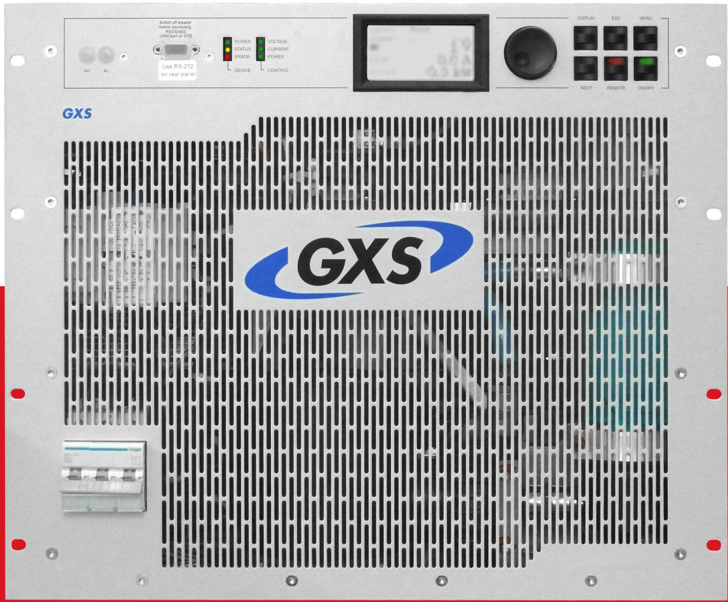
ELECTRONIC TEST & POWER SYSTEMS

ELP-GXS

MODULAR REGENERATIVE DC LOADS



POSITIVE PROBLEM SOLVING

The ELP-GXS is a modern family of DC Electronic Loads. The energy taken from the unit under test is not wasted simply as heat. Instead it is regenerated back to the grid.

The ELP-GXS automatically inverts the DC to AC and synchronises with the 3 phase mains supply and regenerates the output back to the grid. This approach saves significant electricity costs while eliminating the thermal issues associated with traditional heat dissipative loads. A dedicated GUI for implementing battery and fuel cell discharge algorithms is available. Previously recorded discharge details can be transferred to the ELP-GXS meaning real usage conditions can be accurately simulated within the lab.

+ Ideal for Battery Pack and Fuel Cell Testing
+ Stackable up to 1500V / Very High Powers
+ Mains Regeneration of the DC Sink Energy
+ Excellent GUI with Built-in Scope Function
+ Function Generator with V / I Capability
+ Adjustable Internal Resistance

CONTENTS

STANDARD MODELS

SELECTION TABLE

Part Number	Maximum Power	Q4 Sink Voltage Range[1]	Current Range[1,2]
65VDC MODULES			
ELP-GXS 20-65	20kW	6 - 65Vdc	0 to 385A
ELP-GXS 32-65	32kW	6 - 65Vdc	0 to 600A
ELP-GXS 20-65-2	40kW[3]	6 - 130Vdc	0 to 770A
ELP-GXS 32-65-2	64kW[4]	6 - 130Vdc	0 to 1200A
ELP-GXS 32-65-3	96kW[4]	6 - 195Vdc	0 to 1800A
ELP-GXS 32-65-4	128kW[4]	6 - 260Vdc	0 to 2400A
ELP-GXS 32-65-8	256kW[4]	6 - 520Vdc	0 to 4800A
130VDC MODULES			
ELP-GXS 20-130	20kW	12 - 130Vdc	0 to 192A
ELP-GXS 32-130	32kW	12 - 130Vdc	0 to 308A
ELP-GXS 20-130-2	40kW[3]	12 - 260Vdc	0 to 384A
ELP-GXS 32-130-2	64kW[4]	12 - 260Vdc	0 to 616A
ELP-GXS 32-130-3	96kW[4]	12 - 390Vdc	0 to 924A
ELP-GXS 32-130-4	128kW[4]	12 - 520Vdc	0 to 1232A
ELP-GXS 32-130-8	256kW[4]	12 - 1040Vdc	0 to 2464A
400VDC MODULES			
ELP-GXS 20-400	20kW	50 - 400Vdc	0 to 63A
ELP-GXS 32-400	32kW	50 - 400Vdc	0 to 100A
ELP-GXS 20-400-2	40kW[3]	50 - 800Vdc	0 to 126A
ELP-GXS 32-400-2	64kW[4]	50 - 800Vdc	0 to 200A
ELP-GXS 32-400-3	96kW[4]	50 - 1200Vdc	0 to 300A
ELP-GXS 32-400-4	128kW[4]	50 - 1500Vdc	0 to 400A
ELP-GXS 32-400-8	256kW[4]	50 - 1500Vdc	0 to 800A
500VDC MODULES			
ELP-GXS 20-500	20kW	40 - 500Vdc	0 to 50A
ELP-GXS 32-500	32kW	40 - 500Vdc	0 to 80A
ELP-GXS 20-500-2	40kW[3]	40 - 1000Vdc	0 to 100A
ELP-GXS 32-500-2	64kW[4]	40 - 1000Vdc	0 to 160A
ELP-GXS 32-500-3	96kW[4]	40 - 1500Vdc	0 to 240A
ELP-GXS 32-500-4	128kW[4]	40 - 1500Vdc	0 to 320A
ELP-GXS 32-500-8	256kW[4]	40 - 1500Vdc	0 to 640A
600VDC MODULES			
ELP-GXS 20-600	20kW	50 - 600Vdc	0 to 40A
ELP-GXS 32-600	32kW	50 - 600Vdc	0 to 66A
ELP-GXS 20-600-2	40kW[3]	50 - 1200Vdc	0 to 80A
ELP-GXS 32-600-2	64kW[4]	50 - 1200Vdc	0 to 132A
ELP-GXS 32-600-3	96kW[4]	50 - 1500Vdc	0 to 198A
ELP-GXS 32-600-4	128kW[4]	50 - 1500Vdc	0 to 264A
ELP-GXS 32-600-8	256kW[4]	50 - 1500Vdc	0 to 528A

[1] Values for multi-module systems represent the widest operating points. The full current range is not possible with the full voltage range simultaneously. Please see operating range diagrams on page 4 for the V/I range of a specific configuration.
[2] The maximum current that can be recycled derates as the voltage reduces beneath the lower level. Please contact ETPS for the characterisation.
[3] Composed of 20kW ELP-GXS modules. [4] Composed of 32kW ELP-GXS modules. Please contact ETPS for a full breakdown of possible module combinations.

MODULAR ELECTRONIC LOADS

Larger systems can be composed of smaller 20kW or 32kW ELP-GXS modules. Up to 64 of these modules can be arranged in series, parallel or matrix array configurations to create larger systems.

Each module is able to operate independently, so that systems can be reconfigured, expanded or broken up as needs dictate. Inbuilt system comms allow users to switch between various set-ups.

The modular approach is useful for test houses and research labs who regularly test different sized power devices. Individual modules can be used for the day to day testing of multiple small devices, then grouped together for larger projects. The diagram shows all the possible combinations with eight 32kW/500V modules.

SERIES CONNECTION

PARALLEL CONNECTION

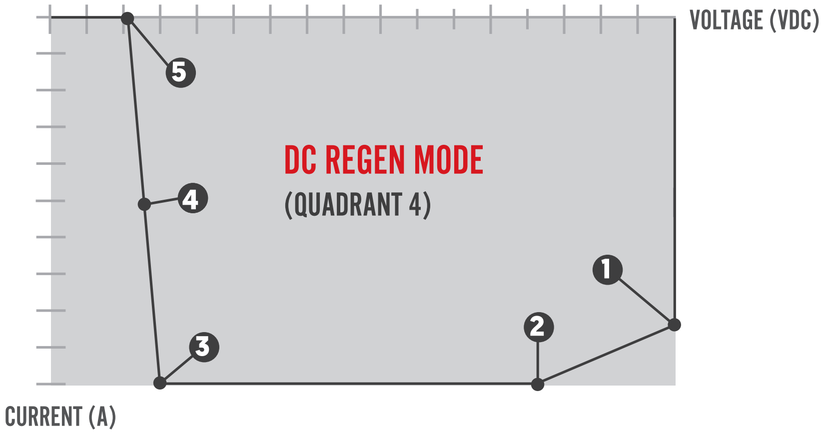
	0 to 500V	0 to 1000V	0 to 1500V
0 to -80A	32kW 1 unit	64kW 2 units	96kW 3 units
0 to -160A	64kW 2 units	128kW 4 units	192kW 6 units
0 to -240A	96kW 3 units	192kW 6 units	
0 to -320A	128kW 4 units	256kW 8 units	
0 to -400A	160kW 5 units		
0 to -480A	192kW 6 units		
0 to -560A	224kW 7 units		
0 to -640A	256kW 8 units		

CABINET OPTIONS

Units can be treated to a laboratory rack or flight case integration. Common options include mains cables, passive indication of any residual DC voltage, isolation monitoring of DC cables and a panel mounted emergency stop. Switch panels with removable DC links can be fitted for modular systems. This simplifies the reconfiguration between series, parallel or independent use. Simple wheeled cabinets are also available.

Having a programmable power system mounted into a flight case on castors is often advantageous, especially when several departments or test cells share the same equipment. Multiple power systems can be fitted into the same flight case. Door hangers are fitted for convenience. Existing ETPS systems can also be retrospectively integrated into new flight cases where requested.

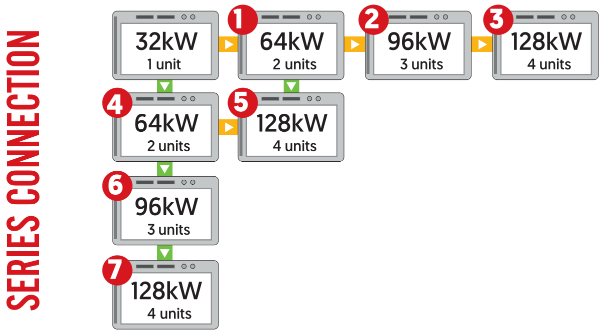
OPERATING RANGE



OPERATING RANGE (PER MODULE)

Part Number	Point 1 (Q4)	Point 2 (Q4)	Point 3 (Q4)	Point 4 (Q4)	Point 5 (Q4)
ELP-GXS 20-65	65V / -308A	53V / -385A	6V / -385A	4V / -193A	2V / 0A
ELP-GXS 20-130	130V / -154A	104V / -192A	12V / -192A	9V / -75A	4V / 0A
ELP-GXS 20-400	400V / -50A	317.5V / -63A	50V / -63A	30V / -21A	20V / 0A
ELP-GXS 20-500	500V / -40A	400V / -50A	40V / -50A	25V / -20A	15V / 0A
ELP-GXS 20-600	600V / -33.3A	500V / -40A	50V / -40A	40V / -20A	30V / 0A
ELP-GXS 32-65	65V / -492A	53V / -600A	6V / -600A	4V / -300A	2V / 0A
ELP-GXS 32-130	130V / -246A	104V / -308A	12V / -308A	9V / -120A	4V / 0A
ELP-GXS 32-400	400V / -80A	320V / -100A	50V / -100A	30V / -33A	20V / 0 A
ELP-GXS 32-500	500V / -64A	400V / -80A	40V / -80A	25V / -32A	15V / 0A
ELP-GXS 32-600	600V / -53.3A	484.8V / -66A	50V / -66A	40V / -33A	30V / 0A

PARALLEL CONNECTION



OPERATING RANGE (SYSTEMS)

	ELP-GXS 32-65	ELP-GXS 32-130	ELP-GXS 32-400	ELP-GXS 32-500	ELP-GXS 32-600
Single Module	0 to 65V, 0 to -600A	0 to 130V, 0 to -308A	0 to 400V, 0 to -100A	0 to 500V, 0 to -80A	0 to 600V, 0 to -66A
Configuration 1	0 to 65V, 0 to -1200A	0 to 130V, 0 to -616A	0 to 400V, 0 to -200A	0 to 500V, 0 to -160A	0 to 600V, 0 to -132A
Configuration 2	0 to 65V, 0 to -1800A	0 to 130V, 0 to -924A	0 to 400V, 0 to -300A	0 to 500V, 0 to -240A	0 to 600V, 0 to -198A
Configuration 3	0 to 65V, 0 to -2400A	0 to 130V, 0 to -1232A	0 to 400V, 0 to -400A	0 to 500V, 0 to -520A	0 to 600V, 0 to -264A
Configuration 4	0 to 130V, 0 to -600A	0 to 260V, 0 to -308A	0 to 800V, 0 to -100A	0 to 1kV, 0 to -80A	0 to 1.2kV, 0 to -66A
Configuration 5	0 to 130V, 0 to -1200A	0 to 260V, 0 to -616A	0 to 800V, 0 to -200A	0 to 1kV, 0 to -160A	0 to 1.2kV, 0 to -132A
Configuration 6	0 to 195V, 0 to -600A	0 to 390V, 0 to -308A	0 to 1.2kV, 0 to -100A	0 to 1.5kV, 0 to -80A	0 to 1.5kV, 0 to -66A
Configuration 7	0 to 260V, 0 to -600A	0 to 520V, 0 to -308A	0 to 1.5kV, 0 to -100A	N/A	N/A

INPUT

STANDARD FEATURES (PER MODULE)

TECHNICAL DATA	
AC Line Voltage / Current Relationship[1]	3 × 380VAC ± 10% / 34Arms (20kW units), 54Arms (32kW units) 3 × 400VAC ± 10% / 32Arms (20kW units), 51Arms (32kW units) 3 × 415VAC ± 10% / 31Arms (20kW units), 49Arms (32kW units) 3 × 440VAC ± 10% / 29Arms (20kW units), 47Arms (32kW units) 3 × 460VAC ± 10% / 28Arms (20kW units), 45Arms (32kW units) 3 × 480VAC ± 10% / 27Arms (20kW units), 43Arms (32kW units)
Line Frequency	48 - 62Hz
Mains Connection Type	3L + PE (no neutral)
Powerfactor at P_{MAX} (Q1 Active / Q4 Mode)	≥0.99
Protective Conductor Current at 50Hz[2]	<20mA
Touch Current Unweighted[2]	<20mA
Touch Current Weighted[2]	<2mA
Load Regulation (CV, CC)	<± 0.1% of full scale value (Typical value for 0 – 100 % load variation, at constant line input and temperature conditions.)
Line Regulation (CV, CC)	<± 0.1% of full scale value (Typical value for input voltage variation within 380 VAC ± 10 % – 480 VAC ± 10 %, at constant load and temperature conditions.)

[1] At nominal output power and nominal line voltage. Soft-start to limit turn-on surge currents.
[2] According to IEC60990: Protective conductor current: 50 Hz component at 400 VAC/50Hz/P_{NOM}. For weighted touch current: Measured for perception/reaction. Protection with earth leakage circuit breaker possible. An additional PE connection is necessary.

OPTIONS

CODE	DESCRIPTION
/FILTER	Input air filter

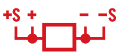
GENERAL SPECIFICATIONS

STANDARD FEATURES (PER MODULE)

TECHNICAL DATA	
Operating Modes	Constant Voltage (0 to 100% of V_{MAX}) Constant Current (0 to 100% of I_{MAX}) Constant Power (5% to 100% of P_{MAX})
Internal Resistance Range	AdjustableΩ_{MAX} = (V_{NOM} / I_{NOM})
Switchable Output Capacitance	6mF / 17.2mF (65V and 130V modules) | 0.09mF / 0.9mF (400V, 500V and 600V modules)
Interfaces	Analogue & RS-232
Remote Sense	0 - V_{MAX}
Efficiency	Up to 92%
CV Load Regulation and Set Tracking	1.1ms (Typical recovery time to within <5 % band of set value for a load (or set value) step 10-90 %, ohmic load, at constant line input and temperature.)
Set Value Tracking CC*	<2ms
Over Voltage Protection (Programmable)	0 - 110% of V_{MAX}
Over Voltage Protection (Response Time)	50µs - 1600ms
Over Current Protection (Programmable)	0 - 110% of I_{MAX}
Over Current Protection (Response Time)	50µs - 1600ms
Output Ripple (300Hz Vpp): 65V/130V Modules	<0.2% (Typical value at nominal ohmic load, line asymmetry < 1 Vrms)
Output Ripple (300Hz Vpp): 400V-600V Modules	<0.5% (Typical value at nominal ohmic load, line asymmetry < 1 Vrms)
Output Ripple (300Hz Vrms): 65V/130V Modules	<0.05% (Typical value at nominal ohmic load, line asymmetry < 1 Vrms)
Output Ripple (300Hz Vrms): 400V-600V Modules	<0.1% (Typical value at nominal ohmic load, line asymmetry < 1 Vrms)
Output Noise (40kHz-1MHz): 65V/130V Modules	<0.2Vpp / <0.05Vrms (Typical value at nominal ohmic load, line asymmetry < 1 Vrms)
Output Noise (40kHz-1MHz): 400V-600V Modules	<1Vpp / <0.2Vrms (Typical value at nominal ohmic load, line asymmetry < 1 Vrms)
Stability (CV, CC)	<± 0.05% (Maximum drift over 8 hours after 30 minute warm-up time, at constant line input, load and temperature conditions)
Temperature Coefficient (CV)	<0.02% of full scale value per°C (Typical change of output values versus ambient temperature, at constant line input and load conditions)
Temperature Coefficient (CC)	<0.03% of full scale value per°C (Typical change of output values versus ambient temperature, at constant line input and load conditions)

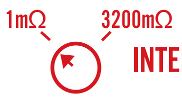
* Rise/ fall time for 10%-90% of a set step.

HIGHLIGHTED FEATURES



SENSE COMPENSATION

Sense plus terminals are built into the ELP-GXS for the connection of sense wire which compensates for voltage drops in the load lines. This has a number of advantages over traditional sense. It is permitted to interrupt the load line during operation (voltage on). The maximum voltage drop compensation is adjustable. The voltage difference between ELP-GXS output and sensing point is monitored. If a set limit is exceeded, the ELP-GXS unit shuts off. This is particularly useful for applications with long cables often prone to unwanted voltage drops.



INTERNAL RESISTANCE RANGE

Each module is built with a user programmable internal resistance range as standard. This makes the power supplies ideal for simulating energy storage devices such as battery packs, fuel cell stacks and super capacitors. The exact range varies by module and can be viewed in the selection table. An extended programming range is available on request by selecting the /IRXTS option below.

OPTIONS

CODE	DESCRIPTION
/IRXTS	Maximum adjustable internal resistance range extended to 32,000mΩ
/CANCABLE	Connecting cable for multi-unit operation
/RMB	Remote Measure Box for higher dynamics in multi-unit operation

SOFTWARE/SOFT TOOLS

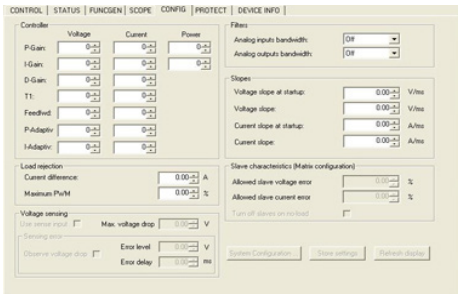
STANDARD TOP CONTROL GUI

All ELP-GXS units come with a simple and intuitive TopControl operating GUI as standard. Live values of the power system are displayed graphically along with any warning and error messages. The software provides a variety of second level parameters, ideal for users who like to optimise their test processes. In standard user mode the operator can remotely program set values, enable voltage output as well as the ability to anlyse different variables including set and actual values via the integrated scope.

The scope function can simultaneously record up to 8 system variables. Recording can be started manually or by a defined trigger event from any variable of the system. All actual and set values (currents/voltages/power/internal resistance) can be recorded. Other recordable items include system temperatures, intermediate DC circuit, low voltage auxiliary power supplies, error related values and variables from the controller section.

A password protected section is available to the advanced user and service technician. In addition to the standard functions the authorised user is able to:

+ Program linear ramp functions at start up and set value steps during operation
+ Configure multi-unit operation
+ Program the PID controller parameters
+ Program the unit's limit values
+ Calibrate and adjust values as necessary
+ Update the firmware



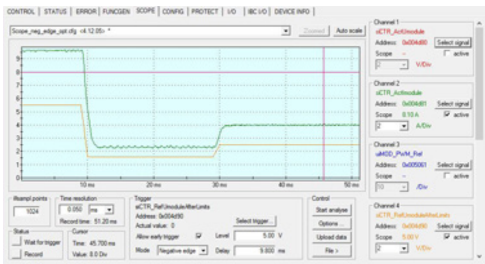
OPTIONAL SOFTWARE

CODE	DESCRIPTION
/TFE	Integrated function generating engine with application area (parametric) programming
/BATSIM	GUI simulating battery characteristics with adjustable parameters
/CAPSIM	GUI simulating the electrical characteristics of capacitors with adjustable parameters
/BATCONTROL	Dedicated battery charge/discharge GUI with adaptive sampling & temp measurement

HIGHLIGHTED OPTION

FUNCTION GENERATOR (/TFE)

Complex DC waveforms can be implemented through an optional embedded function generator. The highly programmable nature of the function generator allows users to plot out exact waveforms. This is often advantageous when emulating a power device with a very specific behaviour profile. For example, when load testing fuel cells, a specific discharge profile can be programmed and replicated.



As well as custom shapes, standard square, sawtooth and sine waveforms can be plotted against time. Voltage/current andvoltage/power relationships can also be programmed where necessary. Parametric programming is possible, where instead of the time axis, an input variable (V_{IN}, I_{IN} or P_{IN}) can be selected.

HIGHLIGHTED OPTIONS

APPLICATION GUIS

An application GUI can be used to program hardware to replicate real world behaviour of a power component. This allows specific sections of a circuit to be isolated and researched.

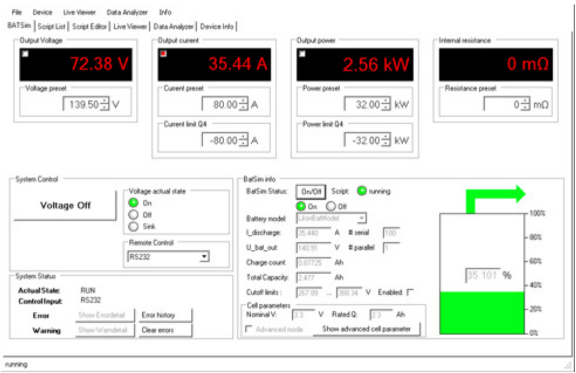
Using a GUI allows a great deal of control, monitoring and reporting to be done remotely. Other advantages include reduced operator errors and preparation time, as well as increased reproducibility and elimination of result variations.

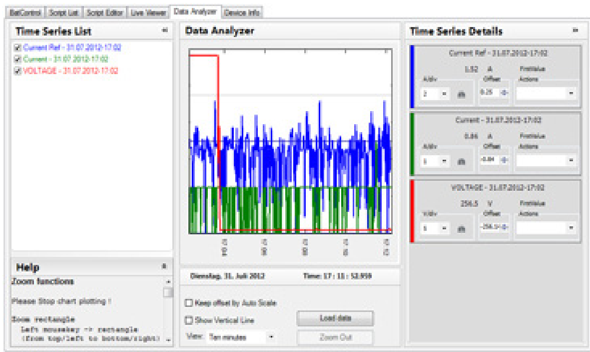
BATTERY EMULATION (/BATSIM)

BatSim provides a convenient method for the ELP-GXS to emulate different sized battery stacks. Nearly all relevant electrical characteristics are programmable, including the number of cells, energy capacity, cut off limits, chemistry type and nominal voltage.

BATTERY/CAPACITOR DISCHARGING (/BATCONTROL)

Advanced battery and capacitor discharge profiles can be implemented through the GUI. Previous data obtained can be imported and recreated, allowing the ELP-GXS to simulate a real world usage profile inside a lab environment.





CAPACITOR SIMULATION (/CAPSIM)

The electrical characteristics of a real capacitor stack can be emulated when CapSim is installed with ELP-GXS modules. Number of cells in series/parallel, state of charge, cell cut off limits, dynamic capacitance and resistance are programmable.

INTERFACES

STANDARD RS-232 INTERFACE

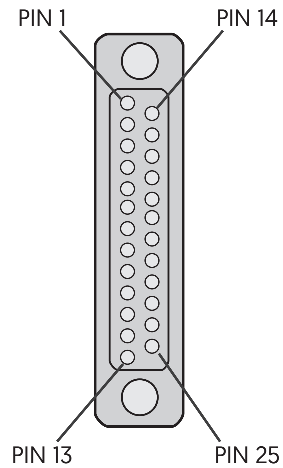
The RS-232 interface is configured as a Sub-D 9 pin connector (female) and is located on the front panel. This interface can be optionally moved to the rear panel. The graphical user interface, TopControl is operated via RS-232. The software runs on Windows and allows the user to control, measure and configure the power system.

TECHNICAL DATA	
Isolation to Electronics and Earth Configuration	125 Vrms
Baud Rate	38,400 baud
Resolution (programming & readback)	0.025% FS (for V & I), 0.1% FS (for P & Ri)

STANDARD ANALOGUE INTERFACE

The control port is configured as a Sub-D 25 female connector and is located on the rear panel. It allows output values to be set and read proportionally using a 0-10Vdc analogue signal. Digital inputs and outputs enable various functions such as the interlock and output ON/OFF. A 10Vdc reference is provided for analogue control. Digital functions are switched via a high/low signal. A 24Vdc supply voltage is provided for these functions. The control port is labelled X105.

TECHNICAL DATA	
Isolation to Electronics and Earth	125 Vrms
Unit Ready/Error	Relay Contact
Ouput Voltage ON / Warnings	Relay Contact
Actual Voltage Readback 0 to 100%	0 to 10V
Actual Current Readback -100% to 0%	-10V to 0V
Resolution (programming & readback) for V, I, P, Ri	0.2% FS
Output Voltage Off/On	0/24VAC/DC
2 Digital Application Inputs	0/24VAC/DC
Interlock Circuit	0/24VDC
Voltage Setting 0 to 100%	0 to 10V
Current Setting -100% to 0%	-10V to 0V
Power Setting 100% to 0%	-10V to 0V
Internal Resistance Setting 0% to 100%	0V to 10V



PIN	SIGNAL	I/O	DESCRIPTION
1	AGND	I	Analogue ground for pins 2–4, 14–16
2	VREF	I	Voltage setpoint input 0–10 V
3	IREF	I	Current setpoint input 0–10 V
4	IACT	O	Current feedback output 0–10 V
5	0 VDC	O	0 VDC I/O ground for pin 25[1]
6	+10 VDC	O	Analogue reference voltage
7	COM	I	(connected to pin 17) 0VDC DigIn; common ground for pins 8–9, 18–20, 24
8	APP_DIGITALIN_4; CLEAR_ERROR	I	Digital input 0-2V /10-24V DC
9	VOLTAGE_ON	I	Digital input 0-2/10-24V DC
10	OK/ALARM_b[2]	O	Relay output 1 normally open
11	OK/ALARM_a[2]	O	Relay output 1 common
12	RUN_b[2]	O	Relay output 2 normally open
13	RUN_a[2]	O	Relay output 2 common
14	PREF	I	Power limit analogue input 0–10 V
15	RREF	I	Ri-simulation analogue input 0–10 V

PIN	SIGNAL	I/O	DESCRIPTION
16	VACT	O	Voltage feedback output 0–10 V
17	COM	I	(connected to pin 7) Common ground to pins 8–9, 18–20, 24
18	APP_DIGITALIN_1	I	Digital input (low) 0-2 VDC/(high) 10–28 VDC
19	APP_DIGITALIN_2	I	Digital input (low) 0-2 VDC/(high) 10–28 VDC
20	APP_DIGITALIN_3; ANAOG_ REFERENCE_ SELECT	I	Digital input ((low) 0-2 VDC/(high) 10–28 VDC Analogue reference select
21	WARN_a[2]	O	Relay output 3 normally open
22	WARN_b[2]	O	Relay output 3 normally closed
23	WARN_c[2]	O	Relay output 3 common
24	INTERLOCK_IN_+	I	Input Interlock +
25	+24 VDC	O	24VDC I/O Aux power output 24 VDC, max. 0.2 A

[1] Pin 5 (0 VDC) is used as the reference earth for pin 25 (24 VDC) and is connected internally to the equipotential bonding via a 1 kΩ resistor to earth.
[2] Maximum switching current: 1 A; maximum switching voltage: 24 V.

OPTIONAL INTERFACES

CODE	DESCRIPTION
/HMI	This provides front panel control and measurement via a menu driven LCD screen. Most users prefer their units to be fitted with HMI. For systems comprised of multiple units or where only remote control is required, cost can be saved by not including front panel controls and display.
/RS232REAR	RS-232 on front and rear panel (time shared mode with RS-232 on front).
/RS422	Differential serial interface (time shared mode with RS-232).
/IEEE	When specified, an integrated IEEE 488.2 interface is built into the rear panel (RS-232 only possible on rear panel). The programming terms employed are compliant with Standard Commands for Programmable Instrumentation (SCPI), making the ELP-GXS ideal for system integration.
/CANOPEN	On request an additional serial interface built to the CAN/CANopen standards can be integrated into the rear panel (RS-232 only possible on rear panel).
/CANMP	Integrated CANmp interface (RS-232 only possible on rear panel).
/OPTOLINK	Rear panel integrated fibre optic interface (RS-232 only possible on rear panel).
/USB	Integrated USB interface. (RS-232 only possible on rear panel). The graphical user interface, TopControl can be operated over the USB port. RS-232 and USB cannot be used at the same time.
/ETH	Ethernet interface with listener and talker functions over a LAN (RS-232REAR required).
/CAN+USB	Combined CAN and USB interface.

HIGHLIGHTED OPTION

CAN MP CAN MULTI-PURPOSE INTERFACE (/CANMP)

CANmp is a high speed digital interface operating at 1kHz. The interface gives users the capability to customise the CAN protocol. Up to 50 messages are user configurable. Messages can be sent cyclically or upon receipt of a sync or syncID signal.

SAFETY & PROTECTION

STANDARD FEATURES (PER MODULE)

TECHNICAL DATA	
Max. Reactive Load Voltage	≤ 110% Vmax
Mounted In Cabinet	Up to IP 54
Basic Construction	IP 20 (current bars on rear side excluded)
EMC Emission / Immunity	EN 61000-6-4 / EN 61000-6-2
Low Voltage Directive 2014/35/EU	EN 50178
Connection to UK Grid	ER G59-3 tested

OPTIONS

CODE	DESCRIPTION
/ISR	Integrated safety relay for shutdown to EN 13849-1 Cat 2/3
/PACOB	Protection against accidental contact of output current bars
/RPP	Automatic voltage matching with reverse polarity protection

HIGHLIGHTED OPTIONS

AUTOMATIC VOLTAGE MATCHING WITH RPP (/RPP)

When researching energy storage devices, Reverse Polarity Protection (RPP) is recommended for devices without an automatic voltage matching circuit. With the ELP-GXS energised but output off, the RPP senses the voltage of the connected energy storage device. A contactor is closed after matching the voltage, to prevent large inrush currents and arcing on start up.

INTEGRATED SAFETY RELAY (/ISR)

For additional safety, a mechanical interlock is available for the mains input of the ELP-GXS. The integrated safety relay provides shutdown safety according to EN 13849-1 category 2/3. The ISR is connected to the external safety switch loop. If the external loop is opened, the DC-output of the power system is powered down immediately.

PROTECTION AGAINST OUTPUT BARS (/PACOB)

A specially produced cover is available which provides protection against accidental contact of AC and DC current bars.

ISOLATION

STANDARD FEATURES (PER MODULE)

TECHNICAL DATA	
Line to Case	1670Vdc for 1s
Output to Case	2540Vdc for 1s (65V and 130V modules) | 2540Vdc for 1s (400V, 500V and 600V modules)
Transformer	4800Vac
Output to Case	10.8 MΩ / high impedance (X109 open)
Per DC Bar	35nF (65V and 130V modules) | 13.6nF (400V, 500V and 600V modules)
- Bar / + Bar[1]	+680Vdc / -680Vdc (65V and 130V modules) | +1000Vdc / -1000Vdc (400V, 500V and 600V modules)

[1] Maximum working voltage including DC output voltage.

MECHANICAL

STANDARD FEATURES (PER MODULE)

TECHNICAL DATA	
Dimensions	19" × 9U × 634mm (W × H × D), a full cabinet integration service is available on request
Weight	97kg
Line Input Connections	Terminal block 4 x 25mm^2
Output Terminals	Nickel-plated copper bars - Length: 40mm, 1 hole 9mm in each bar

OPTIONS

CODE	DESCRIPTION
/LCAL	Integrated liquid cooling of the power stage
/RCU	The RCU provides the HMI functions via cable at a distance of up to 40m. The RCU is available in a compact desktop case or as a 19" rackmount unit.

HIGHLIGHTED OPTIONS

LIQUID COOLING (/LCAL)

Liquid cooling of the ELP-GXS's power stage is available for units which may be subject to naturally hot or uncontrolled environments. This enables operation up to 45°C with no performance derating.

REMOTE CONTROL UNIT (/RCU)

The RCU is an external control unit for controlling multi-module systems, which reduces response times when implementing complex changes. The RCU is available as either a desktop unit or a 19" rackmounting module, with or without an emergency stop.

ETPS engineer electronic power supply and testing systems. Our problem solving skills provide the spark of innovation to some of the world's leading technology brands.

ETPS
ELECTRONIC TEST & POWER SYSTEMS

Tel: +44 (0) 1246 452909
Sales: 0800 612 95 75
sales@etps.co.uk
www.etps.co.uk

ETPS Ltd
Unit 14, The Bridge
Beresford Way, Chesterfield
S41 9FG

POSITIVE PROBLEM SOLVING