

PPX-Series

Programmable High-precision DC Power Supply



FEATURES

- * CV, CC Priority Start Function
- * Four Levels of Current Measurement Resolution (min. 0.1 μ A)/Two Levels of Voltage Measurement Resolution (min. 0.1 mV)
- * Power Output ON/OFF Delay Function
- * Adjustable Voltage and Current Slew Rate
- * Bleeder Circuit Control
- * Delayed Over-current Protection(OCP Delay)
- * Sequential Power Output Function
- * Remote Sensing Function & Data Logger
- * 10 Sets of Memory Function
- * Over Voltage Protection, Under Voltage Limit, Over Current Protection, Over Temperature Protection, AC Alarm Function
- * Supports K-Type Thermocouple Temperature Measurement
- * Interfaces: USB, LAN, RS-232, RS-485, Analog Control; Opt: GPIB

APPLICATIONS

- * IoT Device
- * Portable Device
- * Wearable Device
- * Sensor Component

The PPX-Series programmable high-precision DC power supplies include six models ; PPX-1005(10 V/5 A/50 W) , PPX-2002(20 V/2 A/40 W) , PPX-2005(20 V/5 A/100 W) , PPX-3601(36 V/1 A/36 W), PPX-3603(36 V/3 A/108 W), and PPX-10H01(100 V/1 A/100 W). This series has the output low noise (0.35 mVrms) and fast transient response characteristics (<50 μ s) of conventional linear power supplies. It also provides constant voltage and constant current priority output modes, and the series can also set the voltage and current rising/falling slew rates separately, and the delay time for the output to be turned on and off.

The PPX-Series has four current levels and two voltage levels to provide users with high-precision measurements, and via the Data Logger function, the measurement records can be stored in the USB for long-term measurement and recording of IoT devices, portable devices, wearable devices, and sensor components.

In order to extend the use time of portable devices and wearable devices, manufacturers are not only committed to improving the operating efficiency of the circuit, but also reducing standby power consumption as much as possible. In order to satisfy users' low-power measurement applications, GW Instek has launched the PPX-Series with current measurement resolutions (0.1 μ A, 1 μ A, 10 μ A, 0.1 mA) and voltage measurement resolutions (0.1 mV, 1 mV) to provide power for portable devices and wearable devices. When the device enters the sleep mode or the standby mode, the PPX-Series can still measure the subtle current changes of the DUT.

The PPX-Series provides the Test Sequence function, which allows users to arbitrarily define output waveforms. The voltage rising or falling time and the voltage maintenance time of each step can be set. For the operation, users can directly edit parameters on the front panel of the PPX-Series, or the CSV file can be edited via computer and imported into the PPX-Series, and the PPX-Series can be remotely edited. In addition, the OCP Delay function of the PPX-Series allows users to flexibly adjust the time to enable the over-current protection according to the characteristics of the DUT to protect the DUT and at the same time to test the current change of the DUT within a certain period of time.

Other than voltage, current, and power measurement, the PPX-Series also supports temperature measurement. While collocating with a K Type Thermocouple, the temperature range can be measured from -200 $^{\circ}$ C to +1372 $^{\circ}$ C. Supported standard communication interfaces include USB, LAN, RS-232, RS-485 and optional GPIB interface.



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SPECIFICATIONS							
Model		PPX-1005	PPX-2002	PPX-2005	PPX-3601	PPX-3603	PPX-10H01
OUTPUT RATING							
Output Voltage		10.000 V	20.000 V	20.000 V	36.000 V	36.000 V	100.00 V
Output Current		5.0000 A	2.0000 A	5.0000 A	1.0000 A	3.0000 A	1.0000 A
Output Power		50 W	40 W	100 W	36 W	108 W	100 W
CONSTANT VOLTAGE OPERATION							
Line Regulation *1		± (0.01 % of setting + 1 mV)	± (0.01 % of setting + 1 mV)	± (0.01 % of setting + 1 mV)	± (0.01 % of setting + 3 mV)	± (0.01 % of setting + 3 mV)	± (0.01 % of setting + 7 mV)
Load Regulation *2		± (0.01 % of setting + 2 mV)	± (0.01 % of setting + 2 mV)	± (0.01 % of setting + 3 mV)	± (0.01 % of setting + 3 mV)	± (0.01 % of setting + 4 mV)	± (0.01 % of setting + 7 mV)
Transient Response *3		< 50 μs					
Ripple & Noise	Vrms *4/ Vpp *5	0.35 mVrms / < 6 mVpp	0.5 mVrms / < 8 mVpp	0.5 mVrms / < 8 mVpp	0.8 mVrms / < 10 mVpp	0.8 mVrms / < 10 mVpp	1.2 mVrms / < 15 mVpp
Rise time *6	Rated Load / No Load	20 ms / 20 ms	50 ms / 50 ms	50 ms / 50 ms	50 ms / 50 ms	50 ms / 50 ms	100 ms / 100 ms
Fall time *7	Rated Load / No Load	10 ms / 100 ms	20 ms / 150 ms	20 ms / 150 ms	20 ms / 150 ms	20 ms / 150 ms	50 ms / 250 ms
Setting Range (105 %)		0 V to 10.5 V	0 V to 21.0 V	0 V to 21.0 V	0 V to 37.8 V	0 V to 37.8 V	0 V to 105.0 V
Setting Resolution		0.2 mV	0.5 mV	0.5 mV	1 mV	1 mV	2 mV
Setting Accuracy (23 °C ± 5 °C)		± (0.03 % of setting + 3 mV)	± (0.03 % of setting + 5 mV)	± (0.03 % of setting + 5 mV)	± (0.03 % of setting + 8 mV)	± (0.03 % of setting + 8 mV)	± (0.03 % of setting + 20 mV)
Maximum Remote Sensing Compensation		1 V					
Temperature Coefficient (TYP.) *8		100 ppm/°C					
CONSTANT CURRENT OPERATION							
Line Regulation *1		± (0.02 % of setting + 250 μA)	± (0.02 % of setting + 100 μA)	± (0.02 % of setting + 250 μA)	± (0.02 % of setting + 50 μA)	± (0.02 % of setting + 150 μA)	± (0.02 % of setting + 50 μA)
Load Regulation *9		± (0.02 % of setting + 250 μA)	± (0.02 % of setting + 100 μA)	± (0.02 % of setting + 250 μA)	± (0.02 % of setting + 50 μA)	± (0.02 % of setting + 150 μA)	± (0.02 % of setting + 50 μA)
Ripple & Noise (Arms) *4		2 mA	1 mA	2 mA	400 μA	1 mA	1 mA
Setting Range (105 %)		0 A to 5.25 A	0 A to 2.1 A	0 A to 5.25 A	0 A to 1.05 A	0 A to 3.15 A	0 A to 1.05 A
Setting Resolution		0.1 mA	0.05 mA	0.1 mA	0.02 mA	0.1 mA	0.02 mA
Setting Accuracy (23 °C ± 5 °C)		± (0.05 % of setting + 3.0 mA)	± (0.05 % of setting + 1.0 mA)	± (0.05 % of setting + 3.0 mA)	± (0.05 % of setting + 0.5 mA)	± (0.05 % of setting + 1.5 mA)	± (0.05 % of setting + 1.0 mA)
Temperature Coefficient (TYP.) *8		200 ppm/°C					
MEASUREMENT AND DISPLAY							
Voltage Range	H	10.000 V	20.000 V	20.000 V	36.000 V	36.000 V	100.00 V
	L	1.0000 V	2.0000 V	2.0000 V	3.6000 V	3.6000 V	10.000 V
Current Range	H	5.0000 A	2.0000 A	5.0000 A	1.0000 A	3.0000 A	1.0000 A
	M	500.00 mA	200.00 mA	500.00 mA	100.00 mA	300.00 mA	100.00 mA
	L	50.000 mA	20.000 mA	50.000 mA	10.000 mA	30.000 mA	10.000 mA
	LL	5.0000 mA	2.0000 mA	5.0000 mA	1.0000 mA	3.0000 mA	1.0000 mA
Measurement Resolution	Voltage (H)	1 mV					
	Voltage (L)	0.1 mV					
	Current (H)	0.1 mA					
	Current (M)	0.01 mA					
	Current (L)	0.001 mA					
	Current (LL)	0.0001 mA					
Measurement Accuracy	Voltage (H/L)	± (0.03 % of rdg +2 mV)	± (0.03 % of rdg +4 mV)	± (0.03 % of rdg + 5 mV)	± (0.03 % of rdg + 6 mV)	± (0.03 % of rdg + 8 mV)	± (0.03 % of rdg + 15 mV)
	Temperature Coefficient *8 (TYP.)	100 ppm/°C					
	Current (H/M)	± (0.05 % of rdg + 2.5 mA)	± (0.05 % of rdg + 1.0 mA)	± (0.05 % of rdg + 2.5 mA)	± (0.05 % of rdg + 0.4 mA)	± (0.05 % of rdg + 1.2 mA)	± (0.05 % of rdg + 1.0 mA)
	Current (L/LL)	± (0.1 % of rdg + 40 μA)	± (0.1 % of rdg + 24 μA)	± (0.1 % of rdg + 40 μA)	± (0.1 % of rdg + 16 μA)	± (0.1 % of rdg + 28 μA)	± (0.1 % of rdg + 24 μA)
	Temperature Coefficient *8 (TYP.)	200 ppm/°C					
TEMPERATURE MEASUREMENT							
Temperature (K-Type Thermocouple)	Range	-200 °C to +1372 °C					
	Resolution	0.25 °C					
	Accuracy	± (0.5 % + 2 °C)					
PROTECTION							
Over Voltage Protection (OVP)	Operation	Turns the output off, displays OVP and lights ALARM					
	Setting Range	0.5 V to 11.0 V	1.0 V to 22.0 V	1.0 V to 22.0 V	1.8 V to 39.6 V	1.8 V to 39.6 V	5.0 V to 110.0 V
Over Current Protection (OCP)	Setting Accuracy	(5 % to 110 % of the rated output voltage)					
	Operation	± (1 % of rating)					
	Setting Accuracy	Turns the output off, displays OCP and lights ALARM					
	Setting Range	0.25 A to 5.5 A	0.1 A to 2.2 A	0.25 A to 5.5 A	0.05 A to 1.1 A	0.15 A to 3.3 A	0.05 A to 1.1 A
Over Temperature Withstand Voltage	Setting Accuracy	(5 % to 110 % of the rated output current)					
	Operation	± (1 % of rating)					
	Operation	Turns the output off, displays OTP and lights ALARM					
	Between Input and Chassis	No abnormalities at 1500 Vac for 1 minute.					
	Between Input and Output	No abnormalities at 3000 Vac for 1 minute.					
	Between Output and Chassis	No abnormalities at 500 Vac for 1 minute.					
Insulation Resistance	Between Input and Chassis	500 Vdc, 100 MΩ or more					
	Between Input and Output	500 Vdc, 100 MΩ or more					
	Between Output and Chassis	500 Vdc, 100 MΩ or more					
Analog Control and Signal output *10							
External Voltage Control Output Voltage Accuracy		0 % to 100 % of the rated output voltage in the range of 0 V to 10 V; 1 % of rating					
External Voltage Control Output Current Accuracy		0 % to 100 % of the rated output current in the range of 0 V to 10 V; 1 % of rating					
External Resistor Control Output Voltage Accuracy		0 % to 100 % of the rated output voltage in the range of 0 Ω to 10 kΩ; 1 % of rating					
External Resistor Control Output Current Accuracy		0 % to 100 % of the rated output current in the range of 0 V to 10 V; 1 % of rating					
Output ON/OFF Control		Possible logic selections: Turn the output on using a LOW (0 V to 0.5 V) or short-circuit, turn the output off using a HIGH (4.5 V to 5 V) or open-circuit. Turn the output on using a HIGH (4.5 V to 5 V) or open-circuit, turn the output off using a LOW (0 V to 0.5 V) or short-circuit.					
Monitor Signal	Voltage Monitor (V MON)	10.00 V ± 0.1 V (at rated voltage output); 0 V ± 0.1 V (at 0 V output)					
Output	Current Monitor (I MON)	10.00 V ± 0.1 V (at rated current output); 0 V ± 0.1 V (at 0 A output)					
Status Signal	OUTPUT ON/OFF STATUS	Turns on when the output is on.					
Output *11	CV STATUS	Turns on during CV operation.					
	CC STATUS	Turns on during CC operation.					
	ALM STATUS	Turns on when an alarm has been activated.					
	PWR ON STATUS	Turns on when the power is turned on.					
GENERAL SPECIFICATIONS							
Interface	LAN	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask					
	USB	Type A: Host, Type B: Slave, Speed: 1.1/2.0, USB-CDC					
Nominal Input Voltage *12	RS-232/RS-485	Complies with the EIA-RS-232/RS-485 specifications (excluding the connector)					
	GPIB (Factory Optional)	SCPI-1993, IEEE 488.2 compliant interface					
Input Frequency Range		100 Vac / 120 Vac / 220 Vac / 240 Vac (± 10 %), 50 Hz or 60 Hz, single phase					
Max. Inrush Current		47 Hz to 63 Hz					
Max. Power Consumption		25 Amax 200 VA	20 Amax 150 VA	30 Amax 300 VA	35 Amax 150 VA	40 Amax 300 VA	30 Amax 300 VA
Operating Environment		0 °C to 40 °C; 20 % to 80 % RH; No condensation					
Storage Environment		-20 °C to 70 °C; 20 % to 85 % RH; No condensation					
Dimensions (mm) & Weight		107 mm x 124 mm x 313 mm (W x H x D) (not including protrusions), Approx. 5.5 kg					

Note. *1. At 90 Vac to 110 Vac or 108 Aac to 132 Vac or 198 Vac to 242 Vac or 216 Vac to 264 Vac, constant load.
*2. From No-load to Full-load, constant AC input voltage. Make sure that test leads and output terminals are well connected. It is suggested that utilize 4-wire connection when european terminal output models are employed.
*3. Time for output voltage to recover within ±(0.1 % + 10 mV) of its rated output for a load change from 50 % to 100 % of its rated output current.
*4. Measurement frequency bandwidth is 5 Hz to 1 MHz.
*5. Measurement frequency bandwidth is 10 Hz to 20 MHz.
*6. From 10 % to 90 % of rated output voltage, with rated resistive load.
*7. From 90 % to 10 % of rated output voltage, with rated resistive load.
*8. Temperature coefficient: after a 30 minute warm-up.
*9. For load voltage change, equal to the unit voltage rating, constant AC input voltage.
*10. EXT I/O connector on the rear panel.
*11. Open collector output: Maximum voltage of 30 V and maximum current of 8 mA. The common line for the status pins is floating (isolated voltage of 60 V or less), it is isolated from the output and control circuits.
*12. Before connecting the power plug to an AC line outlet, make sure the voltage selector switches of the bottom panel in the correct position. It might be damaged the instrument by connecting to the wrong AC line voltage.

ORDERING INFORMATION

PPX-1005	50 W Single Programmable High Precision DC Power Supply (10 V/ 5 A)
PPX-2002	40 W Single Programmable High Precision DC Power Supply (20 V/ 2 A)
PPX-2005	100 W Single Programmable High Precision DC Power Supply (20 V/ 5 A)
PPX-3601	36 W Single Programmable High Precision DC Power Supply (36 V/ 1 A)
PPX-3603	108 W Single Programmable High Precision DC Power Supply (36 V/ 3 A)
PPX-10H01	100 W Single Programmable High Precision DC Power Supply (100 V/ 1 A)

ACCESSORIES

Standard Type Jack Terminal

PPX-1005/2005/3603 Power Cord x 1, Test Lead GTL-104A x 1

PPX-2002/3601/10H01 Power Cord x 1, Test Lead GTL-105A x 1

European Test Leads

PPX-1005/2005/3603 Power Cord x 1, Test Lead GTL-204A x 1, GTL-201A x 1

PPX-2002/3601/10H01 Power Cord x 1, Test Lead GTL-205A x 1, GTL-201A x 1

OPTION

PPX-G GPIB Interface (factory installed)

OPTIONAL ACCESSORIES

GTL-104A	Test Lead, U-type to Alligator Test Lead, Max. Current 10 A, 1000 mm
GTL-105A	Test Lead, Alligator to Banana Test Lead, Max. Current 3 A, 1000 mm
GTL-201A	Ground Lead, Banana to Banana, European Terminal, 200 mm
GTL-203A	Test Lead, Banana to Alligator, European Terminal, Max. Current 3 A, 1000 mm
GTL-204A	Test Lead, Banana to Alligator, European Terminal, Max. Current 10 A, 1000 mm
GTL-246	USB Cable(USB 2.0 Type A-Type B Cable, 4P
GTL-205A	Temperature probe Adapter (thermal coupling, K-Type), about 1000 mm
GTL-258	GPIB Cable, 2000 mm
GTL-259	RS-232 Cable with DB9 Connector to RJ45
GTL-260	RS-485 Cable with DB9 Connector to RJ45
GTL-261	Serial Master Cable + Terminator, 0.5 M
GTL-262	RS-485 Slave cable
GRA-441-J	Rack Mount kit (JIS)
GRA-441-E	Rack Mount kit (EIA)

FREE DOWNLOAD

LabVIEW Driver

Specifications subject to change without notice.

PPX-SeriesGD1DS

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