Generic Power Supply Module Installation Manual

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Introduction to this Installation Manual

This Installation Manual is for use by qualified Service Personnel only. This Generic PSU Assembly module should only be installed and/or replaced by qualified personnel.

The installation and/or removal of this Generic PSU Assembly module should only be undertaken once the after PSU Module Installation and Removal section of the appropriate enclosure has been read and understood.

Explanation of Safety Symbols

This symbol refers the user to important information contained in the accompanying literature. Refer to manual.

This symbol indicates that hazardous voltages are present inside. No user serviceable parts inside. This unit should only be serviced by trained personnel.

Safety Warnings

 These servicing instructions are for use by qualified service personnel only. To reduce risk of electric shock do not perform any servicing other than that contained in the Operating Manual unless you are qualified to do so. Refer all servicing to qualified personnel.

WARNING TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Manufacturers Notice

Important Notice

No responsibility is taken by the manufacturer or supplier for any non-compliance to EMC standards due to incorrect installation.

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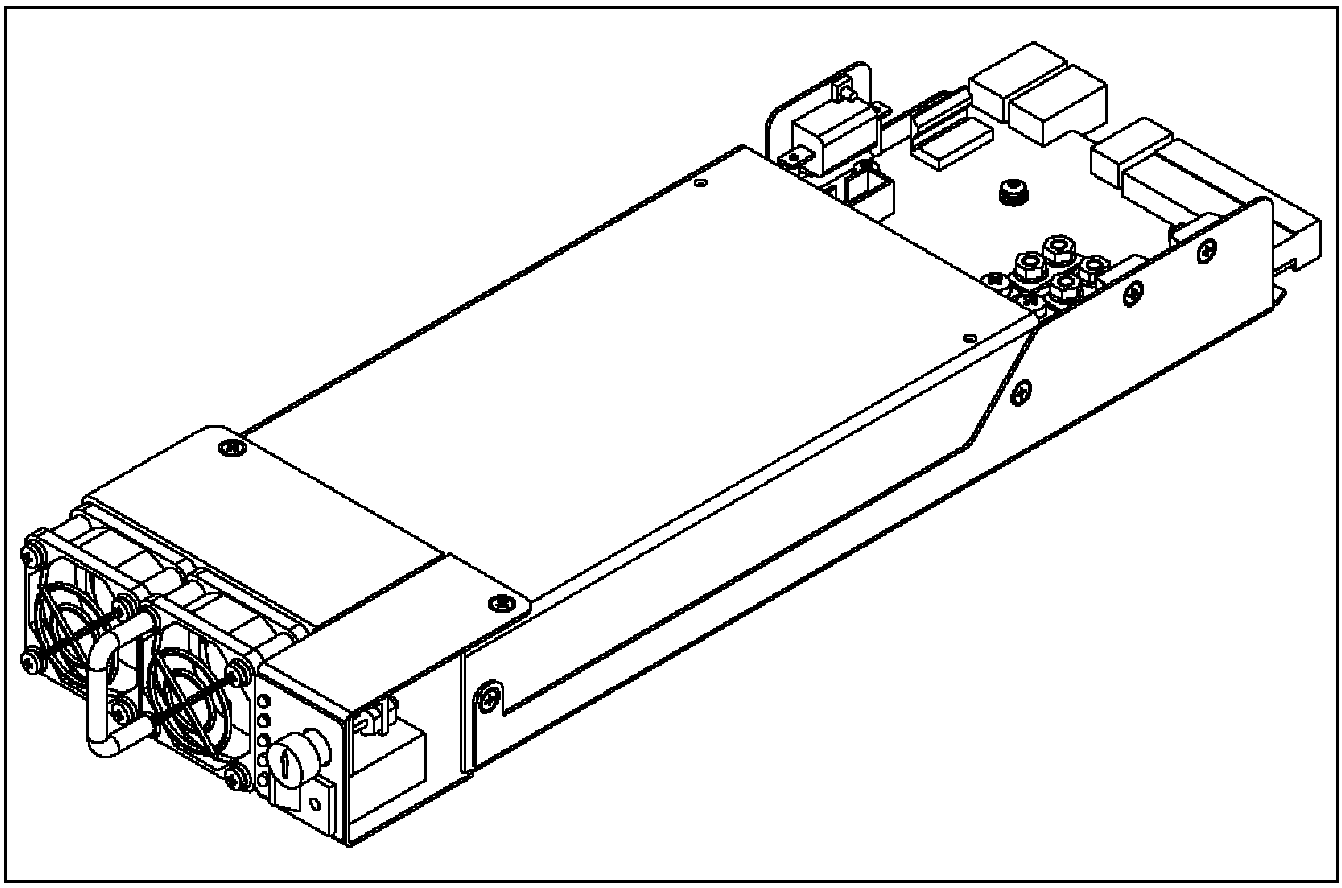
Introduction



The Generic Power Supply Module has been designed to support many different products within the range provided by the company.

This power supply module provides the same voltage rails as required by the Compact PCI. The actual Power Supply Unit that is the core of the module is a completely standard unit in extensive use in several industries. It is known that there is an installed base of several thousands of units all over the world.

The features provided by this assembly are extensive, both in terms of it's operational functionality, and also in terms of the level of monitoring it supports.

This module can operate as a single supply, in N+1 configurations, or in a dual redundant configuration. It is completely hot pluggable with the constraint that it must be switched off at the time it is inserted or removed from the main enclosure.

Order Codes

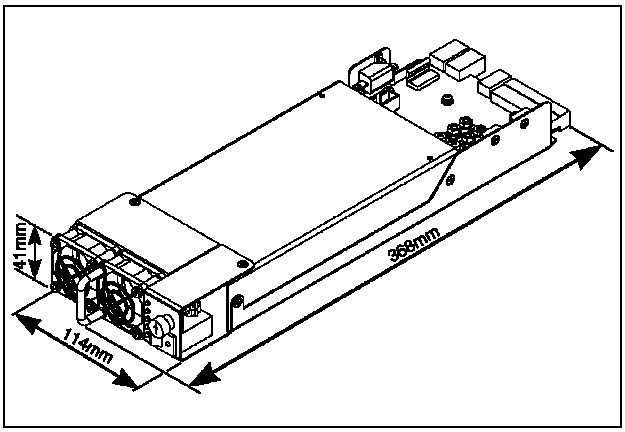
For replacement or extra supplies the order code of this power supply unit is as follows:

SHDPSUA1501

Features

- Fully hot pluggable.
- Compact PCI power rails comprising
  - 5V
  - 3V3
  - +12V
  - -12V
- Independent cooling provided by two fans
- Simple retention system.
- Stainless Steel chassis
- Active Power sharing between multiple supplies
- Passive Diode combination of voltage rails onto Services Backplane
- The Control and Monitor board supports a Full monitoring system including
  - All output power rails ***before*** the current sharing diodes.
  - Temperature
  - Rotation checks on both fans.
  - Supply rails to both fans.
  - Logic supply rails.
  - PSU diagnostic outputs.
- LED indications of PSU status on the front of the module.

Technical Profile



Construction
The System HD Generic Power Supply Module is made up of three main elements.

The chassis for the assembly is made from Stainless Steel.

The interface PCB transfers the AC supply from the backplane to the actual Power Supply Unit (PSU) and the DC supplies from the PSU to the backplane. The PCB also supports all the control and monitoring of the module.

The third element is the actual PSU itself. This is made by Power One. The 150W module uses their MPU150-4350 unit in it's completely standard form.

Approximate dimensions
Height: 41mm
Length: 368mm
Width: 114mm

Environment
Operational: 0°C to +40°C ambient with free air flow. Relative humidity 0% to 90% (non-condensing).
Storage: -30°C to +75°C.

Weight
Complete Power Supply Module is 1.6kg.

AC Input
100-250V 50/60Hz. Inrush Current up to 35A

Power Consumption
< 150W

EMC Environment
The unit is intended for use in the commercial and light industrial environment E2

General Concept

This generic power supply module has been designed to support many different configurations. It can operate as a stand alone unit or in N+1, or dual redundant configurations. The module has it's own fans to keep the cooling independent from that provided for the main enclosure.

This power supply assembly incorporates an extremely high level of monitoring when placed in an enclosure where another board is acting as the supervisor. Most of the monitoring functions are accessed via an I^2C interface. Some of the monitored elements are provided as signals onto the backplane to be used by systems without a supervisory capability.

The unit can be inserted into, or removed from, a live backplane as long as it is switched off first.

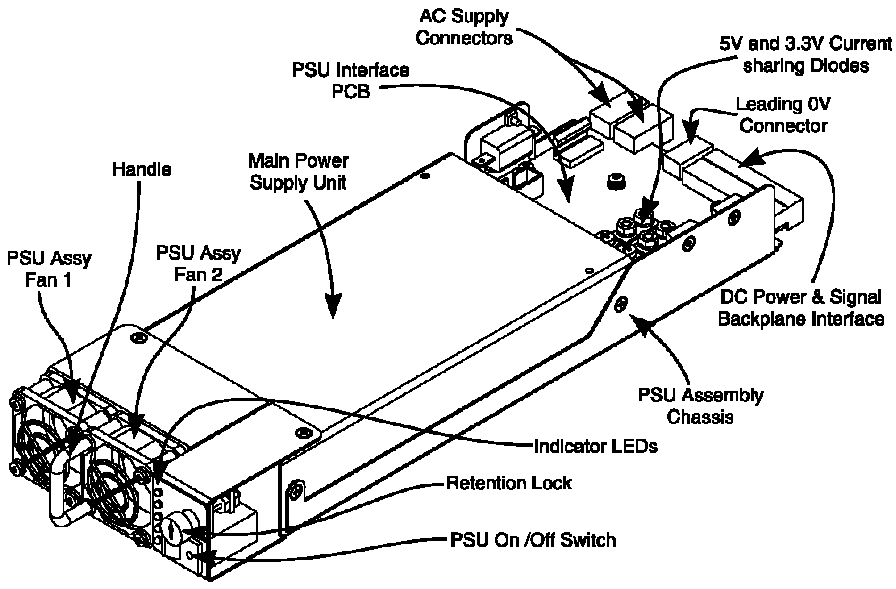
NOTE …

1 **Power Supply Assemblies must only be installed or removed by approved engineers.**

2 **The installation and removal of Power Supply Assemblies should only be undertaken once the installation section of the installation manual for the associated enclosure has been read and understood.**

The AC supply to the module is provided from the backplane using two connectors that incorporate a leading Earth connection.

The DC outputs from the module on the backplane are provided by a single 125-way Z-Pack connector that also provides the discrete monitoring signal interface and the I^2C interface. A separate leading 0V pin is provided to ensure correct live insertion operation.



Power Supply Module

Overview

The System HD Generic Power Supply Module has been designed to be used in many different applications within the Snell and Wilcox product range. It is a 150W unit which incorporates it's own cooling fans, a high level of monitoring, status indications, and mains power switch. A diagram of the module is shown above. The actual power supply unit embedded within the assembly is a completely standard "off the shelf" unit which provides the Compact PCI standard voltage rails. The chassis of the assembly is made of stainless steel and incorporates a handle to facilitate removal and replacement as well as a locking catch to retain the module in the enclosure.

Five LEDs on the front provide information about the status of the module. This includes the status of the four power rails, the AC supply, the AC switch on the front of the unit, and the Fans.

Module Installation and

Removal

This installation manual describes how to install and remove Power Supply Assemblies.

NOTE …

1 Power Supply Assemblies must only be installed or removed by approved engineers.

2 The installation and removal of Power Supply Assemblies should only be undertaken once the installation section of the installation manual for the associated enclosure has been read and understood.

Installing a Power Supply Module

Whether installing or removing a PSU Module from the enclosure it is first necessary to open the Front Panel of that enclosure. This should only be done by an approved engineer.

CAUTION …

1. **If the Power Supply Module has been in operation it is very likely that some parts have become very hot. Therefore it may be necessary for the approved engineer removing the module from the enclosure to wear suitable protection on the hands to prevent burns.**

2. **The Power Supply Module contains Electrostatic Sensitive Devices. Appropriate precautions must be observed. Suitable protective devices must be used or worn before handling the module.**

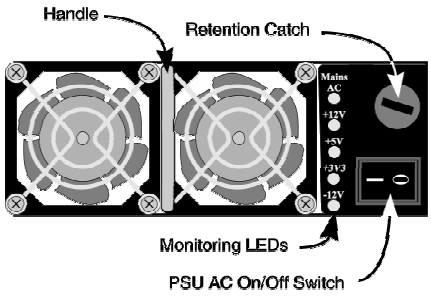
The section of the enclosure installation manual that deals with the Front Panel must also be read and understood before this operation.

The PSU Module is hot-pluggable and so the enclosure can be powered up whilst this module is being installed. It is also acceptable for any of the available AC inlets on the enclosure to be live whilst this operation takes place.

It is very important to note that there may be factors to do with the location and other operating conditions of the enclosure which preclude the safe live insertion of the PSU Assembly.

Proceed as follows:

1. Open the front panel as described in the installation manual for the Enclosure.
2. **Ensure that the AC power switch on the front of the power supply module that is about to be inserted is in the OFF position before inserting the module into the enclosure.**
3. Insert the Power Supply Module with the fans closest to the front of the enclosure and the connectors to the rear, in the next free Power Supply Module location (working up from the bottom if part of System HD).
4. Using the handle on the front of the module, push the module fully home. This should result in the fans and front plate of the module sitting very nearly flush with the front of the enclosure metalwork that supports the processing boards.
5. Turn the retention catch clockwise until it tightens.
6. Switch the newly installed Power Supply Module on using the AC switch on the front of the Module.
7. Refer to the “Monitoring Indications” section of this manual for an explanation of the LED indications on the front of the Power Supply Module.
8. Close and secure the front panel in the manner described in the installation manual for the Enclosure.



Power Supply Module: Front View

Removing a Power Supply Module

Whether installing or removing a PSU Module from the enclosure it is first necessary to open the Front Panel of that enclosure. An approved engineer should only carry out this procedure.

The section of the enclosure installation manual that deals with the Front Panel must also be read and understood before this operation.

The PSU Module is hot-pluggable and so the enclosure can be powered up while this module is removed. It is also acceptable for any of the available AC inlets on the enclosure to be live whilst this operation takes place.

It is very important to note that there may be factors to do with the location and other operating conditions of the enclosure which preclude the safe live removal of the PSU Assembly.

1. Open the front panel as described in the installation manual for the Enclosure.
2. **Ensure that the AC power switch on the front of the power supply module that is about to be removed is in the OFF position.**
3. Refer to the “Monitoring Indications” section of this manual for an explanation of the LED indications on the front of the Power Supply Module. Use these indications to check that the PSU Assembly has powered down before proceeding any further.
4. Turn the retention catch anti-clockwise until it loosens. This should only require a couple of turns.

CAUTION …

1. **If the Power Supply Module has been in operation it is very likely that some parts have become very hot. Therefore it may be necessary for the approved engineer removing the module from the enclosure to wear suitable protection on the hands to prevent burns.**

2. **The Power Supply Module contains Electrostatic Sensitive Devices. Appropriate precautions must be observed. Suitable protective devices must be used or worn before handling the module.**

5. Using the handle on the front of the Power Supply Module remove it from the enclosure. **Take great care in handling the removed Power Supply Module as some parts of it may be very hot. It may be necessary for suitable protection for the hands to be worn to prevent burns or high levels of discomfort**.
6. Close and secure the front panel in the manner described in the installation manual for the Enclosure.

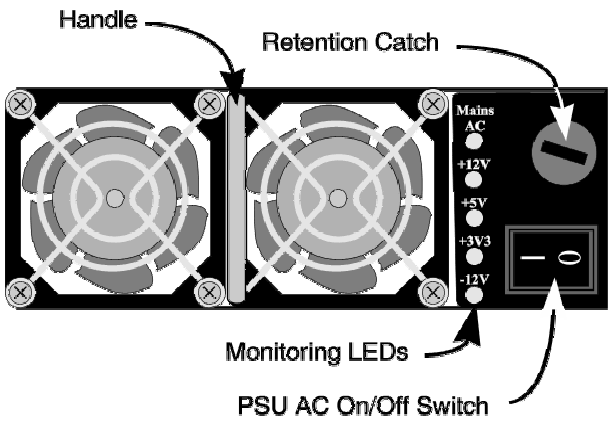
Monitoring Indications and Outputs

Power Supply Module Operation

There are two distinct levels of Power Supply Module monitoring operation**.** Which of these levels is selected depends entirely on the level of monitoring that is being provided by the system which the PSU Assembly is part of.

If there is no monitoring process operating within the system then the Power Supply Module will only provide very basic indications.

If there is a monitoring system operating then the Power Supply Module will give a very sophisticated set of indications. These will be provided locally using the LEDs on the front of the assembly and remotely over whatever medium has been selected. This remote facility automatically includes the Snell and Wilcox RollCall[tm] system.



Power Supply Module: Front View

Indications without a Monitoring System

If there is no monitoring system operating within the enclosure then the indications provided by the Power Supply Module are very basic.

Indications on Insertion – Enclosure not powered.

Obviously if the enclosure is not powered up and the Power Supply Module has been inserted correctly (i.e. switched off) then there will be no indications of any kind.

Indications on Insertion – Enclosure already powered (Live Insertion)

In the case where there is no monitoring system operating, and the Power Supply Module has been inserted correctly (i.e. switched off), there will be no LED indications on the front of the Power Supply Module. However an indication that the supply is inserted into the backplane is that the fans on the front of the assembly will begin to rotate.

Indications when the Module is switched ON

The only indication in this case (no monitoring process) is made by the top (Mains AC) LED on the front of the Power Supply Module. If the primary output rail, which is the 3V3, is within limits according to the actual Power Supply Unit within the Module then this LED is illuminated**.** There are no other checks and no other indications in this case. The other four LEDs will remain off.

Indications with a Monitoring System

If there is a monitoring system operating within the enclosure then the indications provided by the Power Supply Module are very sophisticated.

Indications on Insertion – Enclosure not powered.

Obviously if the enclosure is not powered up and the Power Supply Module has been inserted correctly (i.e. switched off) then there will be no indications of any kind.

Indications on Insertion – Enclosure already powered (Live Insertion)

In the case where there is an operational monitoring system operating, and the Power Supply Module has been inserted correctly (i.e. switched off), there will be valid LED indications on the front of the Power Supply Module.

Note…

It may take several seconds for this indication to become valid.

Until the Power Supply Module is switched on (see next section) the only LED that is active is the “Mains AC” LED which is the top one of the five on the front of the Power Supply Module.

After a few seconds the “Mains AC” LED should begin to flash. In this configuration (Inserted but switched off) it indicates that the Power Supply Module has access to an AC supply.

If, after a few seconds, the “Mains AC” LED has not begun to flash then this means that the Power

Supply Module does not have access to an AC supply. In an enclosure with more than one IEC AC supply inlet this may mean that one of the IEC inlets is not connected or has become faulty.

In addition to the “Mains AC” LED another indication that the supply is inserted into the backplane is that the fans on the front of the assembly will begin to rotate. This rotation will stop when the monitoring system has assessed the Power Supply Module.

Indications when the Module is switched ON

The monitoring system will take a few seconds to register the Power Supply Module after it has been switched on**.** When this checking has taken place the following syntax is applied to the LEDs on the front of the assembly.

Mains AC	OFF	There is no mains AC supply to this Power Supply Module. No other LED indications will be given.
	ON	The Power Supply Unit within the Assembly is indicating that it is receiving an AC supply**.** There are no errors on the Module that are unrelated to the DC rails provided by it.
	Flashing	If this LED is flashing and the Power Supply Module is switched ON it indicates that there is a fault on that Assembly that is unrelated to the DC supplies provided by it. Such a fault will be specifically indicated via the RollCall[tm] control and monitoring system and/or any other connected monitoring system (e.g. RS232). The faults that cause this state are as follows :- Fan Fault Over Temperature Logic supply fault on interface board

-12V +5V +3V3 -12V	ON	This DC output from the Power Supply Unit within the assembly is present and within the set tolerance levels.
	Flashing	This DC output from the Power Supply Unit within the assembly is present but is outside the set tolerance levels.
	OFF	This DC output from the Power Supply Unit within the assembly is not active.

Monitoring Data Provided by the Power Supply Module

An operational monitoring system will make the following data available for each of the Power Supply Assemblies fitted within an enclosure.

On all the following items the monitoring system will provide :

Actual Voltage
Voltage High
Voltage Low

Power Supply Unit Output +12V

Power Supply Unit Output +5V

Power Supply Unit Output +3V3

Power Supply Unit Output -12V

Fan 1 Supply Voltage

Fan 2 Supply Voltage

PSU Interface PCB logic 5V Supply

PSU Interface PCB logic 3V3 Supply

The following items are also reported by the monitoring system for each Power Supply Module

Fan 1 Rotation.

Fan 2 Rotation.

PSU Interface PCB temperature.

PSU Output Good (as provided by the PSU)

PSU AC Input Fail (as provided by the PSU)

Power Supply Module AC Supply Available

This data may be provided via the RollCall[tm] system or another data connection to the enclosure such as an RS232 link where that is supported.

Manual Revision Record

Date	Version No.	Issue No.	Change	Comments
28/09/00	1	1		First draft document Issued.
16/06/01	1	2	Power consumption removed completely due to reference to 250W PSU	Need to add power consumption about 150W PSU.
051001	1	3	Edited header and Footer info. Added power figures for 150W PSU.	New issue released