital Output

Available in Multi I/O >> Digital Output

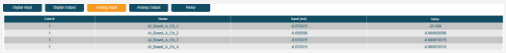


Per card & channel:

- User mode (e.g. Energy pulse)
- State

Analog Input

Available in Multi I/O >> Analog Input

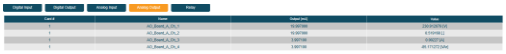


Per card & channel:

- Input current [mA]
- Converted engineering value

Analog Output

Available in Multi I/O >> Analog Output

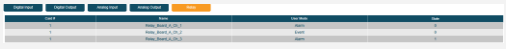


Per card & channel:

- Output current [mA]
- Mapped measured value with unit (e.g. V, A, VAr)

Relay

Available in Multi I/O >> Relay



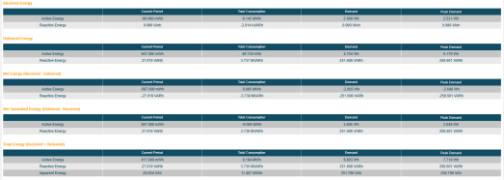
Per card & channel:

- User mode (Alarm / Event)
- State

ENERGY DATA

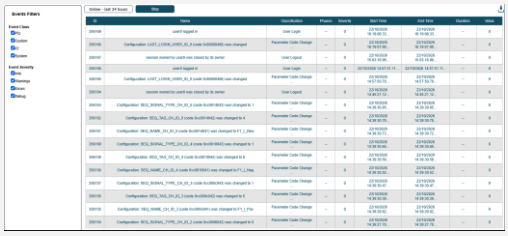
Energy

Available in Energy



Per energy type – Current Period, Total Consumption, Demand & Peak Demand:

- Received Energy (Active & Reactive)
- Delivered Energy (Active & Reactive)
- Net Energy, Received − Delivered (Active & Reactive)
- Net Generated Energy, Delivered − Received (Active & Reactive)
- Total Energy, Received + Delivered (Active, Reactive & Apparent)

POWER QUALITY DATA	
Events *Available in Events* 	**Unified event log:** ■ Event classes: PQ, Custom, IO, System ■ Severity filter: Info, Warnings, Errors, Debug ■ Per event: ID, name, classification, phases, severity, start / end time, duration, value ■ Online view (last 24 hours) and historical date range ■ Export
Configurable PQ Events *Available in Settings >> Events*	■ Dip, Swell, Interruption, RVC ■ Custom events ■ Aggregated events (up to 16, each combining up to 4 PQ events)
Compliance	■ Compliance standards: EN 50160, IEEE 519, FoL (Norway), NRS 048

III. Measurement Range, Resolution & Accuracy

VOLT / AMPS / HERTZ	MEASUREMENT RANGE	RESOLUTION	ACCURACY
V_{RMS} (AC & DC)	0 to 1000 V	10 mV	±0.1% of Nominal Voltage[1]
A_{RMS}	0.01 to 85 A	10 mA	±0.1% of Nominal Current
V_{PK}	8 kV	10 mV	±0.1% of Reading
Voltage Crest Factor	1<	0.01	Better than 0.5%
Current Crest Factor	1<	0.01	Better than 0.5%
Hz to 50 Hz Nominal	40 to 70 Hz	1mHz	±1mHz
Hz to 60 Hz Nominal	40 to 70 Hz	1mHz	±1mHz
K-Factor	0<	0.01	±0.25%

[1] From 5V

DIPS, SWELLS & INTERRUPTIONS	MEASUREMENT RANGE	RESOLUTION	ACCURACY
V_{RMS}½ (AC & DC)	0 to 1000 V	10mV	±0.1% of Nominal Voltage[1]
Duration	HHH,MM,SS,MMM	Half Cycle	One Cycle
Threshold Levels	Programmable thresholds & hysteresis in percentage of nominal voltage or sliding reference voltage (USR). Event detection based upon ½ cycle RMS voltages. Captures dips, swells, interruptions & rapid voltage changes (RVC).		

VOLTAGE HARMONICS	MEASUREMENT RANGE	RESOLUTION	ACCURACY
Harmonic Order	1 to 511 (subgroups per IEC 61000-4-7)	0.01 V	IEC 61000-4-7
Inter-Harmonic Order	1 to 511 (subgroups per IEC 61000-4-7)	0.01 V	IEC 61000-4-7
$THD_{(N=50)}$	0 to 1000 %	0.01 %	±0.25%
THD Even	0 to 1000 %	0.01 %	±0.25%
THD Odd	0 to 1000 %	0.01 %	±0.25%
Hz (Spectrum)	0 to 3174 Hz	fSys 10/12	±5%
Phase Angle	-180° to +180°	0.01°	±0.01°

POWER & ENERGY	MEASUREMENT RANGE	RESOLUTION	ACCURACY
Active Power	±5kW × CT × PT ratio	10mW	±0.2% (Class 0.2S, IEC 62053-22)
Reactive Power	±5kVAr × CT × PT ratio	10mVAr	±0.5% (Class 0.5S, IEC 62053-24)
Apparent Power	±5kVA × CT × PT ratio	10mVA	±0.2%

Active Energy	±5kWh × CT × PT ratio	10mWh	±0.2% recording to Class 0.2S, IEC 62053-22
Reactive Energy	±5kVArh × CT × PT ratio	10mVArh	±0.5% (Class 0.5S, IEC 62053-24)
Apparent Energy	±5kVAh × CT × PT ratio	10mVAh	±0.2%
True Power Factor	±1 (CAP / IND)	10µ	±0.002%
Displacement Power Factor	±1 (CAP / IND)	10µ	±0.002%

** NMi Certificate of Conformity NMi-CoC-26.16: 3-phase 4-wire, CT connected, 50 Hz, In 3 A, Imax 20 A.*

FLICKERING	MEASUREMENT RANGE	RESOLUTION	ACCURACY
PST 10 s, PST 10 Minutes, PLT 2 Hours	0 to 20	0.01	According to IEC 61000-4-30 Class A / IEC 61000-4-15 ±5%
PINST	0 to 20	0.01	±8%

UNBALANCE	MEASUREMENT RANGE	RESOLUTION	ACCURACY
Volts (Negative & Zero Seq.) Ratio	0 to 100%	0.1 %	0.15 %
Current (Negative & Zero Seq.) Ratio	0 to 100%	0.1 %	0.5 %

IV. Measurement Method (identical to G4K)

MEASUREMENT METHOD	
VRMS	$V_{RMS_x} = \sqrt{\sum_{n=1} ((V \cos \varphi)^2 + (V \sin \varphi)^2)}$ *n* = Number of Samples *x* = Specific Channel 10/12 Continuous Non-Overlapping Cycles In Accordance with IEC61000-4-30
VRMS½, ARMS½	Value Is Measured Over 1 Cycle, Commencing At a Fundamental Zero Crossing, & Refreshed Each Half-Cycle. This Technique Is Independent For Each Channel In Accordance With IEC61000-4-30
ARMS	$I_{RMS_x} = \sqrt{\sum_{n=1} ((I \cos \varphi)^2 + (I \sin \varphi)^2)}$ *n* = Number of Samples *x* = Specific Channel 10/12 Continuous Non-Overlapping Cycles In Accordance with IEC61000-4-30
HRMS	$H_{RMS_x} = \sqrt{\sum_{n=2} ((A \cos \varphi)^2 + (A \sin \varphi)^2)}$ *n* = Number of Samples *x* = Specific Channel 10/12 Continuous Non-Overlapping Cycles In Accordance with IEC61000-4-30
VPK, IPK	Absolute Highest Sample Value Within 10/12 Cycle Interval
V Crest Factor	$\frac{V_{Pk}}{V_{RMS}}$ Measures Ratio Between the VPk and VRMS
A Crest Factor	$\frac{I_{Pk}}{I_{RMS}}$ Measures Ratio Between the IPk and ARMS
Hz	$\frac{Complete\ cycles\ in\ 10\ seconds}{10\ seconds}$ Measured Every 10 Seconds in Accordance with IEC61000-4-30
THD	$\sqrt{\frac{\sum_{n=2}^{50} C_n^2}{C_1^2}}$ *C* = Harmonic RMS Value *n* = Harmonic Order
THD Even	$\sqrt{\frac{\sum_{1}^{25} C_{2n}^2}{C_1^2}}$ *C* = Harmonic RMS Value *n* = Harmonic Order
THD Odd	$\sqrt{\frac{\sum_{1}^{25} C_{2n+1}^2}{C_1^2}}$ *C* = Harmonic RMS Value *n* = Harmonic Order

<table>
<tr><td>Harmonics</td><td>$$G_{sg,n}^2 = \sum_{i=1}^{1} C_{k+i}^2$$
In Accordance With IEC61000-4-7</td></tr>
<tr><td>Inter-Harmonics</td><td>In Accordance With IEC61000-4-7</td></tr>
<tr><td>Watt</td><td>$$P = V_{h_1} * I_{h_1} * \cos(\varphi_1) + \sum_{n} V_{h_n} * I_{h_n} * \cos(n * \varphi_1 + \varphi_n)$$
n = 2 to 50</td></tr>
<tr><td>VA</td><td>$$S = V_{RMS} * I_{RMS}$$</td></tr>
<tr><td>VAR</td><td>$$Q = \sqrt{S^2 - P^2}$$</td></tr>
<tr><td>True Power Factor (PF)</td><td>$$PF_{sign} = P_{sign} * Q_{sign}$$
if PF_sign > 0 than IND
PF_sign < 0 than CAP

<table><tr><th>QUADRANT</th><th>P</th><th>Q</th><th>PF</th><th>PF UNIT</th></tr><tr><td>I</td><td>+</td><td>+</td><td>+</td><td>IND</td></tr><tr><td>II</td><td>−</td><td>+</td><td>−</td><td>CAP</td></tr><tr><td>III</td><td>−</td><td>−</td><td>+</td><td>IND</td></tr><tr><td>IV</td><td>+</td><td>−</td><td>−</td><td>CAP</td></tr></table></td></tr>
<tr><td>Displacement Power Factor (PF)</td><td>Same as True PF, But Only With Fundamental Components:

$true\ PF = \left\lvert\frac{P_{h1}}{S_{h1}}\right\rvert$, if Q > 0 than CAP; if Q < 0 than IND</td></tr>
<tr><td>Unbalance</td><td>The Supply Voltage Unbalance is Evaluated Using the Method of Symmetrical Components in Accordance with IEC61000-4-30</td></tr>
<tr><td>Zero Sequence Unbalance</td><td>$$U_0 = \left\lvert\frac{u_0}{u_1}\right\rvert * 100$$</td></tr>
<tr><td>Negative Sequence Unbalance</td><td>$$U_2 = \left\lvert\frac{u_2}{u_1}\right\rvert * 100$$</td></tr>
<tr><td>Positive Sequence</td><td>Defined as the symmetrical vector system derived by application of the Fortescue’s transformation matrix, and that rotates in the same direction as the power frequency voltage (or current):

$$\underline{U_1} = \frac{1}{3}\left(\underline{U_a} + a^1\underline{U_b} + a^2\underline{U_c}\right) where\ a = 1\angle 120° = -\frac{1}{2} + j\frac{\sqrt{3}}{2}$$

and $\underline{U_a}, \underline{U_b}, \underline{U_c}$ are line to neutral voltages (fundamental component)

In Accordance With IEC61000-3-13, ed. 1.0 (2008-02) Ref: 3.26.3</td></tr>
<tr><td>Negative Sequence</td><td>Defined as the symmetrical vector system derived by application of the Fortescue’s transformation matrix, and that rotates in the opposite direction as the power frequency voltage (or current):

$\underline{U_2} = \frac{1}{3}\left(\underline{U_a} + a^2\underline{U_b} + a^1\underline{U_c}\right)$ where $a = 1\angle 120° = -\frac{1}{2} + j\frac{\sqrt{3}}{2}$

and $\underline{U_a}, \underline{U_b}, \underline{U_c}$ are line to neutral voltages (fundamental component)

In Accordance With IEC61000-3-13, ed. 1.0 (2008-02) Ref: 3.26.4</td></tr>
<tr><td>Zero Sequence</td><td>Defined as the in-phase symmetrical vector system derived by application of the Fortescue’s transformation matrix:</td></tr>
</table>

	$\underline{U_0} = \frac{1}{3}\left(\underline{U_a} + \underline{U_b} + \underline{U_c}\right)$ where $\underline{U_a}, \underline{U_b}, \underline{U_c}$ are line to neutral voltages (fundamental component) In Accordance With IEC61000-3-13, ed. 1.0 (2008-02) Ref: 3.26.5
Flicker	Five Block Digital Flickermeter as Described in IEC 61000-4-15 Edition 2. Functional & Design Specification Includes 230V/50Hz, 230V/60Hz, 120V/50Hz, 120V/60Hz Lamp Models
Flicker PINST	Output of Block 5 of the Flickermeter in Accordance with IEC61000-4-15 Edition 2
Flicker PST (10 min)	The Standard Measurement Time For P_{ST} is 10 Minutes: $P_{ST} = \sqrt{0.0314P_{0.1} + 0.0525P_{1S} + 0.0657P_{3S} + 0.28P_{10S} + 0.08P_{50S}}$ Where the Percentiles $P_{0.1}, P_1, P_3, P_{10}, P_{50}$ are the Flicker Levels Exceeded for 0.1, 1, 3, 10 & 50% of the Time During The Observation Period. The Suffix “s” in the Formula Indicates that the Smoothed Value Should be Used. The Smoothed Values are Obtained Using the Following Formulas: P(1s) = (P(.7) + P(1) + P(1.5))/3 P(3s) = (P(2.2) + P(3) + P(4))/3 P(10s) = (P(6) + P(8) + P(10) + P(13) + P(17))/5 P(50s) = (P(30) + P(50) + P(80))/3
Flicker PST (10 s)	Fast-updating short-term flicker indication for real-time monitoring (not an IEC 61000-4-15 aggregation interval)
Flicker PLT	The Long-Term P_{LT} is Derived From the Short-Term Values Over 12 Short-Term Values of 10 Minutes Each Over a Period of 2 hours: $P_{LT} = \sqrt[3]{\frac{\sum_{i=1}^{N} P_{ST_i}^3}{N}}$ Where $P_{ST_i}(i = 1, 2, 3, \dots)$ $are\ the\ Consecutive\ Readings\ of\ the\ PST$
K-Factor	$\frac{\sum_{n=1}^{25}(i_n * n)^2}{\sum_{n=1}^{25} i_n^2}$ Where *n* is the Harmonic #, and i_n is the RMS value of the n^{TH} Harmonic

V. General Specifications

STORAGE CAPACITY	G4610	G4620	G4630
Internal Memory	64 GB	64 GB	64 GB

REAL-TIME (SELF SYNCHRONIZATION)	
Real Time Clock	±5 ppm
Time Synchronization	GPS / NTP / IRIG-B / IEEE 1588 (PTP) / PPS / Self
DEVICE SYNCHRONIZATION ACCURACY	
GPS	0.5 µs
IRIG-B	0.5 µs
NTP Server	100 µs
IEEE 1588 (PTP)	1 µs (Layer 2)
PPS Only	< 10 µs

COMMUNICATION	
CONTROL	
Web Server	Comprehensive web server for local & remote real-time monitoring & control
FTP / SFTP Server	Access to recorded files (PQZ, COMTRADE) and logs
PORTS	
Ethernet Ports	2
RS485/422 Ports	1
USB Ports	2
RS-232	1 per Multi I/O card (time synchronization only)
LAN 1	
Speed	10/100/1000 Mbit/s
Communication Protocols	Modbus TCP, DNP3, IEC 61850, PMU (IEEE C37.118.2), PTP, SSH, FTP, SFTP
Connector Type	RJ45 female with 2 LED indicators
LAN 2	
Speed	10/100/1000 Mbit/s
Communication Protocols	Modbus TCP, DNP3, IEC 61850, PMU (IEEE C37.118.2), PTP, SSH, FTP, SFTP
Connector Type	RJ45 female with 2 LED indicators
Power over Ethernet (PoE PSE – Out)	IEEE 802.3af compatible, 48 VDC, 13 W maximum (optional for Smart Display)
RS485/422 CONNECTION	
Baud Rate	115200 bps (fixed)
Communication Protocols	Modbus RTU
Duplex	Full (4-wire)

Maximum Cable Length	15.2m (50')
MODBUS	
Standard Modbus	Up to 5000 parameters (10,000 registers) per function code (FC3 and FC4)
Fast Modbus	Up to 125 parameters (250 registers)
Function Codes	FC3, FC4 (read)
NOTE	
Protocol restriction	IEC 61850 and DNP3 cannot run at the same time

APPLICABLE STANDARDS	
Measurement Standards	IEEE 1159, IEC 61000-4-7, IEC 61000-4-15, IEC 61000-4-30 Ed. 3.1 Class A, IEC 62586-1, IEC 62586-2, IEEE C37.118.1-2011 + C37.118.1a-2014
Communication Standards	IEEE C37.118.2-2011; COMTRADE IEC 60255-24:2013
Energy Metering Standards	IEC 62052-11:2020, IEC 62053-22:2020, IEC 62053-24:2020, IEC 62052-31:2015
Compliance Standards	EN 50160, IEEE 519, FoL (Norway), NRS 048
EMC Standards	CISPR 32:2015 + A1, FCC 47 CFR Part 15 Subpart B, ICES-003:2020 Issue 7, EN IEC 61000-3-2:2019 + A1, EN 61000-3-3:2013 + A1 + A2, IEC 61000-4-2:2008, IEC 61000-4-3:2006 + A1 + A2, IEC 61000-4-4:2012, IEC 61000-4-5:2014 + A1, IEC 61000-4-6:2013, IEC 61000-4-8:2009, IEC 61000-4-11:2004, IEC 61000-4-12:2017, IEC 61000-4-16:2015, IEC 61000-4-17:2009, IEC 61000-4-18:2019, IEC 61000-4-19:2014, IEC 61000-4-29:2000, CLC/TR 50579:2012
Environmental Standards	IEC 60068-2-1:2007, IEC 60068-2-2:2007, IEC 60068-2-6:2007, IEC 60068-2-14:2009, IEC 60068-2-27:2008, IEC 60068-2-31:2008, IEC 60068-2-57:1989, IEC 60068-2-78:2012, IEC 60255-21-1:1988, IEC 60255-21-2:1988, IEC 60255-21-3:1993, IEC 62262:2002 (IK06)
Safety Standards	IEC 61010-1:2010 + A1:2016, EN 61010-1:2010 + A1:2019

POWER SUPPLY	
Operating Range	AC: 85–264 V, 47–63 Hz; DC: 120–370 V
Auxiliary DC Supply	24 VDC ±20%
Power over Ethernet	PoE output only (LAN2); the unit cannot be powered by PoE
Hold-up Time	Up to 17 s after power-off
Power Consumption	24 VDC: ≤14 VA; 85 VAC: ≤15 VA; 264 VAC: ≤15 VA

VI. PQZIP Recording

METHOD	
PQZIP Compression	Continuous recording of all voltage and current waveforms without triggers or thresholds

WAVEFORM	G4610	G4620	G4630
Voltage Sampling per Cycle	256	512	1024
Current Sampling per Cycle	256	512	1024
Recording Time	1 Week	1 Month	1 Year

PQZ SETTINGS	
PQZ File Interval	1, 5, 15 (default) or 30 minutes
Monthly Ratio	Configurable monthly recording budget [MB]; recording continues when exceeded (warning only)
Cycle-by-Cycle (CBC) Frequency	Disable / System / PMU

COMTRADE	
Format	IEC 60255-24:2013
Sample Rate	32, 64, 128 or 256 samples/cycle (default 256)
Trigger	PQ events; Post Trigger / Post Event, 0–100 s
Digital Input Channels	Up to 8 per instance
Storage	4 GB folder, oldest files removed first (FIFO)

EVENTS	
Memory	Up to 100,000 events (cyclic, oldest overwritten)

FLICKER PST	G4610	G4620	G4630
Recording Interval	10 Minutes	10 Minutes	10 Minutes

ENERGY	G4610	G4620	G4630
Energy Interval	1, 5, 10, 15, 30 min, 1 hour	1, 5, 10, 15, 30 min, 1 hour	1, 5, 10, 15, 30 min, 1 hour
Energy Subinterval	1, 5, 10, 15, 30 min, 1 hour	1, 5, 10, 15, 30 min, 1 hour	1, 5, 10, 15, 30 min, 1 hour

VII. Physical

PHYSICAL	
Dimensions – base unit (W × D × H)	174.6 × 231.7 × 183.2 mm (6.87" × 9.12" × 7.21")
Weight – base unit	1.66 kg (3.66 lb)

ENVIRONMENTAL	
Design	Sleek black, shock proof, easy install, with Multi I/O extension option
Ingress Protection	IP20 according to IEC 60529 (for installation inside an enclosure)
Shock and Vibration	IEC-60068-2-27 , IEC 60721-3-3
Operating Temperature	-20 °C to +70 °C (-4 °F to +158 °F)
Storage Temperature	-40 °C to +85 °C (-40 °F to +185 °F)
Humidity	Up to 85% RH, non-condensing
Maximum Operating Altitude	2Km (1.24Mi)
Warranty	One year

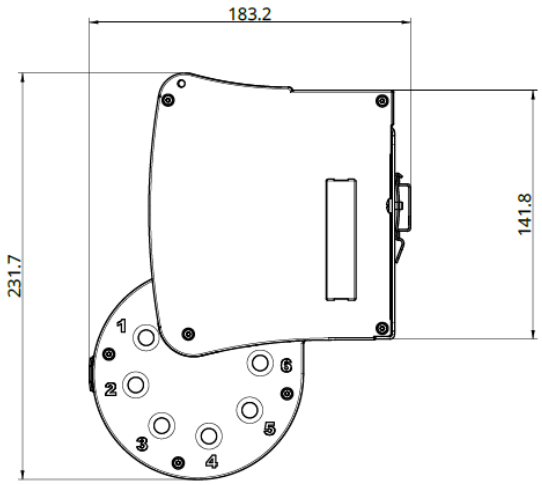
TEMPERATURE SENSORS	
External Temperature Sensor (PT100)	-40 to 90 °C (-40 to +210 °F)
Internal PSU Temperature Sensor	Informative
Internal DSP Temperature Sensor	Informative
Internal CPU Temperature Sensor	Informative
Internal Multi I/O Temperature Sensor	Informative

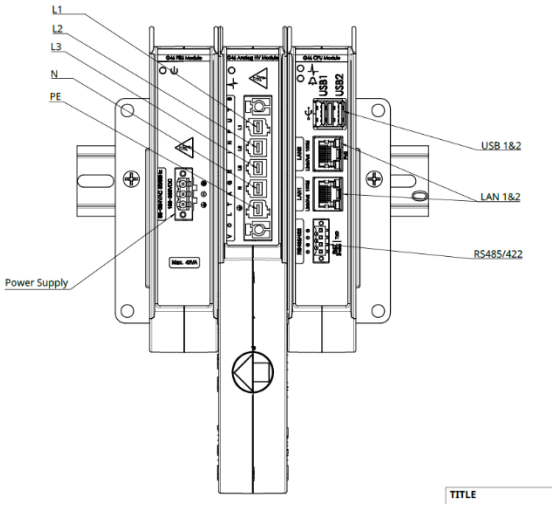
VIII. Dimensional View

DIMENSIONS		
S46-3001-0000 (G4610/20/30)	174.6 × 231.7 × 183.2 mm (6.87" × 9.12" × 7.21")	1.66 kg (3.66 lb)
S46-3101-0000 – 1 × Multi I/O (G4611/21/31)	208.8 × 231.7 × 183.2 mm (8.22" × 9.12" × 7.21")	2.03 kg (4.48 lb)
S46-3201-0000 – 2 × Multi I/O (G4612/22/32)	243 × 231.7 × 183.2 mm (9.57" × 9.12" × 7.21")	2.38 kg (5.25 lb)

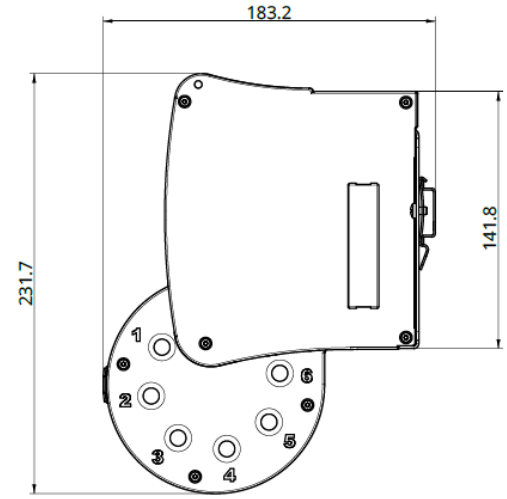
MOUNTING	
Mounting Options	Enclosure / DIN rail / Flat surface
Flat Surface Mounting	Mounting hole pattern (W × H): 124.6 × 99.5 mm (4.91" × 3.92") Mounting holes: Ø6.3 mm, Typ. 4 Clamping-Yoke holder holes: Ø4.2 mm, Typ. 2

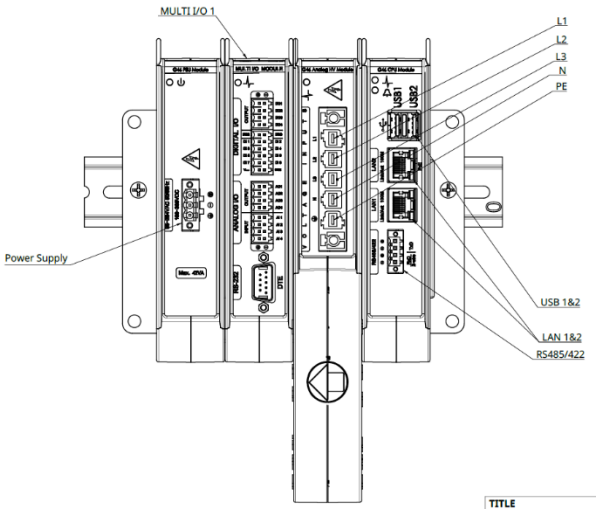
Base unit – Front view / Top view:



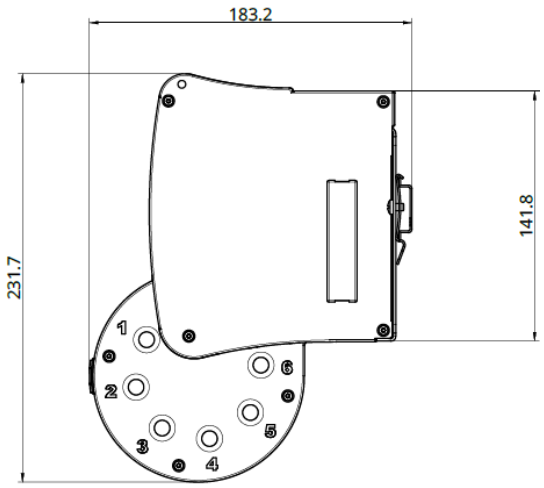


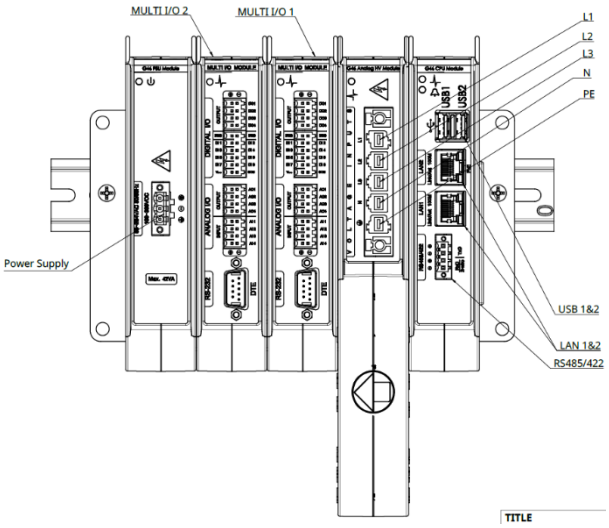
1 × Multi I/O – Front view / Top view:





2 × Multi I/O – Front view / Top view:





DIGITAL INPUTS	
Channels	8 per module
Sampling	128 Samples/Cycle
Range	4 DC options: 3–6 VDC (EBO-0152-4190), 20–50 VDC (EBO-0152-4290), 92–138 VDC (EBO-0152-4390), 176–264 VDC (EBO-0152-4490)
Pulse Type	1→0→1, 0→1→0
Debounce	Configurable [ms]

DIGITAL OUTPUTS	
Channels	4 per module
Maximum Switching Voltage	AC: 100V; DC: 100V
Maximum Current	100 mA
Pulse Type	1→0→1, 0→1→0, KYZ
Modes	Energy pulse, Event, Alarm

ANALOG INPUTS	
Channels	4 per module
Sampling Rate	64 Samples/Cycle
Signal	4–20 mA (Continuous DC)
Resolution	12 bit
Impedance	15 Ohm

ANALOG OUTPUTS	
Channels	4 per module
Signal	4–20 mA
Resolution	12 bit
Accuracy	0.1 %

RELAY OUTPUT MODULE	
Channels	3 x Change Over (Per Module)
Contact Configuration	From COM (NO - Default / NC)
Rated Voltage	AC: 250V
Maximum Switching Voltage	AC: 400V
Maximum Current	AC: 5A/250V; 10A/110V DC: 5A/30V
Maximum Peak Current	15A
Rated Current	6A
Operating Time	4ms
Release Time	6ms
Maximum Reaction Time	10ms
Maximum Drop-out Time	4ms
Output Resistance	50MΩ
Modes	Alarm, Event

RS232 CONNECTIONS	
Intended Use	Time synchronization only
Supported Protocols	GPS (NMEA 0183)
Baud Rate	Auto: 1200 / 2400 / 4800 / 9600 / 14400 / 19200 / 38400 / 57600 / 115200
Connector Type	DB9 Male
Maximum Cable Length	15.2m (50')

IRIG-B	
Signal Type / Format	IRIG-B000 (DC level shift)
Voltage Level	0-5V
Input Impendence	100 Ohm

X. Ordering Information

MODELS	
G4610 / G4611 / G4612	256 samples/cycle; 0 / 1 / 2 Multi I/O cards
G4620 / G4621 / G4622	512 samples/cycle; 0 / 1 / 2 Multi I/O cards
G4630 / G4631 / G4632	1024 samples/cycle; 0 / 1 / 2 Multi I/O cards
ACCESSORY KITS	
KIT-4600-0001	Standard Mechanical Connection Kit
KIT-4600-0002	Extended Mechanical Connection Kit with GPIO
KIT-4600-0003	Extended Mechanical Connection Kit with GPIO (2 Multi I/O)
OPTIONS / LICENSES	
IEC 61850	
Modbus TCP / RTU	
DNP3	
PMU (IEEE C37.118)	
COMTRADE recording	
Storage capacity	
NOTE	
License upgrade	Activated in the field via Settings >> System >> License