3.3 MODES OF OPERATION

The mode of operation is determined by selecting strapping connections on terminal strip TB1, located on the rear panel. The terminal designations are silk screened on the rear panel of the power supply. (Refer to the following chart).

TB1 Pin #	PIN DESCRIPTION
1	+ Voltage (+V)
2	+ Voltage Remote (+V REM)
3	Voltage Programming Current (V PROG I)
4	Voltage Amplifier (V AMP IN)
5	Voltage Programming Resistance (V PROG R)
6	Voltage Programming Resistance Common (V PROG R COM)
7	- Voltage Remote (-V REM)
8	- Voltage (-V)
9	Current Programming Current (I PROG I)
10	Current Amplifier (I AMP IN)
11	Current Programming Resistance (I PROG R)
12	- Shunt (-I)
13	Inverted Amplifier (IN AMP IN)
14	+ Shunt (+I)
15&16	Remote Voltage Turn On (Remote V IN)
16&17	Remote Dry Contact Turn On (Remote SW)

3.3.1 NORMAL OPERATION (Figure 1)

When shipped from the factory, each supply is configured for constant voltage, constant current, local programming, local sensing, single unit mode of operation. This normal mode of operation is used in most applications. All performance specifications, unless otherwise stated, are defined in this configuration. Ripple, programming speed, transient response and stability are optimized with the power supply so configured.

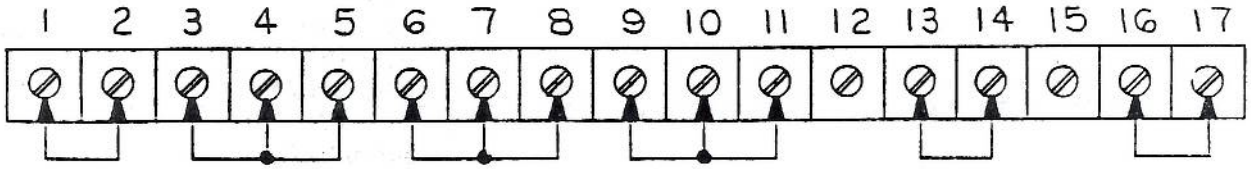


Figure 1. Normal Operation

Load Connection:

Each load must be connected to the power supply output terminals using separate pairs of connecting wires. This will minimize mutual coupling effects between loads and will retain full advantage of the low output impedance of the power supply. Each pair of connecting wires must be as short as possible and twisted or shielded if strong AC or RF fields are present to reduce noise pickup. (If a shielded pair is used, connect one end of the shield to ground at the power supply and leave the other end disconnected.)

3.3.2 REMOTE SENSING (Figure 2)

In applications where the effect of the voltage drop (IR) of the dc load wires would adversely affect the performance of the load, it is possible to sense the voltage at the load rather than at the output terminals of the power supply. Remote sensing will therefore remove the effect of changes in load current through the power distribution system. The maximum available load voltage then equals the rated power supply output voltage less the total of the IR drop.

Instructions for Remote Sensing:

1. Remove jumpers between the following terminals: TB1-1 and TB1-2
   TB1-7 and TB1-8
2. Connect the positive point of load to TB1-2.
3. Connect the negative side of the load to TB1-7 and TB1-6.
4. If the sense points are separated from each other by some distance, it is sometimes necessary to connect a capacitor across the load, or between TB1-2 and TB1-7, within the range of 5 to 50uF.

NOTE: Since the voltmeter is internally connected to the sensing terminals, it will automatically indicate the voltage at the load, not the power supply output terminal voltage.

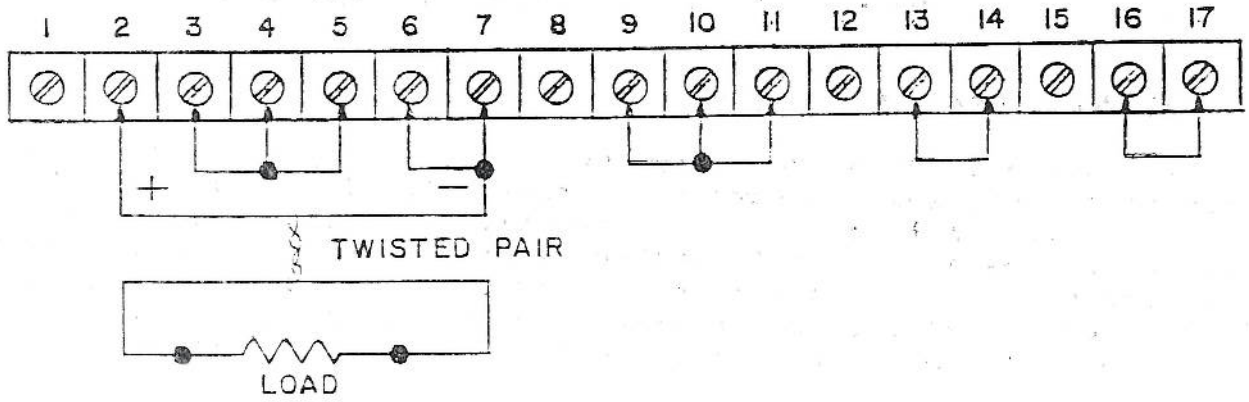


Figure 2. Remote Sensing

3.3.3 REMOTE PROGRAMMING

This power supply may be operated in a remotely programmed mode (externally controlled) by the use of an external resistance. The wire connecting the programming terminals of the supply to the remote programming device should be twisted or, if strong AC or RF fields are present, shielded.

Caution: If the remote programming function fails or is inadvertently adjusted so that the output voltage is programmed to levels of greater than 15% above ratings, damage to the output filter capacitors may occur. To protect against this, it is suggested that the overvoltage protection be used to limit the maximum voltage excursion and safely shut the power supply down.

3.3.4 REMOTE PROGRAMMING by EXTERNAL RESISTANCE (Figures 3 & 4)

Voltage Channel:

A resistance of 0 to 5000 ohms programs the output from zero to full rated voltage.

Programming Resistance = Desired Voltage/Full Rated Output x 5000

1. Remove the jumper between terminals TB1-4 and TB1-5.
2. Connect the programming resistance between terminals TB1-4 and TB1-7.

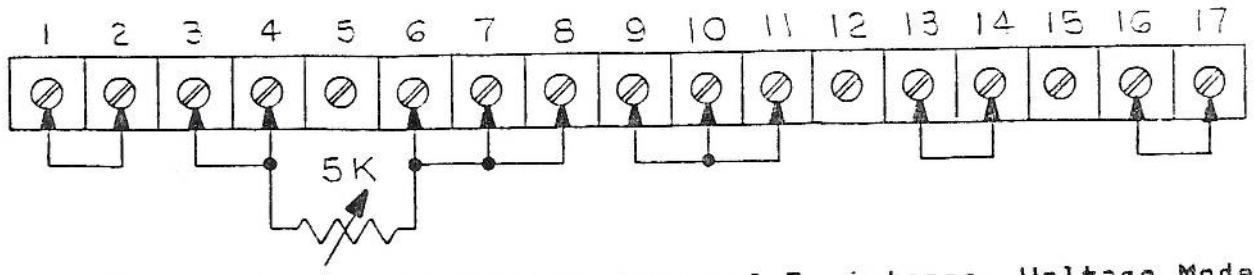


Figure 3. Remote Programming by External Resistance, Voltage Mode

Current Channel:

A resistance of 0 to 100 ohms programs the output from zero to full rated current.

Programming Resistance = Desired Voltage x 100/Full Rated Output

1. Remove the jumper between terminals TB1-10 and TB1-11.
2. Connect the programming resistance between terminals TB1-10 and TB1-12.

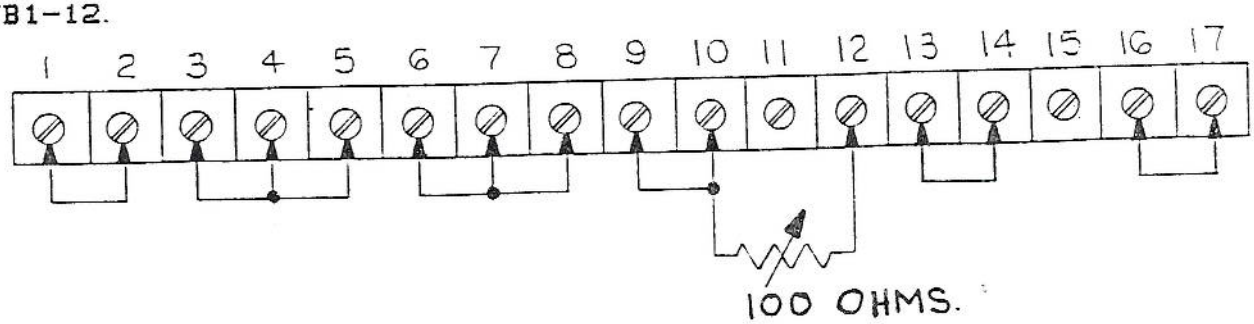


Figure 4. Remote Programming by External Resistance, Current Mode

Caution: An opening in the remote programming circuit is effectively a high programming resistance and will allow an uncontrolled voltage or current rise to the maximum output of the power supply. This may cause possible damage to the power supply and/or load. For this reason, any programming resistor switcher must have shorting contacts. This type of shorting switch connects each successive position before disconnecting the preceding one.

3.3.5 REMOTE PROGRAMMING by EXTERNAL VOLTAGE (Figures 5 & 6)

The front panel voltage or current control is disabled in this operating mode.

Voltage Channel:

A voltage of 0 to 5V programs the output from zero to full rated voltage.

1. Remove the jumpers between terminals TB1-3, TB1-4 and TB1-5.
2. Connect the programming voltage source between TB1-4 (positive) and TB1-6 (negative).

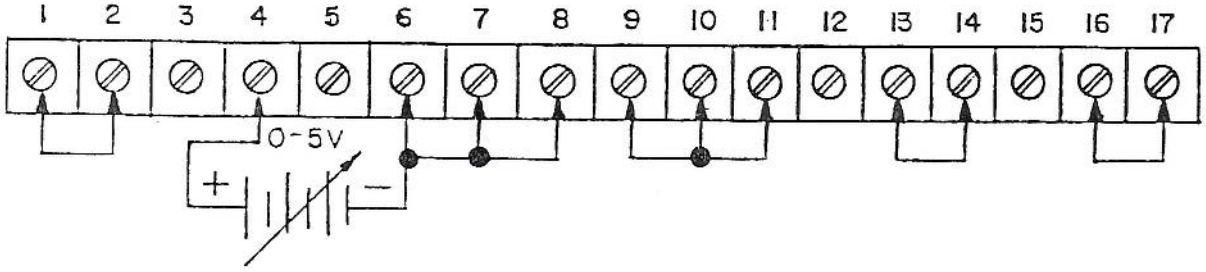


Figure 5. Remote Programming by External Voltage, Voltage Mode

Current Channel:

A voltage of 0 to 100mV programs the output from zero to full rated current.

Note: A signal from a higher potential source may be attenuated to this 100mV level by a resistor divider. For best performance, the source impedance of this divider should not exceed 1000 ohms.

1. Remove the jumpers between terminals TB1-9, TB1-10 and TB1-11.
2. Connect the programming voltage source between terminals TB1-10 (positive) and TB1-12 (negative).

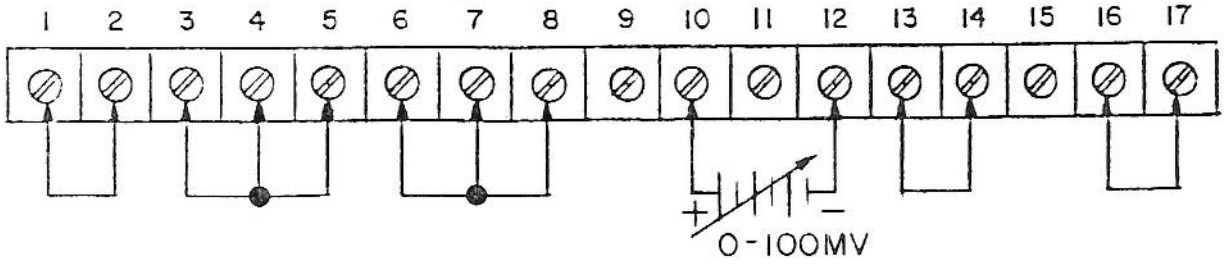
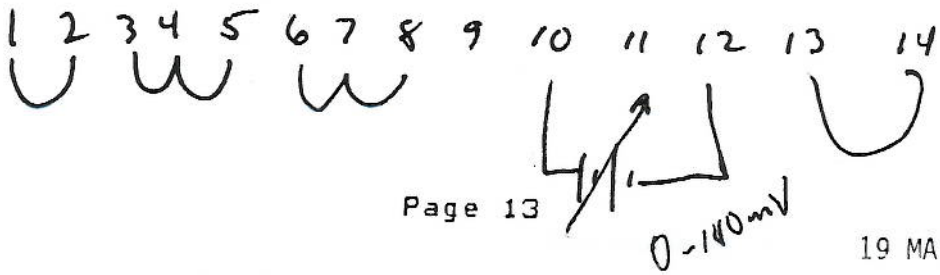


Figure 6. Remote Programming by External Voltage, Current Mode



19 MAY 88

3.3.6 REMOTE PROGRAMMING by EXTERNAL CURRENT (Figures 7 & 8)

The front panel voltage or current control is not disabled in this programming mode. The front panel control must be left in the clockwise position to maintain the programming constant or signal to the output.

A current of 0 to 1mA programs the output from zero voltage to full rated voltage or current.

Voltage Channel:

1. Remove the jumpers between terminals TB1-3 , TB1-4 and TB1-5.
2. Connect a 5K ohm, 1%, 0.5W resistor between TB1-4 and TB1-6.
3. Connect the programming current source between terminals TB1-4 (positive) and TB1-6 (negative).

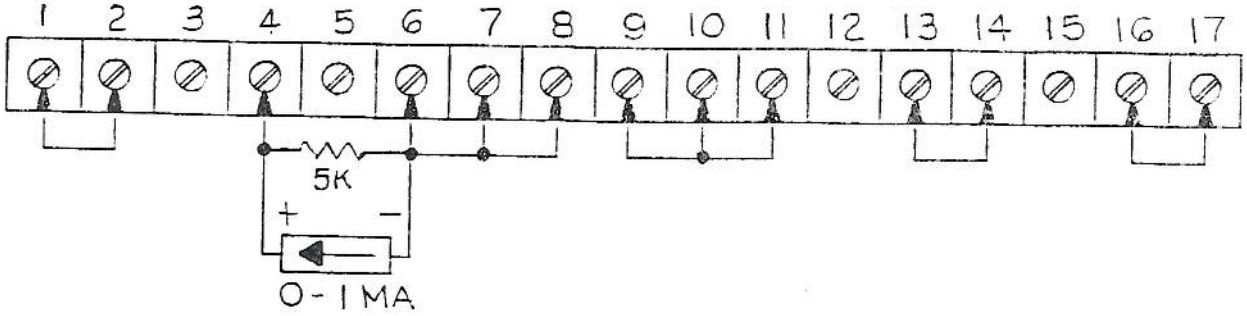


Figure 7. Remote Programming by External Current, Voltage Mode

Current Channel:

1. Remove the jumper between terminals TB1-9 , TB1-10 and TB1-11.
2. Connect a 100 ohm, 1%, 0.5W resistor between TB1-10 and TB1-12.
3. Connect the programming current source between terminals TB1-12 (negative) and TB1-10 (positive).

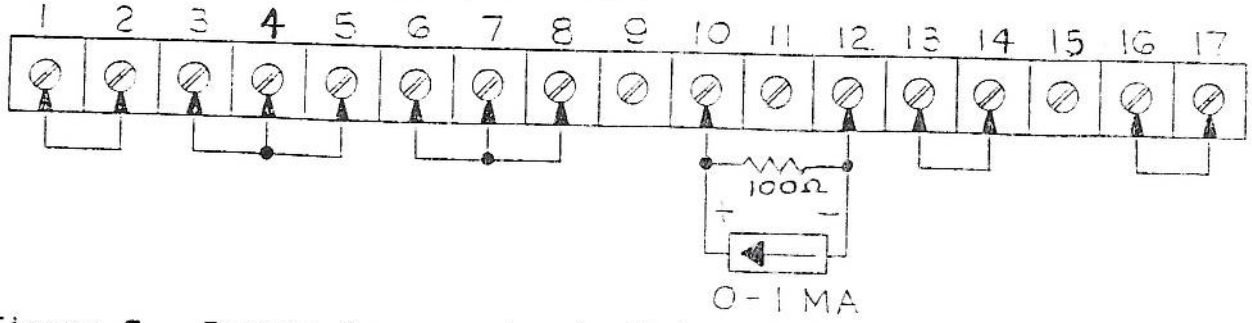


Figure 8. Remote Programming by External Current, Current Mode.

"Power Supply Testing"

9/28/05

Blue 20/30

1 +V
2 +V Rem
3 V Prog I
4 V Amp. In
5 V Prog R
6 V Prog R. Com.
7 -V Rem
8 -V
9 I Prog. I
10 I Amp. In
11 I Prog R
12 -Shunt
13 Inv. Amp IN
14 +Shunt

Normal

1 +V
2 +V Rem
3 V Prog I
4 V Amp. In
5 V Prog R
6 V Prog R Com
7 -V Rem
8 -V
9 I Prog I
10 I Amp. In
11 I Prog R
12 - Shunt
13 Inv Amp IN
14 +Shunt
15 } Remote V Turn On
16 } Remote Dry Contact Turn On
17

Blue "4 PACK"