

**point2point**

# POWER SLEEVE

## User Handbook

### 7501x-HB



## **TABLE OF CONTENTS**

<b>1</b>	<b>INTRODUCTION.....</b>	<b>4</b>
<b>1.1</b>	<b>Interfaces.....</b>	<b>4</b>
1.1.1	ON – OFF(charge) switch .....	4
1.1.2	2.1mm charging input.....	4
1.1.3	Optical input.....	4
1.1.4	Front panel connections.....	4
<b>2</b>	<b>USING THE POWER SLEEVE.....</b>	<b>5</b>
<b>3</b>	<b>BATTERIES .....</b>	<b>6</b>
<b>3.1</b>	<b>Battery Charger .....</b>	<b>6</b>
<b>3.2</b>	<b>Battery Charging.....</b>	<b>6</b>
<b>3.3</b>	<b>Battery Discharging .....</b>	<b>7</b>
<b>3.4</b>	<b>Battery Reconditioning .....</b>	<b>7</b>
<b>3.5</b>	<b>Storage.....</b>	<b>7</b>
<b>3.6</b>	<b>Performance.....</b>	<b>8</b>
<b>3.7</b>	<b>Battery life stages .....</b>	<b>8</b>
3.7.1	Service Life .....	8
3.7.2	Battery End of Life.....	8
3.7.3	Disposal.....	8
<b>4</b>	<b>MAINTENANCE AND FAULT-FINDING GUIDE .....</b>	<b>9</b>
<b>5</b>	<b>PRODUCT WARRANTY .....</b>	<b>10</b>
<b>Appendix I</b>	<b>Fibre Optic Connector Cleaning Procedure .....</b>	<b>11</b>
<b>Appendix II</b>	<b>Specifications .....</b>	<b>12</b>
<b>Appendix III</b>	<b>Accessories .....</b>	<b>13</b>
<b>Appendix IV</b>	<b>Glossary.....</b>	<b>14</b>

# 1 Introduction

The Plug-In module power sleeve enables a Plug-In module to be used for battery powered standalone use. The integrated battery will provide power for up to 50 hours continuous operation.

Power for the module is provided by an integrated 3.6Ah or 9.0Ah NiMH battery. It is recommended for use in a less demanding RFI environments than the shielded module and battery. The sleeve has a built in low voltage disconnect switch which prevents the battery from over discharge.

There is also the option to remotely control power ON/OFF via a multimode fibre link using the PPM Four channel battery switch control module (73681).

75013	Power sleeve with 9.0Ah capacity
75014	Power sleeve with 3.6Ah capacity
75015	Power sleeve with 9.0Ah capacity, with optical switch
75016	Power sleeve with 3.6Ah capacity, with optical switch

## 1.1 Interfaces

### 1.1.1 ON – OFF(charge) switch

The unit is fitted with a front panel switch, this can be set to the ON position that enables power to the plug in module. When set to the OFF(charge) position power is disconnected from the plug in module. In the OFF(charge) position the battery is connected to the front panel 2.1mm connector, this is the position that the switch must be set when charging of the internal battery. The negative connections for Battery is common with the chassis ground and not switched.

To maximise battery life it is recommended that when not in use the sleeve front panel switch be set to its OFF (charge) position. This will avoid over discharging the battery if the unit is unused for an extended period (i.e. over a week).

### 1.1.2 2.1mm charging input

This socket should be connected to a recommended battery charger such as a PPM 56292 4 channel charger. The internal battery will only be available for charging when the front panel switch is set to the OFF(charge) position. The centre pin of the connector is positive, the outside pin is connected to the battery negative and chassis ground.

### 1.1.3 Optical input

Units fitted with the optional remotely control power ON/OFF function contain a fibre optic receiver which senses the presence of a light source, with “LIGHT ON” it enables the DC power, allowing conduction between “Battery” and “Plug in module”. With “LIGHT OFF” the battery is isolated. The negative connections for Battery is common with the chassis ground and not switched.

The Fibre optic control port is ST multimode, it can accommodate a wide range of fibre types including 62.5/125um and 50/125um. It is recommended to use a 62.5/125um for best results. The control circuit draws its power from the battery, but the load is relatively low and hence does not significantly impact the battery endurance.

### 1.1.4 Front panel connections

Switch	SPDT switch	set to either “ON” or “OFF(charge)”
Charging input	2.1mm Socket	Battery charging input
Optical Port	Optical ST connector	Multimode optical control fibre

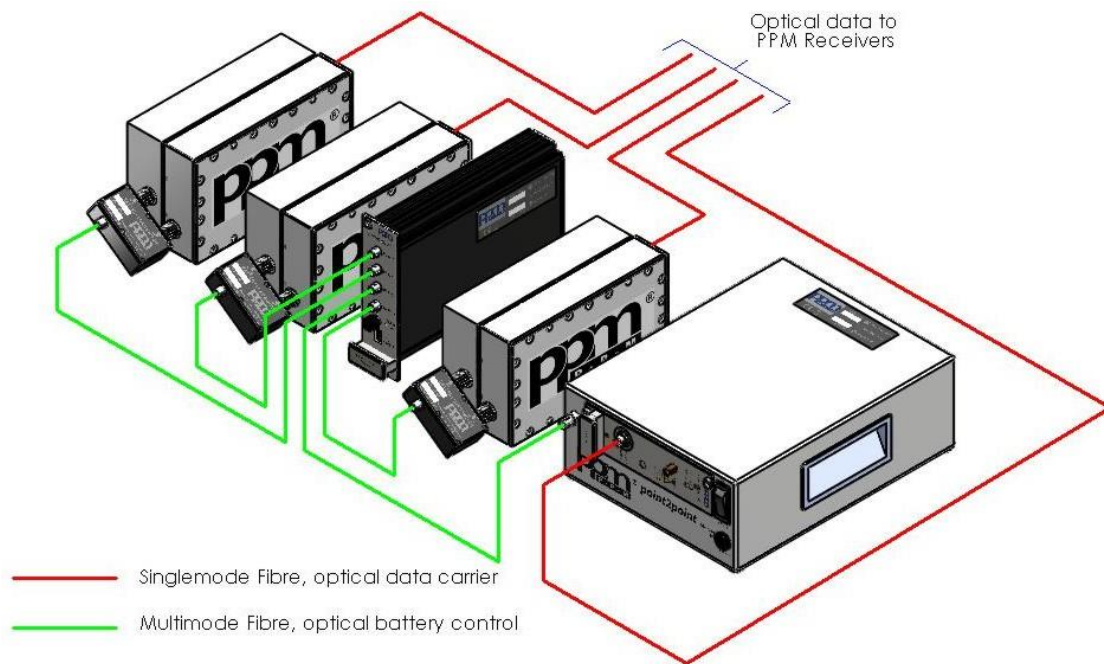
All Power sleeves are supplied with a 73471 charging cable suitable for use with a 56292 4 channel charger

## 2 Using the Power sleeve

To use a power sleeve with a plug in module, you simply need to slide the plug in module into the unit (handle on the left hand side) and push the unit home to ensure that the 96 way connector is fully mated. The retention screws should be tightened to ensure good ground bonding on the front panel.

Power sleeves with the remote control option must be used in conjunction with PPM 73681 four channel battery switch control module. With the optical input unconnected the default state of the switch is OFF. The optical input should be connected using an ST multimode cable to the battery switch controller via a suitable cable.

Each of the four outputs of the battery switch controller can be used to control one battery load switch or power sleeve. The diagram below shows the connections.



Please read fully document Sxx-HB for information on installing your **point2point** equipment before attempting to make any measurements.

Maximum ratings for inputs are given in the technical specifications.

## 3 Batteries

### 3.1 Battery Charger

PPM have collaborated with PAG, a specialist battery charger manufacturer, to develop a customised charger specifically to recharge PPM NiMH battery packs.

The customised charger is available for connection directly to PPM battery packs, the supplied lead mate directly to this charger. The recommended four channel charger is PPM part no 56292.



#### CAUTION

PPM battery packs must not be recharged with non approved chargers.  
Please see [safety warnings](#).

**IMPORTANT** For optimum battery performance, it is essential to ensure the battery charger remains set to its' default 'AUTO' mode.

### 3.2 Battery Charging

Battery packs should only be charged using the [recommended charger](#). Ensure that the front panel switch is in the correct position.

Ideally batteries should be charged when they have returned to ambient temperatures between 15°C to 25°C. This will require battery packs to be left at such ambient temperatures for at least an hour if they are too hot or cold.

It is acceptable to charge batteries at temperatures between 0°C and 40°C, but operating at these extreme temperatures will degrade battery life.

To charge a battery pack, simply connect it to the recommended charger using the supplied cable. Charging will start and stop automatically.



#### CAUTION

Batteries should not be left discharged for extended periods of time. Self-discharge (with no load connected) can over-discharge batteries causing reduced life or permanent damage.  
See [storage times](#).

### **3.3 Battery Discharging**

PPM battery packs are designed for use with PPM equipment only.

Every PPM module designed to operate from a battery pack includes a voltage-detector and switch to automatically disconnect the load from the battery at a safe voltage. The battery pack has built in protection suitable for its operating environment. This will protect the battery and allow it to deliver 3 Amps of continuous current. The protection consists of a bimetal thermal protection, PTC resetable fuse and a non-resetable thermal fuse. The non resetable fuse will only be blown under extreme abuse, under all normal operating conditions the resetable fuses will open first.

#### **WARNING**



PPM battery packs should not be used to power non-PPM equipment. Doing so could result in over-discharge or other hazardous abuse See [safety warnings](#).

Ideally batteries should be discharged at temperatures between 15°C and 25°C. Batteries may be discharged at temperatures from -10°C to +45°C, but repeated discharging at extreme temperatures will shorten working life.

If batteries are stored at temperatures below -10°C or above +40°C, it is very important they are left for at least an hour within this temperature range before starting a discharge.

### **3.4 Battery Reconditioning**

Battery packs contain a string of series cells that gradually become unbalanced in stored capacity.

PPM recommend battery packs are rebalanced at regular intervals to help rebalance cells. Rebalancing is done automatically at the end of the charging cycle.

If your batteries are not regularly fully discharge and exhibiting reduced capacity. You may wish to fully discharge them using your P2P module as a load. This can be done overnight as the P2P module will switch off when the battery is fully discharged. Then run the unit through its normal charge cycle.

Appropriate reconditioning intervals will depend on battery usage. A typical interval would be 3 months.

Battery packs at the end of their working life cannot be reconditioned and should be returned to PPM for replacement of all battery cells. Batteries at the end of their life will often fail to charge.

### **3.5 Storage**

Ideally batteries should be stored in a dry environment at temperatures between 15°C and 25°C

Batteries may however be stored at:

-20°C to +50°C for up to 30 days at 25 to 65%RH

-20°C to +40°C for up to 90 days at 25 to 65%RH

-20°C to +30°C for up to 1 year at 25 to 65%RH

Storage at high relative humidity (RH) is not recommended because expansion and contraction of battery materials may cause leaks and rust to form on metal parts.

Battery self-discharge rate increases with storage temperature.

At 20°C battery capacity falls to 70% after 30 days.

At 40°C battery capacity falls to 40% after 30 days.

Batteries left for extended periods resulting in over-discharge may be permanently damaged.

### 3.6 Performance

The time a battery can provide power to its load will depend on many factors including:

- Battery state of charge
- Battery age and condition
- Ambient temperature
- Load current
- Elapsed time since battery was charged

Nominal times new, fully-charged batteries will power a load at 20°C are:

Load	3.6Ah Battery Pack	9.0Ah Battery Pack
100mA	33 hours	82.5 hours
150mA	22 hours	55.0 hours
200mA	16.5 hours	41.3 hours
250mA	13.2 hours	33.0 hours
300mA	11 hours	27.5 hours
350mA	9.4 hours	23.5 hours
400mA	8.2 hours	20.5 hours
450mA	7.3 hours	18.3 hours
500mA	6.6 hours	11.5 hours
550mA	6.0 hours	10.5 hours
600mA	5.5 hours	9.5 hours

As a guide, temperature and battery condition will cause these times will vary as follows:

- 95% time if discharged at 0°C (-5%).
- 90% time if discharged at -10°C.
- 90% if stored at 25°C for one week after charging
- 75% if stored at 40°C for one week after charging
- 90% after 500 charge/discharge cycles
- 80% after 3 years usage

These variations can be multiplied together as applicable.

*e.g. A 3 year old battery fully charged then stored for a week at 25°C before being discharged at 0°C will only last:*

$$80\% \times 90\% \times 95\% = 68\% \text{ of nominal time.}$$

### 3.7 Battery life stages

#### 3.7.1 Service Life

PPM NiMH battery packs have been designed to provide the maximum possible useful working life. Reliability of all NiMH rechargeable battery cells does however depend on the way battery packs are treated.

Storage and operating temperatures are the most important factors determining useful life, with high temperatures being the most detrimental. Battery capacity will build up to a maximum over the first few charge/discharge cycles then gradually decline with age and usage.

#### 3.7.2 Battery End of Life

PPM recommend batteries are replaced after 500 charge/discharge cycles, 3 years usage or when capacity falls below 80% of nominal – whichever occurs first.

#### 3.7.3 Disposal

PPM recommend battery packs are recycled using a local collection and recycling scheme.

Please see [battery disposal](#).

## 4 Maintenance and Fault-Finding Guide

Refer to the following table that gives a list of commonly encountered problems and suggested solutions.

Fault	Possible Causes	Solution
FOL Device under test permanently OFF	<p>Power sleeve Switch status in correct</p> <p>Battery is discharged.</p> <p>Four channel battery switch control module Switch status incorrect (optical switch only)</p> <p>Four channel battery switch control module TTL control lines are set to incorrect value (optical switch only)</p> <p>Dirt on the fibre optic connectors. (optical switch only)</p> <p>Broken optical fibre. (optical switch only)</p>	<p>Switch Sleeve to ON</p> <p>Recharge/replace Battery Pack</p> <p>Switch Controller to ON LED on controller is GREEN</p> <p>Check controller LED is GREEN, check control connection is HIGH</p> <p>Clean the fibre optic connector. Refer to Appendix</p> <p>Replace cable</p>
FOL Device under test permanently ON	<p>Power sleeve Switch status incorrect</p> <p>Four channel battery switch control module switch status incorrect (optical switch only)</p> <p>Four channel battery switch control module TTL control lines are set to incorrect value (optical switch only)</p> <p>Incorrect optical control cable connected (optical switch only)</p>	<p>Switch Sleeve to OFF</p> <p>Switch Controller to OFF LED on controller is RED</p> <p>Check controller LED is GREEN, check control connections is LOW</p> <p>Connect correctly</p>

In the event of any problems or queries about the equipment, contact PPM or your local agent.



## **5 Product Warranty**

The Company guarantees its products, and will maintain them for a period of three years from the date of shipment and at no cost to the customer. Extended warranty options are available at the time of purchase.

Please note that the customer is responsible for shipping costs to return the unit to PPM.

The Company or its agents will maintain its products in full working order and make all necessary adjustments and parts replacements during the Company's normal working hours provided that the Customer will pay at the rates currently charged by the Company for any replacements made necessary by accident, misuse, neglect, wilful act or default or any cause other than normal use.

Claims must be made promptly, and during the guarantee period.

### **IMPORTANT: -**

**Please contact both your selling agent and PPM prior to returning any goods for Warranty or Non-Warranty repairs. Goods will not be accepted without a valid Goods Return Number (GRN).**

## Appendix I      Fibre Optic Connector Cleaning Procedure

The optical connectors should be cleaned **before each and every use**, even where they have been protected with dust caps.

Cleaning items required

- Lint free fibre cleaning tissues (normal cosmetic tissues produce dust and are not acceptable);
- Reagent grade Iso Propyl Alcohol;
- Air duster or FILTERED compressed air line.

Cable Connector Cleaning

- Dampen a patch of cleaning tissue with IPA and clean all surfaces of the plug ferrule.
- Using a dry cleaning tissue, dry the ferrule and polish the end face.
- Using the air duster, blow away any residue from the end of the connector.

Module Female Receptacle Cleaning (only recommended if problems are being experienced)

- Twist a cleaning tissue to form a stiff probe, and moisten with IPA. Gently push the probe into the receptacle and twist around several times to dislodge any dirt.
- Repeat the above process with a dry tissue.
- Using the air duster, blow away any residue from the receptacle.

### Important Notes

- IPA is flammable. Follow appropriate precautions / local guidelines when handling and storing.
- IPA can be harmful if spilt on skin. Use appropriate protection when handling.
- It should only be necessary to clean the female receptacles on the modules if problems are being experienced.
- Never inspect an optical fibre or connector with the naked eye or an instrument unless you are convinced that there is no optical radiation being emitted by the fibre. Remove all power sources to all modules, and completely disconnect the optical fibres.

## Appendix II Specifications

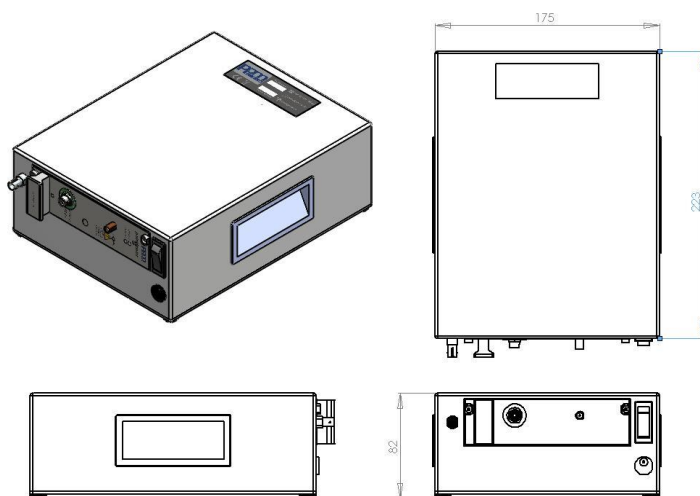
System Parameters (at 25°C,  $I_{load}=500mA$  unless otherwise noted)

### General, specifications

Size	223 x 175 x 82mm
Battery capacity	3.6Ah or 9.0Ah
Weight`	2.4 kg (3.6Ah) or 3.8kg (9.0Ah)
Housing Options	Supports all types of <b>point2point</b> plug in modules
Operating voltage range	+11V to +17V
Low voltage disconnect	Built in
Over current protection	Built in
Operating Current	3A max

### Optical switch, specifications

Time ON > OFF	200 us Typ
Time OFF > ON	1 us Typ
Control sense	“LIGHT ON” = “Battery” connected to “Module”
	“LIGHT OFF” = “Battery” disconnected from “Module”
Standby quiescent current	4mA typ 10mA max (in “LIGHT OFF” state)
Operating quiescent current	15mA max (in “LIGHT ON” state)
Operating range	> 1km (with 50/125um or 62.5/125um multimode cable)
Optical reception wavelength	820nm nominal
Optical threshold ON	>-24dBm
Optical threshold OFF	<-40dBm
Operating Temperature	-10°C to +40°C
Electrical Signal Connector	DIN47295 1.6/5.6 Socket
Optical connector	ST multimode
Fibre options	Multimode 50/125um Multimode 62.5/125um



## Appendix III Accessories

F1R1/1	1m Multimode Fibre Optic Cable 50/125, ST Connectors /10 (=10m), /50. For 25 to 2000m contact PPM
F6R1/1	1m Singlemode Fibre Optic Cable, FC/APC Connectors /10 (=10m), /50. For 25 to 2000m contact PPM
F8R1/1	1m Multimode Fibre Optic Cable 62.5/125, ST Connectors /10 (=10m), /50. For 25 to 2000m contact PPM
73481	Cable Management Reel
73511	Standard Capacity Battery Pack + Battery Linking Plug
73512	High Capacity Battery Pack + Battery Linking Plug
56292	Battery Charger + 4 Charging Leads
73471	Charging cable for Power Sleeve
75002	Plug-In Module Converter Sleeve (for stand-alone use)
73502	Mains Power Supply for Converter Sleeve
SRK-3P/-3RP	19" Cooled Desktop Cases / Subracks
73401	Battery Switch lead, DIN47295 to 2.1mm power plug
73402	Battery Switch lead, DIN47295 to bear end
73682	8 way battery switch control cable, with 0.25m of cable
73680	Single channel battery load optical switch
73681	Four channel battery switch control module
75013	Power sleeve with 9.0Ah capacity
75014	Power sleeve with 3.6Ah capacity
75015	Power sleeve with 9.0Ah capacity, with optical switch
75016	Power sleeve with 3.6Ah capacity, with optical switch

## Appendix IV Glossary

### Abbreviations used in this handbook:

Ah	<p>Ampere-hours</p> <p><i>The capacity of a battery defined as the current, in amperes, multiplied by the number of hours.</i></p>
NiCd	<p>Nickel cadmium</p> <p><i>A mature type of rechargeable battery designed with Nickel and Cadmium electrodes. Unfortunately cadmium and cadmium compounds are highly toxic, so their use is being phased-out or prohibited.</i></p>
NiMH	<p>Nickel metal hydride</p> <p><i>A type of rechargeable battery designed with Nickel and Metal-Hydride electrodes. NiMH batteries are increasingly being used to replace NiCd batteries because they are more environmentally friendly.</i></p>
mAh	<p>milli-Ampere-hours</p> <p><i>The capacity of a battery defined as the current, in milli-amperes, multiplied by the number of hours.</i></p>
RoHS	<p>Restriction of use of Hazardous substances</p> <p><i>European legislation that prohibits the use of six highly toxic substances. One of these is cadmium.</i></p>

**point2point** BATTERY CONVERTER SLEEVE (7501X-HB) ISSUE 3  
CR3359

© PPM LTD., 2015.

NO PART OF THIS DOCUMENT MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM WITHOUT PRIOR WRITTEN PERMISSION.

PPM LTD., 65 SHRIVENHAM HUNDRED BUSINESS PARK, SWINDON, SN6 8TY, UK.

TEL: +44 1793 784389 FAX: +44 1793 784391

EMAIL : [info@ppm.co.uk](mailto:info@ppm.co.uk) WEB: [www.ppm.co.uk](http://www.ppm.co.uk)

---