Multiple Power Supply
Scientech 4077A

Product Tutorial

Ver.1.1

Designed & Manufactured by:
An ISO 9001:2008 company
Scientech Technologies Pvt. Ltd.
94, Electronic Complex, Pardesipura, Indore - 452 010 India,
✆ + 91-731 4211100, ✉: info@scientech.bz , 🌐: www.ScientechWorld.com

Multiple Power Supply
Scientech 4077A

Safety Instructions

Read the following safety instructions carefully before operating the instrument. To avoid any personal injury or damage to the instrument or any product connected to it.

Do not operate the instrument if suspect any damage to it.

The instrument should be serviced by qualified personnel only.

For your safety:

Use proper Mains cord : Use only the mains cord designed for this instrument. Ensure that the mains cord is suitable for your country.

Ground the Instrument : This instrument is grounded through the protective earth conductor of the mains cord. To avoid electric shock the grounding conductor must be connected to the earth ground. Before making connections to the input terminals, ensure that the instrument is properly grounded.

Observe Terminal Ratings : To avoid fire or shock hazards, observe all ratings and marks on the instrument.

Use only the proper Fuse : Use the fuse type and rating specified for this instrument.

Use in proper Atmosphere : Please refer to operating conditions given in the manual.

1. **Do not operate in wet / damp conditions.**
2. **Do not operate in an explosive atmosphere.**
3. **Keep the product dust free, clean and dry.**

Scientech 4077A

Introduction

The **Scientech 4077A Multiple Power Supply** has been designed as a constant current (CC) and constant voltage (CV), source for laboratories, industries and field testing applications, featuring low power loss, compact and lightweight. It provides three floating independent DC output voltages and is ideally suitable for complex analog and digital testing.

The DC outputs 0- 32V and 0 ±15V Dual Track, can be continuously adjusted, with coarse and fine controls. The other DC output 5V also can be adjusted between 4.0V and 6.0V. Current limit is also adjustable for all outputs. Any over loading for adjusted current limit, is indicated by OR LED. When the maximum setting is crossed or the overheating has occurred, the OR LED will lit up.
Two displays (one 3-digit display for voltage & other 3-digit for current) are used to read the instantaneous values. These two displays can be switched simultaneously for either of the DC outputs. It has low residual ripple and noise, as well as excellent line and load regulation. The **Scientech 4077A Multiple Power Supply** is provided with all protective circuits to ensure trouble free operation

Scientech 4077A

Features

- **Three floating, independent DC supply voltages**
- **DC Outputs**

  A: 0 -32V, 2A

  B: 5V, 5 Amps

  C: 0 ± 15V (Dual Tracking) /1A each
- **Constant voltage and constant current operation**
- **Short circuit protection**
- **Digital display for voltage and current**
- **Adjustable current limiter**

Technical Specifications

DC Output	: **A:** 0-32V, 2A **B:** 5V (4.0V to 6.0V), 5A **C:** 0 to ± 15V Dual Tracking, 1A
DC Output A	
DC Output	: 0-32V, continuous variable by means of coarse & fine controls
Output Current	: 2A (maximum)
Current Limit	: Adjustable between 100 mA to 2A
DC Output B	
DC Output	: 5V, adjustable from 4.0V – 6.0V for specific applications.
Output Current	: 5A (maximum)
Current Limit	: Adjustable between 100mA to 5A
DC Output C	
DC Output	: 0 to ± 15V, adjustable by means of coarse and fine controls
Output Current	: 1A
Current Limit	: Adjustable between 100mA to 1A
Tracking Error	: ± (0.1 % + 5mV)
Other Information for all outputs	: (32V/2A, 5V/5A, ± 15V/1A)
Setting Resolution	: Voltage: 10mV Current: 2mA
Internal Resistance	: ≤15mΩ
Stability	: ≤ 2.5mV
Recovery Time	: ≤ 50 µs
Load & Line Regulation	: ≤ 0.05%
Temperature Coefficient	: ≤ 0.05% + 5 mV/°C
Ripple & Noise	: ≤ 1mVrms
Display	: 3digits for voltage, 3 digits for current LED indication for voltage & current
Accuracy	: ± (1% rdg + 1 dgt)

Scientech 4077A

General Information:

Built in over voltage, overload, overheat & short circuit protection.

All outputs are floating.

Insulation:

Between chassis and output terminal	**:**	> 10 MΩ at 100VDC
Between chassis and AC plug	**:**	> 50 MΩ at 500VDC
Power Supply	**:**	230 V AC ± 10% 50Hz
Operating Conditions	**:**	0 - 40^0 C; 90% RH
Dimension	**:**	W 285 x H 75x D 385 mm
Weight	**:**	5.5 Kgs. (approximately)

(Subject to Change)

Scientech 4077A

Front Panel Controls

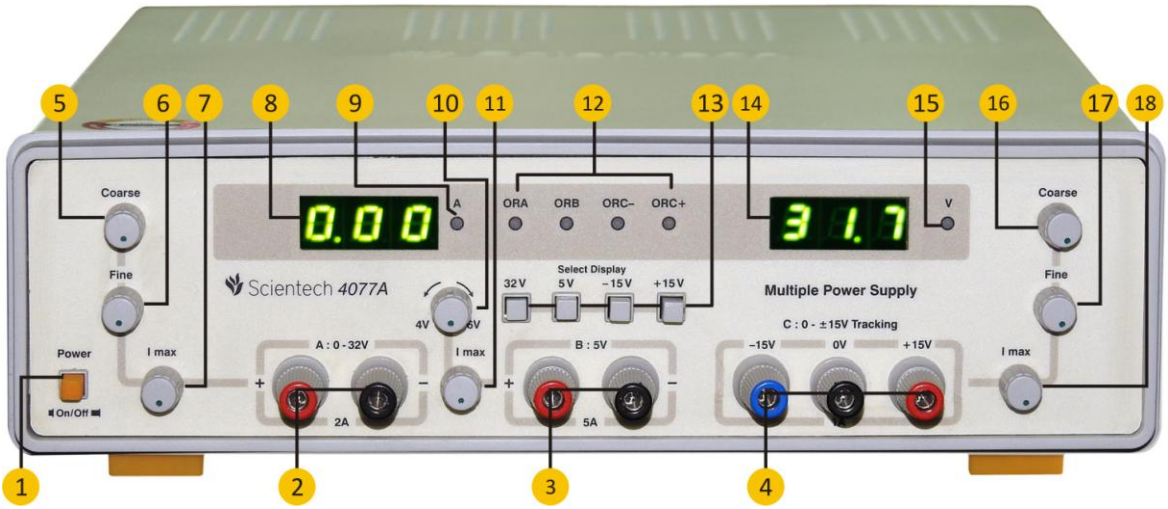

Figure 1

1 **Power:** Push button switch for supplying power to instrument.

2 **A: 0 - 32V (4mm banana terminals):** Output terminals for 4mm banana plugs or cable connection. The output voltages are short circuit protected.

3 **B: 5V (4.0V – 6.0V) (4mm banana terminals):** Output terminals for 4mm banana plugs or cable connection for 5V output. The output voltages are short circuit protected.

4 **C: 0 - ±15V Dual Tracking (4mm banana terminals):** Output terminals for 4mm.banana plugs or cable connection. 0 to + 15V output is "Master" and 0 to -15V output is "Slave", which tracks the output voltage of Mater. The output voltages are short circuit protected. .

5 & 17 **Coarse (adjusting knob):** For the coarse setting of the output voltages at A & C respectively. Adjustment range: 0-32V and 0 - ±15V respectively.

6 & 18 **Fine (adjusting knob):** For the fine settings of the output voltage for A & C output terminals. Adjustment range approximately 2.1V & 1V respectively.

7 & 16 **I max (Adjusting knob):** For current limit setting of the outputs A & C respectively. Adjustment range 100mA -2A & 20mA - 1A each.

8 & 14 **Digital Display (7-segment LED):** 3-digit readout for output voltage and 3-digit readout for output current.

9 **4.0V – 6.0V**: Adjustment for setting the output voltage of the source B from 4.0V to 6.0V.

10 & 15 **V & A Indicators:** Two LEDS indicate the unit of the display.

11 **I max**: For current limit setting of the output B Adjustment range 100mA - 5A.

12 **Select Display (Push Buttons):** Four push buttons can be pressed one at a time. When pressed each selects both displays (Voltage & Current) simultaneously for the respective voltage source to show the instantaneous values.

13 **ORA, ORB, ORC-, ORC+ (Overload indicators):** LEDs for overload indication for respective DC outputs are provided. In case of overheating or output current in excess of set limit corresponding OR LED lits up.

19. **Reset Switch:** The output voltage is cut off during the conditions of overload. By pressing the Reset switch, the normal operating conditions are restored.

Operating Instructions

General Information:

The logical front panel layout of **Scientech 4077A** makes it easy to become familiar with the operation of the instruments. However, even experienced users should read the following instructions thoroughly before using the instrument.

After unpacking the instrument, check for any mechanical damage or loose parts inside. Should there be any transportation damage, inform the supplier immediately and do not put the instrument into operation.

Safety:

The case chassis and all measuring parts are connected to the protective earth contact of the inlet. The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. The protective action must not be negated by the use of an extension cord without a protective Conductor.

Warning !

Any interruption of the protective conductor inside or outside the instrument or disconnection of the protective earth terminal is likely to make the instrument dangerous. Intentional interruption is prohibited. The mains/line plug should be inserted before connections are made to measuring circuits.

When removing the metal case or replacing, the instrument must be completely disconnected from the mains supply. If any measurement or calibration procedures are unavoidable on the opened-up instrument, these must only be carried out by qualified personnel acquainted with the danger involved.

Operating Conditions:

The ambient temperature range during operation should be between 0° - 40°C; 90% RH and should remain within -20°C & + 70°C during transportation or storage. The operational position is optional; however, the ventilation holes on the **Scientech 4077A** must not be obstructed. Prior to calibration a preheat run of approximately 30 minutes is required.

First Time Operation:

After unpacking the instrument check for any mechanical damages. The instrument should be plugged in mains-plug of proper mains supply 230V ± 10%. Switch on the instrument. The power ‘On’ is indicated by lighting of displays.

Operation:

The Multiple Power Supply Scientech 4077A has three electrically isolated supply voltages. This permits easy series connection of output voltages. In case of series connection the maximum output voltage increases with a maximum current of 2Amp.

In the dual tracking supply, the negative (slave) Power Supply tracks the positive (master) supply voltage with 1% tracking error. The current limit setting is also common for both due to overload, if "Master" output voltage falls. The "Slave" will track it. But if "Salve" gets overloaded "Master" will not track the "Slaves" output voltage.

Functional Checks

The **Scientech 4077A** should regularly be tested to assure proper functioning. The following test checks out the power supplies performance and suggestions for adjusting specific values. The adjustment will only be meaningful if the below indicated or equivalent instruments are used. Prior to the functional test or adjustment, the instrument should be on for at least 30 minutes.

Measuring Instruments required:

1. 4 ½ Digit DMM
2. Scientech 801 or equivalent
3. Rheostat: 100Ω- 2A and 17Ω- 5.5A.

Test Procedure:

A. 0-32V DC output

1. **Check of maximum DC output voltage:** Set the Coarse and Fine knobs to maximum, the maximum DC output reading should be between 31V and 33V. This also can be verified on DMM.
2. **Check of minimum DC output voltage:** Set the Coarse and Fine knobs to minimum, the minimum DC output reading should be 00.0 Volts, which when measured on DMM will be approximately 25mV. for load resistor of <10KΩ.
3. **Check of minimum current limit setting:** Set 32VDC output to 10V & short circuit the output terminals. Adjust current limit knob I maximum to minimum the reading on the display should be <100mA.
4. **Check of maximum output current:** Set the DC output voltage to 10V. Short-circuit the output terminals. Adjust the I max current limit knob to maximum, the reading on the display, should be between 2.01A and 2.2A.
5. **Check of over load indicators:** Set the instrument as in step 3 or 4. When the output terminals are short circuited, "ORA" LED should lit.
6. **Check of residual ripple and noise:** Connect any load on DC output 0-32V, and adjust the I max, to maximum (maximum to 2000 mA), and check the ripple and noise on DMM. It should not be more than 1mVrms.

B. 5V DC output:

1. **Check of maximum DC output voltage:** Set 4.0V-6.0V knob to maximum The maximum DC output voltage should be ≥ 6.0V, when measured on the DMM.
2. **Check of minimum DC output voltage:** Set 4.0V – 6.0V knob to minimum The minimum DC output voltage should be ≤ 4.0 V, when measured on DMM.
3. **Check of maximum output current:** Set the current limit knob "I maximum" to 5V maximum Short circuit the output terminals. The reading on the current display should be 5. 1A or 5.2A

4. **Check of minimum output current:** Set the current limit knob "I maximum" to minimum Short circuit the output terminals. The reading on the current display should be ≤ 100mA.

5. **Check of over load indicators:** When the output terminals are short circuited, OR LED should lit.

6. **Check of residual ripple and noise:** Connect a suitable load, so that 5000 mA current flows through it check the ripple and noise on the Oscilloscope, it should be less than 1mVrms.

C. 0 - ± 15V Dual Tracking output:

1. **Check of maximum DC output voltage:** Set the Coarse and Fine knobs of this section to maximum Select display for +15V, then -15V. The maximum output voltage reading should be between 15.5V and 16.5V in both +15V & -15V sections, which also can be verified on DMM.

2. **Check of minimum DC output voltage:** Set the Coarse and Fine knobs of this section to minimum the minimum DC output reading should be 00.0 V for both +15V & -15V, which when measured on DMM will be <25 mV for load resistor of <10KΩ.

3. **Check of maximum tracking error:** Set 0 to +15V output to maximum by the "Coarse & Fine" Controls. Now Check that difference between output voltages at positive and negative output terminals (with respect to common) is not more than 0.15V.

4. **Check of minimum current limit setting:** Set the output to ± 10V. Adjust the current limit knob I maximum to minimum Short circuit all the three terminals of this section. Select display for +15V section then for -15V section. The reading on the display should be ≤100mA.

5. **Check of maximum output current:** Set the output to ±10V. Adjust the current limit knob I maximum to maximum Short circuit all the three terminals of this section. Select display for +15V section then for-15V section. The reading on the display should be between 1.01A and 1.1A in both cases.

6. **Check of over load indicators:** When, +, terminal is shorted to common terminal, the "ORC+" LED should lit. When '-' terminal is shorted to common terminal, the "ORC-" LED should lit.

7. **Check of residual ripple and noise:** Set the I maximum, to maximum Connect two equal loads of any value to both '+' and '-' outputs with respect to common terminal. Check the ripple and noise on DMM. It should not be more than 1mVrms in both the sections.

Warranty

1. We guarantee this product against all manufacturing defects for 12 months from the date of sale by us or through our dealers.
2. The guarantee will become void, if
   a) The product is not operated as per the instruction given in the operating manual.
   b) The agreed payment terms and other conditions of sale are not followed.
   c) The customer resells the instrument to another party.
   d) Any attempt is made to service and modify the instrument.
3. The non-working of the product is to be communicated to us immediately giving full details of the complaints and defects noticed specifically mentioning the type, serial number of the product and date of purchase etc.
4. The repair work will be carried out, provided the product is dispatched securely packed and insured. The transportation charges shall be borne by the customer.

List of Accessories

1. Mains Cord ..... 1 No.
2. Product Tutorial (CD) ..... 1 No.