

# PROGRAMMABLE HIGH-PRECISION DC POWER SUPPLY



The PPX-Series programmable high-precision DC power supplies include six models; PPX-1005(10V/5A/50W), PPX-2002(20V/2A/40W), PPX-2005(20V/5A/100W), PPX-3601(36V/1A/36W), PPX-3603(36V/3A/108W), and PPX-10H01(100V/1A/100W). This series has the output low noise (0.35mVrms) and fast transient response characteristics (<50μs) 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 (0.1μA, 1μA, 10μA, 0.1mA) and voltage measurement resolutions (0.1mV, 1mV) 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°C ~ +1372°C. Supported standard communication interfaces include USB, LAN, RS-232, RS-485 and optional GPIB interface.

Model	PPX-1005	PPX-2002	PPX-2005	PPX-3601	PPX-3603	PPX-10H01
Output Voltage	10V	20V	20V	36V	36V	100V
Output Current	5A	2A	5A	1A	3A	1A
Output Power	50W	40W	100W	36W	108W	100W

## PPX-Series

### FEATURES

- \* CV, CC Priority Start Function
- \* Four Levels of Current Measurement Resolution (min. 0.1μA)/Two Levels of Voltage Measurement Resolution (min. 0.1mV)
- \* 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
- \* Size: 3U High, in Line with 1/4 Rack



Front Panel



Rear Panel

### APPLICATIONS

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

PPX - Series



## SPECIFICATIONS

Model	PPX-1005	PPX-2002	PPX-2005	PPX-3601	PPX-3603	PPX-10H01	
<b>DC Output Mode</b>							
Output Voltage	10.000V	20.000V	20.000V	36.000V	36.000V	100.00V	
Output Current	5.0000A	2.0000A	5.0000A	1.0000A	3.0000A	1.0000A	
Output Power	50W	40W	100W	36W	108W	100W	
<b>CONSTANT VOLTAGE OPERATION</b>							
Line Regulation	±(0.01% of setting+1mV)	±(0.01% of setting+1mV)	±(0.01% of setting+1mV)	±(0.01% of setting+3mV)	±(0.01% of setting+3mV)	±(0.01% of setting+7mV)	
Load Regulation	±(0.01% of setting+2mV)	±(0.01% of setting+2mV)	±(0.01% of setting+3mV)	±(0.01% of setting+3mV)	±(0.01% of setting+4mV)	±(0.01% of setting+7mV)	
Transient Response <sup>1</sup>	<50µs	<50µs	<50µs	<50µs	<50µs	<100µs	
Ripple Noise(Vrms <sup>2</sup> /Vpp <sup>3</sup> )	0.35mVrms/<6mVpp	0.5mVrms/<8mVpp	0.5mVrms/<8mVpp	0.8mVrms/<10mVpp	0.8mVrms/<10mVpp	1.2mVrms/<15mVpp	
Rise Time <sup>4</sup>	20ms	50ms	50ms	50ms	50ms	100ms	
Rated load	20ms	50ms	50ms	50ms	50ms	100ms	
No load	10ms	20ms	20ms	20ms	20ms	50ms	
Fall Time <sup>5</sup>	100ms	150ms	150ms	150ms	150ms	250ms	
Rated load	10ms	20ms	20ms	20ms	20ms	50ms	
No load	100ms	150ms	150ms	150ms	150ms	250ms	
Setting Range (105%)	0V ~ 10.5V	0V ~ 21.0V	0V ~ 21.0V	0V ~ 37.8V	0V ~ 37.8V	0V ~ 105.0V	
Setting Resolution	1mV	1mV	1mV	1mV	1mV	10mV	
Setting Accuracy (23°C±5°C)	±(0.03% of setting+3mV)	±(0.03% of setting+5mV)	±(0.03% of setting+5mV)	±(0.03% of setting+8mV)	±(0.03% of setting+8mV)	±(0.03% of setting+20mV)	
Remote Sensing Compensation Voltage(single line)	1V	1V	1V	1V	1V	3V	
Temperature Coefficient (TYP.)	100 ppm/°C	100 ppm/°C	100 ppm/°C	100 ppm/°C	100 ppm/°C	100 ppm/°C	
<b>CONSTANT CURRENT OPERATION</b>							
Line Regulation	±(0.02% of setting+250µA)	±(0.02% of setting+100µA)	±(0.02% of setting+250µA)	±(0.02% of setting+50µA)	±(0.02% of setting+150µA)	±(0.02% of setting+50µA)	
Load Regulation	±(0.02% of setting+250µA)	±(0.02% of setting+100µA)	±(0.02% of setting+250µA)	±(0.02% of setting+50µA)	±(0.02% of setting+150µA)	±(0.02% of setting+50µA)	
Ripple Noise(Arms <sup>2</sup> )	2mA	1mA	2mA	400µA	1mA	1mA	
Setting Range (105%)	0A ~ 5.25A	0A ~ 2.1A	0A ~ 5.25A	0A ~ 1.05A	0A ~ 3.15A	0A ~ 1.05A	
Setting Resolution	0.1mA	0.1mA	0.1mA	0.1mA	0.1mA	0.1mA	
Setting Accuracy (23°C±5°C)	±(0.05% of setting+3.0mA)	±(0.05% of setting+1.0mA)	±(0.05% of setting+3.0mA)	±(0.05% of setting+0.5mA)	±(0.05% of setting+1.5mA)	±(0.05% of setting+1.0mA)	
Temperature Coefficient (TYP.)	200 ppm/°C	200 ppm/°C	200 ppm/°C	200 ppm/°C	200 ppm/°C	200 ppm/°C	
<b>MEASUREMENT AND DISPLAY</b>							
Measurement Voltage Range	H 10.000V L 1.0000V	H 20.000V L 2.0000V	H 20.000V L 2.0000V	H 36.000V L 3.6000V	H 36.000V L 3.6000V	H 100.00V L 10.000V	
Measurement Current Range	H 5.0000A M 500.00mA L 50.000mA LL 5.0000mA	H 2.0000A M 200.00mA L 20.000mA LL 2.0000mA	H 5.0000A M 500.00mA L 50.000mA LL 5.0000mA	H 1.0000A M 100.00mA L 10.000mA LL 1.0000mA	H 3.0000A M 300.00mA L 30.000mA LL 3.0000mA	H 1.0000A M 100.00mA L 10.000mA LL 1.0000mA	H 1.0000A M 100.00mA L 10.000mA LL 1.0000mA
Measurement Resolution	Voltage(H) 1mV Voltage(L) 0.1mV Current(H) 0.1mA Current(M) 0.01mA Current(L) 0.001mA Current(LL) 0.0001mA	Voltage(H) 1mV Voltage(L) 0.1mV Current(H) 0.1mA Current(M) 0.01mA Current(L) 0.001mA Current(LL) 0.0001mA	Voltage(H) 1mV Voltage(L) 0.1mV Current(H) 0.1mA Current(M) 0.01mA Current(L) 0.001mA Current(LL) 0.0001mA	Voltage(H) 1mV Voltage(L) 0.1mV Current(H) 0.1mA Current(M) 0.01mA Current(L) 0.001mA Current(LL) 0.0001mA	Voltage(H) 1mV Voltage(L) 0.1mV Current(H) 0.1mA Current(M) 0.01mA Current(L) 0.001mA Current(LL) 0.0001mA	Voltage(H) 10mV Voltage(L) 1mV Current(H) 0.1mA Current(M) 0.01mA Current(L) 0.001mA Current(LL) 0.0001mA	Voltage(H) 10mV Voltage(L) 1mV Current(H) 0.1mA Current(M) 0.01mA Current(L) 0.001mA Current(LL) 0.0001mA
Measurement Accuracy	Voltage(H/L) ±(0.03% of rdg + 2mV) Temperature Coefficient*(TYP.) 100 ppm/°C Current(H/M) ±(0.05% of rdg + 2.5mA) Current(L/LL) ±(0.1% of rdg + 40µA) Temperature Coefficient*(TYP.) 200 ppm/°C	Voltage(H/L) ±(0.03% of rdg + 4mV) Temperature Coefficient*(TYP.) 100 ppm/°C Current(H/M) ±(0.05% of rdg + 1.0mA) Current(L/LL) ±(0.1% of rdg + 24µA) Temperature Coefficient*(TYP.) 200 ppm/°C	Voltage(H/L) ±(0.03% of rdg + 5mV) Temperature Coefficient*(TYP.) 100 ppm/°C Current(H/M) ±(0.05% of rdg + 2.5mA) Current(L/LL) ±(0.1% of rdg + 40µA) Temperature Coefficient*(TYP.) 200 ppm/°C	Voltage(H/L) ±(0.03% of rdg + 6mV) Temperature Coefficient*(TYP.) 100 ppm/°C Current(H/M) ±(0.05% of rdg + 0.4mA) Current(L/LL) ±(0.1% of rdg + 16µA) Temperature Coefficient*(TYP.) 200 ppm/°C	Voltage(H/L) ±(0.03% of rdg + 8mV) Temperature Coefficient*(TYP.) 100 ppm/°C Current(H/M) ±(0.05% of rdg + 1.2mA) Current(L/LL) ±(0.1% of rdg + 28µA) Temperature Coefficient*(TYP.) 200 ppm/°C	Voltage(H/L) ±(0.03% of rdg + 15mV) Temperature Coefficient*(TYP.) 100 ppm/°C Current(H/M) ±(0.05% of rdg + 1.0mA) Current(L/LL) ±(0.1% of rdg + 24µA) Temperature Coefficient*(TYP.) 200 ppm/°C	Voltage(H/L) ±(0.03% of rdg + 15mV) Temperature Coefficient*(TYP.) 100 ppm/°C Current(H/M) ±(0.05% of rdg + 1.0mA) Current(L/LL) ±(0.1% of rdg + 24µA) Temperature Coefficient*(TYP.) 200 ppm/°C
<b>TEMPERATURE MEASURED</b>							
Temperature Range	-200°C ~ +1372°C						
Resolution	0.25°C						
Accuracy	±(0.5% + 2°C)						
<b>PROTECTION</b>							
Over Voltage Protection(OVP)	Operation	Turns the output off, displays OVP and lights ALARM					
Setting Range	0.5V ~ 11.0V	1.0V ~ 22.0V	1.0V ~ 22.0V	1.8V ~ 39.6V	1.8V ~ 39.6V	5.0V ~ 110.0V	
Setting Accuracy	(5% to 110% of the rated output voltage) ±(1% of rating)						
Over Current Protection(OCP)	Operation	Turns the output off, displays OCP and lights ALARM					
Setting Range	0.25A ~ 5.5A	0.1A ~ 2.2A	0.25A ~ 5.5A	0.05A ~ 1.1A	0.15A ~ 3.3A	0.05A ~ 1.1A	
Setting Accuracy	(5% to 110% of the rated output current) ±(1% of rating)						
Over Temperature Protection(OTP)	Operation	Turns the output off, displays OTP and lights ALARM					
<b>OTHER</b>							
Interface Capabilities	LAN	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask					
USB	RS-232/RS-485	Type A: Host, Type B: Slave, Speed: 1.1/2.0, USB-CDC Complies with the EIA-RS-232/RS-485 specifications (excluding the connector)					
Nominal Input Voltage <sup>7</sup>	100Vac / 120Vac / 220Vac / 240Vac(±10%), 50Hz / 60Hz, single phase						
Input Frequency Range	47Hz ~ 63Hz						
Max. Inrush Current	25Amax 200VA	20Amax 150VA	30Amax 300VA	35Amax 150VA	40Amax 300VA	30Amax 300VA	
Max. Power Consumption							
Operating Temperature	0°C ~ 40°C						
Storage Temperature	-20°C ~ 70°C						
Operating Humidity	20% ~ 80% RH; No condensation						
Storage Humidity	20% ~ 85% RH; No condensation						
Dimensions & Weight	107(W) × 124(H) × 313(D) mm (not including protrusions); Approx. 5.5kg						

### NOTE:

- \*1. Time for output voltage to recover within ±(0.1% + 10mV) of its rated output for a load change from 50% to 100% of its rated output current  
\*2. Measurement frequency bandwidth is 5 Hz to 1 MHz  
\*3. Measurement frequency bandwidth is 10 Hz to 20 MHz

- \*4. From 10%~90% of rated output voltage, with rated resistive load  
\*5. From 90%~10% of rated output voltage, with rated resistive load  
\*6. Temperature coefficient: after a 30 minute warm-up

- \*7. 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

Specifications subject to change without notice.

PPX-SeriesD1DH

## ORDERING INFORMATION

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

## ACCESSORIES

CD (User Manual), Power Cord, Test Lead (GTL-104A for PPX-1005/PPX-2005/PPX-3603, 1m, 10A) (GTL-105A for PPX-2002/PPX-3601, 1m, 3A) (GTL-204A for PPX-1005/PPX-2005/PPX-3603<European Type Jack Terminal>, 1m, 10A) (GTL-203A for PPX-2002/PPX-3601/PPX-10H01<European Type Jack Terminal>, 1m, 3A) (GTL-201A, Ground lead for European Type Jack Terminal)

## OPTIONAL ACCESSORIES

GTL-258	GPIB Cable, 2000mm	GTL-205A	Temperature probe Adapter(thermal coupling, K-Type), about 1000mm
GTL-259	RS-232 Cable with DB9 connector to RJ45	GRA-441-J	Rack for PPX Series(IIS)
GTL-260	RS-485 Cable with DB9 connector to RJ45	GRA-441-E	Rack for PPX Series(EIA)
GTL-262	RS-485 Slave cable	PPX-G	GPIB Interface(factory installed)
GTL-246	USB Cable(USB 2.0 Type A-Type B Cable,4P)		

Combined Test Solutions,  
4 Commerce Way, Stanbridge Road,  
Leighton Buzzard, LU7 4RW

T: 01525 374466  
E: [sales@ctstest.co.uk](mailto:sales@ctstest.co.uk)  
W: [www.ctstest.co.uk](http://www.ctstest.co.uk)

