

1412

# 80W Triple Range Switching DC Power Supply

# User Manual





## Safety Summary

The following safety precautions apply to both operating and maintenance personnel and must be observed during all phases of operation, service, and repair of this instrument. Before applying power, follow the installation instructions and become familiar with the operating instructions for this instrument.

### ***GROUND THE INSTRUMENT***

To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. This instrument is grounded through the ground conductor of the supplied, three-conductor ac power cable. The power cable must be plugged into an approved three-conductor electrical outlet. Do not alter the ground connection. Without the protective ground connection, all accessible conductive parts (including control knobs) can render an electric shock. The power jack and mating plug of the power cable meet IEC safety standards.

### ***DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE***

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

### ***KEEP AWAY FROM LIVE CIRCUITS***

Instrument covers must not be removed by operating personnel. Component replacement and internal adjustments must be made by qualified maintenance personnel. Disconnect the power cord before removing the instrument covers and replacing components. Under certain conditions, even with the power cable removed, dangerous voltages may exist. To avoid injuries, always disconnect power and discharge circuits before touching them.

### ***DO NOT SERVICE OR ADJUST ALONE***

Do not attempt any internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.





## ***DO NOT SUBSTITUTE PARTS OR MODIFY THE INSTRUMENT***

Do not install substitute parts or perform any unauthorized modifications to this instrument. Return the instrument to Global Specialties (Cal Test Electronics) for service and repair to ensure that safety features are maintained.

### **WARNINGS AND CAUTIONS**

**WARNING** and **CAUTION** statements, such as the following examples, denote a hazard and appear throughout this manual. Follow all instructions contained in these statements.

A **WARNING** statement calls attention to an operating procedure, practice, or condition, which, if not followed correctly, could result in injury or death to personnel.

A **CAUTION** statement calls attention to an operating procedure, practice, or condition, which, if not followed correctly, could result in damage to or destruction of parts or the entire product.

#### **WARNING**

Do not alter the ground connection. Without the protective ground connection, all accessible conductive parts (including control knobs) can render an electric shock. The power jack and mating plug of the power cable meet IEC safety standards.

#### **WARNING**

To avoid electrical shock hazard, disconnect power cord before removing covers. Refer servicing to qualified personnel.

#### **CAUTION**

Before connecting the line cord to the AC mains, check the rear panel AC line voltage indicator. Applying a line voltage other than the indicated voltage can destroy the AC line fuses. For continued fire protection, replace fuses only with those of the specified voltage and current ratings.



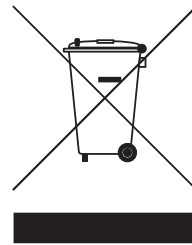


## CAUTION

This product uses components which can be damaged by electro-static discharge (ESD). To avoid damage, be sure to follow proper procedures for handling, storing and transporting parts and subassemblies which contain ESD-sensitive components.

## Compliance Statements

Disposal of Old Electrical & Electronic Equipment (Applicable in the European Union and other European countries with separate collection systems). This product is subject to Directive 2012/19/EU of the European Parliament and the Council of the European Union on waste electrical and electronic equipment (WEEE), and in jurisdictions adopting that Directive, is marked as being put on the market after August 13, 2005, and should not be disposed of as unsorted municipal waste. Please utilize your local WEEE collection facilities in the disposition of this product and otherwise observe all applicable requirements.





# 1 General Information

## 1.1 Product Overview

The Global Specialties model 1412 is a general purpose triple range DC power supply. This multi-range switching mode power supply is like having three power supplies in one. You can set the current limiting value without any connected load or shorting the output terminal.

The modular design with additional rear output terminals and Master & Slave control allow for connecting additional Slave units. User preset upper voltage limit ensures complete protection to voltage sensitive loads. Remote sensing and 4-digit LED meters give precise voltage at the load point.

This power supply is well suited for a wide variety of electrical and electronics applications in service shops, engineering labs, production facilities, school laboratories, and home use.

### Features:

- 80 W
- Three selectable ranges: 0-16 V/5 A, 0-27 V/3 A, 0-36V/2.2 A
- Remote sensing for accurate applied voltage at load point
- Compact, lightweight, and slim tower housing for limited bench space
- Constant voltage (CV) and constant current (CC) operation
- 4-Digit LED displays
- Front/Rear output terminals

## 1.2 Package Contents

Please inspect the instrument mechanically and electrically upon receiving it. Unpack all items from the shipping carton, and check for any obvious signs of physical damage that may



have occurred during transportation. Report any damage to the shipping agent immediately. Save the original packing carton for possible future reshipment.

The 1412 power supply is shipped with the following contents:

- 1412 Power Supply
- User manual
- Output cable
- AC power cord
- Small screw driver

### 1.3 Front Panel Overview

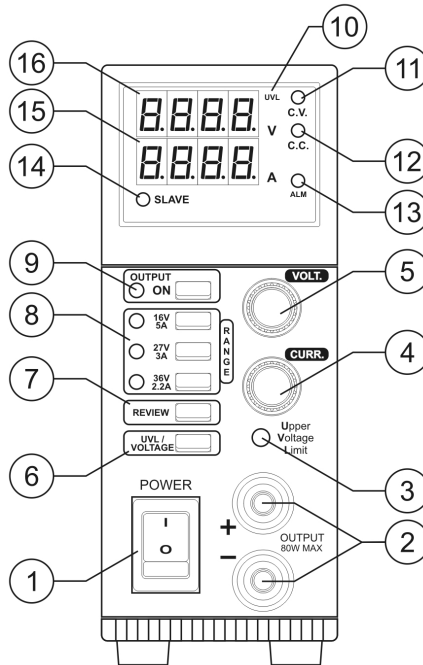


Figure 1.3-1 Front Panel



## Front Panel Controls and Indicators

1. Power On/Off Switch
2. 4 mm Safety Banana Jack Output Terminals
3. UVL (Upper Voltage Limit) Adjustment Screw
4. Current Adjustment
5. Voltage Adjustment
6. UVL Button
7. Review Button
8. Range Selectors
9. Output On/Off Button

## LED Panel

10. UVL Indicator
11. Constant Voltage Indicator
12. Constant Current Indicator
13. Overvoltage or Temperature Alarm
14. Slave Indicator
15. LED Current Display
16. LED Voltage Display





## 1.4 Rear Panel

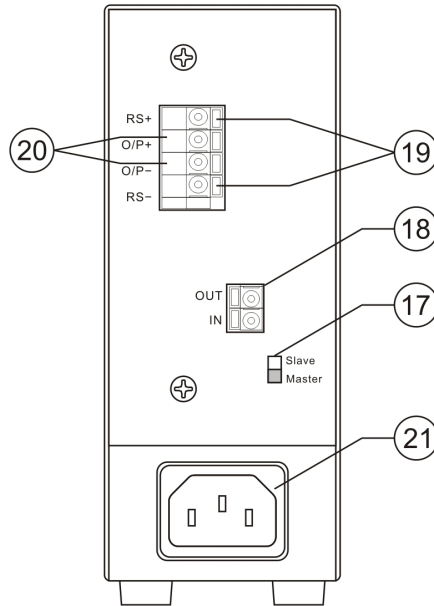


Figure 1.4-1 Rear Panel

### Rear Panel Connectors and Switch

- 17. Master/Slave Switch
- 18. Master/Slave Control Terminals
- 19. Remote Sensing Terminals
- 20. Rear Output Terminals
- 21. AC Power Socket







## 2 Operating the 1412 Power Supply

### 1.1 Plugging in the Unit

The Global Specialties 1412 automatically senses standard power line voltages. There are no switches to set or fuses to change.

### 1.2 Stand Alone Operation

- Set the Master/Slave switch on the back of the unit to the Master position
- Switch on the power supply without any load attached by pushing the Power button. The LED display should light. There should not be any reading on the voltmeter and the ammeter.
- Press the Output On/Off button and its green LED will light up. The voltmeter should now show the previously set output voltage. Use the voltage control knob to adjust the voltage to the desired level.
- Use the Output On/Off button to turn off the output.

#### NOTE

The output will automatically shut off when one of the other voltage/current range selection buttons is pushed. This is to prevent damage to a connected load if the voltage/current values are set too high.

- Press and Hold the Review button to display the previously set voltage and current limiting values. With this button held down, you can set the current limiting value without connecting to a load or shorting the output terminals. Note: The Output button must be in the OFF position.





**NOTE**  
Front and rear output terminals are connected together internally.

### 1.3 Setting the Current Limiting Value

You can set the current limiting value without connecting to the load or shorting the output terminal. Press and hold the Review button and turn the Current Adjustment to your desired value.

### 1.4 Setting the Upper Voltage Limit (UVL) value

The UVL is an added protection for voltage sensitive loads. When the output voltage exceeds the UVL, the output terminal will be turned off automatically and the Alarm LED will light. Only one UVL limit may be set for all three ranges.

1. Press the UVL Button to enter UVL mode. The UVL indicator will light. Insert a small screwdriver into the UVL Adjustment Screw.
2. Turn clockwise to increase the voltage limit and counter-clockwise to decrease the UVL value.

### 1.5 Master & Slave Operation

Two or more units of the 1412 can be connected in parallel to increase output current to the sum of the connected power supplies. In this mode of operation, the designated Master power supply will control all the settings in voltage and current of the Slave power supplies.

1. Set all of the power supplies to the same upper voltage limit (UVL) and voltage/current range.
2. Set the voltage and current limit of all of the slaves to maximum values.





3. Switch off all of the power supplies.
4. Set the Master/Slave switch to the Slave position on all of the Slave units.
5. Connect the power supplies together using the Master/Slave Control Terminals on the back of the units. Note: For proper performance all connecting cables and output cables should be the same gauge and length. See Figure 1.5-1 and Figure 1.5-2.

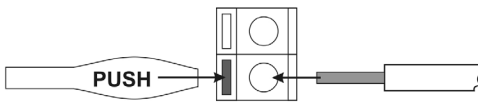


Figure 1.5-1 Back Side Connection

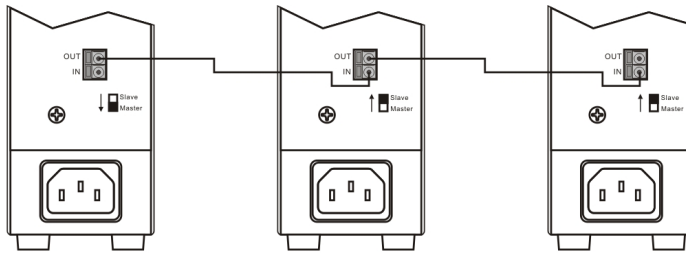


Figure 1.5-2 Master and Slave Connections

6. Using either the output terminals on the front or back of the units, connect the output cables in parallel to the load. See Figure 1.5-3.

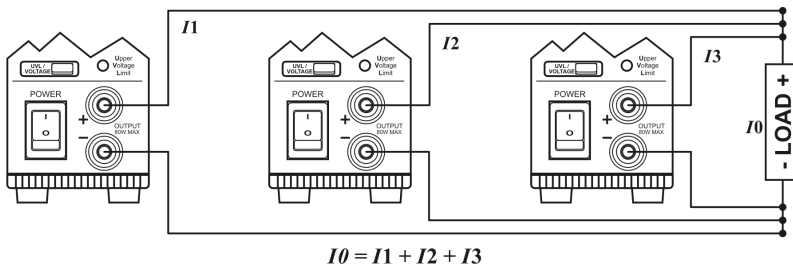


Figure 1.5-3 Load Connections





7. Switch on the Master unit first and set to the desired voltage.
8. Switch on the slave units and the Slave Indicator LED will light to confirm correct connection.
9. All output voltages and currents are now controlled by the Master unit.

#### NOTE

When the output current in the Master & Slave connection drops to zero amps, the output voltage will no longer be controlled by the Master unit. Make sure to keep a minimum current flowing that is at least several percent of the rated current at all times. This can be done by supplying a small removable load.

## 1.6 Remote Sensing Operation

When the output current is high or there is a long connection to the load, there is a voltage drop across the connecting cable such that the voltage at load point is less than at the output terminal of the power supply. By making an extra connection from the remote sensing terminals to the load point, the reading at the output display and load point will match.

### CAUTION

Maintain correct polarity and never short the remote sensing terminals together

1. Connect power supply Output Terminals to the load
2. Connect the Remote Sensing Terminals to the load. Push in on the orange tabs to open the wire clamp





inside the connector.

3. Connect RS+ to the + positive connection at the load.
4. Connect RS- to - negative connection at the load.
5. Note: Always disconnect the Remote Sensing Terminal connections first before the load connections.

### 3 Specifications

All specifications apply to the unit after a temperature stabilization time of 15 minutes over an ambient temperature range of 25 °C ± 5 °C.

<b>Specifications</b>	
<b>Output Ratings</b>	
Max Output Power	80 W
Range 1: 0-16V / 5A	0 - 16.4 V, 0 - 5.1 A
Range 2: 0-27V / 3A	0 - 27.6 V, 0 - 3.1 A
Range 3: 0-36V / 2.2A	0 - 36.8 V, 0 - 2.3 A
Input AC Voltage Range	90 - 264 VAC
<b>Load Regulation</b>	
CC Mode	≤10 mA
CV Mode	≤50 mV
<b>Line Regulation</b>	
CC Mode	≤10 mA
CV Mode	≤4 mV
<b>Ripple &amp; Noise</b>	≤30 mVp-p
<b>Metering Accuracy</b>	
Voltmeter Accuracy	Output ≤5 V ±0.5% +5 counts Output >5 V ±0.5% +3 counts





<b>Specifications</b>	
Ammeter Accuracy	Output $\leq 2$ A $\pm 0.5\%$ +5 counts Output $> 2$ A $\pm 0.5\%$ +3 counts
<b>General</b>	
AC Line Input	90-264 VAC, 47-63 Hz
Efficiency	$\geq 75\%$
Power Factor	$\geq 0.9$
Protection	Adjustable Upper Voltage Limit, Current Limiting Protection, Short Circuit, Overload, Over Temperature Protection
Dimensions (WxHxD)	53.5 x 127 x 330 mm (2 x 5 x 13 in)
Weight	1.9 kg (4.2 lbs)
Operating Environment	10-80% RH Altitude up to 2000 m Pollution degree 2

Specifications are subject to change without notice. To ensure the most current version of this manual, please download the current version from our website: [globalspecialties.com](http://globalspecialties.com).

## 4 Service and Warranty Information

### 1.1 Limited One-Year Warranty

Cal Test Electronics warrants this product to be free from defective material or workmanship for a period of 1 year from the date of original purchase. Under this warranty, Cal Test Electronics is limited to repairing the defective device when returned to the factory, shipping charges prepaid, within the warranty period.

Units returned to Cal Test Electronics that have been subject to abuse, misuse, damage or accident, or have been connected,





installed or adjusted contrary to the instructions furnished by Cal Test Electronics, or that have been repaired by unauthorized persons, will not be covered by this warranty.

Cal Test Electronics reserves the right to discontinue models, change specifications, price, or design of this device at any time without notice and without incurring any obligation whatsoever.

The purchaser agrees to assume all liabilities for any damages and/or bodily injury which may result from the use or misuse of this device by the purchaser, his employees, or agents.

This warranty is in lieu of all other representations or warranties expressed or implied and no agent or representative of Cal Test Electronics is authorized to assume any other obligation in connection with the sale and purchase of this device.

## 1.2 Calibration and Repair

If you have a need for any calibration or repair services, please visit us on the web at: [globalspecialties.com](http://globalspecialties.com). See the “Service” tab. Or contact us via the “Contact” tab. You may also contact us at:

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