

## PL-P series Bus Programmable Laboratory DC PSUs



- Based around "industry standard" PL series bench PSU.
- Full bus control and readback of voltage and current.
- GPIB (IEEE-488.2) and RS-232 interfaces.
- Can be operated as a conventional bench PSU.
- Single, dual and triple output models available.
- Triple version has controllable high current logic output.
- Rack mounting kit (4U) available for all models.

### Model Range:

**PL330P - Single output, 0 to 32V at 0 to 3.1A.**

**PL330DP - Dual output, 2 x 0 to 32V at 0 to 3.1A.**

**PL330TP - Triple output, 2 x 0 to 32V at 0 to 3.1A plus 4 to 6V at 1A to 7A.**

The PL-P series are bus programmable versions of the PL series of precision bench power supplies.

They incorporate both GPIB (IEEE-488) and RS-232 interfaces and provide bus control and readback of voltage and current levels with a resolution of 12-bits.

### MAIN OUTPUT(S)

Output Range:	0 - 32 Volts at 0 - 3.1A.
Voltage Setting:	12 bit resolution (10mV steps)
Current Setting:	12 bit resolution (1mA steps)
Setting Accuracy:	Voltage: $\pm(0.1\% + 10\text{mV})$ Current: $\pm(0.2\% + 2\text{mA})$
Output Mode:	Constant voltage or constant current modes with automatic cross-over.
Output Switch:	Electronic by interface command (front panel output switches must be set to ON)
Readback Resolution:	Voltage: 10mV over the entire range Current: 1mA over the entire range
Readback Accuracy:	Voltage: $\pm(0.1\% \text{ of reading} + 1 \text{ digit})$ Current: $\pm(0.3\% \text{ of reading} + 1 \text{ digit})$
Current Meter Damping:	Nominally 20ms switchable to 2 sec and back by remote commands
Output Terminals:	4mm terminals on 19mm (0.75") spacing.
Output Impedance:	Constant Voltage: Typically $<5\text{m}\Omega$ at 1kHz. Constant Current: Typically $50\text{k}\Omega$ .
Output Protection:	Max. output voltage +20 volts forward; diode clamped for reverse, up to 3A reverse current.
Load Regulation:	$<0.01\%$ of max. output for 90% load change
Line Regulation:	$<0.01\%$ of max. output for 10% line change

**Note:** This is a faxable data sheet, a colour brochure is also available.

Remote Sense:	Eliminates up to 0.5V drop per lead.
Ripple and Noise:	Typically $<1\text{mV rms}$
Transient Response:	$<20\mu\text{sec}$ to $<50\text{mV}$ for 90% load change
Temp. Coefficient:	Typically $<100\text{ppm}/^\circ\text{C}$
Meter Type:	Dual 4 digit with 12.5mm LEDs, Reading rate 4 per second.

### LOGIC OUTPUT - PL330TP

Voltage Range:	4 to 6 Volts in 10mV steps
Output Current:	1 to 7 Amps in approximately 1A steps
Setting Accuracy:	Voltage: $\pm(0.2\% + 10\text{mV})$
Output Switch:	Electronic by interface command (front panel output switch must be set to ON)
Readback Resolution:	Current: 10mA
Readback Accuracy:	Current: $\pm(0.5\% \text{ of reading} + 1 \text{ digit})$
Output Protection:	Over-voltage protection operates above 7V. Diode clamped for reverse currents up to 3A.
Load Regulation:	$<0.01\%$ of max. output for 90% load change
Line Regulation:	$<0.01\%$ of max. output for 10% line change
Remote Sense:	Eliminates up to 0.5V drop per lead.
Ripple and Noise:	Typically $<1\text{mV rms}$
Transient Response:	$<20\mu\text{sec}$ to $<50\text{mV}$ for 90% load change
Temp. Coefficient:	Typically $<100\text{ppm}/^\circ\text{C}$
Meter Type:	3 digit with 12.5mm LEDs. Reading rate 4/s.

### REMOTE CONTROL INTERFACES

Both interfaces feature full control, readback and status reporting.

**RS232:** Variable Baud rate (9600 maximum), 9 pin D-connector (female). Fully compatible with ARC (Addressable RS232 Chain) system.

**GPIB:** Conforming with IEEE-488.1 and IEEE-488.2

Address Selection: By rear panel DIP switch.

Remote/Local: Selected by front panel switch.

Remote Command Response Time:

Interface:  $<15 \text{ ms}$  (single command, input buffer empty).

Output Voltage - Up: Time constant typically 2ms, e.g. 10ms to settle  $<1\%$  of a step change, 15ms to settle  $<0.1\%$ .

Output Voltage - Down: Time constant determined by the discharge of the power supply output capacitor (47 $\mu\text{F}$ ). Typically  $<10\text{ms}$  to settle within 1% for a 10V step change at 50mA load current; typically  $<200\text{ms}$  to settle within 1% at zero load.

Output Current: Typically 50ms to settle  $<10\text{mA}$  for a 1A change.

### GENERAL

Power Requirements: 110, 120, 220 or 240VAC 50/60Hz  $\pm 10\%$

Operating Range: 5 $^\circ\text{C}$  to 40 $^\circ\text{C}$ , 20% to 80% RH

Storage Range: -20 $^\circ\text{C}$  to +60 $^\circ\text{C}$

Size: 170mm(H) x 300mm(D) x 207mm(W) - PL330P  
350mm(W) - PL330DP, 425mm(W) - PL330TP.

Weight: 6.5kg (PL330P), 12.5kg (PL330DP), 16kg (PL330TP).

Rack Mount Option: 19 inch 4U mount for two PL330P or one PL330DP/TP. Anti-tamper cover for security.

Electrical Safety: Designed and manufactured to comply with IEC 348 and IEC1010-1. Full safety sockets available to special order.

EMC: Designed and manufactured to comply with EN50081-1 and EN50082-1.

*Thurlby Thandar Instruments Ltd. operates a policy of continuous development and reserves the right to alter specifications without prior notice.*

Designed and built in the EEC by:



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## **PL-P series Programmable PSUs - Supplemental**

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### **The PL-P series of programmable power supplies**

The Thurlby Thandar PL-P series offers a high performance fully programmable power supply system at low cost.

Based around the 32V-3A versions of the standard PL series, the PL-P models include single, dual and triple output units suitable for bench or rack mounting.

When not connected to the bus, these PSUs can be operated exactly as a standard PL series PSU.

### **GPIB and RS-232 (ARC) interfaces**

Each PL-P series supply is fitted with both a GPIB (IEEE-488) interface and an ARC (addressable RS232) interface as standard.

Both interfaces provide full bus control of voltage and current settings along with full readback of actual current and voltage levels.

The GPIB interface conforms fully with IEEE-488.2 as well as IEEE-488.1. The ARC interface can be used as a conventional RS-232 interface or as part of a multi-instrument ARC system.

On dual and triple output models a single bus address controls all outputs.

### **Fully isolated outputs for maximum flexibility**

Each output is fully floating and is opto-isolated from the bus interfaces.

Outputs can be linked in series or parallel to produce higher voltages or higher currents as required.

### **High resolution control and readback**

Voltage and current levels can be set via the bus to a resolution of 10mV and 1mA for each main output.

The 7 Amp logic output of the PL330TP can also be set to a resolution of 10mV but the current control resolution is limited to 1 Amp steps.

Each main output can be read back via the bus to a resolution of 10mV and 1mA.

### **Simple and consistent control**

PL-P series supplies use simple and consistent command structures which make programming particularly easy regardless of which interface is used.

A National Instruments LabWindows\* device driver is available as an option. LabWindows is a trademark of National Instruments Corporation.

### **ARC, an exclusive Thurlby Thandar innovation**

ARC stands for "Addressable RS-232 Chain" and is a low-cost system for linking instruments together so that they can be controlled and monitored by a personal computer.

The ARC interface is an extension of the industry standard RS-232 interface and is exclusive to Thurlby-Thandar instruments. It differs from conventional RS-232 in that it allows multiple instruments (up to 32) to be controlled using the normal RS-232 or RS-422/423 port of a PC.

ARC provides a low-cost alternative to GPIB which utilises lower cost instruments, inexpensive cables, and can be controlled by any personal computer without the need for a special interface card or special software.



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