



*P31 Series
DC Power Supplies*

**Isolated Analog Interface Option
Addendum**

This manual covers models:

P31-8125	P31-6018
P31-10100	P31-8013
P31-2050	P31-10010
P31-3333	P31-1507
P31-4025	P31-3003.5
P31-5020	P31-6001.7

PowerTen
**9250 Brown Deer Road
San Diego, CA 92121-2294
1-800-733-5427
Tel: (858) 450-0085
Fax: (858) 458-0267
Email: sales@elgar.com
www.elgar.com**


©2002 by Power Ten. This document contains information proprietary to Power Ten. The information contained herein is not to be duplicated or transferred in any manner without prior written permission from Power Ten.

August 27, 2002

Document No. M362280-01 Rev A

SAFETY NOTICE

Before applying power to the system, verify that the P31 Series unit is configured properly for the user's particular application.



WARNING!

HAZARDOUS VOLTAGES IN EXCESS OF 280 VRMS, 600V PEAK MAY BE PRESENT WHEN COVERS ARE REMOVED. QUALIFIED PERSONNEL MUST USE EXTREME CAUTION WHEN SERVICING THIS EQUIPMENT. CIRCUIT BOARDS, TEST POINTS, AND OUTPUT VOLTAGES MAY BE FLOATING ABOVE (BELOW) CHASSIS GROUND.

Installation and service must be performed by qualified personnel who are aware of dealing with attendant hazards. This includes such simple tasks as fuse verification.

Ensure that the AC power line ground is connected properly to the P31 Series unit input connector or chassis. Similarly, other power ground lines including those to application and maintenance equipment must be grounded properly for both personnel and equipment safety.

Always ensure that facility AC input power is de-energized prior to connecting or disconnecting the input/output power cables.



During normal operation, the operator does not have access to hazardous voltages within the chassis. However, depending on the user's application configuration, HIGH VOLTAGES HAZARDOUS TO HUMAN SAFETY may be generated normally on the output terminals.

Ensure that the output power lines are labeled properly as to the safety hazards and that any inadvertent contact with hazardous voltages is eliminated. To guard against risk of electrical shock during open cover checks, do not touch any portion of the electrical circuits. Even when the power is off, capacitors can retain an electrical charge. Use safety glasses during open cover checks to avoid personal injury by any sudden failure of a component.

Due to filtering, the unit has high leakage current to the chassis. Therefore, it is essential to operate this unit with a safety ground.

Some circuits are live even with the front panel switch turned off. Service, fuse verification, and connection of wiring to the chassis must be accomplished at least five minutes after power has been removed via external means; all circuits and/or terminals to be touched must be safety grounded to the chassis.

After the unit has been operating for some time, the metal near the rear of the unit may be hot enough to cause injury. Let the unit cool before handling.

Qualified service personnel need to be aware that some heat sinks are not at ground, but at high potential.

These operating instructions form an integral part of the equipment and must be available to the operating personnel at all times. All the safety instructions and advice notes are to be followed.

Neither Power Ten, San Diego, California, USA, nor any of the subsidiary sales organizations can accept any responsibility for personal, material or consequential injury, loss or damage that results from improper use of the equipment and accessories.

SAFETY SYMBOLS



CAUTION
Risk of Electrical Shock



CAUTION
Refer to Accompanying Documents



Off (Supply)



Direct Current (DC)



Standby (Supply)



Alternating Current (AC)



On (Supply)



Three-Phase Alternating Current



Protective Conductor Terminal



Earth (Ground) Terminal



Fuse



Chassis Ground

POWER TEN FIVE-YEAR WARRANTY

Power Ten warrants all of its power supply products to be free from defects in material and workmanship when used under specified operating conditions and within specified limits. Power Ten domestic warranty shall extend for a period of five (5) years from the date of shipment to the original purchaser.

This warranty is expressly in lieu of and excludes all other expressed or implied warranties, including but not limited to warranties of merchantability and fitness for a particular purpose.

Power Ten, its agents, or representatives shall in no circumstance be liable for any direct, indirect, special, penal or consequential loss or damage of any nature resulting from the malfunction of the product.

Remedies under this warranty are expressly limited to repair or replacement of the product at the sole discretion of Power Ten.

Before returning any defective product to Power Ten, contact a Power Ten representative or the factory at (858) 678-4423 for an RMA number and for instructions on how and where the return is to be shipped. Supplies without this authorization will be returned at the shipper's expense.

Products returned to Power Ten under warranty must be shipped freight prepaid. Power Ten reserves the right to reject any warranty claim on a product that has been altered by the user or damaged in shipping due to the mishandling of the carrier or inadequate packaging.

By returning a product to Power Ten the owner grants permission to Power Ten to open and disassemble the product as required for evaluation. Power Ten has sole responsibility for determining the cause and nature of failure, and Power Ten determination with regard thereto shall be final.

A returned product that is found, upon inspection by Power Ten, to be operational within specification is subject to an inspection and testing fee and applicable freight charges.

Power Ten reserves the right to repair or replace any unit at its sole discretion.

POWER TEN

9250 Brown Deer Road
San Diego, CA 92121-2294
Tel: (800) 978-6680
or (858) 458-0253
Fax: (858) 458-0237

ABOUT THIS DOCUMENT

This manual addendum is intended to be used in conjunction with the *Power Ten P31 Series DC Power Supplies Operation Manual*, Document No. M362186-01.

This addendum has been written expressly for the Power Ten P31 series of power supplies, which have been designed and certified to meet the 1997 Low Voltage and Electromagnetic Compatibility Directive Requirements of the European Community.

Since the goal of the Low Voltage Directive is to ensure the safety of the equipment operator, universal graphic symbols have been used both on the unit itself and in this manual to warn the operator of potentially hazardous situations. See Safety Symbols on page ii.

CONTENTS

SECTION 1 ISOLATED ANALOG INTERFACE OPTION OVERVIEW...	1-1
1.1 Introduction.....	1-1
1.2 General Description.....	1-1
1.3 Specifications.....	1-2
1.3.1 Electrical Specifications.....	1-2
1.3.2 Supplemental Characteristics.....	1-2
SECTION 2 ISOLATED ANALOG PROGRAMMER OPERATION	2-1
2.1 SW1 Switch	2-1
2.1.1 SW1 Switch Setup.....	2-2
2.2 ISOLATED ANALOG PROGRAMMER Connector (J4).....	2-3
2.2.1 ISOLATED ANALOG PROGRAMMER Functions.....	2-4
2.3 Remote Programming Configuration	2-7
2.3.1 Voltage Source Programming of Output Voltage.....	2-7
2.3.2 Voltage Source Programming of Output Current.....	2-8
2.3.3 Voltage Source Programming of OVP.....	2-9
2.3.4 Resistance Programming of Output Voltage	2-10
2.3.5 Resistance Programming of Output Current.....	2-11
2.3.6 Resistance Programming of OVP.....	2-12
2.3.7 4-20mA Current Source Programming of Output Voltage	2-13
2.3.8 4-20mA Current Source Programming of Output Current.....	2-14
2.3.9 Programming the Shutdown Function	2-15
2.3.10 TTL Shutdown	2-15
2.3.11 Shutdown Application – Contact Closure	2-16
2.3.12 Local/Remote Application	2-18
2.4 Remote Monitoring	2-19
2.5 Remote Digital Status Signals.....	2-19

LIST OF TABLES

Table 2–1. SW1 SETUP Switch..... 2-1
 Table 2–2. ISOLATED ANALOG PROGRAMMER Connector Pinout..... 2-3
 Table 2–3. Remote Monitoring..... 2-19
 Table 2–4. Remote Digital Status Signals 2-19

LIST OF FIGURES

Figure 2–1. Rear Panel View, P31 Series DC Power Supply 2-2
 Figure 2–2. Using Shutdown with a DC Input (Positive Logic) 2-15
 Figure 2–3. Using Shutdown with Contact Closure of a Normally OPEN Relay
 (SW1-6 ON)..... 2-16
 Figure 2–4. Using Shutdown with Contact Closure of a Normally OPEN Relay
 (SW1-6 OFF) 2-17
 Figure 2–5. Using Shutdown with Contact Closure of a Normally CLOSED Relay
 (SW1-6 ON)..... 2-17
 Figure 2–6 Using Local/Remote Operation with Contact Closure 2-18

SECTION 1

ISOLATED ANALOG INTERFACE OPTION OVERVIEW

1.1 Introduction

This addendum is to be used in conjunction with the *Power Ten P31 Series DC Power Supplies Operation Manual*, Document No. M362186-01.

The Power Ten Isolated Analog Interface Option provides a remote isolated analog programming interface, which has safety isolation from the output terminals. This allows the remote analog interface to be connected to user-accessible, Safety Extra Low Voltage, (SELV) control circuits, even though the output terminals are floated at a high potential with respect to the chassis.

1.2 General Description

The Isolated Analog Interface Option provides isolation for all programming, monitoring, and digital I/O signals that are available through the standard rear panel analog interface connector. This isolation barrier eliminates the connection that exists in the standard models between the non-isolated remote interface circuits and the power supplies output return (negative) terminal. All control and monitoring signals on the Isolated Analog Interface Option are optically coupled from the power supply output, and can be user accessible irrespective of the float potentials that could exist at the output terminals.

The Isolated Analog Interface Option provides a full complement of programming, monitoring, and control functions. Remote programming is available for output voltage, current, and overvoltage protection (OVP). Analog output monitor signals are available for the output voltage and current. Digital I/O signals provide indication of the operational state, and a means of enabling the remote interface and the output.

The type and range of the control and monitor signals are user-selectable with a rear panel setup switch and connector jumpers. The output voltage, current, and OVP can be programmed with a 0-5VDC, 0-10VDC, or 0-5k Ω resistance; in addition, the output voltage and current can be programmed with 4-20mA signals. The output voltage and current monitors can produce 0-5VDC, 0-10VDC, or 4-20mA signals. Isolated 1mA current sources are provided to facilitate the utilization of 0-5k Ω programming resistances.

Except for the isolated remote analog interface, the installation and operation of the power supplies remains as presented in the Operation Manual. The following sections provide a detailed description of the new features and the differences in operation.

1.3 Specifications

1.3.1 Electrical Specifications

Remote Voltage Programming Accuracy, 0-5/10V Inputs:

Output Voltage: 0.5% of V_{max}

Output Current: 0.75% of I_{max}

OVP: 1.0% of 1.1 X V_{max}

Remote 4-20 mA Programming Accuracy:

Output Voltage: 1.0% of V_{max}

Output Current: 1.0% of I_{max}

Burden voltage of 6.25 VDC (312.5 ohms nominal)

1.3.2 Supplemental Characteristics

Remote Resistance Programming Accuracy, 0-5k Ω Input:

Output Voltage: 1.0% of V_{max}

Output Current: 1.5% of I_{max}

OVP: 1.5% of 1.1 X V_{max}

Remote Monitor Accuracy:

Output Voltage, 0-5/10V ranges: 0.5% of V_{max}

Output Voltage, 4-20mA: 1.0% of V_{max}

Output Current, 0-5/10V ranges: 0.75% of I_{max}

Output Current, 4-20mA: 1.0% of I_{max}

Electrical Isolation:

500 VDC from all isolated inputs to supply output

SECTION 2

ISOLATED ANALOG PROGRAMMER OPERATION

2.1 SW1 Switch

The SW1 SETUP switch is accessible from the rear panel of the unit. It provides user selection of the programming/monitoring ranges and shutdown logic signal level. Setting a switch to the 1 or 0 position changes a range. The factory default settings are shown below.

Refer to Figure 2–1 for a rear panel view of the P31 Series DC power supply.

Switch Position	Function	OFF (0) Position	ON (1) Position
1	Voltage Programming Range Select	0-10 VDC	* 0-5 VDC, 4-20mA
2	Current Programming Range Select	0-10 VDC	* 0-5 VDC, 4-20mA
3	OVP Programming Range Select	0-10 VDC	* 0-5 VDC
4	Output Voltage Monitor Range Select	0-5 VDC	*0-10 VDC
5	Output Current Monitor Range Select	0-5 VDC	* 0-10 VDC
6	Remote ON-OFF Level Select	Active Low Signal	* Active High Signal

* Indicates default settings

Table 2–1. SW1 SETUP Switch

2.1.1 SW1 Switch Setup

The following sections describe the functions of the various switch positions:

Voltage Programming Range Select (V PROG): SW1-1, ON (1) position, selects 0-5VDC programming range for the output voltage. Must also be set to ON (1) position when the Isolated Analog Programmer is wired for 4-20mA input programming. OFF (0) position, selects 0-10VDC programming for the output voltage.

Current Programming Range Select (I PROG): SW1-2, ON (1) position selects 0-5VDC programming range for the output current. Must also be set to ON (1) position when the Isolated Analog Programmer is wired for 4-20mA input programming. OFF (0) position, selects 0-10VDC programming for the output voltage.

OVP Programming Range Select (OVP PROG): SW1-3, ON (1) position selects 0-5VDC programming of OVP threshold. OFF (0) position, selects 0-10VDC programming for OVP threshold.

Output Voltage Monitor Range Select (V MON): SW1-4, ON (1) position selects 0-10VDC range for readback of output voltage. OFF (0) position selects 0-5VDC readback of output voltage. 4-20mA readback for output voltage is independent of the position of this switch.

Output Current Monitor Range Select (I MON): SW1-5, ON (1) position selects 0-10VDC range for readback of output current. OFF (0) position selects 0-5VDC readback of output current. 4-20mA readback for output current is independent of the position of this switch.

Remote ON-OFF Level Select (S/D): SW1-6, ON (1) position selects ACTIVE-HIGH logic level for disabling the output with the S/D signal of the Isolated Analog Programmer connector. OFF (0) position selects the ACTIVE-LOW logic level for disabling the output with the S/D signal of the Isolated Analog connector.

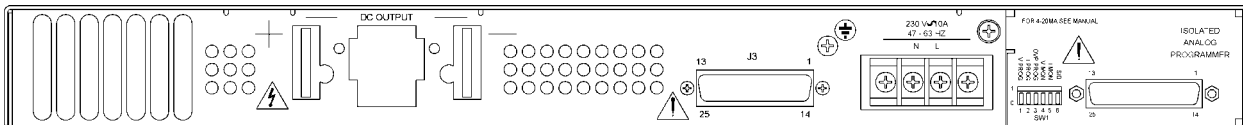


Figure 2–1. Rear Panel View, P31 Series DC Power Supply

2.2 ISOLATED ANALOG PROGRAMMER Connector (J4)

The ISOLATED ANALOG PROGRAMMER connector is a 25-position female Subminiature-D type. The table below defines each pins function.

Pin	Function
1	ANALOG-CONTROL input
2	Isolated Analog Common
3	OVP programming input
4	Voltage monitor output, 4-20mA
5	VOLTAGE-MODE status output
6	Isolated Analog Common
7	Current monitor output, 0-5/10V
8	4-20mA voltage programming offset signal (-2.5VDC)
9	Voltage programming input, 0-5/10V
10	Current programming input, 0-5/10V
11	4-20mA current programming offset signal (-2.5VDC)
12	Isolated Analog Common
13	Return for 4-20mA current programming signal
14	Shut-Down input
15	Auxiliary 16VDC output (+)
16	OVP resistance programming output, 1mA source
17	OVP status output
18	FAULT status output
19	Voltage monitor output, 0-5/10V
20	Input for 4-20mA current programming offset signal (-2.5VDC)
21	Voltage resistance programming output, 1mA source
22	Current resistance programming output, 1mA source
23	Input for 4-20mA current programming offset signal (-2.5VDC)
24	Current monitor output, 4-20mA
25	Return for 4-20mA voltage programming

Table 2–2. ISOLATED ANALOG PROGRAMMER Connector Pinout



CAUTION

The signals of the ISOLATED ANALOG PROGRAMMER have an internal connection to chassis ground. Damage could result if the voltage from signal returns, Pin-2, 6, 12, 13, and 25 to chassis ground exceeds 60VDC.

2.2.1 ISOLATED ANALOG PROGRAMMER Functions

The following sections describe the functions of the various signals of the ISOLATED ANALOG Programmer. Circuit is SELV, and all connections have electrical isolation from the output of the unit. Pin numbers correspond to the rear panel J4 connector pin out of Table 2–2.

Digital Control Input Signals

ANALOG-CONTROL (Remote/Local): Pin-1, enables remote analog programming with an active-low logic level. When a low level is applied, the supply will power-up with the analog interface in control of the output voltage. When high, the power supply will be in local control mode. Signal return is at J4-2.

EXTERNAL SHUT DOWN (S/D): Pin-14, disables the output when applied and supply is working in the Remote Control mode. Logic level can be selected with switch SW1-6 to be active high or low. Signal return is at J4-2.

Digital Control Status Output Signals

VOLTAGE-MODE: Pin-5, nominal 5VDC logic level indicates operation in constant-voltage mode. Low logic level indicates operation in constant current mode. Signal return is at J4-2.

OVP: Pin-17, nominal 5VDC logic level indicates that the output has been disabled because of overvoltage protection. Signal return is at J4-2.

FAULT: Pin-18, nominal 5VDC logic level indicates that the output is disabled because of an over temperature or shutdown fault. Signal return is at J4-2.

Analog Monitor Signals

VOLTAGE MONITOR, 0-5/10V: Pin-19, provides an analog readback of the output voltage with a 0-5VDC or 0-10VDC signal (user selectable with switch SW1-4) indicating 0-100% of full scale output. Signal is referenced to J4-6.

VOLTAGE MONITOR, 4-20mA: Pin-4, provides an analog readback of the output voltage with a 4-20mA signal indicating 0-100% of full scale output. Signal return for the 4-20mA current is J4-6.

CURRENT MONITOR, 0-5/10V: Pin-7, provides an analog readback of the output current with a 0-5VDC or 0-10VDC signal (user selectable with switch SW1-5) indicating 0-100% of full scale output. Signal return is at J4-6.

CURRENT MONITOR, 4-20mA: Pin-24, provides an analog readback of the output current with a 4-20mA signal indicating 0-100% of full scale output. Signal return for the 4-20mA current is J4-6.

Analog Programming Signals

OVP PROGRAMMING INPUT: Pin-3, an input signal of 0-5 volts or 0-10 volts (user selectable with switch SW1-3) programs the OVP threshold from 5-110% of full scale output voltage. Signal return is at J4-12.

***Note:** The OVP input is programmed to 110% by an internal connection between the 1mA source on Pin-16 to a separate circuit. This allows the user to program remotely without having to provide a separate programming source or jumper to the OVP input.*

VOLTAGE PROGRAMMING INPUT: Pin-9, an input signal of 0-5 volts, 0-10 volts or 4-20mA programs the output voltage from 0-100% of full scale.

a) An input signal of 0-5 volts or 0-10 volts (user selectable with switch SW1-1) programs the output voltage from 0-100% of full scale. Signal return is at J4-12.

b) An input signal of 4-20mA (with switch SW1-1 set to ON (1) position, programs the output voltage from 0-100% of full scale. Jumpers from J4-25 to J4-12 and J4-20 to J4-8 are also required. Signal return for the 4-20mA current is J4-25.

CURRENT PROGRAMMING INPUT: Pin-10, an input signal of 0-5 volts, 0-10 volts or 4-20mA programs the output current from 0-100% of full scale.

a) An input signal of 0-5 volts or 0-10 volts (user selectable with switch SW1-2) programs the output current from 0-100% of full scale. Signal return is at J4-12.

b) An input signal of 4-20mA (with switch SW1-2 set to ON (1) position) programs the output current from 0-100% of full scale. Jumpers from J4-13 to J4-12 and J4-23 to J4-11 are also required. Signal return for the 4-20mA current is J4-23.

OVP RESISTANCE PROGRAMMING OUTPUT: Pin-16, provides a 1mA current source which when connected to Pin-3, the OVP PROG INPUT, with a 0-10K Ω external resistor connected between Pin-16 and Pin-12, programs the OVP threshold from 5-110% of full scale output voltage. Switch SW1-3 must be set to ON (1) to select 0-5VDC input range.

***Note:** The OVP input is programmed to 110% by an internal connection between the 1mA source on Pin-16 to a separate circuit. This allows the user to program remotely without having to provide a separate programming source or jumper to the OVP input.*

VOLTAGE RESISTANCE PROGRAMMING OUTPUT: Pin-21, provides a 1mA current source which when connected to Pin-9, the V PROG INPUT, with a 0-5K Ω external resistor connected between Pin-21 and Pin-12, programs the output voltage from 0-100% of full scale output. Switch SW1-1 must be set to ON (1) to select 0-5VDC input range.

CURRENT RESISTANCE PROGRAMMING OUTPUT: Pin-22, provides a 1mA current source which when connected to Pin-10, the I PROG INPUT, with a 0-5K Ω external resistor connected between Pin-22 and Pin-12, programs the output current from 0-100% of full scale output. Switch SW1-2 must be set to ON (1) to select 0-5VDC input range.

Auxiliary Sources

AUXILIARY DC OUTPUT: Pin-15, 16VDC source for use with logic and programming circuits. Source capability is adequate to provide for full scale programming of output voltage, current, or OVP when the user connects it to the appropriate programming input(s). Source is referenced to Pin-6. Can be used as a source for 4-20mA programming current.

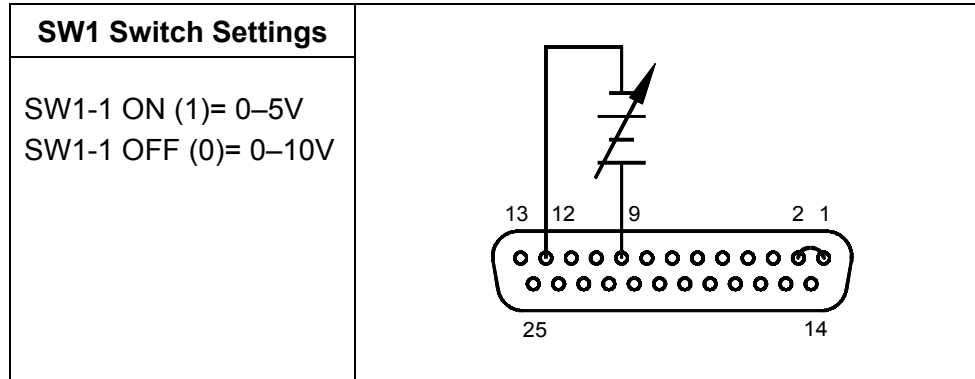
AUXILIARY DC RETURN: Pin-6, return for AUXILIARY source output.

4-20MA CURRENT PROGRAMMING OFFSET SIGNAL (-2.5VDC): Pin-8, provides a negative 2.5VDC to zero out the 4mA signal generated by internal circuits when using 4-20mA programming of output voltage. Jumpers to Pin-20.

4-20MA CURRENT PROGRAMMING OFFSET SIGNAL (-2.5VDC): Pin-11, provides a negative 2.5VDC to offset the signal generated by internal circuits when using 4-20mA programming of output current. Jumpers to Pin-23.

2.3 Remote Programming Configuration

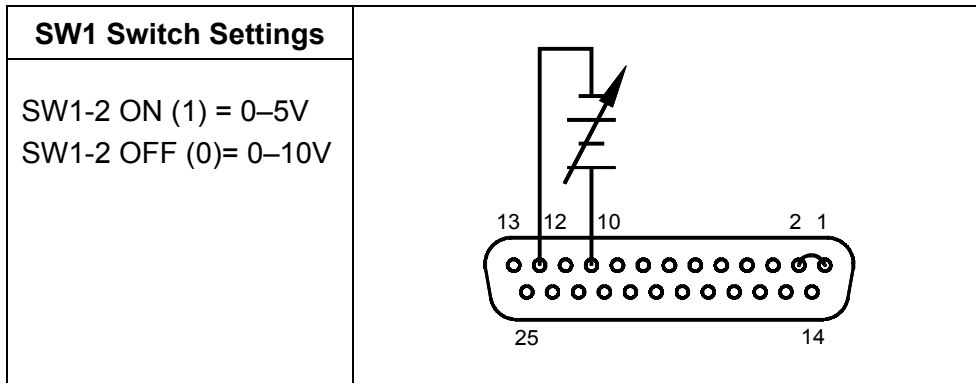
2.3.1 Voltage Source Programming of Output Voltage



Set up for voltage source programming of the output voltage as follows:

1. Set SW1-1, V PROG, to ON (1) for 0-5VDC programming range.
2. Set SW1-1, V PROG, to OFF (0) for 0-10VDC programming range.
3. Connect the external programming voltage source to the ISOLATED ANALOG PROGRAMMER connector, J4, with positive to Pin-9 and negative to Pin-12.
4. Connect Pin-1, ANALOG-CONTROL, of the ISOLATED ANALOG PROGRAMMER connector, J4, to Pin-2 to enable remote control.
5. Program the other parameters to the desired limit values.

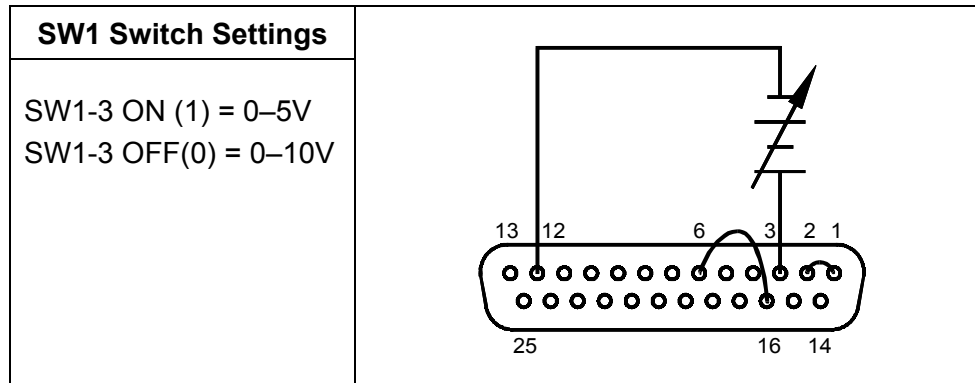
2.3.2 Voltage Source Programming of Output Current



Set up for voltage source programming of the output voltage as follows:

1. Set SW1-2, I PROG, to ON (1) for 0-5VDC programming range.
2. Set SW1-1, V PROG, to OFF (0) for 0-10VDC programming range.
3. Connect the external programming voltage source to the ISOLATED ANALOG PROGRAMMER connector, J4, with positive to Pin-10 and negative to Pin-12.
4. Connect Pin-1, ANALOG-CONTROL, of the ISOLATED ANALOG PROGRAMMER connector, J4, to Pin-2 to enable remote control.
5. Program the other parameters to the desired limit values.

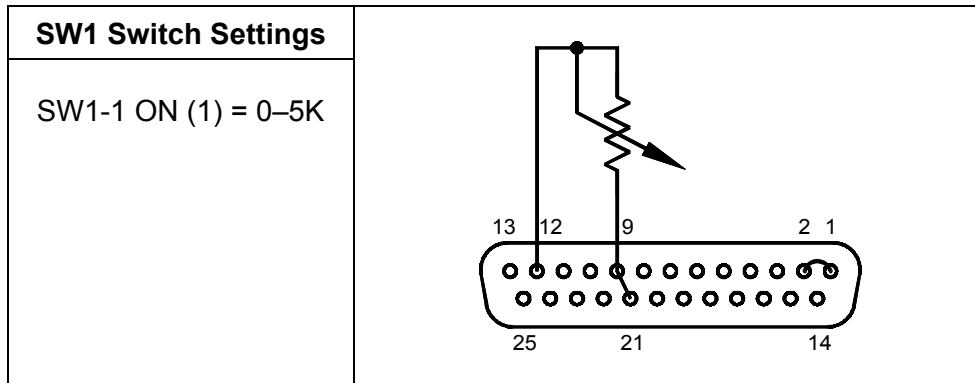
2.3.3 Voltage Source Programming of OVP



Set up for voltage source programming of OVP as follows:

1. Set SW1-3, OVP PROG, to ON (1) for 0-5VDC programming range.
2. Set SW1-3, OVP PROG, to OFF (0) for 0-10VDC programming range.
3. Connect the external programming voltage source to the ISOLATED ANALOG PROGRAMMER connector, J4, with positive to Pin-5 and negative to Pin-12.
4. Connect Pin-1, ANALOG-CONTROL, of the ISOLATED ANALOG PROGRAMMER connector, J4, to Pin-2 to enable remote control.
5. Connect Pin 16, OVP RESISTANCE PROGRAMMING OUTPUT, of the ISOLATED ANALOG PROGRAMMER connector, J4, to Pin 6 to disable the default OVP programming connection.
6. Program the other parameters to the desired limit values.

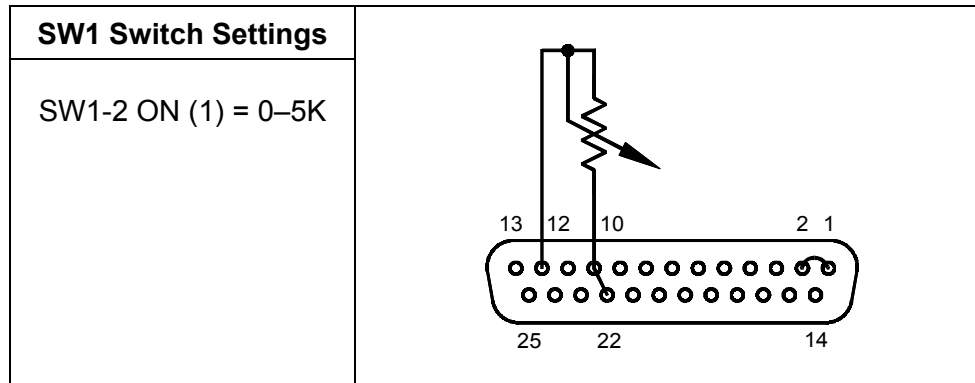
2.3.4 Resistance Programming of Output Voltage



Set up for resistance programming of the output voltage as follows:

1. Set SW1-1, V PROG, to ON (1) for 0-5VDC programming range.
2. Connect the external programming resistance, 0-5k Ω , to the ISOLATED ANALOG PROGRAMMER connector, J4, from Pin-9 to Pin-12.
3. Connect a jumper from Pin-21 to Pin-9 to connect the 1mA current source.
4. Connect Pin-1, ANALOG-CONTROL, of the ISOLATED ANALOG PROGRAMMER connector, J4, to Pin-2 to enable remote control.
5. Program the other parameters to the desired limit values.

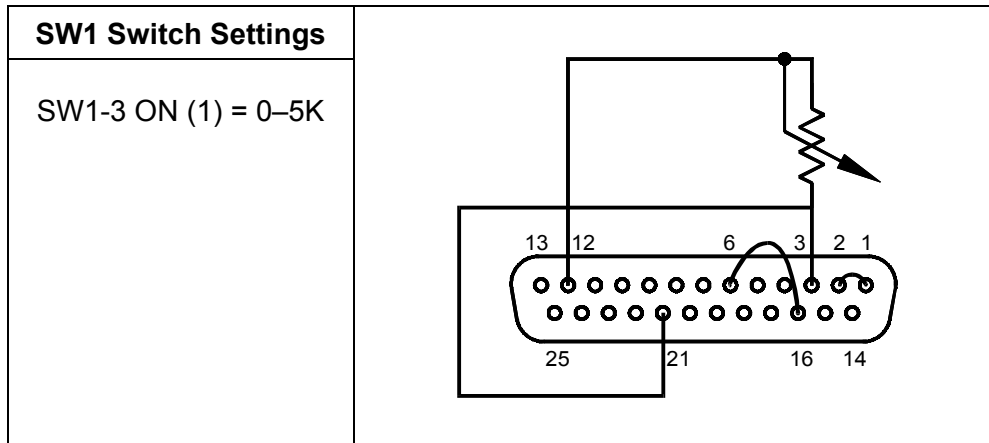
2.3.5 Resistance Programming of Output Current



Set up for resistance programming of the output current as follows:

1. Set SW1-2, I PROG, to ON (1) for 0-5VDC programming range.
2. Connect the external programming resistance, 0-5k Ω , to the ISOLATED ANALOG PROGRAMMER connector, J4, from Pin-10 to Pin-12.
3. Connect a jumper from Pin-22 to Pin-10 to connect the 1mA current source.
4. Connect Pin-1, ANALOG-CONTROL, of the ISOLATED ANALOG PROGRAMMER connector, J4, to Pin-2 to enable remote control.
5. Program the other parameters to the desired limit values.

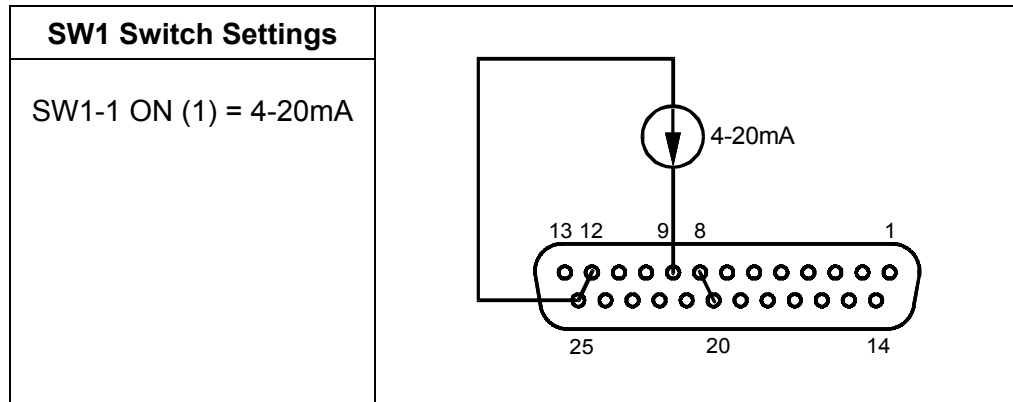
2.3.6 Resistance Programming of OVP



Set up for resistance programming of the output voltage as follows:

1. Set SW1-3, OVP PROG, to ON (1) for 0-5VDC programming range.
2. Connect the external programming resistance, 0-5K Ω , to the ISOLATED ANALOG PROGRAMMER connector, from Pin-3 to Pin-12.
3. Connect a jumper from Pin-3 to Pin-21 or Pin-22, (whichever one is available) to connect the 1mA current source.
4. Connect Pin-1, ANALOG-CONTROL, of the ISOLATED ANALOG PROGRAMMER connector, J4, to Pin-2 to enable remote control.
5. Program the other parameters to the desired limit values.
6. Connect Pin-16, OVP Default Programming Input, of the ISOLATED ANALOG PROGRAMMER connector (J4) to Pin-6 to disable the default OVP programming connection.

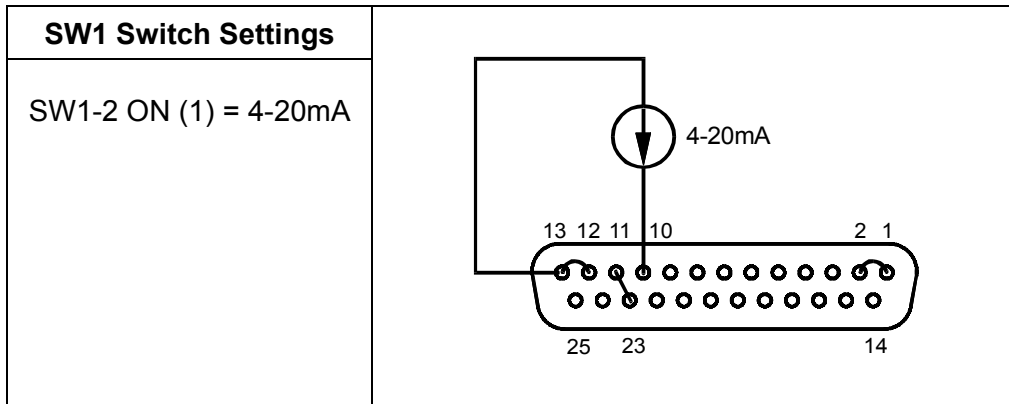
2.3.7 4-20mA Current Source Programming of Output Voltage



Set up for 4-20 mA programming of the output voltage as follows:

1. Set SW1-1, V PROG, to ON (1) for 4-20mA programming range.
2. Connect the external programming current source to the ISOLATED ANALOG PROGRAMMER connector, J4, with the source to Pin-9 and the return to Pin-25.
3. Connect a jumper from Pin-25 to Pin-12 to connect the 4-20mA current sense resistors to common.
4. Connect a jumper from Pin 20 to Pin 8 to provide the negative 2.5VDC to zero out the 4mA signal generated by internal circuits.
5. Connect Pin-1, ANALOG-CONTROL, of the ISOLATED ANALOG PROGRAMMER connector, J4, to Pin-2 to enable remote control.
6. Program the other parameters to the desired limit values.

2.3.8 4-20mA Current Source Programming of Output Current



Set up for 4-20 mA programming of the output current as follows:

1. Set SW1-2, I PROG, to ON (1) for 4-20mA programming range.
2. Connect the external programming current source to the ISOLATED ANALOG PROGRAMMER connector, J4, with the source to Pin-10 and the return to Pin-13.
3. Connect a jumper from Pin-13 to Pin-12 to connect the 4-20mA current sense resistors to common.
4. Connect a jumper from Pin 23 to Pin 11 to provide the negative 2.5VDC to zero out the 4mA signal generated by internal circuits.
5. Connect Pin-1, ANALOG-CONTROL, of the ISOLATED ANALOG PROGRAMMER connector, J4, to Pin-2 to enable remote control.
6. Program the other parameters to the desired limit values.

2.3.9 Programming the Shutdown Function

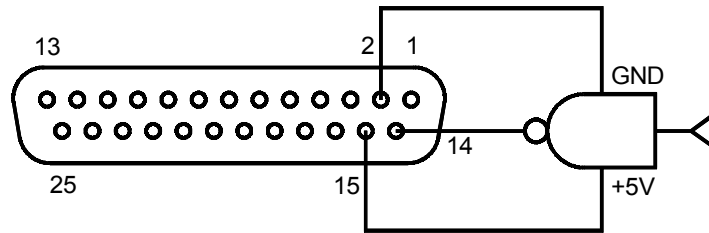


Figure 2–2. Using Shutdown with a DC Input (Positive Logic)

2.3.10 TTL Shutdown

Set up for Shutdown input signal as follows:

1. Connect the shutdown signal source to the ISOLATED ANALOG PROGRAMMER connector, J4, with positive to Pin-14 and the return to Pin-2.
2. Set switch SW1-6 to select the desired logic as defined in the following table.

Switch SW1-6 Setting	Signal Level	Output Condition
OFF (0) = Negative Logic	Low	OFF
	High	ON
ON (1) = Positive Logic	High	OFF
	Low	ON

2.3.11 Shutdown Application – Contact Closure

An external relay, whether normally open or normally closed, may be used to activate the Shutdown circuit. Either positive or negative logic may be used.

Set up for Shutdown input signal as follows:

1. Connect one side of the external relay to pin 15 (+16 VDC Auxiliary Output) on connector J4. Connect the other side of the relay to pin 14 (Remote Shutdown Input).
2. Set rear panel DIP switch SW1-6 to select the desired circuit logic as defined in the following table.

Relay	Switch SW1-6 Setting	Relay Coil State	Output
Normally Open Relay	ON (1) (Positive Logic)	Energized	OFF
		De-energized	ON
	OFF (0) (Negative Logic)	Energized	ON
		De-energized	OFF
Normally Closed Relay	ON (1) (Positive Logic)	Energized	ON
		De-energized	OFF
	OFF (0) (Negative Logic)	Energized	OFF
		De-energized	ON

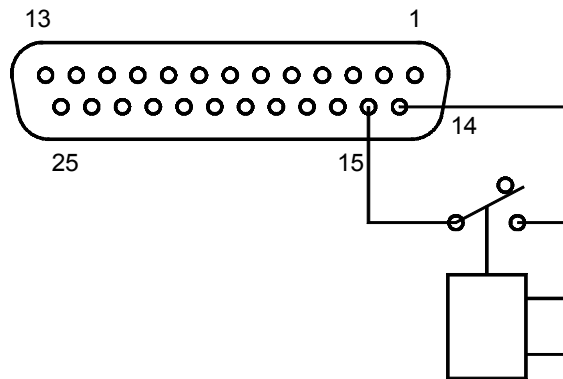


Figure 2–3. Using Shutdown with Contact Closure of a Normally OPEN Relay (SW1-6 ON)

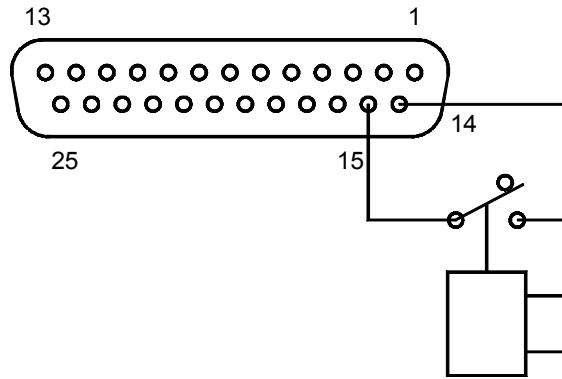


Figure 2-4. Using Shutdown with Contact Closure of a Normally OPEN Relay (SW1-6 OFF)

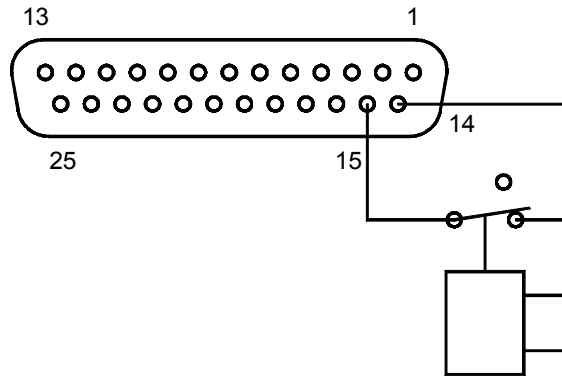


Figure 2-5. Using Shutdown with Contact Closure of a Normally CLOSED Relay (SW1-6 ON)

2.3.12 Local/Remote Application

An external relay or switch may be used to select the Local/Remote function.

1. Connect one side of the contacts to Pin-15 (+16 VDC Auxiliary Output) on connector J4. Connect the other contact to Pin-2. Connect the wiper to Pin-1, Analog Control Input.
2. Remote operation results when Pin-1 is low (Pin 1-2) and local supply operation results when Pin-1 is high (Pin1-15).

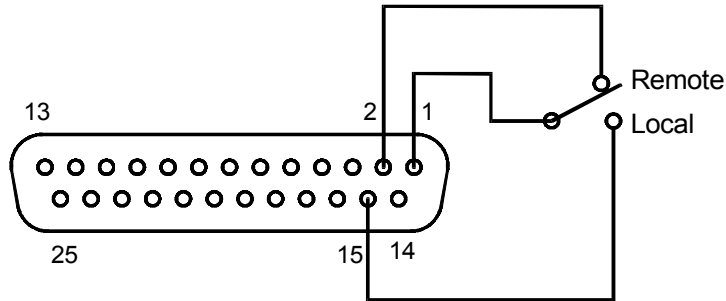


Figure 2–6 Using Local/Remote Operation with Contact Closure

2.4 Remote Monitoring

Analog signals are available for monitoring the output voltage and current. These signals vary proportionally to the output parameters, and have user selectable ranges of 0-5VDC, 0-10VDC, or 4-20mA for an output change from zero to full scale. Refer to Table 2–3 for information on configuring the monitors.

Output Monitor Signal	Isolated Analog Programmer Connector J4		SW1 SETUP Switch		Signal Range
	Signal	Return	Position	Setting	
Voltage	Pin-19	Pin-12	4 - V MON	ON (1)	0-10VDC
Voltage	Pin-19	Pin-12	4 - V MON	OFF (0)	0-5VDC
Voltage	Pin-4	Pin-12	N/A	N/A	4-20mA
Current	Pin-7	Pin-12	5 - I MON	ON (1)	0-10VDC
Current	Pin-7	Pin-12	5 - I MON	OFF (0)	0-5VDC
Current	Pin-24	Pin-12	N/A	N/A	4-20mA

Table 2–3. Remote Monitoring

2.5 Remote Digital Status Signals

Digital signals are available for remote monitoring the operational status of the unit. Refer to Table 2–4 for information on the characteristics of the signals.

Status Indicator Signal	Isolated Analog Interface Connector J4		Logic Levels (with No Signal Output Current)		Output Resistance
	Signal	Return	Asserted	Not Asserted	
VOLTAGE-MODE	Pin-5	Pin-6	5V	0V	1k Ω
OVP	Pin-17	Pin-6	5V	0V	1k Ω
FAULT	Pin-18	Pin-6	5V	0V	1k Ω

Table 2–4. Remote Digital Status Signals

This page intentionally left blank.