PPX-Series

Programmable High-Precision DC Power Supply

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

GW INSTEK
Simply Reliable

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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-Sseries 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.

A. DISPLAY MODE

Voltage and Current

Voltage, Current and Wattage

Voltage, Current and Sequence Test

Voltage, Current and Temperature Measurement

The PPX-Series has four display modes, namely 1) voltage and current 2) voltage, current and wattage 3) voltage, current and Sequence Test 4)voltage, current and temperature measurement, which are convenient for users to switch to different display modes according to test requirements.

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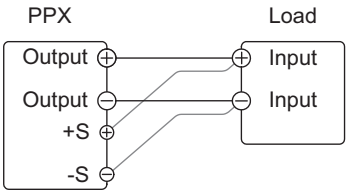
B. REMOTE SENSING



REMOTE SENSING CONNECTION DIAGRAM

The Remote Sensing function can be used to compensate for the voltage drop caused by the resistance on the test connection lead from the power output to the load. PPX-1005/2002/2005/3601/3603 compensates for voltages up to 1 volt, and PPX-10H01 compensates for voltages up to 3 volts. When testing, choose a test connection lead with a voltage drop less than the compensation voltage of the PPX series as much as possible.

C. TEMPERATURE MEASUREMENT

Blue: Temperature Control on with no GTL-205A Connected

Green: Output Safe is Activated and Output is on with GTL-205A Connected

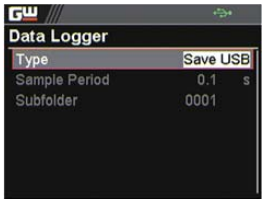
White: Temperature Control on with GTL-205A Connected

Red: The Alarm of Short Circuit Occurs From Temperature Measurement

The PPX-Series can measure DUT temperature while outputting power. Before measuring the temperature, please use the optional accessory GTL-205A (temperature probe adapter with K-type thermocouple) to connect the DUT and TC input terminals on the front panel of the PPX-Series respectively. During the measurement process, users can set the monitoring temperature for the DUT. Once the measurement temperature reaches the monitoring temperature value, the PPX-Series will stop the output. The PPX-Series can measure the temperature range of -200.0℃~1372.0℃ (-328.0℉~2501.6 ℉). Users can choose the display unit as ℃ or ℉ according to the requirement.

D. DATA LOGGER

Dlog Icon Appears



Data Logger Function

Save Data Log Into USB Disk

The PPX-Series can record the measured voltage, current and temperature data to a USB flash drive or can be remotely controlled to read the data. Data sampling interval is 0.1~999.9 seconds.

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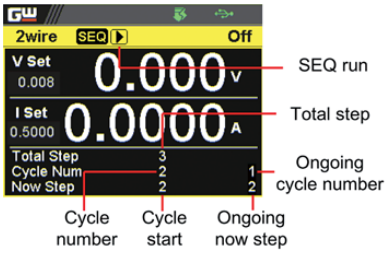
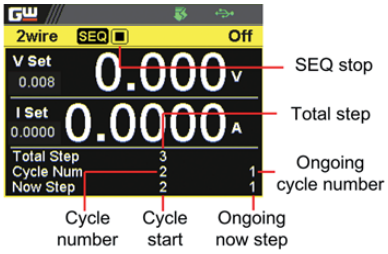
E. SEQUENCE TEST



SEQ Run in Cycle Mode



SEQ Stop in Cycle Mode

The Sequence Test function allows users to plan the PPX-Series to execute a sequential power output. The PPX-Series will automatically execute the planned power output to the DUT to realize automated measurement. The PPX-Series can store 10 sets of edited Test Scripts in the internal memory, and can also be connected to a USB flash drive to store Test Scripts in the USB flash drive.

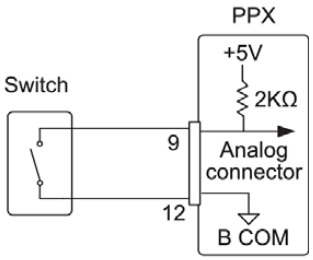
F. V/ I SLEW RATE

Model	R_V Slew Rate/ F_V Slew Rate Setting Range
PPX-1005	0.0001V/ms ~ 0.1V/ms
PPX-2002	0.0001V/ms ~ 0.2V/ms
PPX-2005	0.0001V/ms ~ 0.2V/ms
PPX-3601	0.0001V/ms ~ 0.36V/ms
PPX-3603	0.0001V/ms ~ 0.36V/ms
PPX-10H01	0.001V/ms ~ 0.5V/ms

Voltage Rising/Falling Slew Rate

The PPX-Series can adjust the slew rate of current and voltage. Via setting the rising and falling time of voltage and current, users can verify the performance of the DUT during the voltage/current changes. In addition, the adjustment of the slew rate slows down the voltage transfer, which can effectively avoid the damage of the inrush current to the DUT, therefore, the series is especially suitable for the testing of capacitive loads and motors.

G. ANALOG REMOTE CONTROL



External Control of Output

The PPX-Series supports the analog control function, including external voltage to control voltage output/current output, external resistance to control voltage output/current output, external control of power output, trigger input/trigger output, and voltage/current monitoring.

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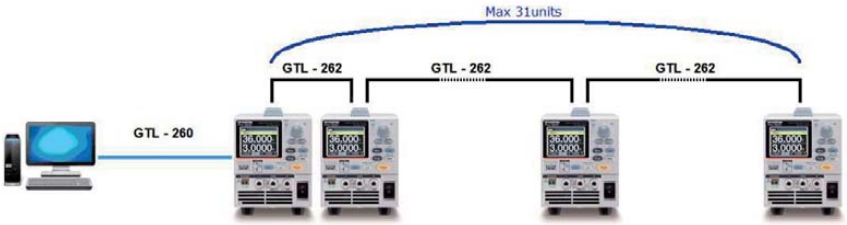
PANEL INTRODUCTION

H. MULTIPLE UNIT CONNECTION



Multiple Unit Connection

The PPX-Series can connect up to 31 units. The PC is connected to the first unit of PPX through GTL-260, and the remaining PPX units are connected in a daisy-chained method via GTL-262. When using PPX-Series Multiple Unit Connection for remote program control and slave expansion, there is no need to use other remote control equipment (E.g. switch/Hub), which can help users save equipment purchase costs.

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SPECIFICATIONS

Model	PPX-1005	PPX-2002	PPX-2005	PPX-3601	PPX-3603	PPX-10H01
DC Output Mode						
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
CONSTANT VOLTAGE OPERATION						
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*1	<50µs	<50µs	<50µs	<50µs	<50µs	<100µs
Ripple Noise(Vrms*2/Vpp*3)	0.35mVrms/<6mVpp	0.5mVrms/<8mVpp	0.5mVrms/<8mVpp	0.8mVrms/<10mVpp	0.8mVrms/<10mVpp	1.2mVrms/<15mVpp
Rise Time*4 Rated load	20ms	50ms	50ms	50ms	50ms	100ms
Rise Time*4 No load	20ms	50ms	50ms	50ms	50ms	100ms
Fall Time*5 Rated load	10ms	20ms	20ms	20ms	20ms	50ms
Fall Time*5 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
CONSTANT CURRENT OPERATION						
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*2)	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
MEASUREMENT AND DISPLAY						
Voltage Range H	10.000V	20.000V	20.000V	36.000V	36.000V	100.00V
Voltage Range L	1.0000V	2.0000V	2.0000V	3.6000V	3.6000V	10.000V
Current Range H	5.0000A	2.0000A	5.0000A	1.0000A	3.0000A	1.0000A
Current Range M	500.00mA	200.00mA	500.00mA	100.00mA	300.00mA	100.00mA
Current Range L	50.000mA	20.000mA	50.000mA	10.000mA	30.000mA	10.000mA
Current Range LL	5.0000mA	2.0000mA	5.0000mA	1.0000mA	3.0000mA	1.0000mA
Measurement Resolution Voltage(H)	1mV	1mV	1mV	1mV	1mV	10mV
Measurement Resolution Voltage(L)	0.1mV	0.1mV	0.1mV	0.1mV	0.1mV	1mV
Measurement Resolution Current(H)	0.1mA	0.1mA	0.1mA	0.1mA	0.1mA	0.1mA
Measurement Resolution Current(M)	0.01mA	0.01mA	0.01mA	0.01mA	0.01mA	0.01mA
Measurement Resolution Current(L)	0.001mA	0.001mA	0.001mA	0.001mA	0.001mA	0.001mA
Measurement Resolution Current(LL)	0.0001mA	0.0001mA	0.0001mA	0.0001mA	0.0001mA	0.0001mA
Measurement Accuracy Voltage(H/L)	±(0.03% of rdg + 2mV)	±(0.03% of rdg + 4mV)	±(0.03% of rdg + 5mV)	±(0.03% of rdg + 6mV)	±(0.03% of rdg + 8mV)	±(0.03% of rdg + 15mV)
Measurement Accuracy Temperature Coefficient*6(TYP.)	100 ppm/°C	100 ppm/°C	100 ppm/°C	100 ppm/°C	100 ppm/°C	100 ppm/°C
Measurement Accuracy Current(H/M)	±(0.05% of rdg + 2.5mA)	±(0.05% of rdg + 1.0mA)	±(0.05% of rdg + 2.5mA)	±(0.05% of rdg + 0.4mA)	±(0.05% of rdg + 1.2mA)	±(0.05% of rdg + 1.0mA)
Measurement Accuracy Current(L/LL)	±(0.1% of rdg + 40µA)	±(0.1% of rdg + 24µA)	±(0.1% of rdg + 40µA)	±(0.1% of rdg + 16µA)	±(0.1% of rdg + 28µA)	±(0.1% of rdg + 24µA)
Measurement Accuracy Temperature Coefficient*6(TYP.)	200 ppm/°C	200 ppm/°C	200 ppm/°C	200 ppm/°C	200 ppm/°C	200 ppm/°C
TEMPERATURE MEASURED						
Temperature (K-Type Thermocouple) Range	-200°C~+1372°C					
Temperature (K-Type Thermocouple) Resolution	0.25°C					
Temperature (K-Type Thermocouple) Accuracy	±(0.5% + 2°C)					
PROTECTION						
Over Voltage Protection(OVP) Operation	Turns the output off, displays OVP and lights ALARM					
Over Voltage Protection(OVP) 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
Over Voltage Protection(OVP) 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					
Over Current Protection(OCP) 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
Over Current Protection(OCP) 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					
OTHER						
Interface Capabilities LAN	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask					
Interface Capabilities USB	Type A: Host, Type B: Slave, Speed: 1.1/2.0, USB-CDC					
Interface Capabilities RS-232/RS-485	Complies with the EIA-RS-232/RS-485 specifications (excluding the connector)					
Nominal Input Voltage*7	100Vac / 120Vac / 220Vac / 240Vac(±10%), 50Hz / 60Hz, single phase					
Input Frequency Range	47Hz – 63Hz					
Max. Inrush Current	25Amax	20Amax	30Amax	35Amax	40Amax	30Amax
Max. Power Consumption	200VA	150VA	300VA	150VA	300VA	300VA
Operaing 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-SeriesD1BH

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(JIS)
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)		

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