

Battery Condition Test Function (BCT)

Applies to models: PB251A-XX-BCT

The **BCT** is an optional feature of the **PB251A-XX** which determines the condition of the back-up batteries. If implemented correctly it provides an early warning for batteries showing reduced capacity resulting from ageing or sulphation. The BCT function is indicated by the suffix “-BCT” in the model code.

- The **BCT** function (when active) reduces the voltage of the power supply and allows the battery to power the load. During the **BCT** an additional relay changes state to indicate that the **BCT** is in progress. This relay may be used to switch in an additional load (e.g. external load resistors) to provide a quicker and / or more meaningful test for the battery.

During the **BCT**, if the battery terminal voltage falls below a set value (the „OK / FAILURE threshold’), the **BATT OK** alarm is activated and the **BCT FAILED** LED is switched on to indicate that the test has failed.

- The „OK / FAILURE’ threshold is usually set by the customer at order time. This threshold can be set to values to suit the specific battery types and installation requirements. If a **BCT** failure is detected, the power supply unit immediately aborts the test and reverts to mains input power. The **BATT OK** alarm relay and the **BCT FAILED** LED both stay latched indicating a **BCT** failure. This BCT failure indication is reset either by briefly disconnecting both the mains power input and the battery or when the system passes the next **BCT** successfully.
- The frequency (BCT interval time) and the duration of the **BCT** may be specified by the customer. The requested times will be set during the manufacturing process and are currently not user adjustable.
- To prevent a **BCT** with partially discharged batteries, a mains-failure longer than a few seconds resets the internal **BCT** interval timer. This resetting of the interval timer delays the next **BCT** by the interval time.
- To improve the reliability of the **BCT** results, we recommend that sufficient load be applied to the battery during the test.
- Care must be taken that the cabling to the battery is of adequate capacity to minimize voltage drops which could be a cause of false alarms.
- In situations where the system load current fluctuates significantly, the results of a **BCT** can be meaningless as the rate of discharge is unknown. Only additional (constant) loading to the battery during the **BCT** can improve this situation.
- The PB251A is available with temperature compensated battery charging (indicated by a suffix „-T’ in the model code). However the battery „OK / FAILURE’ threshold is not temperature compensated and the temperature dependency of the battery terminal voltage and capacity during a **BCT** needs to be taken into account when specifying this parameter.
- The **BCT** should be used in conjunction with other maintenance checks in determining whether or not the battery system will operate in the event of a power failure. It should not be relied upon as a definitive test since every battery has different design and operating characteristics.
- All parameters and settings including the thresholds and the values for all timing events are held in non-volatile flash memory. Currently these are set during the manufacturing process.

- Please specify the following parameters when ordering a PB251A with the **BCT** function:

BCT Interval Time: Time between successive **BCT**'s in Days, Hours, Minutes and Seconds.
Default: six days, twenty three hours, fifty nine minutes, fifty nine seconds.

BCT Duration: Duration of BCT in Hours, minutes.
Default: One hour.

OK / Failure Threshold: Voltage threshold indicating battery is faulty in volts / cell.
Default: 2.04

BCT Front panel indicators / command description:

In the upper right region of the front panel, four indicators and a push button are dedicated to the BCT's functions. They are labeled as follows:

Run	Reset	Comms	Active	Failed
First LED	Push button	Second LED	Third LED	Fourth LED

Function description:

- First "Run" LED:
This blinking LED indicates that the BCT is currently measuring the BCT interval time or running a BCT.
- "Reset" push button:

The functions of the "Reset" push button are:
 - Reset all interval timers to a zero value.
 - Assuming that the PB251A has been connected, to the 240V ac source, for more than a minute: If a battery is connected and mains 240V ac source power is present, an instant BCT action will be active while pressing the push button.Normal operation will resume as soon as the "Reset" push button is released.
- Second "Comms" LED:
Indicates normal communication between the internal PB251A main board and BCT control board.
- Third "Active" LED:
Indicates a BCT operation is in progress.
- Fourth "Failed" LED:
Indicates a BCT failed operation.
The "Battery OK" relay changes state and latches as well to indicate a failed BCT.

To prevent an accidental event, this button can only be activated by inserting a small screw driver to press it.

BCT Front panel top alarm connector description:

NO C NC

BCT voltage-free relay contacts: (Maximum: 30 Watts, 1 Ampere, 60Volts, 62.5VA)

NO ← C: These contacts are closed during normal operation of the PB251A.

C ← NC: These contacts are closed while a BCT is in progress. They can be used to switch in an additional load using a separate user-supplied contactor or relay.

OPERATION AND INSTALLATION MANUAL

PB251A SERIES BATTERY CHARGERS / DC UNINTERRUPTIBLE POWER SUPPLIES

PB251A SERIES BATTERY CHARGERS / DC UPS

The PB251A series is a family of 13.8Vdc and 27.6Vdc 275W/330W off-line battery chargers / DC uninterruptible power supplies which operate from 220/240Vac mains power. When connected to a lead-acid battery, these units provide uninterrupted power to a DC load in the event of a mains failure.

The PB251A contains a two step current limited float charger, battery charge current limiting, a battery low voltage disconnect, mains/charger and battery alarms, battery present detection and optional float voltage temperature compensation (option -T). It employs high efficiency switching technology, combined with very low output noise which makes it suitable for powering sensitive loads such as radio equipment.

The PB251A is available with a 10BaseT / 100BaseTX Ethernet interface (option -N). This interface supports SNMP V1, XML and an embedded webpage allowing the PB251A to be monitored remotely.

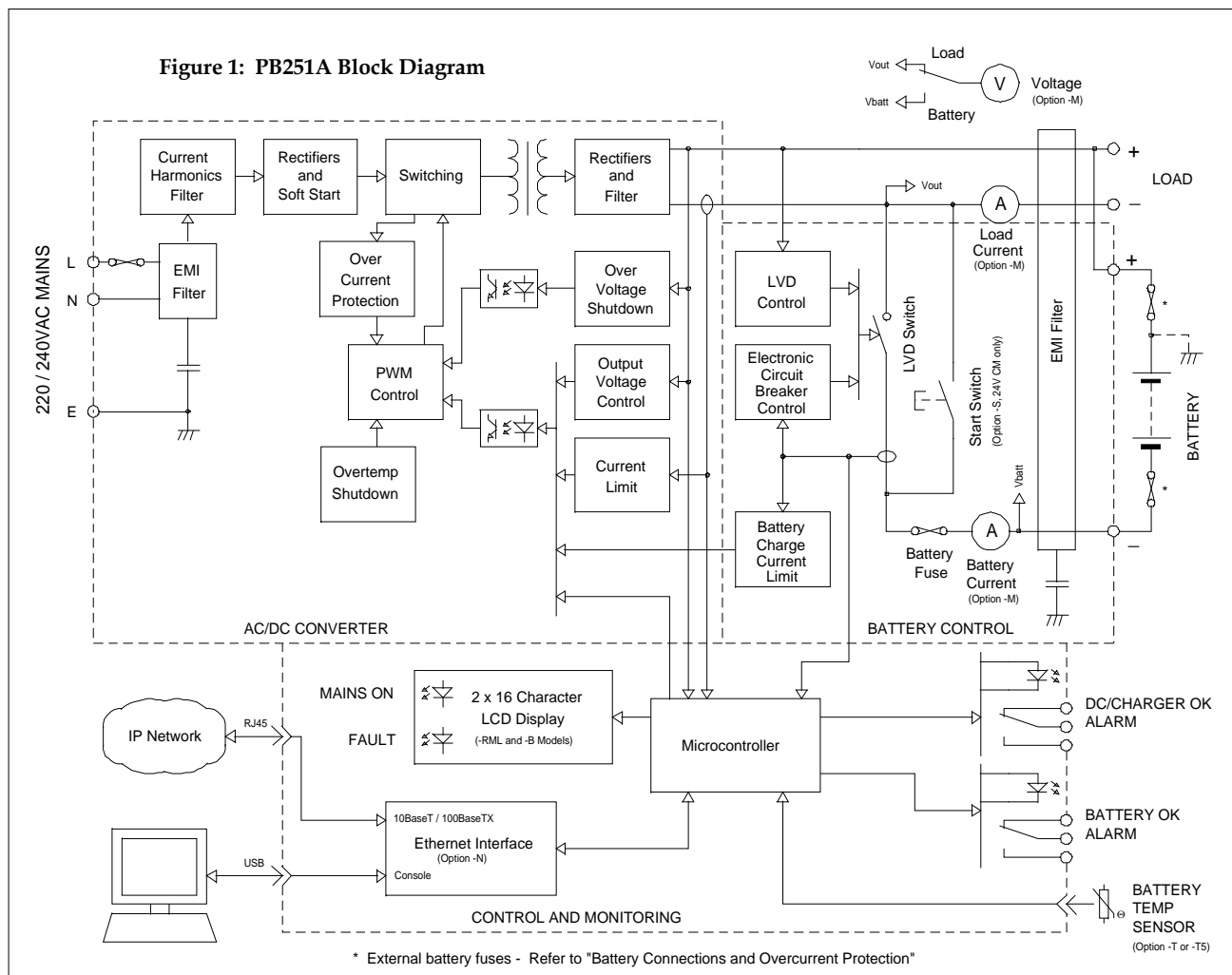
The PB251A is available in chassis mount (CM) and 2RU 19" rack mount (RML and B) variants. A supplementary heatsink (option-H) is available to increase the output power or maximum ambient temperature rating of the chassis mount variant. All models employ natural convection cooling.

The rack mount (RML and B) variants incorporate an alphanumeric LCD display as standard. These variants are also available with analogue meters (option -M).

FEATURES AND OPERATION

Figure 1 is a block diagram of the PB251A detailing its various functions as follows.

- A high efficiency switching AC/DC converter provides 13.8Vdc @ 16A/20A or 27.6Vdc @ 11A/12A directly to the load and to charge the battery. This converter provides a constant output float voltage and a constant current limit. Latching output overvoltage shutdown and autoresetting overtemperature shutdown are also included.
- The battery is connected across the output of the AC/DC converter via an electronic low voltage disconnect switch (LVD switch) in the negative lead. As a result, the output and battery voltage are essentially equal and the battery is available to supply the load the instant when mains power fails.
- The PB251A operates as a two step charger. If the battery is discharged and mains voltage is applied, the PB251A provides constant current to the battery. Once the battery voltage has risen to the float voltage, the AC/DC converter operates as a constant voltage charger.
- Battery charging current is controlled by its own constant current limiter. This circuit reduces the AC/DC converter output to control the charging current into the battery. It is factory adjustable between 10% and 100% of the rated output of the AC/DC converter. Consequently, the maximum battery charging current can be set to suit the installed battery capacity (typically 0.1C), and battery damage due to excessive charging current is prevented. This current limiter has no effect on output current to the load. The unit is protected against battery reverse polarity by an internal fuse.
- To protect the battery against overdischarge, the electronic LVD switch disconnects the negative load terminal from the negative battery terminal when the battery is fully discharged. This switch is automatically reset on reapplication of mains power. For this switch to operate correctly, the battery negative and load negative must not be connected together outside of the PB251A.
- To reset the LVD switch without mains voltage, *momentarily* connect battery negative and load negative together externally to the PB251A. This will raise the output voltage above the LVD threshold causing the LVD switch to close. After this connection is removed, the load will operate from the battery until the battery becomes fully discharged and the LVD switch reopens.
- A "start" switch is available on 24V chassis mount (CM) models only (Option -S). This option adds a built-in push button switch which momentarily connects battery negative to load negative bypassing the electronic LVD switch causing it to close.
- The LVD switch also operates as a self-resetting electronic circuit breaker for the battery. This protects the load wiring against overcurrents or accidental short circuits. The circuit breaker trips in less than 2mS for short duration current surges of greater than typically 350% of the AC/DC converter output current rating and in less than 300ms for overcurrents greater than typically 170% of the AC/DC converter output current rating.



- Advanced monitoring and control functions are provided by an embedded microcontroller.
- The microcontroller provides two alarms with separate voltage free changeover contacts. The alarm terminal markings show the contact state in the normal (no alarm) condition. An LED is provided for each of these alarms on the chassis mount models (CM) and on the rack mount models with analogue meters (Option -M). These green LEDs are ON in the normal (no alarm) condition.
 - DC/CHARGER OK indicates an alarm (LED off) in the following conditions.
 - i. Loss of mains power, or
 - ii. Failure of the off-line AC/DC converter and battery charger.
 - BATTERY OK indicates an alarm (LED off) in the following conditions.
 - i. The battery voltage is less than 1.8V/cell, or
 - ii. No battery is connected to the PB251A, or
 - iii. The battery wiring is faulty, or
 - iv. A battery fuse has failed.
- Once per hour, the embedded microcontroller performs a battery present test. It momentarily reduces the float voltage setpoint causing the load to be supplied from the battery. If no battery is present, the microcontroller asserts a battery disconnected alarm. This causes the BATTERY OK alarm to change to the alarm state. This alarm will also be raised in the event one or more of the battery fuses has failed, or the battery wiring is faulty. This alarm is reset when the battery connection is restored. On initial application of ac mains to the system, a battery present test is not performed until the battery voltage rises to 2.3V/cell.
- Temperature compensation of the battery float voltage is available with the optional battery temperature sensor (Option -T or -T5). The battery float voltage is set to 2.30V/cell at 25°C with compensation of -3.3mV/°C/cell at other temperatures.

- A 2 line, 16 character LCD display is provided on the RML and B rack mount models. This display shows the following.
 - i. Load and battery voltage,
 - ii. Load current
 - iii. Battery current. Positive battery current indicates that the battery is charging. Negative battery current indicates that the battery is discharging.
 - iv. AC Mains status: OK / FAIL
 - v. Battery status: OK / Charging / DISCHARGING / LOW VOLTS / DISCONNECTED / Test.
 - vi. Load status: ON Mains / ON BATTERY.
- Two status LEDs are provided on the RML and B rack mount models. MAINS ON (Green) and FAULT (Red). FAULT is asserted under any of the following conditions indicating an alarm: MAINS FAIL / LOAD ON BATTERY/ BATTERY DISCHARGING / BATTERY LOW VOLTS / BATTERY DISCONNECTED.
- Analogue meters (instead of the LCD display) are optional on the RML and B rack mount models (Option -M). Three front panel meters (load voltage or battery voltage / switch selected, load current and battery current) and two alarm LED's (DC OK and BATTERY OK) are provided with this option.
- A 10BaseT / 100BaseTX Ethernet interface for remote monitoring via the Internet is available on all models (Option -N). See "Ethernet Interface" for configuration and operating details of this interface.

MODEL SUMMARY AND RATINGS

PB251A Ordering Information

PB251A -12 CM -
 1 2 3 4

- 1 Series name

2 Output Voltage 12: 13.8Vdc
 24: 27.6Vdc

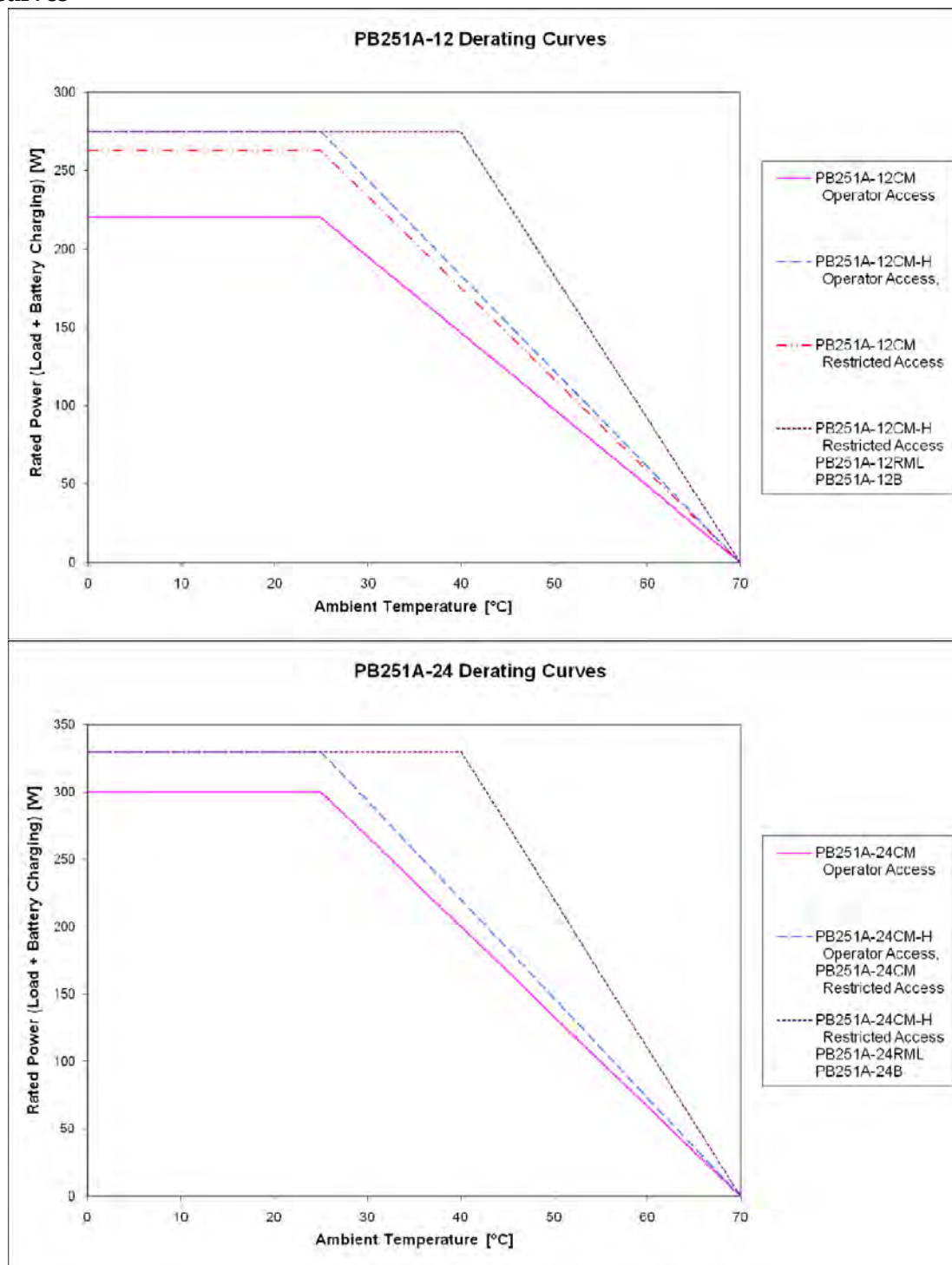
3. Enclosure
 CM: chassis mount
 RML: rack mount
 B: rack mount with radio connectors

4. Options (Multiple options can be specified)
 Options must be specified at time of order.

 - H: Supplementary heatsink (-CM models only)
 - T: Battery temperature sensor with 2 meter cable
 - T5: Battery temperature sensor with 5 meter cable
 - S: "Start" switch (24V -CM models only)
 - CC: Conformal coating
 - M: Analogue meters (-RML and -B models only)
 - BCT: Battery capacity test (Contact Powerbox)
 - N: Ethernet interface
 - ##: Non standard battery charging current limit, if different from default. (## = Current limit in Amperes)

MODEL	PB251A-12CM	PB251A-24CM	PB251A-12CM-H	PB251A-24CM-H	PB251A-12RML/ PB251A-12B	PB251A-24RML/ PB251A-24B
Total Load+Charge Power	220W	300W	275W	330W	275W	330W
DC Output	13.8V 16A	27.6V 11A	13.8V 20A	27.6V 12A	13.8V 20A	27.6V 12A
Default Battery Charge Current Limit	2A	2A	4A	2A	4A/20A	2A/12A
Size	264 x 172 x 67mm (L x W x H)		264 x 186 x 67mm (L x W x H)		19" x 2RU x 233mm 483 x 88.1 x 250mm (W x H x D)	
Weight	1.9kg		2.1kg		5.5kg	

Derating Curves



Sizing Example

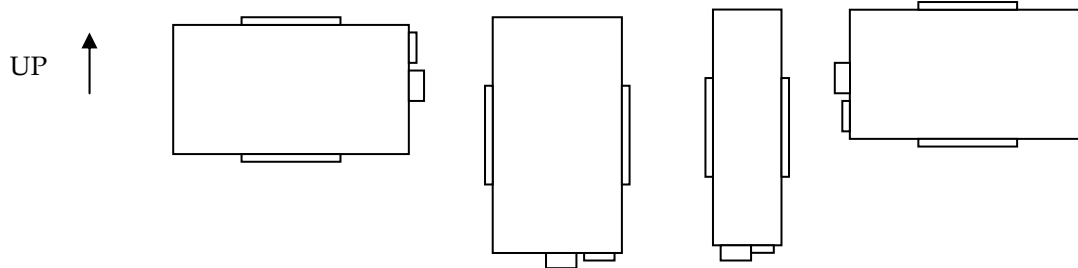
The total output power (load plus battery charging) must be less than or equal to the rated power (load plus battery charging) at the required maximum ambient temperature.

For example: An installation must supply a 13.8V load of 10A and charge a 20Ah backup battery in a maximum ambient temperature of 40°C with free access to the PB251A by any user. The battery requires a maximum charging current of 2A (0.1C). The sum of the load current and maximum battery charging current is 10A + 2A = 12A. Multiplying by the float voltage gives a maximum output power of 13.8V x 12A = 166W. Referring to the derating curve, model PB251A-12CM has a maximum rated output power of 147W at 40°C so it is not suitable for this application. However, model PB251A-12CM-H (with the supplementary heatsink) has a maximum rated output power of 187W at 40°C so it is suitable. The default charge current limit on PB251A-12CM-H is 2A, so battery charging current does not need to be specified.

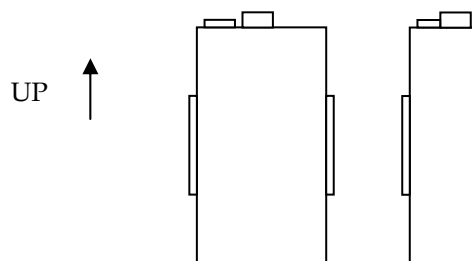
INSTALLATION

Mounting

CM Models: Chassis mount models are designed to be mounted on a flat horizontal or vertical surface. Two mounting brackets with screws are provided to allow the unit to be mounted by either the bottom or one side. The unit can be mounted horizontally or in the following vertical orientations without additional protection



If a chassis mount model is to be mounted in any of the following orientations, a non-combustible plate must be mounted below the PB251A or the PB251A must be installed inside a separate enclosure complying with AS/NZS60950, Cl. 4.6.2.



Ensure that airflow around the unit is not impeded.

RML and B Models: Rack mount models occupy 2RU in a 19" rack and are attached by four M6 screws via the front panel. Other equipment can be installed above and below the PB251A provided that the ambient air temperature around the unit complies with the derating curves. Areas to the left and right sides and to the rear of the PB251A must be open to provide circulation of cooling air.

Terminals

Refer to mechanical outline drawings for terminal sizes and locations.

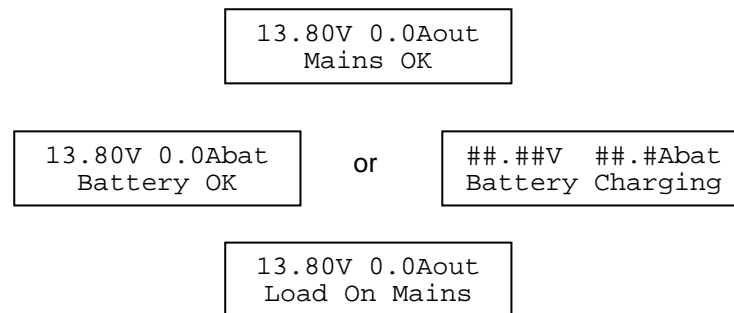
Battery Connections and Overcurrent Protection

The PB251A family is intended be used with valve regulated lead acid batteries of capacities typically between 20Ah and 40Ah. Larger batteries can be accommodated; however, the battery charging current limit may need to be adjusted at Powerbox's factory.

It is recommended that batteries be installed according to AS2676.2:1992. In particular, one or both of the battery leads must be protected against overcurrent by a fuse or circuit breaker located close to the battery. Refer to figure 1. If the positive terminal of the battery is earthed, then a fuse or circuit breaker is only required in the negative terminal. If neither terminal of the battery is earthed, then a fuse or circuit breaker is required in both terminals. It is recommended that the negative terminal of the battery not be earthed. These protective devices must be sized to interrupt the short circuit current of the battery.

Commissioning

1. Ensure that the external battery fuse in the negative battery lead is not installed and that all loads are either disconnected or turned off.
2. Apply 220/240Vac mains voltage to the input.
3. Wait for approximately one minute. This allows the PB251A to complete its first battery present test after which it will raise a BATTERY DISCONNECTED alarm. Measure the voltage at the output terminals of the unit. This voltage should be either 13.8Vdc or 27.6Vdc. On rack mount versions (RML and B), this can be measured using the front panel LCD or analogue voltmeter with the switch set to "LOAD".
4. Measure the voltage drop across the fuse holder in the negative battery lead. This voltage should be less than $\pm 2.5\text{Vdc}$ for 13.8V models and less than $\pm 5\text{Vdc}$ for 27.6V models. If the voltage is above this limit, the battery polarity is reversed and should be corrected before proceeding.
5. Install the fuse in the battery negative lead. The BATTERY DISCONNECTED alarm should clear within approximately 10 seconds.
6. Measure the voltage across the battery. This should equal 2.30V/cell (13.8V or 27.6V) or it should gradually rise indicating that the battery is charging. On rack mount models, the LCD should display the following or similar screens appropriate to the model and the load / battery conditions.



The battery current (##.##Abat) should be positive current into the battery.

7. On chassis mount models (CM) and rack mount units with analogue meters, confirm that both LEDs on the unit are ON indicating no alarms.
8. On rack mount models with the LCD display, the MAINS ON LED should be ON and the FAULT LED should be OFF.
9. Turn on loads or connect loads to the unit.

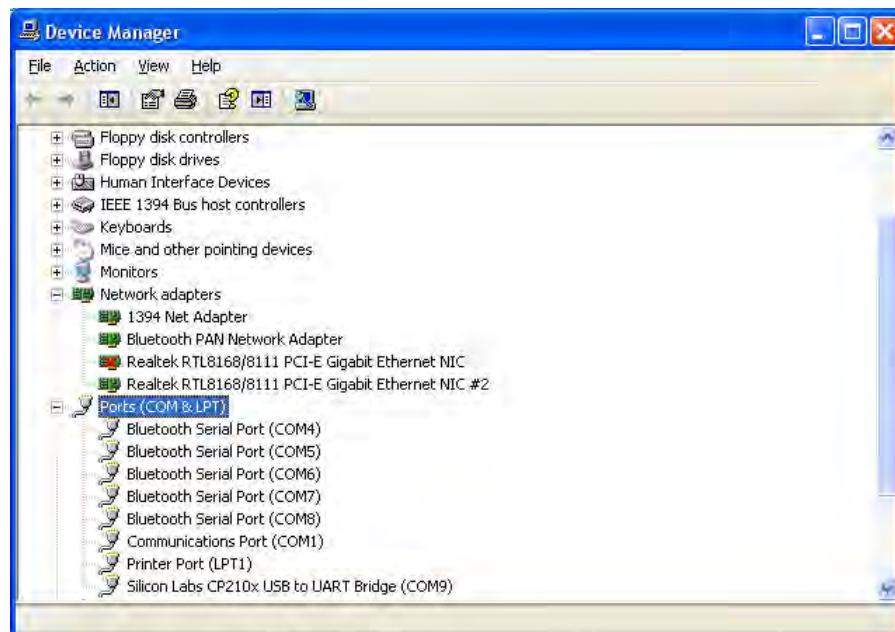
ETHERNET INTERFACE (Option -N)

Configuration

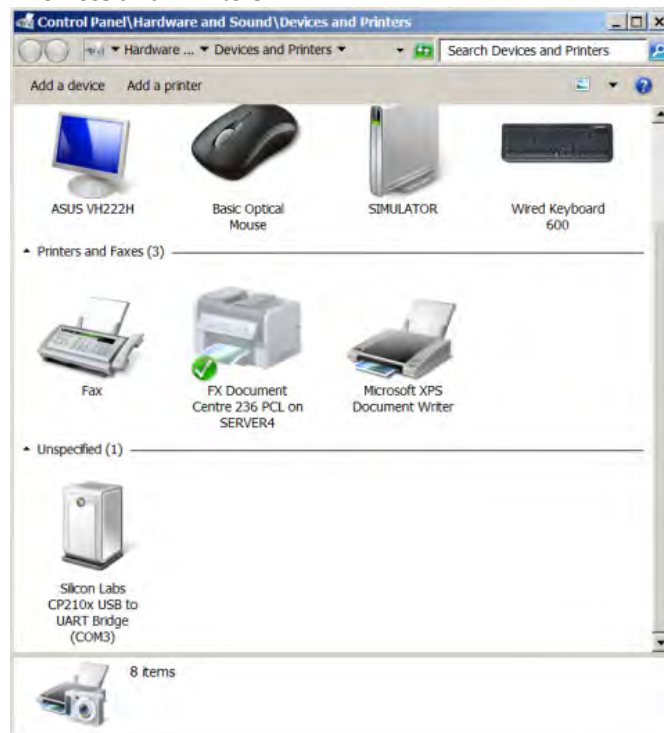
Setup of the Ethernet interface requires the following:

- A PC running Windows XP, Vista or Windows 7 with one free USB port
- A terminal emulator program such as Hyperterminal.
- The driver disk supplied with the unit (CD or USB thumbdrive).

1. DO NOT connect the PB251A network port to an IP internet until it is configured.
2. DO NOT connect the PB251A USB port to the PC at this time.
3. Before configuring the Ethernet interface, you will need to define the following parameters:
 - IP address for the PB251A: The PB251A supports static IP addresses only.
 - IP address for the Default Gateway
 - Subnet mask if different from 255.255.255.0
 - SNMP Target Address: If using SNMP, this is the IP address of the SNMP manager which will be receiving SNMP traps generated by the PB251A.
 - SNMP Target Port: This is the port number for the trap receiver on the SNMP manager. It is usually set to 162.
 - SNMP Community Name: This is the community name which you wish to use on the PB251A for SNMP read and write operations being performed by the SNMP manager. This can be an alphanumeric string up to 20 characters long.
4. Install the Silicon Labs CP2102 USB to UART Bridge Virtual COM Port Driver on the PC. This driver can be found in the directory <X: \CP2102 USB to UART Bridge VCP Driver\> on the PB251A USB Flash Drive supplied with the PB251A. Double click on the file named "CP210x_VCP_Win_XP_S2K3_Vista_7.exe" to install the driver.
5. Connect the USB "CONSOLE" port on the PB251A to a spare USB port on the PC. The PC should recognize the CP2102 USB to UART Bridge and set up the driver automatically. This process opens a new COM port on the PC for communication with the PB251A.
6. Note the COM port number for the PB251A by reviewing the following:
 - Windows XP: <Start ><Control Panel><System><Hardware><Device Manager><Ports (COM & LPT)><+>



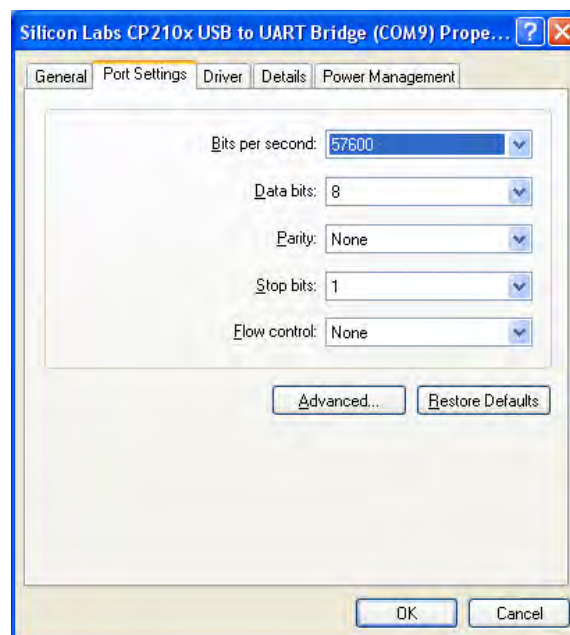
- Windows 7: <Start><Devices and Printers>



- Configure this COM port to the following settings:

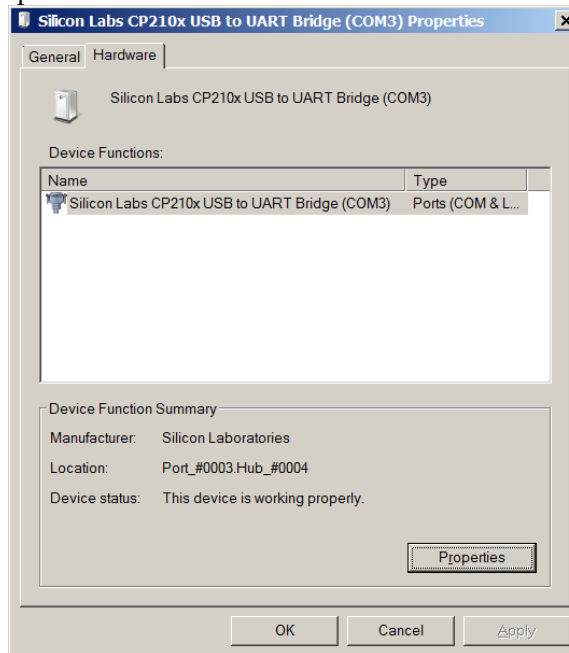
- Baud rate: 57,600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

- Windows XP: Under <Ports (COM & LPT)> right mouse click on “Silicon Labs CP210x USB to UART Bridge (COMX)” and select <Properties>. Enter the above settings on the “Port Settings” tab.

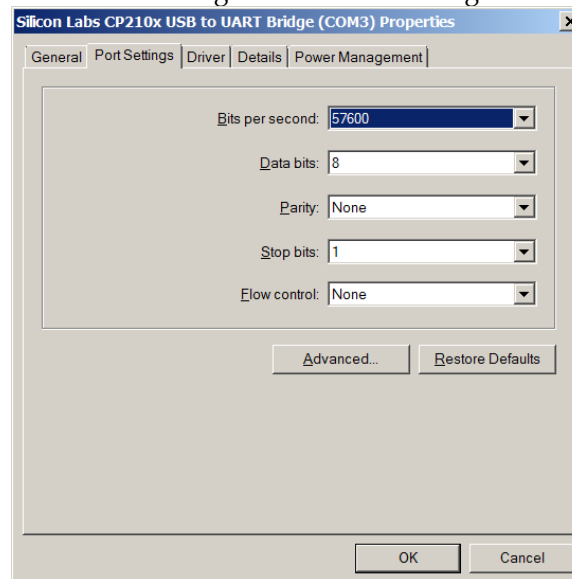


Click OK

- Windows 7: On <Devices and Printers> right mouse click on “Silicon Labs CP210x USB to UART Bridge (COM3)” and select <Properties>. Click on the “Hardware” tab.



Click “Properties”. Enter the above settings on the “Port Settings” tab.



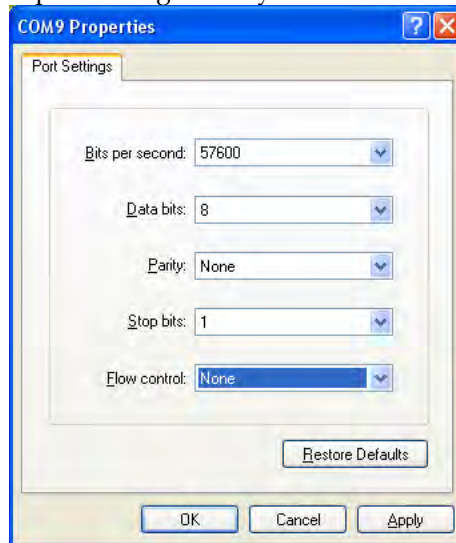
Click OK.

- Start the terminal emulator program and set up a connection to the CP2102 USB to UART Bridge COM port.



Click OK

- Configure the COM port settings in Hyperterminal to the settings in 7 above. Note, Hyperterminal does not automatically use the COM port setting which you have set above.



Click "OK".

- Save this Hyperterminal connection so that you can re-open it in the future without having to reload the port settings.
9. Push the reset switch on the PB251A network interface. This switch is accessed through the cutout next the USB "CONSOLE" port on the PB251A. Put a small flat screwdriver into this cutout and push to the side.
 10. After approximately five seconds, Hyperterminal should show a screen similar to the following.

```

.....Unable to establish Ethernet Connection

Initializing network stack...

IP Address                192.168.3.3
Default Gateway           192.168.3.254
DHCP                      Disabled
Subnet Mask               255.255.255.0
MAC Address               4C:32:D9:0 :4 :0
SNMP Target Address       192.168.1.124
SNMP Target Port          162
SNMP Community Name       test
Model Number              PB251A-12RML-N
Firmware Version          317-3001 V1.03 200911

HTTPD ready
Press 1 to change IP configuration.      9
    
```

11. Press "1" within ten seconds to access the IP configuration program.

- Hyperterminal should display the following screen:
Change IP Configuration

```

Enter new values in dotted decimal ("a.b.c.d") notation.
Press <enter> to retain existing value or to accept new value.
Press <esc> anytime to exit without changing.

Existing IP Address:      192.168.3.3
Enter new IP Address:
    
```

- Enter the IP address for the PB251A followed by <enter>.


```
Enter new IP Address:          192.168.1.171<enter> (for example)

Existing Default Gateway:      192.168.3.254
Enter new Default Gateway:
```
- Enter the IP Address of the Default Gateway for the PB251A followed by <enter>.


```
Enter new Default Gateway:     192.168.1.240<enter> (for example)

Existing Subnet Mask:          255.255.255.0
Enter new Subnet Mask:
```
- Enter the new Subnet Mask if different than 255.255.255.0 followed by <enter>. Otherwise press <enter>.


```
Enter new Subnet Mask:         <enter> (for example)
Enter new Subnet Mask:         255.255.255.0

Existing SNMP Trap Target Address: 192.168.1.124
Enter new SNMP Trap Target Address:
```
- Enter the new SNMP Trap Target Address followed by <enter>.


```
Enter new SNMP Trap Target Address: 192.168.1.208<enter> (for example)

Existing SNMP Trap Target Port:    162
Enter new SNMP Trap Target Port (162):
```
- Enter the new SNMP Trap Target Port if different than 162 followed by <enter>. Otherwise press <enter>.


```
Enter new SNMP Trap Target Port (162): <enter> (for example)
Enter new SNMP Trap Target Port (162): 162

Existing SNMP Community Name: test
Enter new SNMP Community Name (Max 20 char):
```
- Enter the SNMP Community Name for the PB251A followed by <enter>.


```
Enter new SNMP Community Name (Max 20 char): abcde<enter> (for example)

Do you wish to save changes (Y/N)?:
```
- Type Y <enter>.
- Hyperterminal will display the following or similar screen with the new configuration.


```
Saving changes.
Save successful.
Rebooting network interface1.....Unable to establish Ethernet Connection

Initializing network stack...

IP Address          192.168.1.171

Default Gateway      192.168.1.240

DHCP                 Disabled

Subnet Mask          255.255.255.0

MAC Address          4C:32:D9:0 :4 :0

SNMP Target Address  192.168.1.208

SNMP Target Port     162

SNMP Community Name  abcde

Model Number         PB251A-12RML-N

Firmware Version     317-3001 V1.03 200911

HTTPD ready
Press 1 to change IP configuration.      0
IP configuration change program terminated.
```

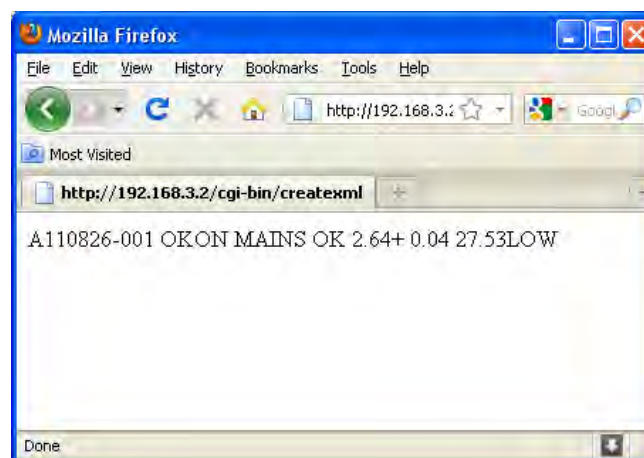

13. Plug the an Ethernet cable into the network port on the PB251A. Depending on the network, Hyperterminal should display a message similar to the following.
100 Mbps Full-Duplex
14. To confirm that the PB251A Ethernet interface is working properly, perform a “ping” on the PB251A’s IP address using the ping utility at the Windows command prompt or equivalent.
15. The PB251A Ethernet interface is now ready to be used. Hang up the Hyperterminal session. Close Hyperterminal and unplug the USB connection from the PB251A. Note, if the USB cable is unplugged during any of the above configuration, you will need to close the Hyperterminal program and start from item 5 above.

Embedded Webpage

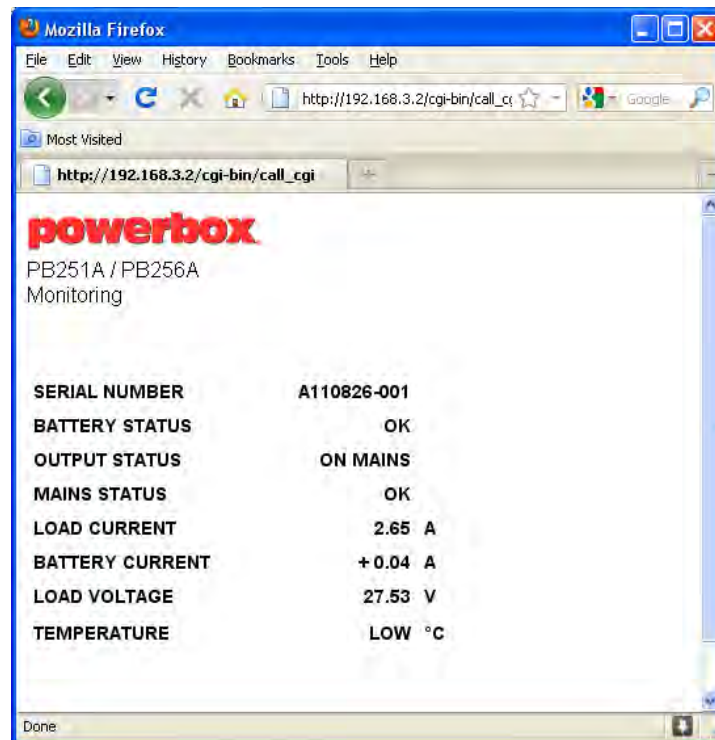
To access the embedded html webpage for the PB251A, enter the IP address for the PB251A into the address bar on your web browser. This should display the following webpage.



Clicking on *XML* displays the current parameters for the PB251 in XML format as follows.



Clicking on *Webpage* displays the current status of the PB251A. This webpage regenerates automatically approximately once every 30 seconds.



Note: The temperature parameter "LOW" indicates that no battery temperature probe is attached to the PB251A.

SNMP

The PB251A Ethernet interface supports SNMP V1 and operates as an SNMP agent. It supports the following MIB's

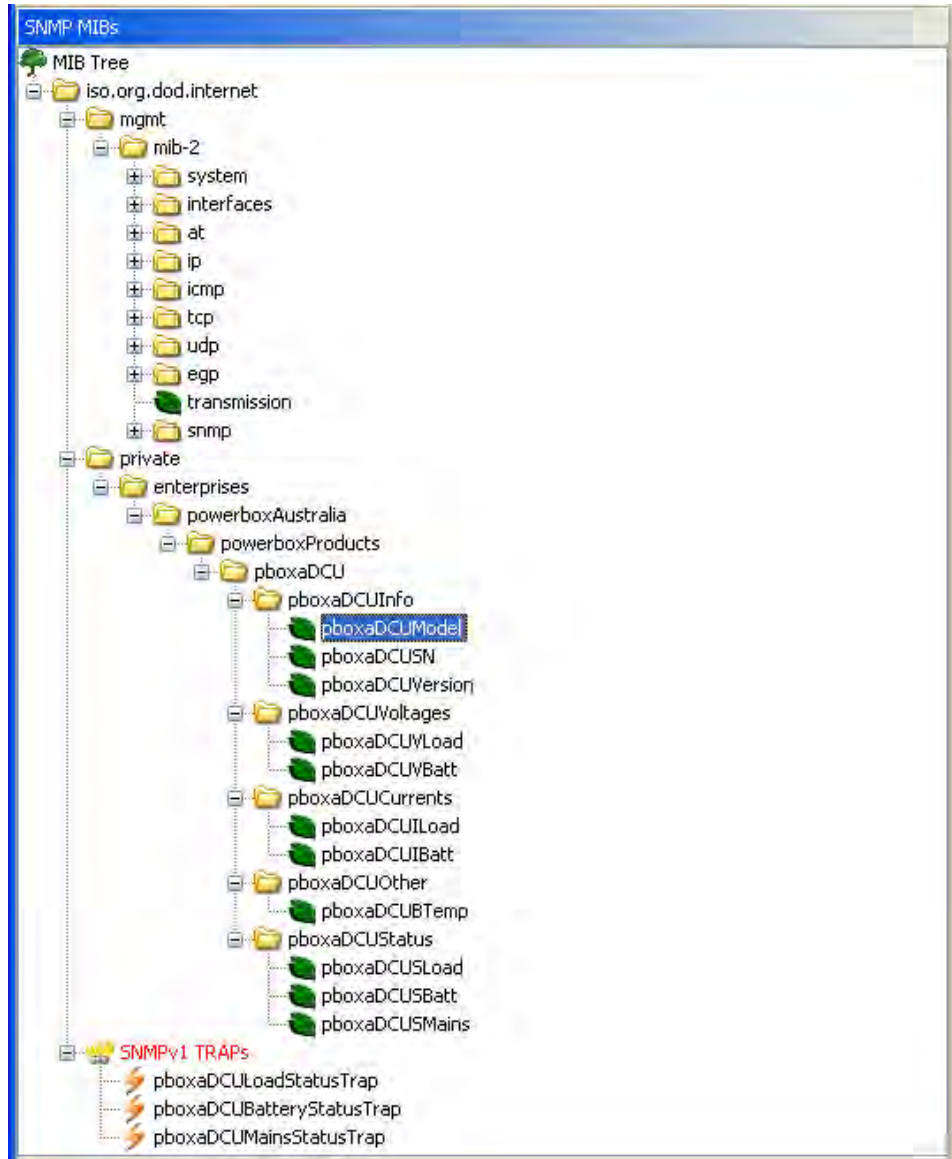
- MIB-II per RFC 1213
- POWERBOX-AUS-MIB: Top-level structure of the Powerbox Australia MIB.
- POWERBOX-AUS-DCU-MIB: DC Uninterruptible Power Supply (DCU) Group object definitions.

The Powerbox MIB's require the following additional MIB's to be loaded in the SNMP manager.

- RFC1155-SMI
- RFC-1212
- RFC1213-MIB
- RFC-1215

Copies of these MIB's are available in <X: \MIBs \> on the PB251A USB Flash Drive supplied with the PB251A.

The following is a graphical representation of the MIB tree structure supported by the PB251A Ethernet interface.



MIB Leaf Objects and OID's

The SNMP leaf objects supported by the PB251A are as follows. All leaf objects are read only.

Object Identifier	OID	Description	Syntax
pboxaDCUModel	.1.3.6.1.4.1.31933.1.1.1.1	Model number	Display String
pboxaDCUSN	.1.3.6.1.4.1.31933.1.1.1.2	Serial number	Display String
pboxaDCUVersion	.1.3.6.1.4.1.31933.1.1.1.3	Software version	Display String
pboxaDCUVLoad	.1.3.6.1.4.1.31933.1.1.2.1	Load voltage in millivolts	Integer
pboxaDCUVBatt	.1.3.6.1.4.1.31933.1.1.2.2	Battery voltage in millivolts	Integer
pboxaDCUILoad	.1.3.6.1.4.1.31933.1.1.3.1	Load current in milliamperes	Integer
pboxaDCUIBatt	.1.3.6.1.4.1.31933.1.1.3.2	Battery current in milliamperes	Integer
pboxaDCUBTemp	.1.3.6.1.4.1.31933.1.1.4.1	Battery temperature in °C	Integer
pboxaDCUSLoad	.1.3.6.1.4.1.31933.1.1.5.1	Load status	Integer
pboxaDCUSBatt	.1.3.6.1.4.1.31933.1.1.5.2	Battery status	Integer
pboxaDCUSMains	.1.3.6.1.4.1.31933.1.1.5.3	AC mains status	Integer

SNMP Traps

The following table summarizes the SNMP traps generated by the PB251A.

pboxaDCULoadStatusTrap	This trap is generated once whenever there is a change in pboxaDCUSLoad. It is repeated every approximately 30 seconds if pboxaDCUSLoad is in an alarm condition.
pboxaDCUBatteryStatusTrap	This trap is generated once whenever there is a change in pboxaDCUSBatt. It is repeated every approximately 30 seconds if pboxaDCUSBatt is in an alarm condition.
pboxaDCUMainsStatusTrap	This trap is generated once whenever there is a change in pboxaDCUSMains. It is repeated every approximately 30 seconds if pboxaDCUSMains is in an alarm condition.

POWERBOX-AUS-MIB

The following is a copy of POWERBOX-AUS-MIB detailing the Powerbox Australia enterprise and group objects.

```

POWERBOX-AUS-MIB DEFINITIONS ::= BEGIN
--
-- Top-level structure of the Powerbox Australia MIB
--
-- Powerbox Australia Pty. Ltd.
-- Contact:      Peter R. Keeler
--               P.O. Box 128
--               Mount Kuring-Gai NSW 2080
--               Australia
--               p:      +61-2-9457-2200
--               email:  design@powerbox.com.au
--
-- Version:      1.00
-- Description:   Origin
-- Author:       Peter R. Keeler
-- Date:         21/06/11
--

IMPORTS
    enterprises
        FROM RFC1155-SMI;

-- Powerbox Australia enterprise
powerboxAustralia OBJECT IDENTIFIER ::= { enterprises 31933 }

-- Groups in powerbox-australia enterprise
powerboxProducts OBJECT IDENTIFIER ::= { powerboxAustralia 1 }

-- powerboxProducts group management objects
pboxaDCU OBJECT IDENTIFIER ::= { powerboxProducts 1 }

END

```

POWERBOX-AUS-DCU-MIB

The following is a copy of POWERBOX-AUS-DCU-MIB detailing group and leaf objects and SNMP traps generated by the PB251A Ethernet Interface.

```
POWERBOX-AUS-DCU-MIB DEFINITIONS ::= BEGIN

--
-- DC Uninterruptible Power Supply (DCU) Group object definitions
--
-- Powerbox Australia Pty. Ltd.
-- Contact:      Peter R. Keeler
--              P.O. Box 128
--              Mount Kuring-Gai NSW 2080
--              Australia
--              p:      +61-2-9457-2200
--              email:  design@powerbox.com.au
--
-- Version:      1.01
-- Description:   Syntax corrections. Trap definitions added.
-- Author:       Peter R. Keeler
-- Date:         17/08/11
--

IMPORTS
    OBJECT-TYPE
        FROM RFC-1212
    DisplayString
        FROM RFC1213-MIB
    TRAP-TYPE
        FROM RFC-1215
    pboxaDCU
        FROM POWERBOX-AUS-MIB;

-- pboxaDCU group management objects

pboxaDCUInfo      OBJECT IDENTIFIER ::= { pboxaDCU 1 }
pboxaDCUVoltages OBJECT IDENTIFIER ::= { pboxaDCU 2 }
pboxaDCUCurrents OBJECT IDENTIFIER ::= { pboxaDCU 3 }
pboxaDCUOther     OBJECT IDENTIFIER ::= { pboxaDCU 4 }
pboxaDCUStatus    OBJECT IDENTIFIER ::= { pboxaDCU 5 }

-- pboxaDCUInfo group objects

pboxaDCUModel OBJECT-TYPE
    SYNTAX DisplayString (SIZE (0..255))
    ACCESS read-only
    STATUS optional
    DESCRIPTION
        "DC UPS Model number"
    ::= { pboxaDCUInfo 1 }

pboxaDCUSN OBJECT-TYPE
    SYNTAX DisplayString (SIZE (0..255))
    ACCESS read-only
    STATUS optional
    DESCRIPTION
        "DC UPS Serial number"
    ::= { pboxaDCUInfo 2 }

pboxaDCUVersion OBJECT-TYPE
    SYNTAX DisplayString (SIZE (0..255))
    ACCESS read-only
    STATUS optional
    DESCRIPTION
        "DC UPS Software version"
    ::= { pboxaDCUInfo 3 }

-- pboxaDCUVoltages group objects

pboxaDCUVLoad OBJECT-TYPE
    SYNTAX INTEGER
    ACCESS read-only
    STATUS optional
    DESCRIPTION
        "Load voltage in millivolts"
    ::= { pboxaDCUVoltages 1 }
```

```

pboxaDCUVBatt OBJECT-TYPE
    SYNTAX INTEGER
    ACCESS read-only
    STATUS optional
    DESCRIPTION
        "Battery voltage in millivolts"
    ::= { pboxaDCUVoltages 2 }

-- pboxaDCUCurrents group objects

pboxaDCUILoad OBJECT-TYPE
    SYNTAX INTEGER
    ACCESS read-only
    STATUS optional
    DESCRIPTION
        "Load current in milliamperes."
    ::= { pboxaDCUCurrents 1 }

pboxaDCUIBatt OBJECT-TYPE
    SYNTAX INTEGER
    ACCESS read-only
    STATUS optional
    DESCRIPTION
        "Battery current in milliamperes. A positive value indicates
        charging current flowing into the battery. A negative value
        indicates that the battery is discharging at the measured
        current."
    ::= { pboxaDCUCurrents 2 }

-- pboxaDCUOther group objects

pboxaDCUBTemp OBJECT-TYPE
    SYNTAX INTEGER
    ACCESS read-only
    STATUS optional
    DESCRIPTION
        "Battery temperature in degrees C. This is used for battery
        float voltage temperature compensation. If no temperature
        sensor is installed, this value is set to -20 and the
        temperature compensation is turned off"
    ::= { pboxaDCUOther 1 }

-- pboxaDCUStatus group objects

pboxaDCUSLoad OBJECT-TYPE
    SYNTAX INTEGER {
        on-mains(1),
        on-battery(2)
    }
    ACCESS read-only
    STATUS optional
    DESCRIPTION
        "Load status.
        This object indicates whether the load is being supplied from
        the AC mains power source (normal operation), or from the
        backup battery (AC mains or battery charger failure)."
    ::= { pboxaDCUStatus 1 }

pboxaDCUSBatt OBJECT-TYPE
    SYNTAX INTEGER {
        battery-ok(1),
        battery-low-voltage(2),
        battery-disconnected(3),
        battery-discharging(4),
        battery-charging(5),
        battery-test(6)
    }
    ACCESS read-only
    STATUS optional
    DESCRIPTION
        "Battery status.
        Battery Status = battery-low-voltage is given for battery
        voltage less than 1.80 V/cell.
        Battery Status = battery-disconnected indicates that no
        battery is connected to the DC UPS. This indicates if there
        is a failed battery fuse or an open circuit in the battery
        wiring. If all battery wiring is good, this indicates that
        the battery is defective and is not able to support the
    
```

```

load for even a few seconds.
Battery Status = battery-test is given when the DCU is
checking if a battery is connected to it.
Battery Status = battery-charging is given then the battery
charging current is greater than 250mA (12V battery) or 100mA
(24V battery).
Battery Status = battery-OK is given when the battery current
is in the range -250mA to 250mA (12V battery) or -100mA to
100mA (24V battery)."
::= { pboxaDCUStatus 2 }

pboxaDCUMains OBJECT-TYPE
    SYNTAX INTEGER {
        mains-ok(1),
        mains-fail(2)
    }
    ACCESS read-only
    STATUS optional
    DESCRIPTION
        "AC Mains status."
    ::= { pboxaDCUStatus 3 }

-- Trap definitions

pboxaDCULoadStatusTrap TRAP-TYPE
    ENTERPRISE pboxaDCU
    VARIABLES {
        pboxaDCUModel,
        pboxaDCUSN,
        pboxaDCUSLoad
    }
    DESCRIPTION
        "pboxaDCULoadStatusTrap:
        This trap is sent once whenever there is a change in
        pboxaDCUSLoad (Load Status) to indicate that the load has
        changed from being powered from AC mains to being powered from
        the battery, or vice versa. If pboxaDCUSLoad is on-battery(2),
        this trap is repeated every approximately 30 seconds to
        indicate an alarm condition."
    ::= 1

pboxaDCUBatteryStatusTrap TRAP-TYPE
    ENTERPRISE pboxaDCU
    VARIABLES {
        pboxaDCUModel,
        pboxaDCUSN,
        pboxaDCUSBatt,
        pboxaDCUVBatt,
        pboxaDCUIBatt
    }
    DESCRIPTION
        "pboxaDCUBatteryStatusTrap:
        This trap is sent once whenever there is a change in
        pboxaDCUSBatt (Battery Status). If pboxaDCUSBatt is
        battery-low-voltage(2), battery-disconnected(3),
        battery-discharging(4), or battery-test(6), this trap is
        repeated every approximately 30 seconds to indicate an alarm
        condition.
        In a normally functioning system, a 6 second battery test
        is performed once every hour. This will generate at least
        two battery status traps: one when the battery test starts,
        and one at the end of the test when pboxaDCUSBatt returns
        to either battery-charging(5) or battery-ok(1). If no
        battery is connected to the system, or if the battery fuse
        has blown, pboxaDCUSBatt will be battery-disconnected(3) after
        this test. In this case, a battery status trap will be
        repeated every approximately 30 seconds until the battery
        connections are repaired."
    ::= 2

pboxaDCUMainsStatusTrap TRAP-TYPE
    ENTERPRISE pboxaDCU
    VARIABLES {
        pboxaDCUModel,
        pboxaDCUSN,
        pboxaDCUMains
    }
    DESCRIPTION

```


"pboxaDCUMainsStatusTrap.
This trap is sent once whenever there is a change in
pboxaDCUSMains (AC Mains Status). If pboxaDCUSMains
is mains-fail(2), this trap is repeated every approximately
30 seconds to indicate an alarm condition."

::= 3

END

SPECIFICATIONS

MODEL		PB251A-12CM	PB251A-12CM-H	PB251A-24CM	PB251A-24CM-H	PB251A-12RML /PB251A-12B	PB251A-24RML /PB251A-24B
INPUT	VOLTAGE [V]	AC190 - 265 1ø or DC225 - 400					
	CURRENT [A]	3.0 max.					
	FREQUENCY [Hz]	50/60 (45 - 65)					
	EFFICIENCY [%]	85 min.		88 min.		85 min.	88 min.
	INRUSH CURRENT [A]	10 max. (cold start)					
OUTPUT (AC Mains Operation)	VOLTAGE [VDC]	13.8		27.6		13.8	27.6
	Adjustment Range	12.0 - 16.0V		24.0 - 31.0V		12.0 - 16.0V	24.0 - 31.0V
	CURRENT [A] ¹	16.0	20.0	11.0	12.0	20.0	12.0
	CURRENT LIMIT [A] ¹	20.5	20.5	12.5	12.5	20.5	12.5
	Adjustment Range	10 - 20.5A		5.0 - 12.5		10 - 20.5A	5.0 - 12.5
	BATTERY CHARGING CURRENT LIMIT [A] ²	2.0	4.0	2.0	2.0	4.0 / 20.0	2.0 / 12.5
	Adjustment Range	2.0 - 20.5A		1.0 - 12.5		2.0 - 20.5A	1.0 - 12.5
	LINE REGULATION [%]	0.2 typ.					
	LOAD REGULATION [%]	0.5 typ.				1.0 typ.	
	RIPPLE [mVp-p] ³	28 max.		55 max.		28 max.	55 max.
	NOISE [mVp-p] ³	28 max.		55 max.		28 max.	55 max.
	OVERVOLTAGE SHUTDOWN	17.5 - 20.0 (Latching)		31.5 - 39.0 (Latching)		17.5 -20.0 (Latching)	31.5 - 39.0 (Latching)
	OUTPUT SHORT CIRCUIT PROTECTION	Indefinite (Autoresetting)					
	BATTERY CHARGER SHORT CIRCUIT PROTECTION	Indefinite (Autoresetting)					
	OVERTEMPERATURE SHUTDOWN [°C]	100 typ. (Autoresetting)					
OUTPUT (Battery Operation)	VOLTAGE DROP BATTERY TO OUTPUT [V]	0.2 typ.				0.25 typ.	
	LOW VOLTAGE DISCONNECT [V]	10.5 typ.		21.0 typ.		10.5 typ.	21.0 typ.
	Adjustment Range	9.6 - 12.0		19.2 - 24.0		9.6 - 12.0	19.2 - 24.0
	OUTPUT OVERLOAD PROTECTION	Battery Electronic Circuit Breaker					
	BATTERY REVERSE POLARITY PROTECTION	Internal Fuse					
DISPLAYS AND ALARMS	DC / CHARGER OK	LED (Green) ON=OK, Voltage-free Changeover Contact (32V,1A) Alarm on loss of mains or failure of AC/DC converter and battery charger.					
	BATTERY OK	LED (Green) ON=OK, Voltage-free Changeover Contact (32V,1A) Alarm on battery low voltage, if no battery is connected or on failure of battery fuse or wiring.					
	Alarm Voltage (Falling) [V]	10.8		21.6		10.8	21.6
						2 Line x 16 character LCD, Load Voltage, Battery Voltage, Load Current, Battery Current, AC Mains Status, Battery Status, Load Status, MAINS ON - LED, FAULT - LED	
	LCD DISPLAY	N/A					
	METERS	N/A				Option (-M) Output / Battery Voltage, Load Current, Battery Current	
ISOLATION	INPUT - OUTPUT	4242 VDC, 1 minute					
	INPUT - GROUND	2121 VDC, 1 minute					
	OUTPUT - GROUND	707 VDC, 1 minute					
SAFETY AND EMC	SAFETY	AS/NZS 60950, Class I					
	EMC	Complies with ACA EMC Scheme - C-Tick RF Emissions Comply with AS/NZS CISPR11 Group1, Class B Harmonic Current Emissions Comply with AS/NZS 61000.3.2, Class A					
ENVIRONMENT AND OTHERS	OPERATING TEMP AND HUMIDITY	0 to 70°C, 5 to 90%RH (Non condensing) (Refer to DERATING CURVES)					
	CASE SIZE / WEIGHT	-CM Models: 264 x 172 x 67mm (LxWxH) / 1.9 kg -CM-H Models: 264 x 186 x 67mm (LxWxH) / 2.1 kg				19"x2RUx232mm rack mount enclosure 483x88.1x250mm (WxHxD) / 5.5 kg	
	COOLING METHOD	Natural Convection					

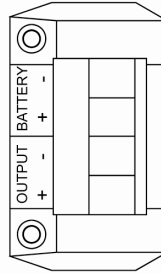
Notes: ¹ Sum of load + batt. charging current. ² This feature limits batt. charging current but not load current. ³ Using a 100MHz oscilloscope at the output terminals.

PB251A-CM (-H) MECHANICAL OUTLINE

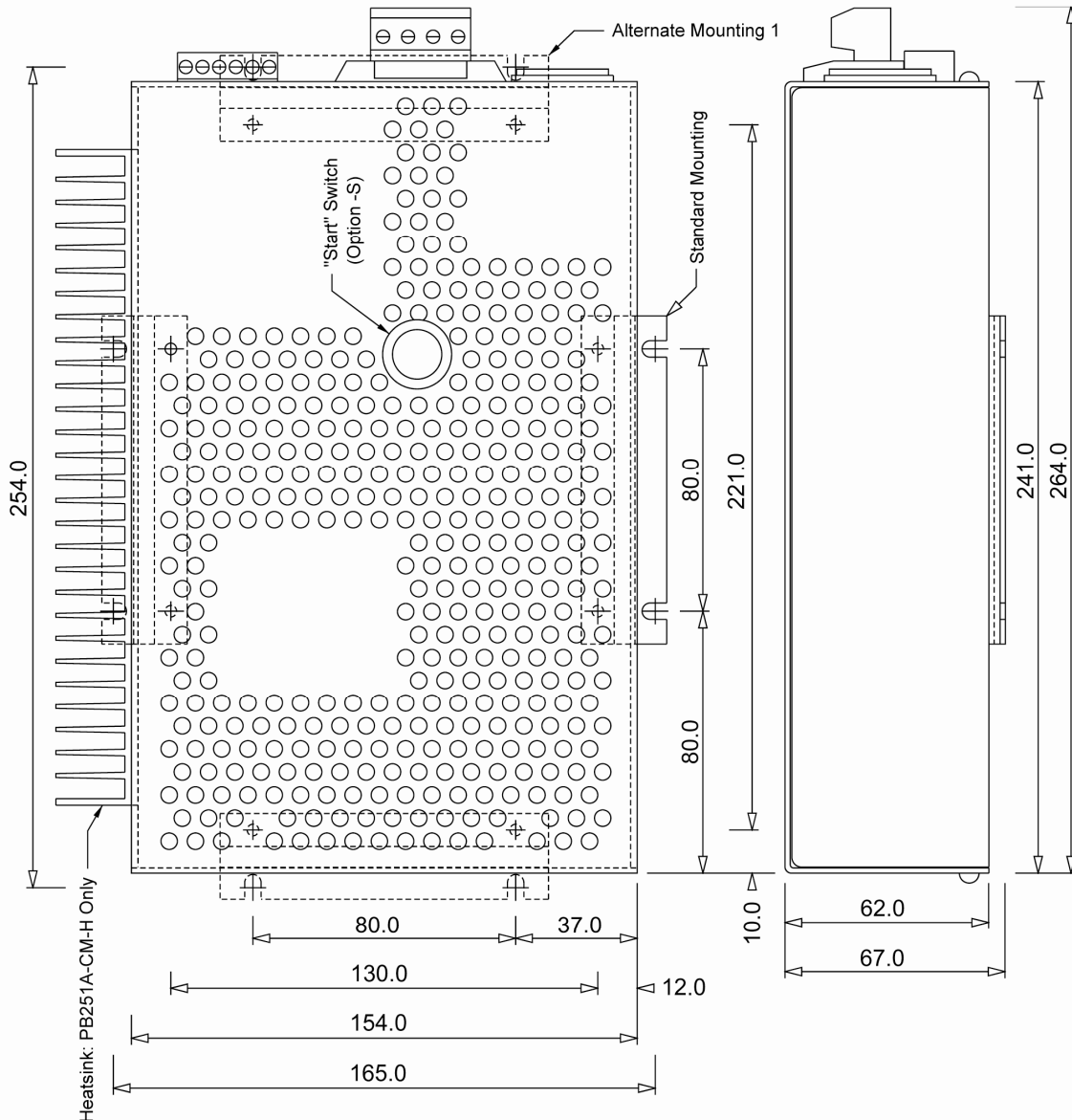
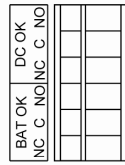
NOTES:

1. Mounting Centres: Suitable for M4 Hardware
Standard: 165 x 80 mm
Alternate 1: 254 x 80 mm
Alternate 2: 77 x 80 mm
2. M3 threaded holes on bottom of base.
Standard: 130 x 80 mm centres
Alternate 1: 221 x 80 mm centres
Alternate 2: 42.5 x 80 mm centres
3. AC Mains: 10A Class 1 IEC60320 power inlet
4. Output and Battery: 4W Pluggable Screw Terminal Block
Suitable for up to 4 sq. mm wire.
5. Alarms: 6W Pluggable Screw Terminal Block
Suitable for up to 1.5 sq. mm wire.

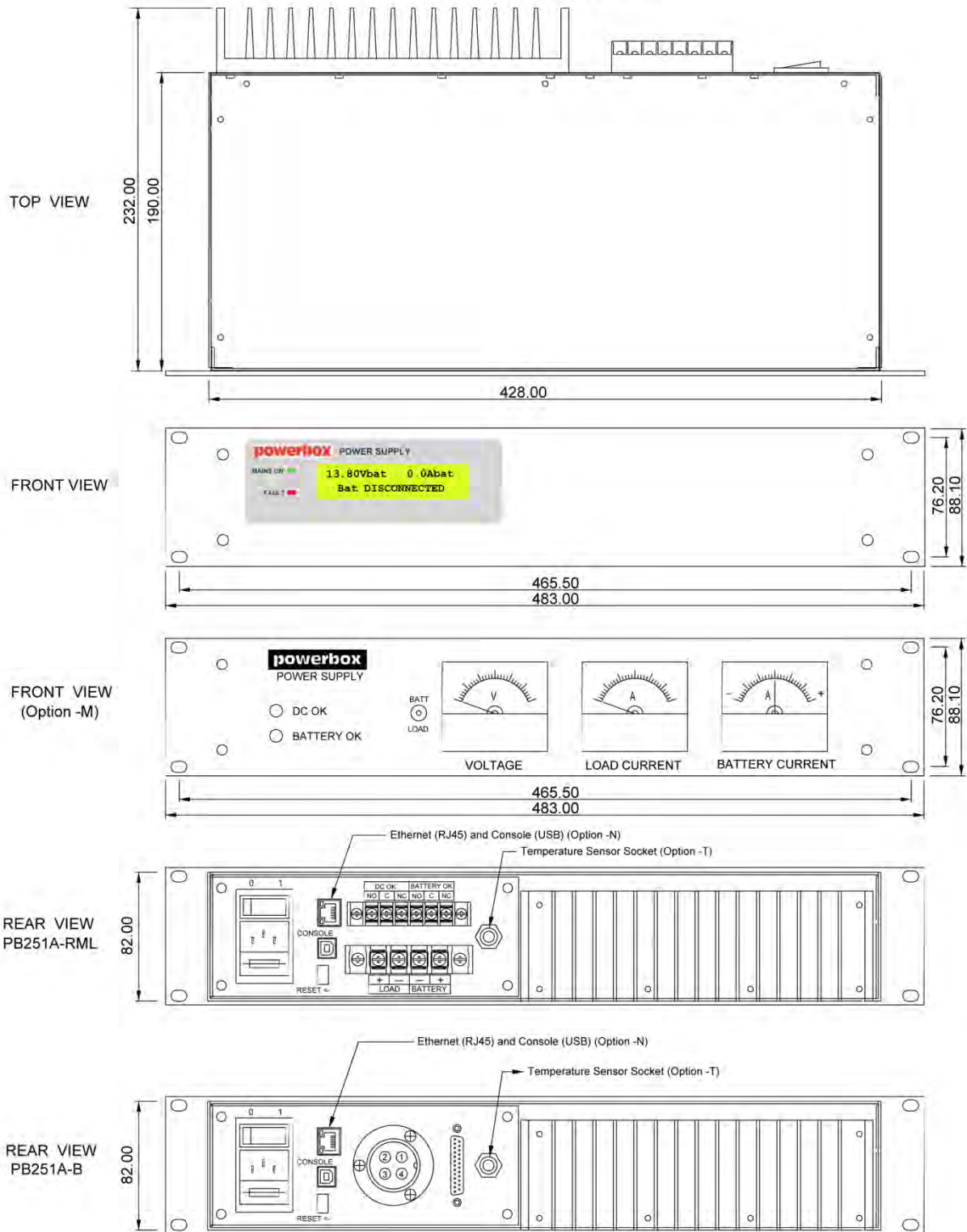
OUTPUT / BATTERY TERMINATIONS



ALARM TERMINATIONS



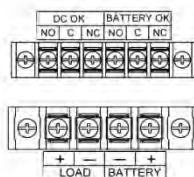
PB251A-RML & -B MECHANICAL OUTLINE



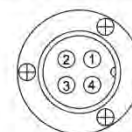
NOTES:

1. 2RU x 19" rack enclosure per IEC297
2. Mounting slots are suitable for M6 hardware.
3. Input connector is a 10A Class 1 IEC60320 inlet.
4. 2 meter IEC mains cord with Australian plug is supplied with unit.
5. PB251A-B alarm terminal is DB25 female.
6. PB251A-B output and battery connector is Hirose pn. HS28R-4A. Mating connector is Hirose pn. HS28P-4A (not supplied).
7. PB251A-RML output terminals are M4 screws suitable for ring or fork lugs up to 9.5 mm wide.
8. PB251A-RML alarm terminals are M3.5 screws suitable for ring or fork lugs up to 8 mm wide.

PB251A-RML ALARM AND OUTPUT TERMINALS



PB251A-B OUTPUT & BATTERY CONNECTOR



PB251A-B ALARM CONNECTOR





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PROPOSAL: PB251A-24CM with "Start" Switch

Function

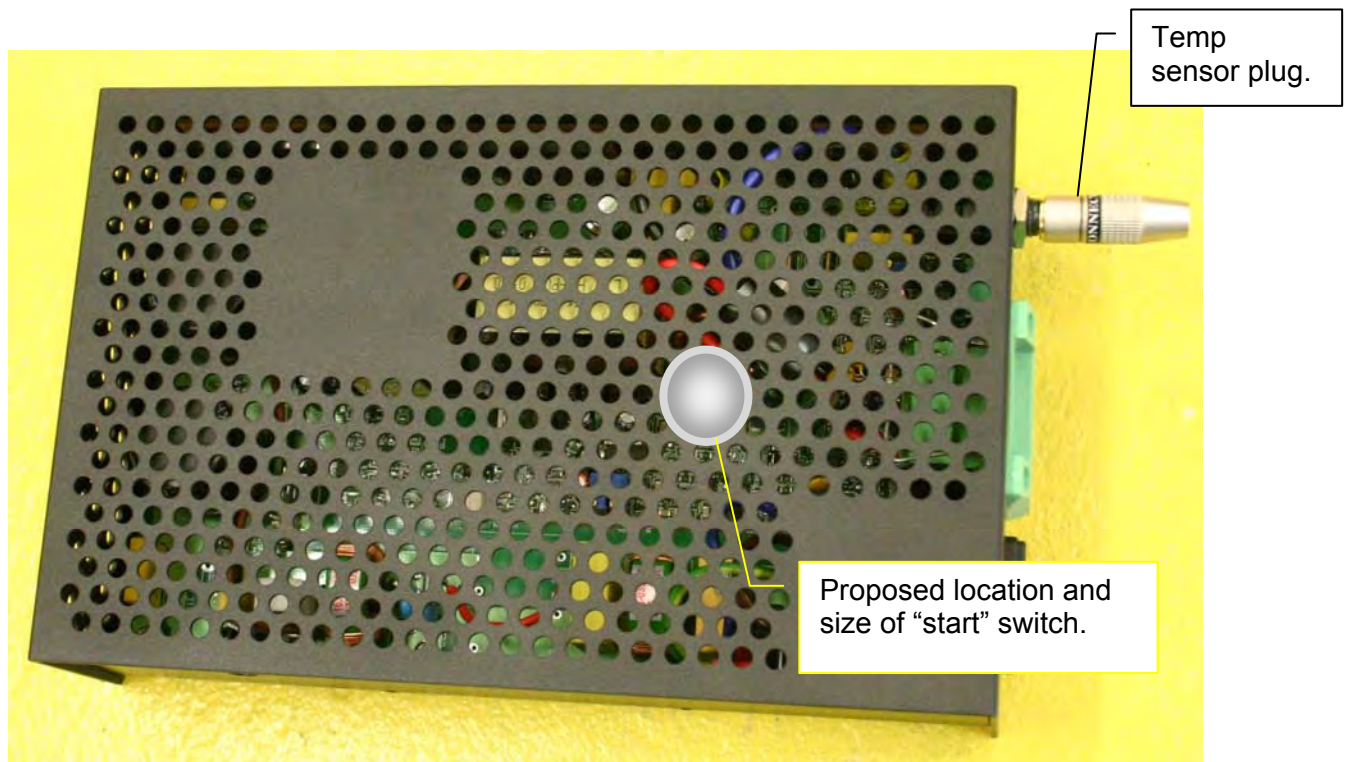
The start switch would be used to reset the low voltage disconnect switch LVD in the PB251A when operating from a battery only. This is a momentary contact switch which is pushed to turn on the +24V output from the PB251A. Once this output is present, the LVD resets and the switch can be released.

Protection

The start switch will be protected against load short circuits by the internal battery fuse in the PB251A. However, since this is an internal fuse, the PB251A cover will need to be removed in order to replace it. It is recommended that service technicians check for a short circuit on the load before pushing the "start" switch to prevent this fuse from blowing.

Location

The proposed location of the start switch is on the top cover as shown below.



P.Keeler
2/08/10

PB251A Series

220-330 WATTS DC UPS



Powerbox Queensland Urban Utilities RTU Power Supply 24V DC

PB251 Series is now superseded by *PB251A series* as outlined below and related product information.
(Same Dimensions as PB251-24CM).

Model PB251-24CM-CC-T Chassis Mount is now superseded by and supplied in 2 variations as required:

1. PB251A-24CM-CC-T-S
2. PB251A-24CM-CC-T5-S

The PB251A-24CM-CC-T-S is now available with either the standard temperature compensation cable length of 2.5m (suffix -T), or the longer 5.0m length (suffix -T5). This Temperature Compensation cable comes with a plug on the non sensor end and the complete cable is now removable from the PB251A.

There is also a 'Start' Switch function, (suffix -S), included for resetting the LVD function directly from the battery when no AC mains is present. (Refer to page 2 and PDF).

Series Coding Example: PB251A-24CM-CC-T-S

PB251A = Series

-24CM = 27.6VDC Output @ 11A - Chassis Mount

-CC = Conformal Coating

-T = 2.5m length removable Temperature Compensation cable with plug

-S = 'Start' Switch

PB251A series has the ability to detect:

- Battery Disconnected or fuse fail
- Battery Missing
- Faulty Battery Cable
- Battery Low
- Battery OK on Mains
- Battery OK Mains Fail

For the 24VDC chassis mount unit, the Standard Model is PB251A-24CM.

(Refer to PB251A Series Manual for further technical specifications).

NON-STANDARD OPTIONS: (Continued on page 2).

The standard model (PB251A-24CM) is available with various non-standard options as shown below.

-N = Network Card for chassis mount

-BCT = Battery Condition Test

-CC = Conformal Coating

-T = 2.5m length (Standard) Removable Temperature Compensation Cable with plug on the non-sensor end.

-T5 = 5.0m length - Removable Temperature Compensation Cable with plug on the non-sensor end.

Suitable for where the PSU/Charger is some distance away from the batteries and a longer cable is required.

NOTE: Where no Temperature Compensation cable is required, the unit will not come with a temperature plug socket fitted.

NON-STANDARD OPTIONS: (continued)

- S = "Start" Switch for resetting the LVD function directly from the battery when no AC mains is present. (Refer to PB251A Start Switch PDF). - Available on 24VDC version only.
- XX = Non-standard battery charging current on request (replace 'XX' with current required. E.g. 04 for 4.0A battery charging current) - Changed in Powerbox Manufacturing prior to despatch .
- H = Heatsink for operating to 330W at 27.6V output.- Fitted to unit when ordered.
- P = Heat transferring mounting plate- fitted to unit when ordered.

1. Start Switch Option: (Refer PB251A manual and PB251A Start Switch Powerbox 020810.pdf) Available on 24VDC version only

The "start" switch option to the PB251A-24CM-T will allow the 24V output to be turned on directly from the battery without mains having to be present. This is a momentary contact switch which is pushed to "start" the output. Once the output comes up to voltage, the internal LVD switch closes and the "start" switch can be released. One problem with this solution is that if the output is short circuited and the switch is pushed, the internal battery protection fuse will blow. The cover must be removed to replace this fuse (20A automotive blade fuse). The PB251A Start Switch PDF photo also shows the plug for the battery temperature sensor. (shown below)

2. BCT (Battery Condition Test) Function Option: (Refer to PB251A manual & 251-1605X1.pdf).

Standard setting is for a 1 Hour Check every 7 days to see if the battery is holding / still there. Lowers the voltage to 22V and if it discovers the battery is holding - goes back up to 27.6V - No load is applied. (Can be changed on request)



PBIH Series

15-150 WATTS DC/DC SINGLE OUTPUT

FEATURES

- Wide selection of models
- 4 input voltage ranges
- High efficiency
- Low output ripple
- Proven reliability
- Good thermal margins

SPECIFICATIONS

INPUT	
Input voltage	12VDC (9.2–16) 24VDC (19–32) 48VDC (38–63) 110VDC (85–140)
Inrush current	20A max. for 110V only
OUTPUT	
Output voltage	See table
Voltage adjustment	±10%, ±5% for PBIH-F
Output current	See table
Ripple & noise	Output Volts x 1% + 50mV to -100mV pk-pk
Line regulation	0.8% over input range
Load regulation	0.9%, 0%–100% load
Temperature coefficient	0°C to 50°C, 0.03% per °C
Overvoltage protection	O.V. clamp, PBIH-F Output shutdown, PBIH-G, J, M, R – input must be switched off for at least 30S to reactivate
Overcurrent protection	Fold back – PBIH-F Current limiting, PBIH-G, J, M, R (PBIH-R series is adjustable); PBIH110xxR models are not adjustable
Drift	Output V x 0.5% + 15(mV) per 8 hrs after 1 hr warm-up
Rise Time	200ms max. – PBIH-F, M, R 100ms max. – PBIH-G, J (at 25°C)
Holdup time	10ms (only 110V input)
Remote sense	PBIH-R Series only



OPERATING	
Efficiency	70%–89%
Safety isolation (1 minute)	Type – 12, 24, 48V input Input – Output: 1500VAC Input– Case: 1500VAC Output– Case: 500VAC Type– 110V input Input– Output: 2000VAC Input– Case: 2000VAC Output– Case: 500VAC
Insulation resistance	50MΩ (500VDC) Input – Case
Parallel operation	Consult sales office for details
Remote control	PBIH-R Series: Open link: output normal Short link: output off
ENVIRONMENTAL	
Operating temperature	0°C to 50°C full load
Cooling	Convection cooled
Storage temperature	-20°C to +85°C
Humidity	85%
Shock	30G, PBIH-F, G and J
Vibration	(5Hz–10Hz, 10mm), (10Hz–50Hz) 2G, PBIH-F, G and J
STANDARDS AND APPROVALS	
Safety	Designed to UL1950
C-Tick	AS/NZS CISPR11 Group 1, Class A
MECHANICAL	
Weight	PBIH-F : 250g PBIH-G : 380g PBIH-J : 410g PBIH-M : 800g PBIH-R : 1.4kg

PBIH Series

15-150 WATTS DC/DC SINGLE OUTPUT

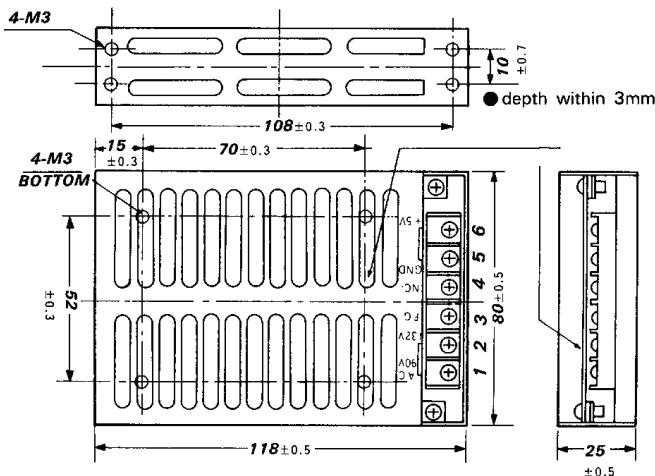
SELECTION TABLE

MODEL NUMBER	INPUT	OUTPUT	OUTPUT POWER
PBIH-1205F	9.2-16V	5V 3A	15W
PBIH-1212F	9.2-16V	12V 1.2A	15W
PBIH-1215F	9.2-16V	15V 1A	15W
PBIH-1224F	9.2-16V	24V 0.62A	15W
PBIH-2405F	19-32V	5V 3A	15W
PBIH-2412F	19-32V	12V 1.2A	15W
PBIH-2415F	19-32V	15V 1A	15W
PBIH-2424F	19-32V	24V 0.62A	15W
PBIH-4805F	38-63V	5V 3A	15W
PBIH-4812F	38-63V	12V 1.2A	15W
PBIH-4815F	38-63V	15V 1A	15W
PBIH-4824F	38-63V	24V 0.62A	15W
PBIH-11005F	85-140V	5V 3A	15W
PBIH-11012F	85-140V	12V 1.2A	15W
PBIH-11015F	85-140V	15V 1A	15W
PBIH-11024F	85-140V	24V 0.62A	15W
PBIH-1205G	9.2-16V	5V 5A	25W
PBIH-1212G	9.2-16V	12V 2.1A	25W
PBIH-1215G	9.2-16V	15V 1.7A	25W
PBIH-1224G	9.2-16V	24V 1.1A	25W
PBIH-1248G	9.2-16V	48V 0.5A	25W
PBIH-2405G	19-32V	5V 5A	25W
PBIH-2412G	19-32V	12V 2.1A	25W
PBIH-2415G	19-32V	15V 1.7A	25W
PBIH-2424G	19-32V	24V 1.1A	25W
PBIH-2448G	19-32V	48V 0.5A	25W
PBIH-4805G	38-63V	5V 5A	25W
PBIH-4812G	38-63V	12V 2.1A	25W
PBIH-4815G	38-63V	15V 1.7A	25W
PBIH-4824G	38-63V	24V 1.1A	25W
PBIH-4848G	38-63V	48V 0.5A	25W
PBIH-11005G	85-140V	5V 5A	25W

MODEL NUMBER	INPUT	OUTPUT	OUTPUT POWER
PBIH-11012G	85-140V	12V 2.1A	25W
PBIH-11015G	85-140V	15V 1.7A	25W
PBIH-11024G	85-140V	24V 1.1A	25W
PBIH-11048G	85-140V	48V 0.5A	25W
PBIH-1205J	9.2-16V	5V 8A	40W
PBIH-1212J	9.2-16V	12V 3.3A	40W
PBIH-1215J	9.2-16V	15V 2.7A	40W
PBIH-1224J	9.2-16V	24V 1.7A	40W
PBIH-1248J	9.2-16V	48V 0.8A	40W
PBIH-2405J	19-32V	5V 10A	50W
PBIH-2412J	19-32V	12V 4.3A	50W
PBIH-2415J	19-32V	15V 3.4A	50W
PBIH-2424J	19-32V	24V 2.5A	50W
PBIH-2448J	19-32V	48V 1A	50W
PBIH-4805J	38-63V	5V 10A	50W
PBIH-4812J	38-63V	12V 4.3A	50W
PBIH-4815J	38-63V	15V 3.4A	50W
PBIH-4824J	38-63V	24V 2.5A	50W
PBIH-4848J	38-63V	48V 1A	50W
PBIH-11005J	85-140V	5V 10A	50W
PBIH-11012J	85-140V	12V 4.3A	50W
PBIH-11015J	85-140V	15V 3.4A	50W
PBIH-11024J	85-140V	24V 2.5A	50W
PBIH-11048J	85-140V	48V 1A	50W
PBIH-1205M	9.2-16V	5V 18A	100W
PBIH-1212M	9.2-16V	12V 9A	100W
PBIH-1215M	9.2-16V	15V 7A	100W
PBIH-1224M	9.2-16V	24V 4.5A	100W
PBIH-1248M	9.2-16V	48V 2A	100W
PBIH-2405M	19-32V	5V 20A	100W
PBIH-2412M	19-32V	12V 9A	100W
PBIH-2415M	19-32V	15V 7A	100W

MODEL NUMBER	INPUT	OUTPUT	OUTPUT POWER
PBIH-2424M	19-32V	24V 5A	100W
PBIH-2448M	19-32V	48V 2A	100W
PBIH-4805M	38-63V	5V 20A	100W
PBIH-4812M	38-63V	12V 9A	100W
PBIH-4815M	38-63V	15V 7A	100W
PBIH-4824M	38-63V	24V 5A	100W
PBIH-4848M	38-63V	48V 2A	100W
PBIH-11005M	85-140V	5V 20A	100W
PBIH-11012M	85-140V	12V 9A	100W
PBIH-11015M	85-140V	15V 7A	100W
PBIH-11024M	85-140V	24V 5A	100W
PBIH-11048M	85-140V	48V 2A	100W
PBIH-1205R	9.2-16V	5V 27A	150W
PBIH-1212R	9.2-16V	12V 13A	150W
PBIH-1215R	9.2-16V	15V 10A	150W
PBIH-1224R	9.2-16V	24V 6.5A	150W
PBIH-1248R	9.2-16V	48V 3.3A	150W
PBIH-2405R	19-32V	5V 30A	150W
PBIH-2412R	19-32V	12V 14A	150W
PBIH-2415R	19-32V	15V 11A	150W
PBIH-2424R	19-32V	24V 7A	150W
PBIH-2448R	19-32V	48V 3.5A	150W
PBIH-4805R	38-63V	5V 30A	150W
PBIH-4812R	38-63V	12V 14A	150W
PBIH-4815R	38-63V	15V 11A	150W
PBIH-4824R	38-63V	24V 7A	150W
PBIH-4848R	38-63V	48V 3.5A	150W
PBIH-11005R	85-140V	5V 30A	150W
PBIH-11012R	85-140V	12V 14A	150W
PBIH-11015R	85-140V	15V 11A	150W
PBIH-11024R	85-140V	24V 7A	150W
PBIH-11048R	85-140V	48V 3.5A	150W

PBIH-F



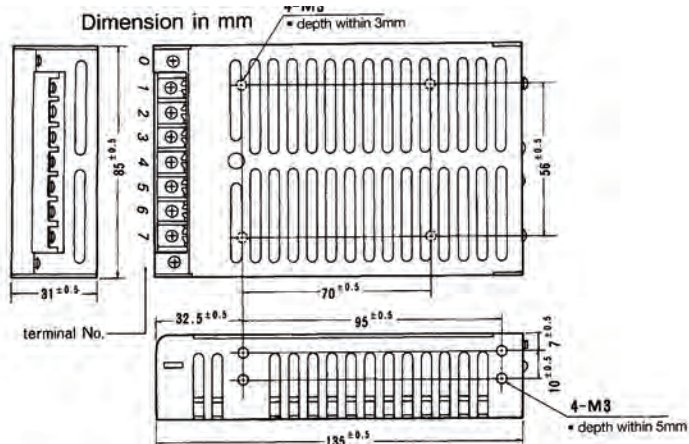
• Dimensions in mm

terminal No.	
1	0 V (DC in)
2	+V (DC in)
3	FG
4	NO Connection
5	-V out
6	+V out

PBIH Series

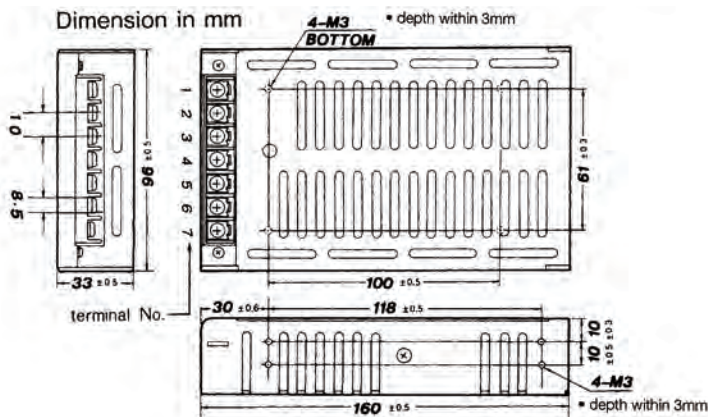
15-150 WATTS SINGLE OUTPUT

PBIH-G



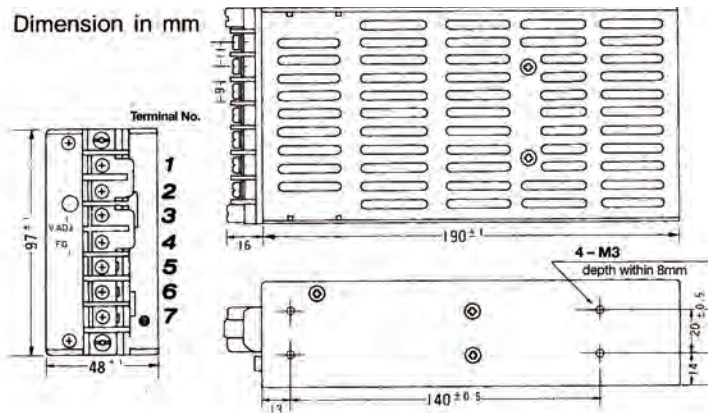
Terminal	Connection
0	FG
1	DC +V in
2	0V in
3	LFG
4	NO
5	NO
6	-V out
7	+V out

PBIH-J



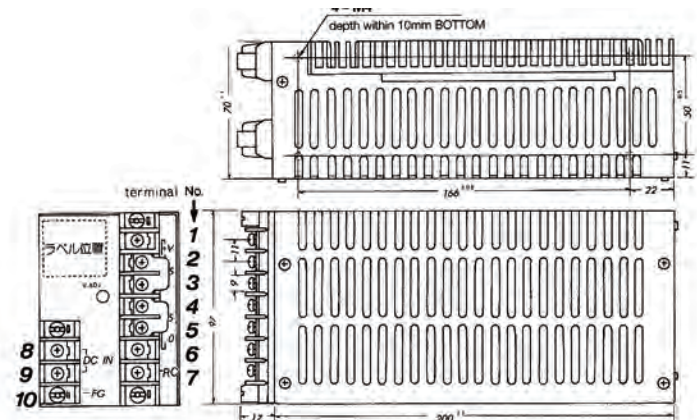
Terminal	Connection
1	FG
2	DC +V in
3	0V in
4	LFG
5	-V out
6	+V out
7	NC

PBIH-M



Terminal	Connection
1	+V out
2	+V out
3	-V out
4	-V out
5	FG
6	-V in
7	+V in

PBIH-R



Terminal	Connection
1, 2	+V out
3	+S
4	-S
5, 6	-V out
7	Remote Control
8	DC +V in
9	DC 0V in
10	FG

CP M SNT 120W 24V 5A**Weidmüller Interface GmbH & Co. KG**

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**PRO-M = Power-Reliable-Optimized**

The perfectly reliable power supply for automation technology.

The ten different versions for the 24V-DC power supply all feature a solid but thin metal housing which enables them to be installed without any side gaps. This results in less space required on the mounting rail. Wide range of AC/DC inputs and a wide temperature range enable them to be used anywhere. Because of its high efficiency, resistance to overloads and high power reserves, the PRO-M is a trusted power supply for use in any application. The three-phase PRO-M power supply modules continue to function reliably when one phase fails (i.e., in two-phase mode).

General ordering data

Order No.	8951340000
Type	CP M SNT 120W 24V 5A
Version	Power supply, switch-mode power supply unit
GTIN (EAN)	4032248742554
Qty.	1 pc(s).

CP M SNT 120W 24V 5A

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Technical data

Dimensions

Length	125 mm	Width	40 mm
Height	130 mm	Weight	0.7 kg
Net weight	724.3 g		

Temperatures

Operating temperature	-25 °C...+70 °C	Storage temperature	-40 °C...+85 °C
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Input

AC current consumption	1.1 A @ 230 V AC / 2.0 A @ 115 V AC	Conductor connection system	Screw connection
Connection system [Input]	Screw connection	DC current consumption	0.4 A @ 370 V DC / 1.2 A @ 120 V DC
DC input voltage range	80...370 V DC (Derating @ 120 V DC)	Frequency range AC	47...63 Hz
Input fuse	Yes	Input fuse (internal)	Yes
Input voltage range AC	85...264 V AC (Derating @ 100 V AC)	Recommended back-up fuse	4 A / DI, safety fuse 6 A, Char. B, circuit breaker 3...5 A, Char. C, circuit breaker
making current	max. 40 A	rated input voltage	100...240 V AC (wide-range input)

output

Conductor connection system	Screw connection	Connection system [Output]	Screw connection
Output current	5 A	Output voltage	22.5...29.5 V DC (adjustable via potentiometer on front)
Output voltage type	DC	Output voltage, max.	29.5 V
Output voltage, min.	22.5 V	Output voltage, note	(adjustable via potentiometer on front)
Parallel connection option	yes, max. 5	Powerboost @ 24 V DC, 60 °C	6 A for 1 min, ED = 5 %
Rated (nominal) output current @ U_{Nom}	5 A @ 60 °C	continuous output current @ 24 V DC	6.0 A @ 45 °C, 5.3 A @ 55 °C, 3.8 A @ 70 °C
rated output voltage	24 V DC \pm 1 %	residual ripple, breaking spikes	< 50 mV _{SS} @ 24 V DC, I_N

General data

AC failure bridging time @ I_{Nom}	> 100 ms @ 230 V AC / > 20 ms @ 115 V AC	Current limiting	> 120 % I_N
Degree of efficiency	90 % @ 230 V AC / 88 % @ 115 V AC	Housing version	Metal, corrosion resistant
Indication	Operation, green LED	MTBF	> 500,000 h acc. to IEC 1709 (SN29500)
Mounting position, installation notice	Horizontal on TS35 mounting rail, with 50 mm of clearance at top and bottom for air circulation. Can be mounted side by side with no space in between.	Operating temperature	-25 °C...+70 °C
Power factor (approx.)	> 0.5 @ 230 V AC / > 0.6 @ 115 V AC	Protection against reverse voltages from the load	30...35 V DC
Weight	0.7 kg		

Creation date June 21, 2012 5:00:31 AM CEST

Catalogue status 14.04.2012 / We reserve the right to make technical changes.

Q-Pulse id: TMS139

26/09/2012

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CP M SNT 120W 24V 5A

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Technical data

EMC / shock / vibration

Limiting of mains voltage harmonic currents	Acc. to EN 61000-3-2	Noise emission acc. to EN55022	Class B
Interference immunity test acc. to	EN61000-4-2 (ESD), EN61000-4-3 and EN61000-4-8 (fields), EN61000-4-4 (burst), EN61000-4-5 (surge), EN61000-4-6 (conducted), EN61000-4-11 (dips)	Shock resistance IEC 60068-2-27	Acc. to EN50178, shock: 5g in all directions

Insulation coordination

Class of protection		Insulation voltage	3 kV input/ouput; 2 kV input/earth; 0.5 kV output/earth
	I, with PE connection		
Pollution severity	2	electrical isolation, input-earth	2 kV
electrical isolation, input-output	3 kV	electrical isolation, output-earth	0.5 kV

Electrical safety (applied standards)

Electrical machine equipment	Acc. to EN60204	For use with electronic equipment	Acc. to EN50178 / VDE0160
Protection against dangerous shock currents	Acc. to VDE0106-101	Protective separation / protection against electrical shock	VDE0100-410 / acc. to DIN57100-410
Safety extra-low voltage	SELV acc. to EN60950, PLEV acc. to EN60204	Safety transformers for switch-mode power supplies	Acc. to EN61558-2-17

Connection data

Conductor cross-section, AWG/kcmil , max.	12	Conductor cross-section, AWG/kcmil , max.	12
Conductor cross-section, AWG/kcmil , min.	26	Conductor cross-section, AWG/kcmil , min.	26
Conductor cross-section, flexible , max.	2.5 mm ²	Conductor cross-section, flexible , min.	0.5 mm ²
Conductor cross-section, flexible , min.	0.5 mm ²	Conductor cross-section, rigid , max.	6 mm ²
Conductor cross-section, rigid , max.	6 mm ²	Conductor cross-section, rigid , min.	0.5 mm ²
Conductor cross-section, rigid , min.	0.5 mm ²	Connection system [Input]	Screw connection
Connection system [Output]	Screw connection	Number of terminals [Input]	3 for L/N/PE
Number of terminals [Output]	5 (++) / (—)	Wire connection cross section, flexible (input), max.	2.5 mm ²

Classifications

ETIM 3.0	EC001039	eClass 5.1	27-04-90-02
eClass 6.0	27-04-90-04	eClass 7.0	27-04-90-04

Downloads

Declaration of Conformity	K469_12_11.pdf
PDF	Warranty information
EPLAN	8951340000.ema
3-D model	

CP M SNT 120W 24V 5A**Weidmüller Interface GmbH & Co. KG**

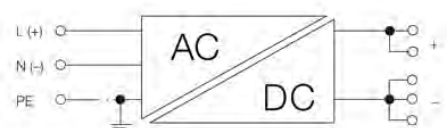
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www.weidmueller.com**Drawings****Electric symbol**

With DC connection, note polarity