

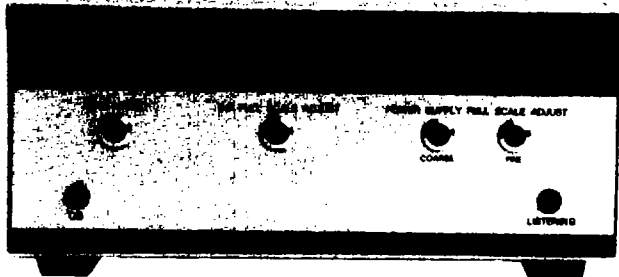
# POWER SUPPLIES

## Digital Programmable: HP-IB Programmer

### Model 59501A



- HP-IB power supply control
- HP-IB-to-power-supply isolation
- Programmable range

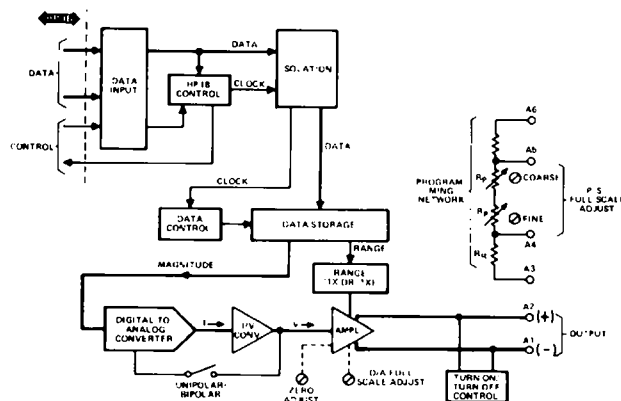


## Description

The 59501A is an isolated digital-to-analog converter designed to provide a convenient interface between the Hewlett-Packard Interface Bus and HP power supplies. With the 59501A, a wide range of DC voltages and currents becomes automatically controllable via the HP-IB. With proper wiring, the built-in isolation devices protect other instrumentation on the HP-IB from damage that could be caused by power supply outputs. In addition, an internal control circuit holds the output level near zero until programmed data is received. A programmable High/Low range control improves resolution by ten-to-one.

Power supply control is accomplished through the 59501A's programmable output voltage and programming network (see below). By making the appropriate connections between the 59501A's rear terminals and the remote programming terminals on the supply, the output voltage (or current) of the supply can be programmed from zero to its full rated output. The 59501A front panel controls provide fast and easy calibration of power supply outputs. The Zero Adjust enables the user to correct for small offsets in power supply response to programmed inputs. The Power Supply Full Scale Adjust (part of programming network) enables the user to set the maximum output desired from the power supply when the 59501A is programmed to its maximum value. For example, this adjustment would normally be used to calibrate the maximum programmable output of a 320Vdc power supply to 320 volts. However, it could also be used to set the maximum to 200 volts.

The 59501A also can be used directly as a low level DC signal source. Unipolar and bipolar output modes are available with output voltages programmable from zero to 9.99 volts, or minus 10.0 to plus 9.98 volts. Output current up to 10 milliamps is available and is automatically limited to protect the 59501A and user equipment. The 59501A produces a full scale voltage change in approximately 250  $\mu$ s from the time the digital data is received.



- Programmable 10-volt DC output
- Unipolar/Bipolar operation
- Fast digital to analog conversion

## Specifications

### Digital to Analog Converter

**DC output voltage:** programmable in high or low ranges within the voltage limits shown below. Output mode is unipolar or bipolar and is selected by a rear panel switch.

**Unipolar:** 0 to 9.99 V (low range, 0 to 9.999 V).

**Bipolar:** -10 to +9.98 V, (low range, -1 to +0.998 V).

**DC output current:** 10 mA maximum.

**PARD (ripple and noise):** 2 mV rms/10 mV p-p.

**Resolution:** unipolar, 10 mV (low range, 1 mV). Bipolar, 20 mV (low range, 2 mV).

**Accuracy:** specified at 23°C  $\pm$  5°C.

**Unipolar:** 0.1% + 5 mV (low range, 0.1% + 1 mV).

**Bipolar:** 0.1% + 10 mV (low range, 0.1% + 2 mV).

**Stability:** change in output over 8 hour interval under constant line, load, and ambient following a 30 minute warm-up. Stability is included in accuracy specification measurements over the temperature range indicated.

**Unipolar:** 0.04% + 0.5 mV (low range, 0.04% + .1 mV).

**Bipolar:** 0.04% + 1 mV (low range, 0.04% + .2 mV).

**Temperature coefficient:** unipolar, 0.01%/°C + 0.5 mV/°C (low range, 0.1%/°C + 0.1 mV/°C). Bipolar, 0.01%/°C + 0.5 mV/°C (low range, 0.01%/°C + 0.1 mV/°C).

**Zero adjust:** plus or minus 250 millivolts.

**D/A Full scale adjust:** plus or minus 5%.

**Programming speed:** the time required for output to go from zero to 99% of programmed output change is 250  $\mu$ s (measured with resistive load connected to output terminals).

### Power Supply Programming

**Programming network specifications:** in the following specifications, M represents the calibrated full scale value of the supply being programmed and P is the actual programmed output. The full scale value (M) can be any value within the supply's output range and is calibrated with the 59501A programmed to its maximum high range output.

**Accuracy:** specified at 23°C  $\pm$  5°C.

**Unipolar:** 0.05% M + 0.25% P (low range, 0.01% M + 0.25% P).

**Bipolar:** 0.1% M + 0.25% P (low range, 0.02% M + 0.25% P).

**Isolation:** 600 V dc between HP-IB data lines and output terminals.

**Temperature coefficient:** 0.005% M/°C + 0.015% P/°C (low range, 0.01% M/°C + 0.015% P/°C).

**Programming resolution:** 0.1% M (low range, 0.01% M).

**Programming speed:** D/A programming speed plus the programming speed of the power supply.

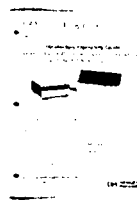
### General

**Temperature range:** operation: 0 to 55°C, Storage: -40 to 75°C.

**Power:** 100, 120, 220, or 240 Vac (+6% -13%) 47-63 Hz, 10 VA (selectable on rear panel).

**Size:** 101.6 H x 212.9 W x 294.6 mm D (4" x 8.38" x 11.6")

**Weight:** Net 1.36 kg (3 lb). Shipping 1.81 kg (4 lb).



Several programming notes are available to assist in operating the 59501A Power Supply Programmer with the HP desktop computers

### Accessories

**5061-0072:** rack mounting adapter kit for one 59501A

**5061-0094:** cabinet lock-together kit to connect

two 59501A's

**5061-0074:** rack flange kit to mount two locked 59501A's

### Ordering Information

**59501A** HP-IB Isolated D/A Power Supply Programmer

### Price

\$43

\$60

\$16.50

### Price

\$750