

RAYCON PI - Series Solar Charge Controller Technical Specifications

SOLAR PWM CHARGE CONTROLLER FOR INVERTER/UPS INTEGRATION

Now you cut down your monthly electricity bill by simply converting your existing non solar UPS to Solar just by adding RAYCON PI Solar Charge Controller and Solar Panels. It is one time investment and it can reduce electricity bill considerably. Return on the Investment can be expected well within 2 years of utilization of this system.



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Installation of RAYCON Inverter Integrator does not require electrical wiring. All that you have to do is:

- 1) Unplug the three pin mains plug of the HUPS from the mains supply socket and plug it to the socket provided in the RAYCON PI solar charge controller.
- 2) Connect the Battery positive to positive terminal connection and negative of the Battery to negative terminal connection provided on the RAYCON Solar Charge controller. (Marked as B+ and B-)
- 3) Connect the Solar Panel positive to positive terminal connection and negative of the Solar Panel to negative terminal connection provided on the Solar Charge controller. (Marked as P+ and P-)
- 4) Lastly Plug the Mains chord of the Solar Charge Controller to the Mains supply and Switch on the Mains supply switch.

You have successfully completed the installation.

Table of Suitable RAYCON charge controllers for various Solar panel and Inverter configurations

Model No:	Solar panel Size (Peak Watt)	Inverter Configurations (VA)
RAYCON PI-2420	100 - 250 Watt in 12 Volt configuration	300 - 800 VA (All makes of HUPS / Inverter in 12 Volt mode)
	100 - 500 Watt in 24 Volt configuration	600 - 880 VA (All makes of HUPS / Inverter in 24 Volt mode)
RAYCON PI-2440	100 - 500 Watt in 12 Volt configuration	600 - 1200 VA (All makes of HUPS / Inverter in 12 Volt mode)
	200 - 1000 Watt in 24 Volt configuration	880 - 2200 VA (All makes of HUPS / Inverter in 24 Volt mode)

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I. Technical Specifications:

	Product Rating	12/24 V , 20 A (12 / 24 V Automatic Selection) Model: RAYCON PI – 2420	12/24 V , 40 A (12 / 24 V Automatic selection) Model: RAYCON PI - 2440
1	Nominal SPV input voltage	12/24 V DC	12/24 V DC
2	Max. SPV input voltage	55 V DC	55 V DC
3	Nominal SPV input current	15.0 Ampere	35.0 Ampere
4	Max. SPV input current	20.0 Ampere	40.0 Ampere
5	Max. Load Current	16.0 Amp	35.0 Amp
6	Self Consumption	< 30 mW @ 25 °C	< 30 mW @ 25 °C
7	Float Charge	13.7 V DC @ 25°C in 12V mode 27.4 V DC @ 25°C in 24V mode	13.7 V DC @ 25°C in 12V mode 27.4 V DC @ 25°C in 24V mode
8	Boost Charge	14.4 V DC @ 25°C,2h in 12V mode 28.8 V DC @ 25°C,2h in 24V mode	14.4 V DC @ 25°C,2h in 12V mode 28.8 V DC @ 25°C,2h in 24V mode
9	Equalisation	14.7V (12 V mode) 29.4V (24 V mode) For every 10 complete cycles @ 2.45 V per cell (can be customised as per Battery specs)	14.7V (12 V mode) 29.4V (24 V mode) For every 10 complete cycles @ 2.45 V per cell (can be customised as per Battery specs)
10	Charging Technology	PWM with Boost, Float and Equalize modes	PWM with Boost, Float and Equalize modes
11	Load Disconnect Voltage	10.8 V in 12 V mode 21.6 V in 24 V mode	10.8 V in 12 V mode 21.6 V in 24 V mode

12	Load Reconnect Voltage	12.2 V in 12 V mode 24.4 V in 24 V mode	12.2 V in 12 V mode 24.4 V in 24 V mode
13	Battery Low voltage cut-off	10.8 V in 12 V mode 21.6 V in 24 V mode Optional Load current compensation for cut-off voltage value variation.	10.8 V in 12 V mode 21.6 V in 24 V mode Optional Load current compensation for cut-off voltage value variation.
14	Battery Type	Gel / Sealed / Flat paste flooded	Gel / Sealed / Flat paste flooded
15	Recommended Battery Capacity	12V,100AH or 24V,100AH	12V,200AH or 24V,200AH
16	Operating Environment	-20 °C to +60 °C	-20 °C to +60 °C
17	Temperature Compensation	-5 milli Volt / °C / Cell	-5 milli Volt / °C / Cell
18	Efficiency	> 98% @ 25 °C	> 98% @ 25 °C

II. Protections

	Solar Terminal	Battery Terminal	Load Terminal
Reverse Polarity	YES (Solid State)	YES (Solid State)	-NA-
Short circuit	YES	YES (Software based)	YES (Software based)
Over current	YES (Software based)	YES (Software based)	YES (Software based)
Reverse Current	YES	YES	-NA-
Over Voltage	YES (Software based)	YES (Software based)	-NA-
Under Voltage	YES (Software based)	YES (Software based)	-NA-
Over Temperature	-NA-	-NA-	-NA-

Note: Please be noted that if the battery terminals are reversed, Buzzer will indicate the alarm upon which the terminals to battery are to be disconnected. Failing to do so will damage the PWM CCU.

III. Indications

LED	Status	Function
Solar Charging RED LED Indicator	ON	During BOOST charging state
	Flash	During FLOAT charging state
	OFF	Under Non-availability of SOLAR Power
Battery SOC GREEN and RED LED Indicators	RED ON	Under LOW BATTERY condition
	GREEN ON	Under FULL Charge condition
Mode indication YELLOW LED Indicator	ON	During INV. MODE in mode selection
	OFF	Only solar charge available
Mode indication Amber LED Indicator	ON	During DUAL MODE in mode selection
	OFF	Only solar charge available
Fault Indication	Blinking All LED'S	During fault condition (Disconnect the Solar Panel and Battery terminals during this condition and reconnect one by one by rechecking the connectivity again)

IV. Selection Switches:

1. 2-Switches are provided for Battery type selection.
2. 1-Push button Switch for selecting modes during inverter Integration.

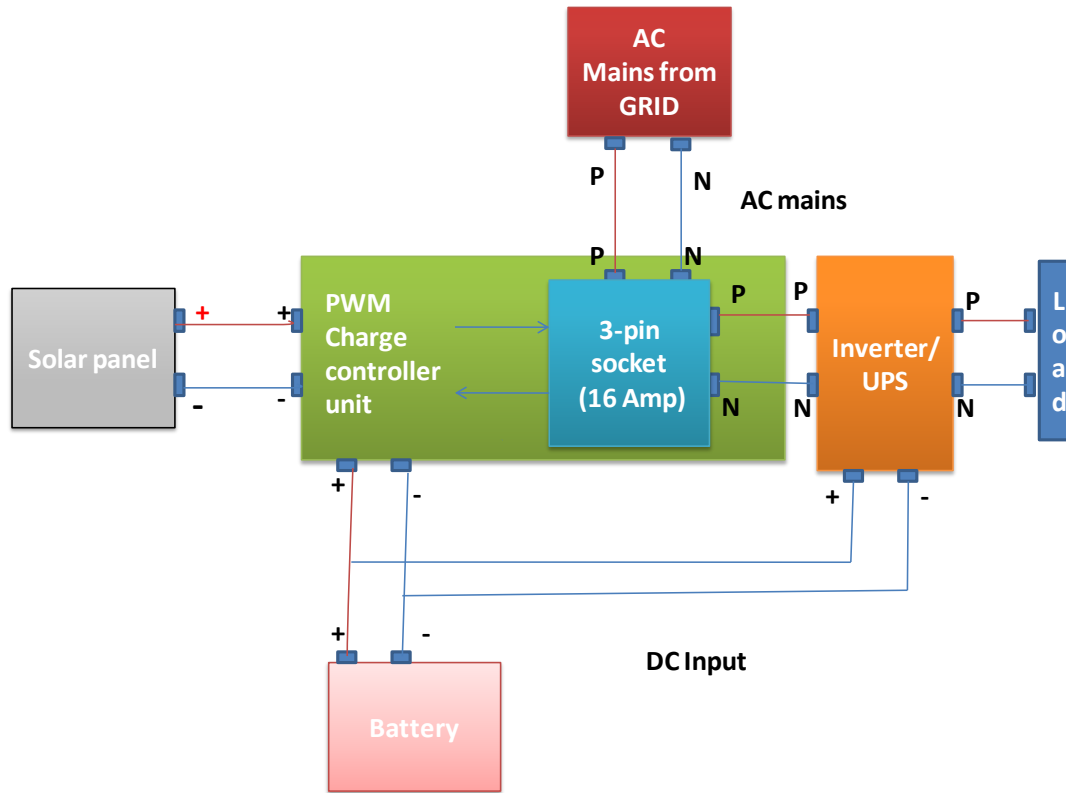
V. Precautions:

1. Do not connect the Solar panel terminals when battery is connected in reverse polarity.
2. Do not connect the Load when battery is connected in reverse polarity.

Note: Avoid short circuits of Solar Panel / Load terminals during installation.

PWM CHARGE CONTROLLER FOR INVERTER/UPS INTEGRATION

Connectivity Diagram:



Technical features of PWM Charge Controller for Inverter Integration:

- PWM based charging control.
- Charging through Solar panel or Grid supply based on availability of sources.
- Charging based on the mode selection with an option to choose among Power Savings / Maximum backup / Convenience.
- Temperature compensation for better battery charging for various climates and terrain.
- On Board Grid availability detector along with LED Indication.
- Grid connectivity using Relay with built in easily replaceable Fuse.
- 3 Pin Grid Socket cable of handling currents of up to 16 Amp.

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Modes of operation of the charge controller:

One Push Button Switch is provided for Power Saver and Dual Mode selection. Default Mode is INV mode, in which SPV power is available along with AC grid up on requirement and necessity. When the user chooses to press the push button Switch for the first time, Charge controller enters into Power Saver Mode and disables the Grid power based charging to the Inverter and only allows Solar Charging. For the Second press of this Button, Charge Controller enters into Dual Power Mode in which Battery will be charged with SPV as well as from Grid continuously until the battery is full.

Inv Mode (Default Mode):

During the Inv mode of operation, the SPV will charge the battery along with AC grid. Based on SPV power and Battery voltage the CC controls Grid power to the Inverter which in turn charges the battery. CC will allow Grid power to the Inverter when Battery Voltage drops down below 12.7 Volts.

Power save Mode:

During the power save mode, only solar source is available to charge the battery (No grid power). Even after the sunset, CC will not allow the grid to take over, but it drives the load with the battery current till battery reaches its lower cut off value.

This mode provides maximum savings to the user but with a compromise on the operating hours of Load. This mode is preferred during Summer/Sunny days to ensure power backup with maximum savings.

Dual Mode:

During the Dual mode of operation, both SPV and Grid will charge the battery until it reaches the maximum charging voltage.