

Programmable DC **LINEAR** Power Supplies

...the Industry's Most Advanced Line of Power Products

THE PD SERIES PROVIDES:

- **ePower (Ethernet Control)**
- **Widest Selection**
- **Unlimited V/I Combinations**
- **"One-Box" Interface Design**
- **Custom Design and Modifications**



ETHERNET INTERFACE
ePower

KEY FEATURES

- Multiple Power Levels from 20 to 1,250Watts
- Co-resident GPIB and RS-232 Standard Interfaces
- Closed-Case Calibration
- Master/Slave Capability
- Low Ripple and Noise (PARD)
- Power Off Memory
- CE-Mark Compliance
- Output Isolation & Polarity Reversal Relays (optional)

AMREL
AMERICAN RELIANCE, INC.

PROGRAMMABLE DC LINEAR POWER SUPPLIES

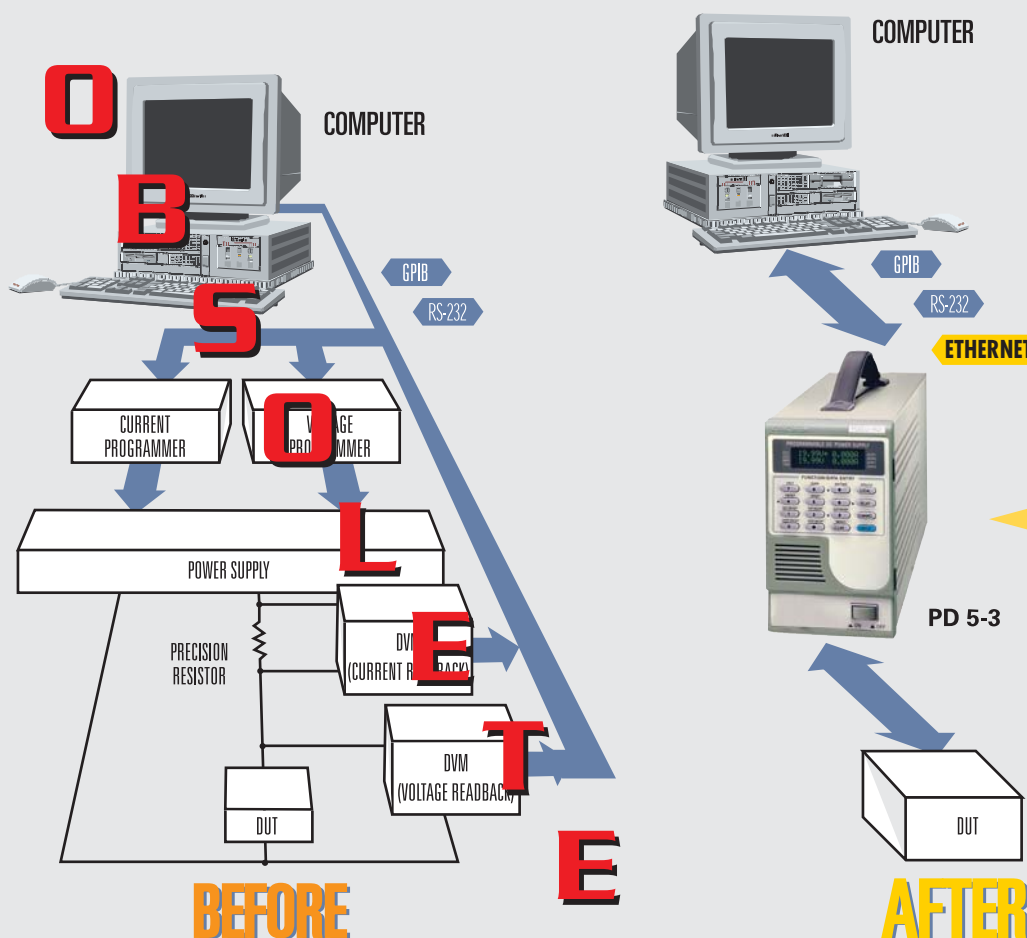
ONE-BOX SOLUTION

- GPIB (IEEE-488.1 and IEEE-488.2 SCPI)
- RS-232 Interface
- Front Panel Keypad
- Voltage and Current Readback
- Simple Closed-Case Calibration
- LabVIEW and LabWindows VISA Drivers

AVAILABLE INTEGRATED OPTIONS

- ePower - Ethernet Interface for LAN/WAN connectivity
- RS-485 - Master/slave connections
- External Analog Control (0-10V)
- Fine Tune Control Knob (Encoder)
- Output Isolation Relay
- Reverse Voltage Polarity Relay

ETHERNET



AMREL's advanced architecture integrates the basic power supply with a built-in voltage and current programmer as well as digital readback metering – all in a single convenient space-saving enclosure. AMREL PD Series programmable power supplies are all controllable via GPIB or RS-232 (co-resident) interface buses. Closed-case calibration via remote interface or front panel greatly simplifies the calibration process. AMREL's one-box design facilitates the use of the popular LabVIEW and LabWindows drivers for use in highly functional ATE environments.

AMREL's **ePower Solution** provides complete remote access and control of the PD power supply. This is accomplished via an optional integral Ethernet Interface. User can easily connect, initialize, and configure the power supply to a LAN/WAN network with the eTools software provided as shown in the diagram below.

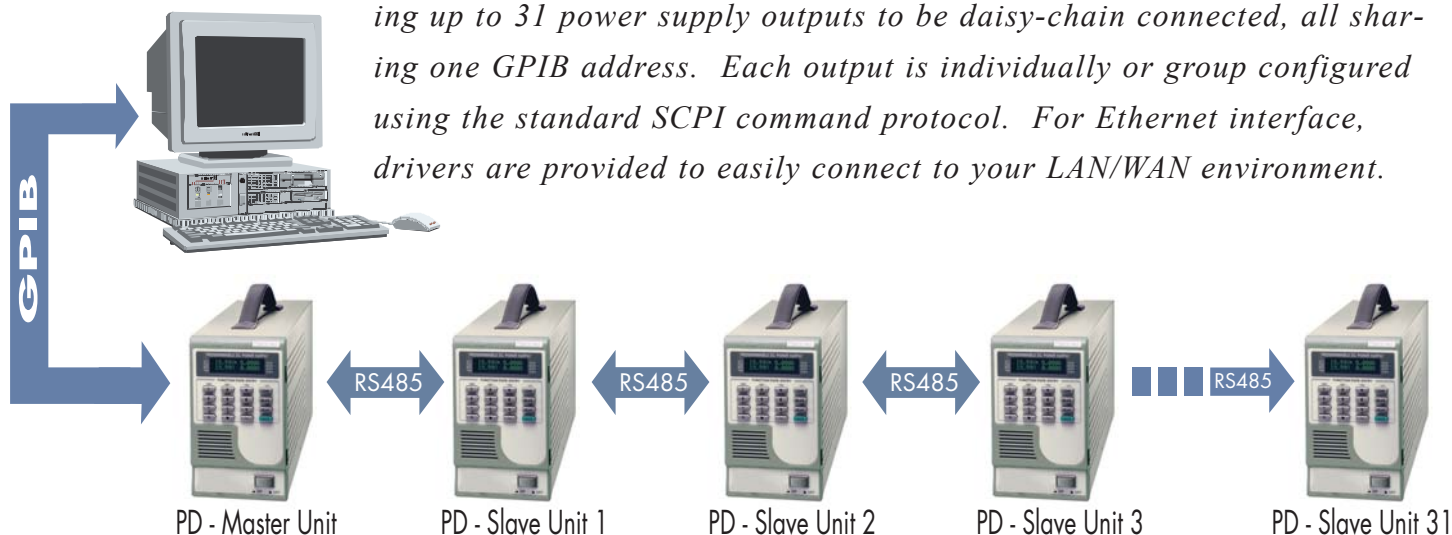


KEY ADVANTAGES FOR USING ePower

- Access (local and remote) to power supply controls over the computer network
- Access from multiple computers for multiple user control
- Unlimited number of devices connected
- Fast transmission (10MB) speeds for measurements of voltage and current

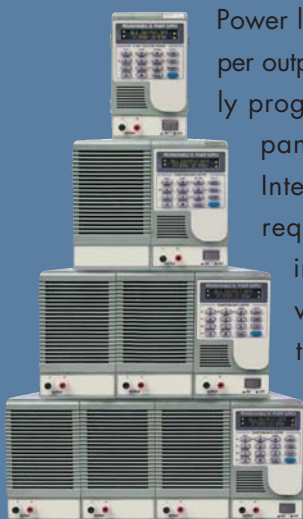
MASTER/SLAVE CONFIGURATION

The PD Series features an optional RS-485 or Ethernet Interface allowing up to 31 power supply outputs to be daisy-chain connected, all sharing one GPIB address. Each output is individually or group configured using the standard SCPI command protocol. For Ethernet interface, drivers are provided to easily connect to your LAN/WAN environment.



PDM SERIES - ONE CHASSIS POWER SUPPLY ASSEMBLY

AMREL's PDM series is a multi-channel assembly that supports up to 8 outputs per 19" wide/4U high chassis.



Power levels range from 20-150W per output. Each output is individually programmable through the front panel keypad or the GPIB Interface (only one address required). AMREL offers the industry's widest range of voltage/current combinations.

For more information, please contact AMREL Sales.

MODIFICATIONS AND CUSTOM DESIGN

If your application requires non-standard voltage/current combinations or special functions, modified/custom units can be provided typically within 6-8 weeks ARO.

Below is a sample of some of the customizations that are available:

- Lower ripple noise (via additional filtering)
- Higher programming/readback resolutions
- Crowbar OVP circuitry
- Redundant OVP protection
- Multiple Output voltage/current ranges
- Non-standard I/O and power connectors and terminals
- Special output sequencing functions

OTHER AVAILABLE PRODUCTS

Programmable DC Electronic Loads (air/water-cooled)

- 60 to 100KWatts
- 60 to 1200Vdc
- Up to 1200Amps

Programmable DC Switching Power Supplies

- 1.2KWatts and 3.2KWatts
- 8 to 600Vdc
- 2 to 150Amps for 1.2KWatts
- 10.5 to 400Amps for 3.2KWatts

FLEXIBLE DESIGN FOR RACK MOUNTING

- Flexible design... PD units may be easily mounted as 1/4, 1/2 and 3/4 Rack Modules into a full 19"/4U high rack for integration
- Single and dual output available - up to 8 outputs per 19"/4U high rack
- Interchangeable functionality as a "stand-alone", "master" or "slaved device".



eTool SOFTWARE SUPPORT PACKAGES

This software facilitates the integration of the power supply into an ATE environment. It provides full management control for the device on either an Ethernet network or closed-loop. These software tools also provide portability to test and measurement software platforms like National Instruments' LabWindows/CVI and LabVIEW as well as proprietary C/C++ test applications running under Windows.

	NAME OF TOOLING	FUNCTIONS AND USERS
eTool-1	The ePower programming sample code based on socket library	Provides Standard C source code for different C/C++ development environments, as well as Windows. All C/C++ programmers, different development environments, with some basic socket programming knowledge.
eTool-2	Instrument Drivers for NI LabWindows & NI LabVIEW	Provides virtual instrument of ePower that supports GPIB, RS-232 and Ethernet. Programmers who are familiar with NI LabVIEW or LabWindows environment.
eTool-3	Virtual COM	Provides Windows virtual COM port device drivers. Hides the details of Ethernet operation. Users only need to operate the ePower unit on RS-232 to control remotely. All Windows development environments have tools for RS-232 communications. Programmers familiar with Windows' RS-232 COM port communications.
eTool-4	Configuration tool	Automatically check all connected ePower units on Ethernet when both PC and ePower units are connected to Ethernet (along with basic information of ePower units, such as model number, maximum voltage and current, etc...). Also automatically sets Ethernet configurations for all connected ePower units. Operators who are familiar with TCP/IP, and without the knowledge of setting an IP address.
eTool-5	EDS application	Demonstrates all functionalities of ePower. It can be connected to ePower units through GPIB, RS-232, TCP, or UDP. Configure ePower voltage and current level according to predefined table and graphic display of real time voltage and current read back values.

WIDEST SELECTION/UNLIMITED COMBINATIONS

- Over 220 standard models
- Over 300 voltage and current combinations
- Wide output voltage range: 5 to 350Vdc
- Wide output current range: 80mA to 50Amps
- Power range from 20 to 1,250Watts

AMREL PD Series offers over 220 standard models of linear DC power supplies with the lowest output noise in the industry.

Total system expandability: all models can be configured in any combination without limitation, regardless of output requirements. In addition, each PD Series unit can be ordered to function as a master controlling up to 31 power supply output channels, or as a slaved device, when either IEEE-488.2 (SCPI) or Ethernet is specified.

The totally modular PD Series features a comprehensive line of models with numerous voltage & current combinations for the ultimate in configuration flexibility. Off-the-shelf models are available from 5V to 350Vdc, 20 to 1,250Watts, in $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and full-rack widths.

Along with the choice of single or dual output units, all models can be configured in any voltage, current or power arrangement resulting in over 300 available combinations. Whether the user's needs are for a stand-alone bench top unit or a multi-channel modular rack system, the PD Series delivers the ultimate in flexibility.

PROGRAMMABLE PROTECTION

The PD series provides programmable protection:

Over Voltage (OVP), Over Current (OCP) and Over Temperature (OTP). Whenever any setting is tripped, the outputs are instantaneously disabled, protecting the power supply and device under test from damage due to internal or external causes. Optional SCR is for crowbar protection.

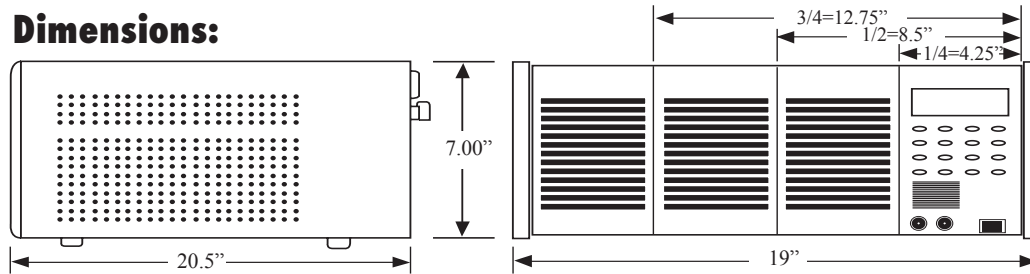
Fault Indicator/Remote. Shut-down power supplies can be controlled independent of GPIB. If power supply experiences an error condition (Over Current, for example), it can signal the other units to also shut down their outputs simultaneously.

Virtually, any fault condition or change of state of the power supply can be enabled to generate a SRQ. This signals the computer to take appropriate action upon the fault condition.



SPECIFICATIONS

Dimensions:



AC LINE INPUT:

120/240Vac \pm 10%

LINE FREQUENCY:

50/60 Hz

TOPOLOGY: LINEAR

Constant Voltage (CV)

Constant Current (CC)

OUTPUT VOLTAGE:

5 to 350Volts (Maximum)

OUTPUT CURRENT:

0 to 50Amps (Continuous maximum)

OUTPUT POWER:

20 to 1,750Watts

PROGRAMMING RESOLUTION(LSB):

Voltage - $V_{max}/10000$

Current - $I_{max}/10000$

PROGRAMMING ACCURACY:

CV - $\pm(0.05\%$ of setting + 2LSB)

CC - $\pm(0.15\%$ of setting + 5LSB)

READBACK ACCURACY:

CV - $\pm(0.1\%$ of setting + 2LSB)

CC - $\pm(0.2\%$ of setting + 5LSB)

LINE REGULATION:

CV - $\pm 0.001\% + 1mV$

CC - $\pm 0.01\% + 1mA$

LOAD REGULATION:

CV - $\pm 0.001\% + 1mV$

CC - $\pm 0.01\% + 1mA$

RIPPLE & NOISE: (20MHz to 20MHz)

CV - $0.3mV_{rms}$ (Typical); $2mV_{rms}$ (Maximum),

$3mV_{p-p}$ (Typical); $20mV_{p-p}$ (Maximum)

CC - $3mA_{rms}$ (Typical); $10mA_{rms}$ (Maximum)

TRANSIENT RESPONSE:

< 50 μ (Typical) for the output voltage to recover to its previous level (within 0.1% of the rated voltage or 20mV, whichever is greater) following any step change in load current up to 50% of the rated current.

REMOTE SENSING CAPABILITY:

Voltage Drop Per Lead: Up to $\frac{1}{2}$ of half rated output voltage

Load Regulation: Add 3mV to spec for each 1-volt change in the +output lead due to load current changes.

Load Voltage: Subtract voltage drop in load leads from specified output voltage rating.

DRIFT:

$\pm 0.01\% + 1mV$ (following a 30-minute warm-up, change in output over 8 hours under constant line, load and ambient temperature).

OPERATING TEMPERATURE:

0°C to 50°C

STORAGE TEMPERATURE:

-40°C to 70°C

TEMPERATURE COEFFICIENT:

100ppm/°C (change per °C)

HUMIDITY:

0% to 95% RH non-condensing

OUTPUT ISOLATION:

$\pm 500V_{dc}$ (maximum, from chassis ground)

PROGRAMMING METHODS:

Local Operation: Keypad and Encoder (option-K)

Remote Operation: Standard-IEEE-488.1 GPIB & RS-232 Interfaces

Optional-RS-485, IEEE-488.2 SCPI,

USB & Ethernet Interfaces

DISPLAY:

16x2 (Characters x Rows) with Backlit LCD & Annunciators

CV/CC/OVP/CVP/RMT/LCL/CH/RL/RNG/LIST/STS

20x2 (Characters x Rows) Vacuum Florescent Display

DIMENSION: (4U HIGH)

Full Rack: 17in W x 7in H x 20.5in D

Three-Quarters Rack: 12.75in W x 7in H x 20.5in D

Half Rack: 8.5in W x 7in H x 20.5in D

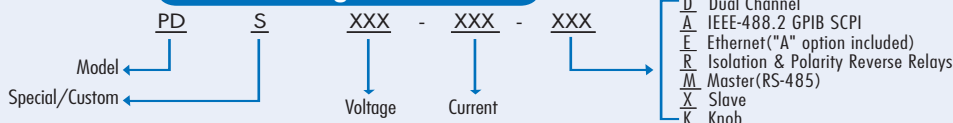
One-Quarter Rack: 4.25in W x 7in H x 20.5in D

(Rack Mountable with optional kits available for all)

NOTE: Benchtop version (BPD Series) is available:

8.5" W x 7" H x 15.6" D (Half Rack)

PD Ordering Information



AMREL is committed to solving your application driven requirements by providing standard, modified and customized power products.

**PRODUCT
CONFIGURATOR**
www.amrel.com

Programmable DC Linear Power Supply Models

The products below are a partial listing of AMREL's most popular standard models. For power supply voltage-current combinations not listed, please contact our sales department at **(800) 654-9838** or e-mail ariinfo@amrel.com.

power products

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WIDEST AVAILABLE SELECTION IN THE MARKET

MODEL	OUTPUT VOLTAGE(V)	OUTPUT CURRENT(A)	SINGLE OUTPUT WIDTH	DUAL OUTPUT WIDTH
PD 5-10	5	10	1/4 rack	1/2 rack
PD 5-20	5	20	1/2 rack	3/4 rack
PD 5-24	5	24	1/2 rack	3/4 rack
PD 5-30	5	30	1/2 rack	3/4 rack
PD 5-40	5	40	1/2 rack	**
PD 8-4	8	4	1/4 rack	1/4 rack
PD 8-10	8	10	1/4 rack	1/2 rack
PD 8-20	8	20	1/2 rack	3/4 rack
PD 8-40	8	40	1/2 rack	**
PD 8-50	8	50	3/4 rack	**
PD 16-6	16	6	1/4 rack	1/2 rack
PD 20-2	20	2	1/4 rack	1/4 rack
PD 20-4	20	4	1/4 rack	1/2 rack
PD 20-5	20	5	1/4 rack	1/2 rack
PD 20-10	20	10	1/2 rack	3/4 rack
PD 20-30	20	30	Full rack	**
PD 20-50	20	50	Full rack	**
PD 30-0.6	30	0.6	1/4 rack	1/4 rack
PD 30-1.2	30	1.2	1/4 rack	1/4 rack
PD 30-2.5	30	2.5	1/4 rack	1/2 rack
PD 30-3.5	30	3.5	1/4 rack	1/2 rack
PD 30-5	30	5	1/2 rack	3/4 rack
PD 30-10	30	10	3/4 rack	**
PD 35-2	35	2	1/4 rack	1/2 rack
PD 40-1	40	1	1/4 rack	1/4 rack
PD 40-2	40	2	1/4 rack	1/2 rack
PD 40-3.5	40	3.5	1/2 rack	3/4 rack
PD 40-5	40	5	1/2 rack	3/4 rack
PD 40-7	40	7	3/4 rack	**
PD 40-25	40	25	Full rack	**
PD 40-30	40	30	Full rack	**
PD 60-3	60	3	1/2 rack	3/4 rack
PD 60-6	60	6	3/4 rack	**
PD 60-10	60	10	Full rack	**
PD 60-20	60	20	Full rack	**
PD 80-2.5	80	2.5	1/2 rack	3/4 rack
PD 80-3.5	80	3.5	3/4 rack	**
PD 120-0.3	120	0.3	1/4 rack	1/2 rack
PD 120-0.5	120	0.5	1/4 rack	1/2 rack
PD 120-1	120	1	1/2 rack	3/4 rack
PD 250-0.2	250	0.2	1/4 rack	1/2 rack
PD 250-0.6	250	0.6	1/2 rack	3/4 rack
PD 300-4	300	4	Full rack	**
PD 350-0.15	350	0.15	1/4 rack	1/2 rack
PD 350-0.6	350	0.6	1/2 rack	3/4 rack
PD 350-1.2	350	1.2	Full rack	**
*** PD 350-5	350	5	Full rack	**

** Please contact sales dept.

*** 5 U Height

* Add "D" suffix to indicate dual channel output


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