User Manual

Switching Mode Power Supply with USB Remote Control

MP710079
MP710079 US

MP710080
MP710080 US

MP710081
MP710081 US
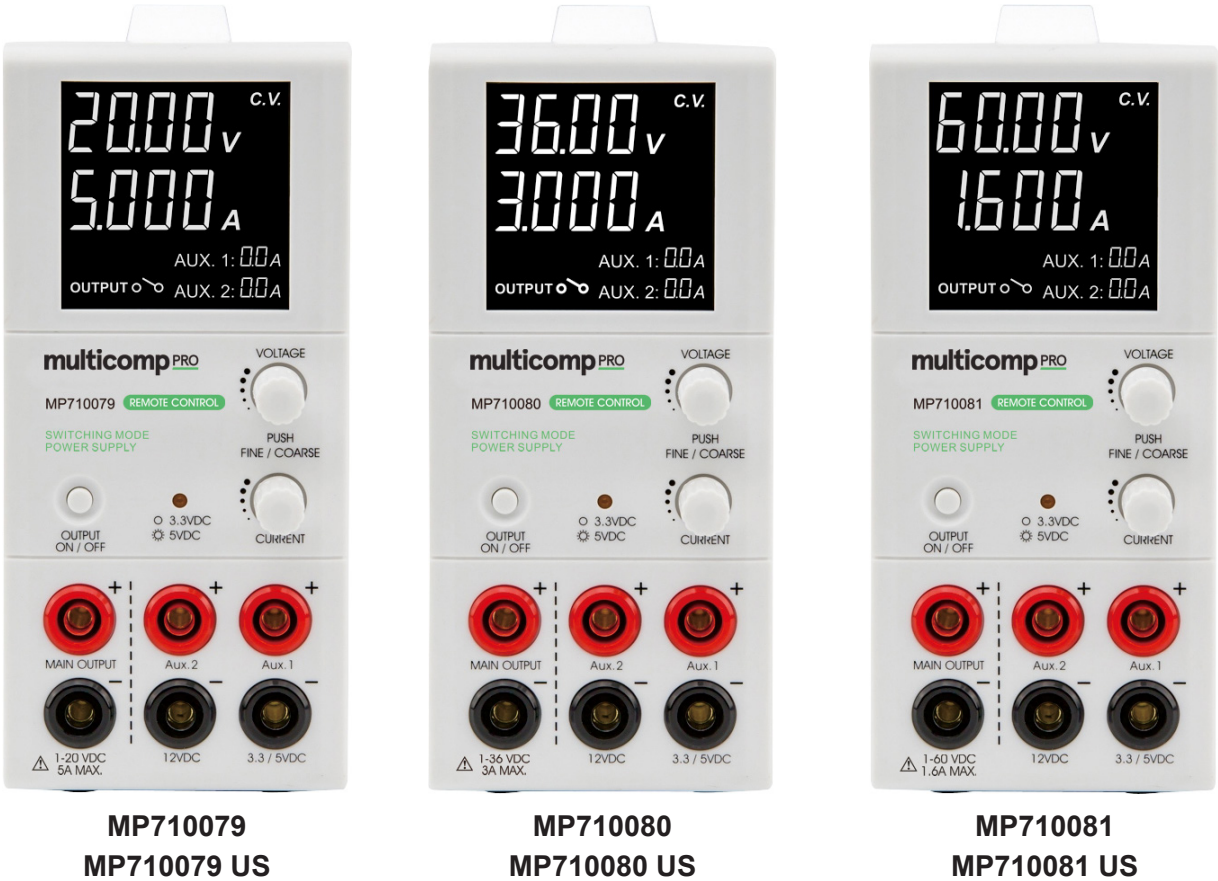
Part Number: MP710079; MP710080; MP710081; MP710079 US; MP710080 US; MP710081 US

Introduction

This series of 100W Switching Mode Power Supplies with Current Limiting Control is designed with the objectives of high accuracy, compactness and easy portability. Rotary encoder tuning with MCU are used for voltage and current control. 4 digit display LCD of voltage and current for high precision.

This power supply is ideal for trouble shooting circuit boards or devices which require two or three different input voltages such as 3V or 5V, 12V and 1-36V. This power supply can provide 3 outputs at the same time.

All three outputs are fully isolated so different cross connections of 2 or 3 outputs can provide various fixed or variable output voltages. Any output can be connected for positive or negative polarity.

Features

- Remote Programmable via USB
- 4 Digit Display with 10mV & 10mA resolution
- 3 isolated outputs with 1 x variable, 2 x isolated fixed

Controls and Indicators
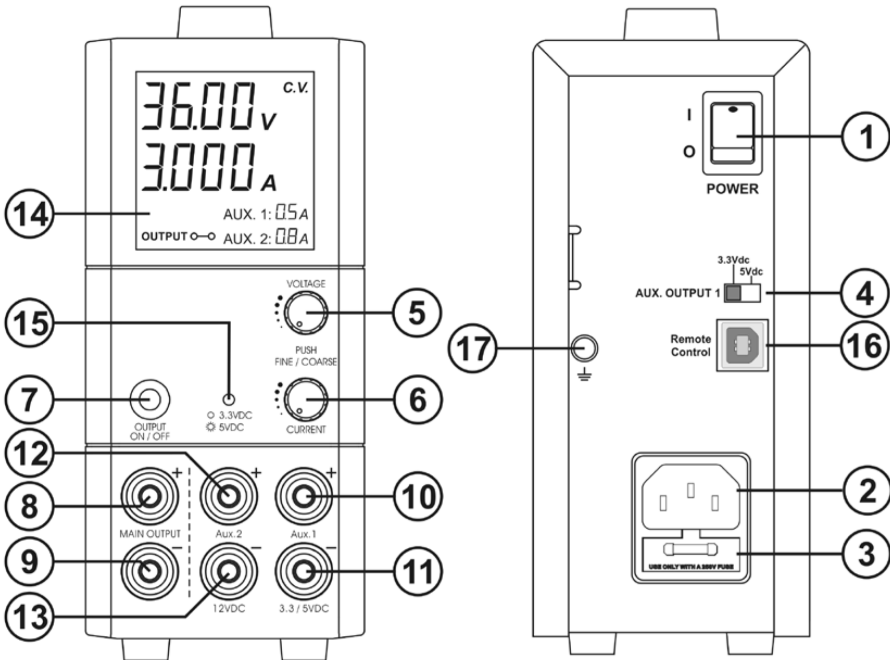
1. Power Switch:
   - Turns the power supply on–off, when it is on the front display lights up.
2. AC Input Socket with Fuse
3. Concealed Fuse box (ply open the cover to get to the fuse)
4. 3.3V/5VDC selection switch (for Aux output 1)
5. Output Voltage Tuning knob. (Quick push the knob to toggle the coarse and fine tuning)
6. Output Current Tuning knob. (Quick push the knob to toggle the coarse and fine tuning)

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7. Output On/Off push button
- For Main output: Quick push this button to turn the Main output ON/OFF
- For Main output & Aux outputs: Push and hold this button for 3 seconds to turn the Main and Aux outputs OFF, quick push this button again to turn them ON

8. Main Output Terminal Positive (+) Red colour.

9. Main Output Terminal Negative (-) Black co8lour

10. Aux Output 1 Terminal Positive (+) Red colour (3.3V DC or 5V DC selectable)

11. Aux Output 1 Terminal Negative (-) Black colour (3.3V DC or 5V DC selectable)

12. Aux Output 2 Terminal Positive (+) Red colour (Fixed 12V DC)

13. Aux Output 2 Terminal negative (-) Black colour (Fixed 12V DC)

14. LCD Display panel showing:
- 4 digit voltmeter, Ammeter, (CV) constant voltage mode, (CC) constant current mode,
- Output Terminal on/off state Output○⌿○
- 2 digit Aux outputs Ammeter.

15. Aux 1 output voltage indicator

16. USB remote control

17. Ground Terminal

Operations

Basic Mode of Operation

This power supply is designed to operate as a constant voltage source or as a constant current source. Automatic crossover to either mode of operation occurs when the load condition changes as following:

Constant Voltage (CV), Automatic crossover & Constant Current (CC)

The power supply functions as a constant voltage source (CV) as long as the load current is less than the preset current limiting value. When the load current is equal to or greater than the preset current limiting value, the power supply will automatically cross over to the constant current mode, voltage will drop, (CC) will show on the LCD display panel and it will operate as a constant current source.

When the load current drops below the preset current limiting value, the supply returns to constant voltage (CV) mode.

Set the Output Voltage and Presetting Current Limiting Value (CC)

Turning the voltage or current knob to set your desired values.

Quick pushes on the knobs will move the decimal place for fast tuning.

Turn the knob when the desired number column is flashing otherwise you need to repeat quick pushes again.

One quick push on the current knob to see the preset current limiting value.

Aux. output 1 voltage selection

Move the switch (4) at the back of power supply for selection of 3.3 or 5 VDC.

At 3.3VDC setting, indicator (15) is Off

and at 5VDC setting indicator (15) is On.

Connection and Operation Procedure

1. Check the rating label and plug in to AC mains.

2. Switch on the power supply and the LCD display should be on at the same time.

3. The (CV) icon should be shown on the display.

4. Turn to current volume knob (6) to maximum clockwise if you do not require lower Current limiting value, otherwise do the preset the (CC) limiting procedure.

5. Set your desired output voltage and then turn off the output terminal by push button (7).

6. Connect to your load positive to positive and negative to negative.

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7. Turn on the output terminal again and check if display shows (CV).

8. If display shows (CC), either your preset current limiting value is too low or your load requires more voltage and current. You need to re-access the voltage and current requirement of your load and increase the voltage or current accordingly until (CV) appears.

Connecting the 3 outputs (using NTP -6531, 1-36V, 0.25-3A as an example)

All the three outputs are fully isolated from ground and with each other so that it is possible to make cross connections to power a circuit board or device that requires for example: +3 or +5V, +12 V or -12V and 1-36V as shown in Fig.1.

The variable main output is set for 12V and it is assigned as the +12V source (available maximum current 3A)

Note the variable main output can be set for other voltage (1-36V) such as 16V.

The fixed 12V is made as the - 12V source (available maximum current 0.5A)

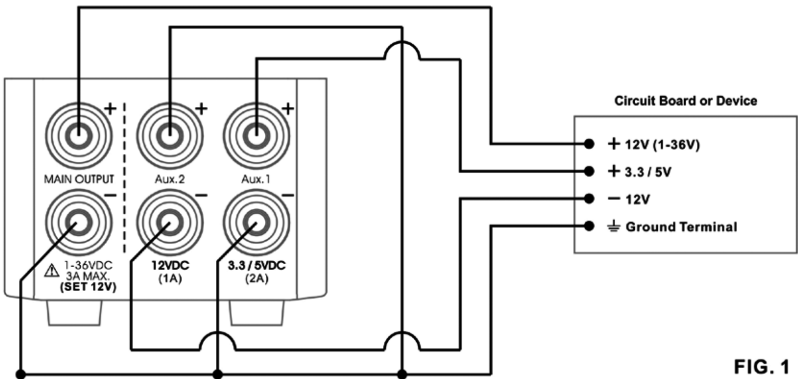The fixed 5V is made as the +5V source. (available maximum current 0.5A)

FIG. 1

DIAGRAM SHOWING CIRCUIT BOARD OR DEVICE

Connecting outputs in series (using NTP-6531 as an example)

You can have a 17V fixed output by connecting the 5V in series with the 12V outputs.

The 2 outputs (Aux.1) can be connected in series to make a variable 5V to 41V with maximum current 2A (Fig. 2)

The 3 outputs can be connected in series to make a variable 17V to 53V with maximum current 1A, (Fig. 3)

There are other combination of cross connections for different positive and negative output voltages.
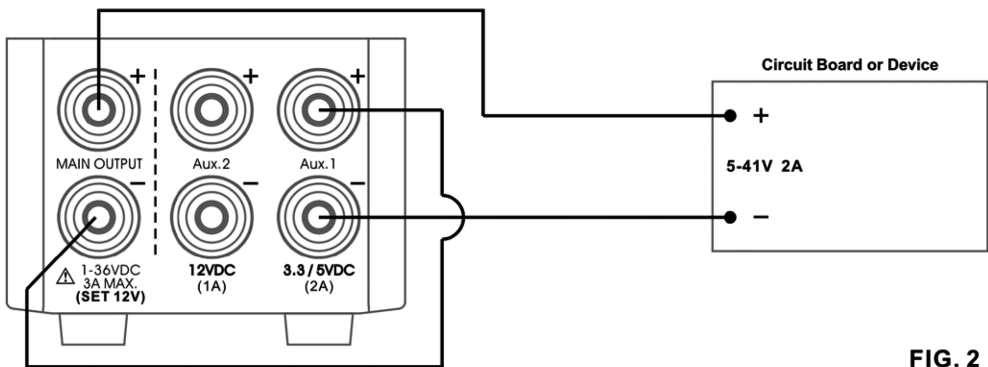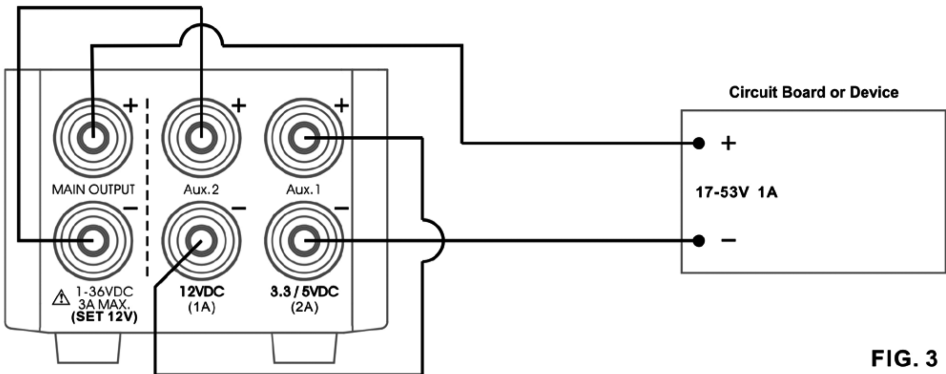

FIG. 2

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FIG. 3

Tracking Output Over Voltage Protection (OVP)

This is to protect the connected load in the event that the output voltage control circuit malfunctions, the maximum output voltage will not exceed 30% of the adjusted voltage value at the time of the operation.

Over Temperature Protection

When the temperature inside the power supply becomes higher than a pre-determined value, the output voltage and current of the power supply will automatically decrease to zero to prevent damage to power supply. When the temperature inside the power supply returns to normal then the power supply will automatically return to operation again.

PC Connection

The NTP with USB can be remote control using Windows PC. Connecting the NTP to PC using provided USB cable as following connection diagram.

For the detail usage of driver and PC software.

Specifications

Part Number	MP710079 MP710079 US	MP710080 MP710080 US	MP710081 MP710081 US
Output Voltage Range	1V DC to 20V DC	1V DC to 36V DC	1V DC to 60V DC
Output Current Range	0.25A to 5A	0.25A to 3A	0.25A to 1.6A
Voltage Regulation			
Load from 10% to 90% Variation	70mV	70mV	70mV
Line from 90 to 264V AC Variation	25mV		
Ripple & Noise (peak to peak)	≤120mV	≤150mV	≤180mV

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Part Number	MP710079 MP710079 US	MP710080 MP710080 US	MP710081 MP710081 US
Current Regulation			
Load from 10% to 90% Variation	50mA		
Line from 90 to 264V AC Variation	20mA		
Ripple & Noise (peak to peak)	≤50mA		
Switching Operation Frequency	50kHz to 150kHz		
Aux output 1	Fixed 3.3 /5V DC. 1.8A cont. 2A Max.		
Aux output 2	Fixed 12V DC, 800mA cont. 1A Max.		
Power Factor	>0.9		
Efficiency at Maximum Power	≥80.5%		
Volt and Amp Control Type	Rotary Encoder		
Voltmeter and Ammeter Display	4 Digit LCD		
Voltmeter Accuracy	5 counts for range V<5V ±0.2% +5 counts for range V≥5V		
Ammeter Accuracy	15 counts for range I≤1A ±0.5% +6 counts for range I>1A		
LCD Indication	CC, CV, Amp, Volt, Output ON-OFF, Aux output current		
Protection	Short Circuit, Overload, Over Temperature, Tracking OVP		
CE Approvals	LVD: EN 61010, EMC: EN 55011		
Cooling System	Natural Convection		
Dimensions (W×H×D)	70mm × 150mm × 250mm / 2.8″ × 6″ × 9.8″		
Input Voltage (Universal input)	100V AC to 240V AC, 50Hz / 60Hz		
Full Load Input Current at 230V AC	0.83A		
Weight	2 kgs		

Caution:

1. Use a grounded 3 pin AC source.
2. This unit is for indoor use only.
3. Do not operate or place this unit in a humid, dusty, in direct sunlight location or near any heat source.
4. Before plugging into local AC mains, check with the rating label at the back of the unit.
5. Do not block any ventilation openings of the unit.
6. This unit must be used within the specified rating, regular excessive continuous loading may cause damage to the power supply.
7. The gauge size of input power cable must be at least 0.75mm2 and the total length of power cable must not exceed 3m.

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Operation Environmental Condition

10-80% R.H.
Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 40°C.
Altitude up to 2000m
Installation category: CAT 2
Pollution degree: 2
Mains supply voltage fluctuation up to ±10% of the normal voltage

Command Set

Command code & Return Value	Description	Example
Input Command: SOUT<Output>[CR] Return Value: [OK][CR]	Set Output on/off Set Output off: <Output>=0 Set Output on: <Output>=1	Input Command: SOUT0[CR] Return Value: [OK][CR] Meaning: Set Output off
Input Command: GOUT [CR] Return Value: <Output> [CR][OK][CR]	Get Output Status Output off: <Output>=0 Output on: <Output> =1	Input Command: GOUT[CR] Return Value: 0[CR][OK][CR] Meaning: Output is off
Input Command: SETD <VOLTAGE><CURRENT>[CR] Return Value: [OK][CR]	SET Voltage and Current <voltage> =0000~3640 <Current> =0000~5100	Input Command: SETD05001000[CR] Return Value: [OK][CR] Meaning: Voltage 5.00V Current 1.000A
Input Command: GETD [CR] Return Value: <Voltage><;><Current><;> <CV/CC Mode><;>[CR][OK][CR]	Get display Volt & display Curr & CV/CC mode <voltage> =0~9999 <Current> =0~9999 <CV mode> =0 CV Mode <CC mode> =0 CC Mode	Input Command: GETD [CR] Return Value: 500;1000;0;[CR][OK][CR] Meaning: The Display value is 5.00V and 1.000A It is CV mode
Input Command: GETS [CR] Return Value: <Voltage><;><Current><;>[CR] [OK][CR]	Get Setting Volt & Curr <voltage> =0~3640 <current> =0~5100	Input Command: GETS[CR] Return Value: 500;1000;[CR][OK][CR] Meaning: The Memory setting voltage value is 5.00V and Current is 1.000A
Input Command: VOLT<Voltage>[CR] Return Value: [OK][CR]	Set output voltage	Input Command: VOLT 1000[CR] Return Value: [OK][CR] Meaning: Set voltage value is 10.00V
Input Command: CURR<Current>[CR] Return Value: [OK][CR]	Set output current	Input Command: CURR1000[CR] Return Value: [OK][CR] Meaning: Set Current value is 1.000A
Input Command: GMOD [CR] Return Value: <MODE>[CR][OK][CR]	Get MODE <MODE>=NTP????	Input Command: GMOD[CR] Return Value: NTP5521[CR][OK][CR] Meaning: Mode is NTP5521
Input Command: GVSH [CR] Return Value: <Voltage>[CR][OK][CR]	Get voltage set high limit <voltage>=????	Input Command: GVSH [CR] Return Value: 3600 [CR][OK][CR] Meaning: voltage set high limit is 36.00V
Input Command: GVSL [CR] Return Value: <Voltage>[CR][OK][CR]	Get voltage set low limit <voltage>=???	Input Command: GVSL [CR] Return Value: 100 [CR][OK][CR] Meaning: Voltage set low limit is 1.00V

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Command code & Return Value	Description	Example
Input Command: GISH [CR] Return Value: <Current>[CR][OK][CR]	Get current set high limit <Current>=????	Input Command: GISH [CR] Return Value: 5500 [CR][OK][CR] Meaning: Current set high limit is 5.500A
Input Command: GISL [CR] Return Value: <Current>[CR][OK][CR]	Get current set low limit <Current>=???	Input Command: GISL [CR] Return Value: 250 [CR][OK][CR] Meaning: Current set low limit is 0.250A
Input Command: GMAX [CR] Return Value: <Voltage><;><Current><;>[CR] [OK][CR]	Get voltage set high limit & current set high limit <voltage> =???? <current> =????	Input Command: GMAX [CR] Return Value: 3600;5500;[CR][OK][CR] Meaning: Voltage set high limit is 36.00V & Current set high limit is 5.500A
Input Command: GMIN [CR] Return Value: <Voltage><;><Current><;>[CR] [OK][CR]	Get voltage set low limit & cur- rent set low limit <voltage> =??? <current> =???	Input Command: GMIN [CR] Return Value: 100;250;[CR][OK][CR] Meaning: Voltage set low limit is 1.00V & Current set low limit is 0.250A

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