TENMA®

72-8795

PROGRAMMABLE DC POWER SUPPLY

User's Manual

TENMA®

405 S. Pioneer Blvd
Springboro, OH 45066
mcmelectronics.com

72-8795 Programmable DC Power Supply Series

PROGRAMMABLE DC POWER SUPPLY

Thanks for using our products. Please read this manual thoroughly before operation.

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[Step 3]

After zeroing the voltage of the three channels, which are also saved, move the cursor to **[CURRENT]** of **[CH1]**. Connect the ammeter and adjust the knob to make the current reading equal 0MA. Then press **[ENTER]** to store the calibration data of the corresponding channel. Move the cursor down to zero and calibrate the current of channel 2 and channel 3 with the same procedure.

ZERO CALIBRATION		H
CH1Votage	Current ✣	
CH2Votage	Current	
CH3Votage	Current	

[Step 4]

After completing step 3, move the cursor to the left; press key 2(cursor down) until the calibration interface reads “Output Calibration”. Move the cursor to a corresponding channel and adjust the output voltage by using the rotary knob to equal 32V reading on the voltmeter. Press **[ENTER]** and then the calibration data of the corresponding channel is stored. Move the cursor down into the calibration of the other channels with the same procedure, with channels 1 and 2 at 32 V, and channel 3 at 6 V.

OUTPUT CALIBRATION		H
CH1Votage ✣	Current	
CH2Votage	Current	
CH3Votage	Current	

[Step 5]

After completing the maximum voltage calibration, connect the ammeter and adjust the current of channel 1 to equal 3A. Press **[ENTER]** to save the current of the channel. Then move the cursor to carry on with the current calibration and storage of channel 2 and channel 3.

OUTPUT CALIBRATION		H
CH1Votage	Current ✣	
CH2Votage	Current	
CH3Votage	Current	

3. Cleaning

When the unit is unplugged, use a damp cloth or mild cleanser to wipe the housing. Never use an abrasive cloth or harsh solvents, as these will damage the housing of the instrument.

2. Adjustment And Calibration

2.1.1 Preparation

a. Power unit on and allow 30 minutes to warm up before calibration.

b. Ambient temperature: 23±5°C, Humidity: Less than RH80%.

c. Select a reliable six-and-a-half digital voltmeter with a current test range more than 5A.

2.1.2 Output Calibration Steps:

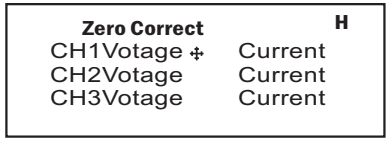
[Step 1]

Press **[SHIFT][4]** to display Password input window, input Password (293856) by using the number keys, and the Calibration window will appear. If an incorrect password is entered, the unit returns to the home screen.

[Step 2]

Control the cursor by using the arrows assigned to the 8, 2, 4, 6 keys. Set the cursor to the calibrated item of the corresponding channel, and using a connected voltmeter for correct readings, use the rotary knob to adjust parameters and regulate the voltage of the corresponding channel to a 0V reading on the voltmeter. Press **[ENTER]** to store the calibration data of the corresponding channel. Move the cursor down to calibrate the other channels with the same procedure.

Tip: Use the F/C feature to switch between broad and precise incremental control.



Safety Symbols

WARNING: Warning statements identify conditions or practices to avoid electric shock that could cause personal injury or death.

CAUTION: Caution statements identify conditions or practices that could result in damage to this product or other property.

Ground; Ground terminal

Frame or chassis ground terminal

Safety Precautions

1. Pressure, shock, abuse, and vibration should be avoided.
2. Do not dismantle, alter, or repair this unit yourself. This could easily damage the unit, and could cause further property damage, injury, or electrical shock.
3. This unit was designed to be used with 110 volt power. Note the maximum power and amperage settings, and fuse specifications for use with this product.
4. This unit uses three linear power supplies, and has been designed to ensure that the machine casing and power are properly grounded when used with a grounded outlet.
5. Never use around high moisture areas, never submerge in water, and never use with wet hands.
6. Range of operating temperature is 0°C~40°C (32°F ~ 104°F); do not use in high temperature, high humidity, high radiation, and areas with magnetic interference.

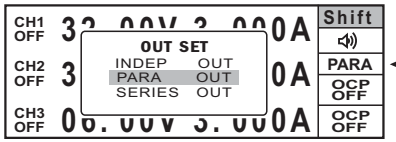
Product Overview

72-8795 Programmable Power Supply is controlled by a Micro Processor Unit (MPU) that is designed for a communication interface by RS-232 or USB to computer to enable advanced testing and power delivery by programmable control. The voltage and current are controlled by a 12 bit D/A Converter with high resolution and accuracy. Also, the digital interface provides a speedy, precise and convenient input of information controlled by intuitive controls. The adjustment of voltage/current is made by software calibration, eliminating potential manual fault, that increases the precision of the instrument. Over Voltage Protection (OVP) and Over Current Protection (OCP) can be set with the software and utilized by the hardware to achieve precise, instant protection to prevent damage and increase the users' safety.

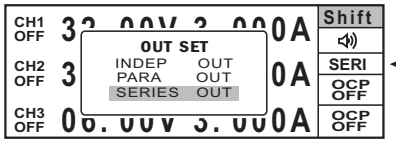
We warrant this unit to be free from manufacturer material and workmanship defects for one year from the original date of purchase within North America. If the unit fails during normal use withing the warranty period, please contact the authorized reseller of this product for repair or replacement. This warranty does not apply to defects and failure resulting from customer actions, such as mishandling, misapplication, overloading power or current, unauthorized repair, or any modification. The reseller and manufacturer hold the right to deny any warranty claims based on these reasons, or to fulfill warranty with a similar product at a similar value.

Additional Features

- Programmable power supply with a digital interface
- Three separately adjustable linear outputs
- The 192×64 LCD Display can display multiple settings and measurements simultaneously
- Windows-based interface for user-friendly operation
- High stability and low drift
- Over Voltage, Current, and Temperature protection
- Intelligent fan control adjusts with output power
- Built-in warning buzzer
- Accurate user calibration software
- Space-saving design
- Fine adjustment knob
- 90 setting memory
- Parallel, series, and independent operation modes
- 1-second timing resolution.



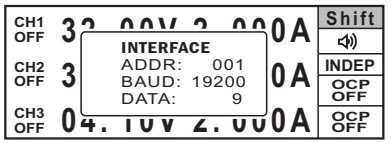
← Parallel Output Mode



← Serial Output Mode

8. Communication Setting

Press [SHIFT][COMM] to access the interface for the communication setting. Use the key directions to move the cursor to the corresponding value place. You can set the power address, communication speed and data bit by using the rotary knob to change the values. Press [ENTER] to store and exit.



General Maintenance

To avoid electrical shock, do no perform any service or repair other than those outlined in these operating instructions. Any additional attempts at servicing or modifying this unit voids all manufacturer warranty and liability.

1. Fuse Replacement

If the fuse blows, the display will not light and the power supply will not operate. Replace the fuse with a compatible rated fuse. The unit was originally supplied with a 5 Amp 250V glass type fuse. The fuse compartment is located at the AC plug terminal

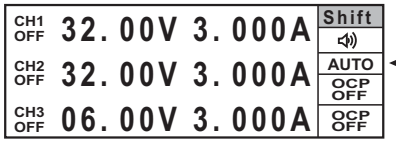
WARNING: Replace fuse only with 250V fuse of the specific type and rating, and always disconnect power cord before replacing fuse.

5.2 Sequence range activation

After setting all needed values and delays, move the cursor over the delay value of the last step in the sequence to be used and press [AUTO], and a box should appear after the value. After the automatic sequence reaches this step, it will return to the first step and continuously repeat the sequence.

6. Automatic sequence execution

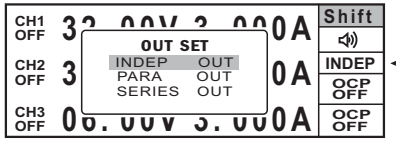
From the home screen, press [AUTO], which will set the unit to AUTO mode. Press [OUTPUT] to activate the selected and stored settings; the unit then will output the sequences of t voltage, current, and delay parameters. The unit will continued to run through the sequences. Press [AUTO] to stop the automatic sequence.



← Programming Output Mode

7. Series and parallel operation mode

Press [SHIFT][PARA/SER] to select between operation modes. Use the rotary knob to select the desired output mode. Press [ENTER] to confirm and return to the main screen. When the unit operates in series or parallel output modes, channel 2 operates as the master (CH1 and CH2 will output the settings for Ch2). In independent mode, each channel will output it's own individual settings.



← Independent Output Mode

Technical specifications

Note: The following indexes are tested after unit being powered for 20 minutes.

Specifications		72-8795
Output	Voltage	0~32V x 2, 0-6V
	Current	0~3A x 3
Load Effect	Voltage	≤3mV(≤8mV rated current>3.0A)
	Current	≤3mA(≤5mA rated current>3.0A)
Power Effect	Voltage	≤ 3mV(AC±5%)
	Current	≤ 3mA
Resolution	Voltage	10mV
	Current	1mA （2mA rated current>3A）
Set Accuracy (25±5℃)	Voltage	≤0.05%+10 mV(+20 mV rated voltage>36V)
	Current	≤0.1%+5ma(+10 mA rated current>3.0A)
Ripple (20Hz-20MHz)	Voltage	Ripple≤1 mVrms
	Current	≤3mArms(≤5mArms rated current>3.0A)
Temperature Coefficient (0 ~ 40℃)	Voltage	100ppm+3mV
	Current	100ppm+3mA
Read back Resolution	Voltage	10 mV
	Current	1mA(2mA rated current>3.0A)
Response Time	Voltage rise	10%~90%≤ 100ms
	Current fall	90%~10%≤10ms(≥10% rated load)
Readback Temperature Coefficient	Voltage	≤100ppm+10 mV
	Current	≤150ppm+10 mA
Drift	Voltage	≤100ppm+10 mV
	Current	≤150ppm+10 mA
Serial synchronous operation	Serial synchronous error	≤0.1%+20 mV
	Series(Load)	20 mA

Parallel Simultaneous Operation	Set Accuracy	Voltage≤0.05%+20 mV Current≤0.1%+20 mV
	Load regulation	Voltage≤5mA Current≤6mA
	Power regulation	Voltage≤3 mV Current≤6mA
Memory		Store/Recall points 0~90
Timer	Setting time	1s~9999s
	Resolution	1s
	Function	Auto Step running
Interface		RS232,USB interface
Physical Specification	Dimensions	230（W）×140（H）×380（L）mm
	Weights	10Kg (22 lbs)
Operation Environment		Indoor use, Altitude up to 2000 m

Precautions before operation

1.Unpacking the Instrument

The product has been fully inspected and tested at our factory before shipping. Please carefully unpack and inspect it to check if there is any damage that may have occurred during transportation. If any signs of damage are found, please contact our customer service team before operation.

2. Power requirements

The product has been designed to be used with 110V 60Hz power supplies. Make certain that the power supply and outlet are properly grounded before use. Do not modify the power plug or cord in any way. Use only the power cable that is included in the packaging, or a direct replacement.

Example: Set current at 1.500A.

Press **[I SET][1][.][0][0][0][ENTER]**

If the load current through output terminals exceeds the setting value, the instrument will operate in the C.C. mode; if load current does not exceed the setting value, the instrument will operate in the C.V. mode.

3. Over Current Protection Setting

Press**[OCP]** to turn on the OCP mode. OCP mode is can be turned off by pressing **[SHIFT][OCP]**.

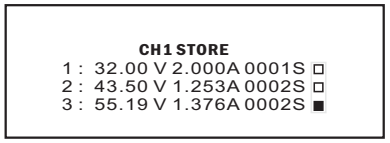
4. Voltage/Current Step Setting

While using the rotary knob for changing value, pressing F/C will switch between macro and micro incremental values to either rapidly change or fine tune values.

5. The data storage and call setting

5.1 The data storage setting

Press **[SHIFT][STORE]** to access the data store menu screen. Use the rotary knob to select the channel group, and then press **ENTER**. Move the cursor selection by pressing the direction key (8,2,4,6) to select voltage, current and delay time; press **ENTER**, then you can input data directly. Press **ENTER** again to store.



Example: To set output voltage, current and delay time of the CH1 memory of " 01" to be 15.00V, 3.00A, 20S. Press **[SHIFT][STORE]** to access menu screen, and us rotary knob to select Ch1 STOREl. Then press **ENTER** to access CH1 storage interface; move the cursor to the voltage and press **ENTER** to input voltage with number keys or rotary knob, and then press **ENTER** to store data. Repeat for current and delay settings. Press **[SHIFT][STORE]** to store all settings.

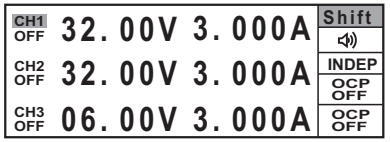
Operation

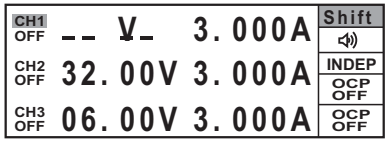
1.Output Voltage Setting

Select the desired channel by pressing **[SHIFT][CH#]** to set the cursor to toggle that channel.

Method 1: Set output voltage by pressing **[V SET]** and using the number and decimal keys to key in **[voltage value]**, then press **[ENTER]**.

Method 2: Press **[V SET]**, press the rotary knob once, and turn the rotary knob to input **[voltage value]**. The output voltage setting is changed immediately during selection. Press **[ENTER]** to save the voltage setting.





Example: To set voltage at 18.50V.

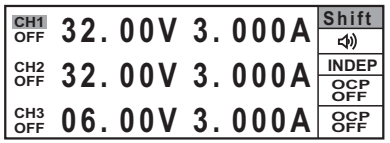
Press **[V SET][1][8][.][5][0][ENTER]**.

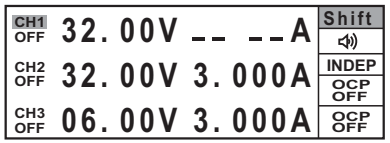
2. Output Current Setting:

Select the desired channel by pressing **[SHIFT][CH#]** to set the cursor to toggle that channel.

Method 1: Set output current by pressing **[I SET]** and using number keys to key in **[current value]**, then press **[ENTER]**.

Method 2: Press **[I SET]**, press the rotary knob once, and turn the rotary knob to input **[current value]**. The output current setting is changed immediately during selection. Press **[ENTER]** to save the current setting.





WARNING: To avoid electrical shock, make sure the power cord has been securely connected to a properly grounded outlet.

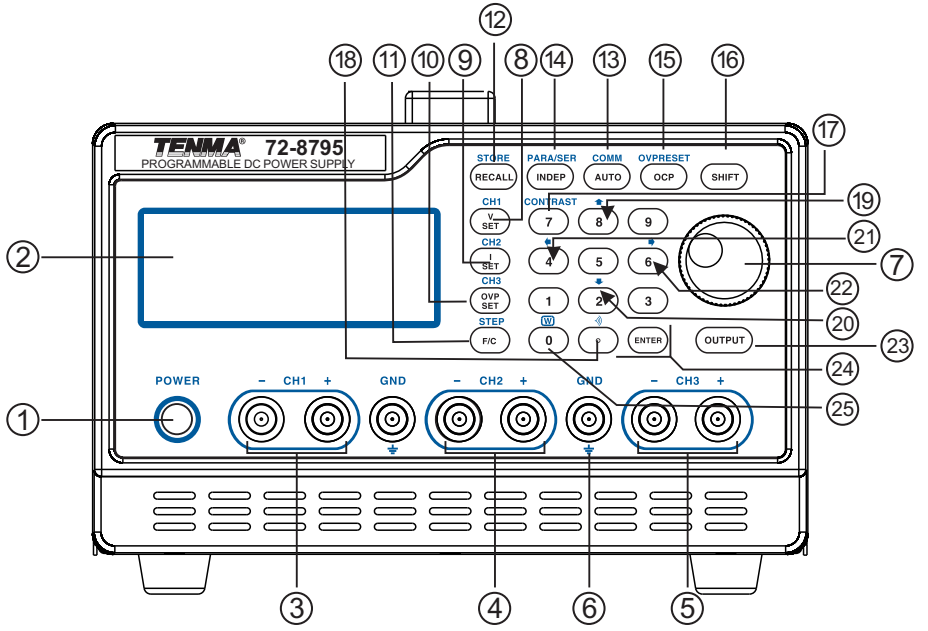
CAUTION: To avoid personal injury and damage, disconnect the power cord before removing the fuse holder.

3. Operation Environment

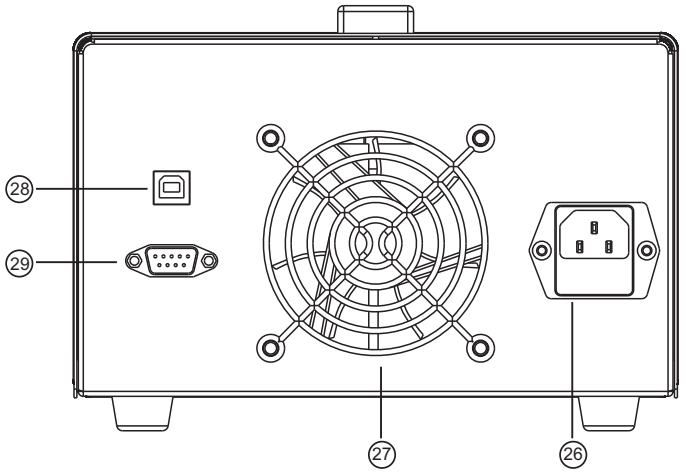
The working ambient temperature range of this instrument is from 0° to 40°C (32° to 104°F). Do no operate the instrument outside of this range. Extreme temperatures can cause damage to the unit.

Panel Introduction

Layout of Front Panel



Layout of Rear Panel



Function description as below:

1	POWER	Toggle main unit power on/off
2	DISPLAY	Displays output voltage and current, power settings, and volume, OVP, and OCP statuses
3	CH1 OUT	CH1 output terminals
4	CH2 OUT	CH2 output terminals
5	CH3 OUT	CH3 output terminals
6	GND Terminal	Ground terminal connecting to CASE
7	Rotary Knob	Press and turn to incrementally adjust power settings; turn to cycle through menus and setting
8	V SET(CH1)	Set Output voltage; [SHIFT] [CH1] to select Channel 1 settings
9	I SET(CH2)	Set Output current: [SHIFT] [CH2] to select Channel 2 settings
10	OVP SET(CH3)	Set Over-voltage Protection value: [SHIFT] [CH3] to select Channel 3 settings

11	F/C (STEP)	Change incremental tuning value of the rotary knob; [SHIFT][Step] to change the incremental steps of the rotary knob
12	RECALL(STORE)	Recall the stored settings; [SHIFT][STORE] to edit and save channel settings.
13	AUTO(COMM)	Toggles automatic execute mode; [SHIFT] [COMM] to access the interface of the communication settings.
14	INDEP (PARA/SER)	Switch to independent output mode; [SHIFT][PARA/SER] to switch to Parallel or Serial output mode
15	OCP (OVP RESET)	Turn OCP on or off; [SHIFT][RESET] key to clear over-voltage protection
16	SHIFT	Press first to access the second assigned function of a button.
17	CONTRAST	[SHIFT][CONTRAST] to access the display contrast settings, use the rotary knob to adjust; press [ENTER] to exit setting.
18	🔊	[SHIFT] [🔊] to toggle the audible alert on or off.
19	▲	Move the cursor upward by pressing [▲] in the storage settings
20	▼	Move the cursor downward by pressing [▼] in the storage settings
21	◀	Move the cursor on the left by pressing [◀] in the storage settings
22	▶	Move the cursor on the right by pressing [▶] in the storage settings
23	OUTPUT	Turn on or off output; if a channel is selected, you can turn on or off the corresponding channel; when you select no channel, all channels on turned on or off.
24	0~9 ".", ENTER	Data entry, ENTER Value output
25	W, "0"	Press [SHIFT] [W] to restore factory settings
26	AC Power Socket	AC power input terminal
27	Cooling Fan	Cooling Fan
28	Interface	USB communication interface
29		RS232C communication interface