Programmable Switching D.C. Power Supply (Multi-Range D.C. Power Supply)

The PSW-Series is a single output multi-range programmable switching DC Power Supply covering a power range up to 1080W. This series of products include six models with the combination of 30V, 80V, and 160V rated voltages, 720W and 1080W maximum output powers. The multi-range feature allows the flexible and efficient configuration of voltage and current within the rated power range. As the PSW-Series can be connected in series for maximum 2 units or in parallel for maximum 3 units, the capability of connecting multiple PSW-Series units for higher voltage or current output provides a broad coverage of applications. With the flexibility of multi-range power utilization and series/parallel connection, the PSW-Series significantly reduces the user's cost for various power supply products to accommodate the projects with different power requirements.

The C.V/C.C priority selection of the PSW-Series is a very useful feature for DUT protection. The conventional power supply normally operates under C.V mode when the power output is turned on. This could bring a high inrush current to the capacitive load or current-intensive load at the power output-on stage. Taking the I-V curve verification of LED as an example, it becomes a very challenging task to perform this measurement using a conventional power supply. With LED connected to a power supply under C.V mode as the initial setting, when the power output is turned on and the voltage rises to the LED forward voltage, the current will suddenly peak up and exceed the preset current limit. Upon detecting this high current, the power supply starts the transition from C.V mode to C.C mode. Though the current becomes stable after the C.C mode being activated, the current spike occurred at the C.V and C.C crossover point may possibly damage the DUT. At the power output-on stage, the PSW-Series is able to operate under C.C priority to limit the current spike occurred at the threshold voltage and therefore protects DUT from the inrush current damage.

The adjustable slew rate of the PSW-Series allows user to set for either output voltage or output current, a specific rise time from low to high level transition, and a specific fall time from high to low level transition. This facilitates the characteristic verification of a DUT during voltage or current level changes with controllable slew rates. Most manufacturing tests of lighting device or large capacitance capacitor transition. This facilitates the characteristic verification of a DUT during voltage or current level changes with controllable slew rates. Most manufacturing tests of lighting device or large capacitance capacitor.

The PSW-Series is a single output multi-range programmable switching DC Power Supply covering a power range up to 1080W. This series of products include six models with the combination of 30V, 80V, and 160V rated voltages, 720W and 1080W maximum output powers. The multi-range feature allows the flexible and efficient configuration of voltage and current within the rated power range. As the PSW-Series can be connected in series for maximum 2 units or in parallel for maximum 3 units, the capability of connecting multiple PSW-Series units for higher voltage or current output provides a broad coverage of applications. With the flexibility of multi-range power utilization and series/parallel connection, the PSW-Series significantly reduces the user's cost for various power supply products to accommodate the projects with different power requirements.
The PSW-Series is a single output multi-range programmable switching DC Power Supply covering a power range up to 1080W. This series of products includes six models with the combination of 30V, 80V and 160V rated voltages and 300mA, 720mA and 1080mA maximum output powers. The multi-range feature allows the flexible and efficient configuration of voltage and current within the rated power range. As the PSW-Series can be connected in series for maximum 2 units or in parallel for maximum 3 units, the capability of connecting multiple PSW-Series units for higher voltage or higher current output provides a broad coverage of applications. With the flexibility of multi-range power utilization and series/parallel connection, the PSW-Series significantly reduces the user’s cost for various power supply products to accommodate the projects with different power requirements.

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The adjustable slow rate of the PSW-Series allows users to set for either output voltage or output current, a specific rise time from low to high level transition, and a specific fall time from high to low level transition. This facilitates the characteristic verification of a DUT during voltage or current level changes with controllable slow rates. Most manufacturing test equipment set a slow rate or a slow transition capability during power output-on are associated with the occurrence of high surge current, which can greatly reduce the life time of the DUT. To prevent inrush current from damaging current-intensive devices, a smooth and slow voltage transition during power On-Off can significantly reduce the spike current and protect the device from high current damage.

The OVP and OCP protections are provided with the PSW-Series. Both OVP and OCP levels can be selected within the range of 10% to 110%, with default level set at 110%, of the rated voltage/current of the power supply. When any of the protection levels is tripped, the power output will be switched off to protect the DUT. The PSW-Series provides USB Host/Device and LAN interfaces as standard and CP/IP-USB Adaptor as optional. The LabVIEW driver and the Data Logging PC software are supported on all the available interfaces. An analog control/monitoring connector is also available at the rear panel for external control of power On/Off and external monitoring of output power Voltage and Current.

**Programmable Switching D.C. Power Supply (Multi-Range D.C. Power Supply)**

**PSW-Series**

**FEATURES**
- Constant Power Output for Multi-Range (V & I) Operation
- C.V / C.C Priority : Particularly Suitable for the Battery and LED Industry
- Adjustable Slow Rate
- Series and Parallel Operation (2 units in Series/3 units in Parallel Maximum)
- High Efficiency and High Power Density
- 1/2, 1/3, 1/6 Rack Mount Size Design (1U/2U/3U Standard) for 160W, 720W, 1080W
- Standard Interface : LAN, USB, Analog Control Interface
- Optional Software : CP/IP-USB Adaptor
- LabVIEW Driver

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SERIES OPERATION (3 UNITS)</th>
<th>SERIES OPERATION (2 UNITS)</th>
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<tbody>
<tr>
<td>PSW 30-16</td>
<td>30V/16A</td>
<td>30V/16A</td>
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<td>PSW 30-32</td>
<td>30V/32A</td>
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<tr>
<td>PSW 80-11.5</td>
<td>80V/11.5A</td>
<td>80V/11.5A</td>
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<tr>
<td>PSW 80-13.5</td>
<td>80V/13.5A</td>
<td>80V/13.5A</td>
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<td>PSW 80-27</td>
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<td>PSW 80-40.5</td>
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<td>PSW 160-7.2</td>
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<td>160V/7.2A</td>
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<tr>
<td>PSW 160-14</td>
<td>160V/14A</td>
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</tbody>
</table>

**POWER SUPPLIES**

- PSW 80-40.5 (0-30V, 0-40.5A, 160W)
- PSW 80-27 (0-30V, 0-27A, 720W)
- PSW 30-36 (0-30V, 0-36A, 360W)

**POWER SOURCES**

- Analog Control Interface
- USB/LAN/CP/IP(Option)
- USB/LAN/CP/IP
- With thermal sensing control
- 5VDC~24VAC, 50/60Hz, single phase

**DIMENSIONS & WEIGHT**

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions</th>
<th>Weight</th>
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<tbody>
<tr>
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<td>PSW 30-108</td>
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<td>PSW 80-11.5</td>
<td>324(W)x350(D)x124(H) mm</td>
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<tr>
<td>PSW 80-13.5</td>
<td>324(W)x350(D)x124(H) mm</td>
<td>Approx. 7kg</td>
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<td>PSW 80-27</td>
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<td>Approx. 21kg</td>
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<tr>
<td>PSW 160-21.4</td>
<td>324(W)x350(D)x124(H) mm</td>
<td>Approx. 76kg</td>
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</tbody>
</table>
Multi-Range D.C. Power Supply

Rear Panel

PSW-Series

ORDERING INFORMATION
PSW-30.36 (0~30V / 0~108A / 1080W) Multi-Range DC Power Supply
PSW-30.72 (0~72V / 0~27A / 720W) Multi-Range DC Power Supply
PSW-30.108 (0~108V / 0~72A / 720W) Multi-Range DC Power Supply
PSW-80.13.5 (0~40V / 0~13.5A / 525W) Multi-Range DC Power Supply
PSW-80.27 (0~27V / 0~40A / 525W) Multi-Range DC Power Supply
PSW-80.40 (0~40V / 0~27A / 1080W) Multi-Range DC Power Supply
PSW-80.40.5 (0~40V / 0~5A / 204W) Multi-Range DC Power Supply
PSW-160.7.2 (0~160V / 0~7.2A / 1080W) Multi-Range DC Power Supply
PSW-160.16.4 (0~160V / 0~16A / 2560W) Multi-Range DC Power Supply
PSW-160.21.6 (0~160V / 0~21.6A / 3600W) Multi-Range DC Power Supply

ACCESSORIES
User Manual x 1, CD-ROM x 1 (Programmable User Manual), GTI-123 Test Lead x 1, Power Cord x 1 (Region dependent), CTI-240 USB Cable x 1, Type II, PSW-004 Basic Accessories Kit x 1
Includes: 4/16 Terminal screws and washers x 2, An E filter x 1, Analog control protection dummy x 1, Analog control bulb leads x 1, All terminal screws, nuts and washers x 2.

OPTIONAL ACCESSORIES
PSW-001 Accessory Kit
PSW-002 Simple IDC Tool
PSW-003 Contact Removal Tool
PSW-005 Cable for 2 Units of PSW-Series in Series Mode Connection
PSW-006 Cable for 2 Units of PSW-Series in Parallel Mode Connection
PSW-007 Cable for 3 Units of PSW-Series in Parallel Mode Connection
CUG-001 GPIB to USB Adaptor
CA8-0134 Rack Mount Kit (2U)
CA8-0153 Rack Mount Kit (1U)
GET-001 Extended Terminal (MAX. 40A)

GUG-001 GPIB to USB Adapter
For: GDS-3000 Series, PSW-Series

GET-001 Extended Terminal

Cable for 2 Units of PSW-Series in Parallel Mode Connection
Cable for 2 Units of PSW-Series in Series Mode Connection

PSW-005
PSW-006
PSW-007

CABLES FOR 2 UNITS OF PSW-SERIES IN PARALLEL MODE CONNECTION
CABLES FOR 2 UNITS OF PSW-SERIES IN SERIES MODE CONNECTION

CABLES FOR 2 UNITS OF PSW-SERIES IN SERIES MODE CONNECTION

CABLES FOR 2 UNITS OF PSW-SERIES IN PARALLEL MODE CONNECTION

OPTIONAL ACCESSORIES
PSW-001 Accessory Kit
PSW-002 Simple IDC Tool
PSW-003 Contact Removal Tool
PSW-005 Cable for 2 Units of PSW-Series in Series Mode Connection
PSW-006 Cable for 2 Units of PSW-Series in Parallel Mode Connection
PSW-007 Cable for 3 Units of PSW-Series in Parallel Mode Connection
CUG-001 GPIB to USB Adaptor
CA8-0134 Rack Mount Kit (2U)
CA8-0153 Rack Mount Kit (1U)
GET-001 Extended Terminal (MAX. 40A)

ORDERING INFORMATION
PSW-10V Series Operating Area
PSW 10V Series Operating Area
PSW 80V Series Operating Area

When the power supply is configured that the total output (Current x Voltage output) is less than the rated power output, it functions as a typical Constant Current (C.C) and Constant Voltage (C.V) power supply.

B. C.V / C.C PRIORITY SELECTION

The Inrush Current and Surge Voltage occur at LED Forward Voltage (Vf) Under C.V Priority

The PSW-Series provides C.C Mode and C.V Mode to fit various applications in the general purpose market. To get into critical application niches, however, the power supply needs to provide advanced features to meet the specific requirements. The C.C and C.V Priority Selection enable the power supply to run under C.C priority, rather than normal C.V priority, at the output-on stage.

C. ADJUSTABLE SLEW RATE

The Adjustable Rise Time of the PSW-Series

The PSW-Series has adjustable slew rates for the level transition of both Current and Voltage. This gives the PSW-Series power supply the ability to set specific rise time and fall time of the Voltage and Current drawn from the power supply to verify DUT performance during the Voltage / Current level transition. This feature also provides the benefit to slow down the voltage transition at the power output-on to prevent DUT from inrush current damage. This is especially useful for the test of heavy-current drawn devices like capacitors.

D. BLEEDER CONTROL

The PSW-Series employs a bleeder resistor in parallel with the output terminal. Bleeder resistor is designed to dissipate the power from the power supply filter capacitors when power is turned off and the load is disconnected. Without a bleeder resistor, power terminal may remain charged on the filter capacitors for some time and be potentially hazardous. In addition, bleeder resistor also allows for smoother voltage regulation of the power supply as the bleeder resistor acts as a minimum voltage load. The bleeder resistance can be turned on or off using the configuration setting.

A. MULTI-RANGE OPERATION

The Adjustable Rise Time of the PSW-Series

The Adjustable Rise Time of the PSW-Series

The PSW-Series Built-in Bleeder Resistor

The PSW-Series Built-in Bleeder Resistor

PSW-004 Basic Accessories Kit x 1
Includes: 4/16 Terminal screws and washers x 2, An E filter x 1, Analog control protection dummy x 1, Analog control bulb leads x 1, All terminal screws, nuts and washers x 2.
**Multi-Range D.C. Power Supply**

### Rear Panel

**PSW-Series**

#### ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage Range</th>
<th>Current Range</th>
<th>Output Power</th>
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</thead>
<tbody>
<tr>
<td>PSW-001</td>
<td>0<del>30V / 0</del>10A</td>
<td>300W</td>
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<tr>
<td>PSW-002</td>
<td>0<del>30V / 0</del>14A</td>
<td>720W</td>
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<tr>
<td>PSW-003</td>
<td>0<del>30V / 0</del>72A</td>
<td>1080W</td>
<td></td>
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<tr>
<td>PSW-004</td>
<td>0<del>30V / 0</del>108A</td>
<td>1080W</td>
<td></td>
</tr>
</tbody>
</table>

#### ACCESSORIES

- User Manual x 1, CD-ROM x 1 (Programmable User Manual), GDS-125 Test Lead x 1, Power Cord x 1 (Region dependent), CAT-240 USB Cable x 1, Type B, Type 1, PSW-004 Basic Accessories Kit x 1
- Includes: M4 Terminal screws and washers x 2, An & Filter x 1, Analog control protection dummy x 1, Analog control board units x 2, Analog terminal board, leads and washers x 2.

#### OPTIONAL ACCESSORIES

- PSW-001 Accessory Kit
- PSW-002 Simple IDC Tool
- PSW-003 Contact Removal Tool
- PSW-004 Basic Accessories Kit x 1
- PSW-005 Cable for 2 Units of PSW-Series in Series Mode Connection
- PSW-006 Cable for 2 Units of PSW-Series in Parallel Mode Connection
- PSW-007 Cable for 3 Units of PSW-Series in Parallel Mode Connection
- GUG-001 GPIB to USB Adapter
- CBA-003 Rack Mount Kits (5) x 1
- CBA-005 Rack Mount Kits (8) x 1

#### GET-001 Extended Terminal

### C.C / C.V Priority Selection

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### Multi-Range Operation

When the power supply is configured that the total output (Current x Voltage output) is less than the rated power output, it functions as a typical Constant Current (C.C) and Constant Voltage (C.V) power supply.

However, when the power supply is configured such that the total output power (Current x Voltage Output) exceeds the rated power output, the effective output is actually limited to the operation area of the unit.
**Multi-Range D.C. Power Supply**

### E. SERIES AND PARALLEL CONNECTIONS

![Series Connection Diagram](image1)

**Parallel Connection**

To increase power output capacity, the PSW-Series could be connected in Series mode to perform double voltage rating or in parallel mode to perform triple current rating for each model. With Multi-Range feature and Series/Parallel connection capability, the PSW-Series is a high power density and cost-effective equipment for the tests of DC power modules, batteries and components in a broad power range.

### F. OUTPUT ON/OFF DELAY

The output On/Off delay feature enables the setting of a specific time delay for output on after the power supply output is turned on, and a specific time delay for output off after the power supply output is turned off. When multiple PSW units are used, the On/Off delay time of each unit can be set respectively referring to fix time points. This multiple-output control can be done through the Analog Control terminal at the rear panel or through the PC programming with standard commands.

### G. VARIOUS INTERFACES SUPPORT & EXTENDED TERMINAL BOX

The PSW-Series provides USB Host port in the front panel for easy access of stored data, such as test script program. In the rear panel, a USB Device port is available for remote control or I & V data logging of power output through a PC controller. The LAN interface, which meets DHCP standard, is provided as a standard feature of the PSW-Series for system communications and ATE applications.

An Extender Terminal box (P/N: GET-001) is provided as optional accessory to extend the power output form the rear panel to the front side. This extender terminal gives R&D or QC engineers convenience to do the jobs without frequently reaching the output terminal at the rear side of the PSW-Series.

### H. EXTERNAL ANALOG REMOTE CONTROL

![External Analog Remote Control Diagram](image2)

**External Voltage Control of the Voltage Output**

**External Switch Control of the Main Power Shut-down**

**External Resistance control of the Voltage Output**

**External DMM Monitoring of the Output Voltage**

**External DMM Monitoring of the Output Current**

**External Switch Control of the Output On/Off**

On the rear panel of the PSW-Series power supply, a 26-pin Analog Control connector is available to perform lots of remote control and monitoring functions. The output voltage and current can be set using external voltage or resistance.

The power supply output on/off and main power shut-down can also be controlled using external switches. This Analog Control Connector is compiled with the MIL-26 pin connector (OMRON XG4 IDC plug) standard.

### I. USING THE RACK MOUNT KIT

![Rack Mount Kit Diagram](image3)

**Rack Mount Kit GRA-410-J (JIS)**

**Rack Mount Kit GRA-410-E (EIA)**

The Rack Mount Kit of the PSW-Series supports both EIA and JIS standards. A standard rack can accommodate 6 units of type I (360W Output Power) models, or 3 units of type II (720W Output Power) models, or 2 units of type III (1860W Output Power) models.
Multi-Range D.C. Power Supply

E. SERIES AND PARALLEL CONNECTIONS

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The power supply output on/off and main power shut-down can also be controlled using external switches. This Analog Control Connector is complies with the MIL-26 pin connector (OMRON XG4 IDC plug) standard.

I. USING THE RACK MOUNT KIT

The Rack Mount KIT of the PSW-Series supports both EIA and JIS standards. A standard rack can accommodate 6 units of type I (360W Output Power) models, or 3 units of type II (720W Output Power) models, or 2 units of type III (1080W Output Power) models.

The Rack Mount KIT for EIA standard (P/N: GRA-410-E) and for JIS standard (P/N: GRA-410-J) are provided as optional accessories for the PSW-Series.