

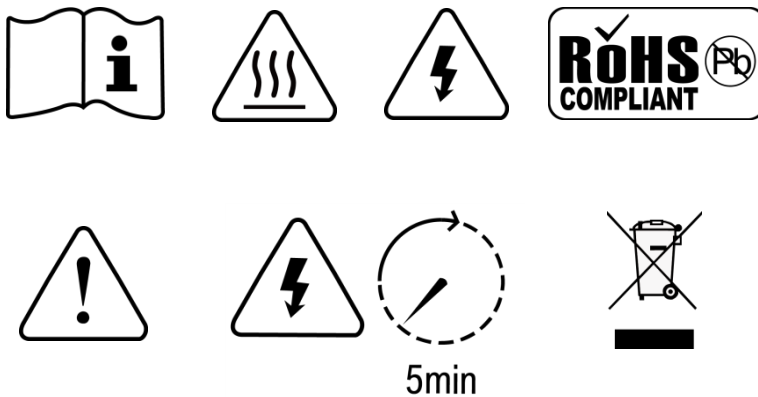
LMP1218-PWM

Master Power Unit



Version: A1.0

Date: Sept. 2020



WARNING : FIRE HAZARD

**SUITABLE FOR MOUNTING ON CONCRETE OR OTHER
NON- COMBUS TABLE SURFACE ONLY**

**CAUTION : THE DC AND AC BREAKER MUST HAVE BEEN
TURNED OFF BEFORE SERVICING**

MADE IN CHINA

Disclaimer

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- Take no warranty as to the accuracy, sufficiency of suitability of any technical or other information provided in this manual or other documentation.
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About this Manual

This manual describes our product features and provides procedure of installations. This manual is for anyone intending to install our equipment.

General Instruction

Thanks for choosing our products and this manual were suitable for LMP1218-PWM Master Power Unit.

This chapter contains important safety and operation instructions. Read and keep this User Guide well for later reference.

The LMP1218-PWM Master Power Unit needs to be installed by professionals and please pay attention to the following points prior to installation:

- 1> Please check the input voltage or voltage of battery is same to the nominal input voltage of this unit.
- 2> Please connect positive terminal "+" of battery to "+" input of this unit.
- 3> Please connect negative terminal "-" of battery to "-" input of this unit.
- 4> Please use the shortest cable to connect and ensure the secure connection.
- 5> While connecting, please secure the connection and avoid short cut between positive terminal and negative terminal of battery, which will cause damage of battery.
- 6> This unit will have high voltage inside. Only authorized electrician can open the case.
- 7> This unit WAS NOT designed to use in any life retaining equipment.

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1. General Safety Instruction

1.1 Safety Instruction

As dangerous voltages and high temperature exist within the LMP1218-PWM Master Power Unit, only qualified and authorized maintenance personnel are permitted to open and repair it. Please make sure the unit is turned off before open and repair it.

This manual contains information concerning the installation and operation of LMP1218-PWM Master Power Unit. All relevant parts of the manual should be read prior to commencing the installation. Please follow the local stipulation meantime.

Any operation against safety requirement or against design, manufacture, safety standard, and are out of the manufacturer warranty.

1.2 General Precaution

1.2.1 Do not expose to dust, rain, snow or liquids of any type, it is designed for indoor use. DO NOT block off ventilation, otherwise the LMP1218-PWM Master Power Unit would be overheating.

1.2.2 To avoid fire and electric shock, make sure all cables selected with right gauge and being connected well. Smaller diameter and broken cable are not allowed to use.

1.2.3 Please do not put any inflammable goods near to this unit.

1.2.4 Never place this unit directly above batteries, gases from a battery will corrode and damage LMP1218-PWM Master Power Unit.

1.2.5 Do not place battery over LMP1218-PWM Master Power Unit.

1.3 Precaution regarding battery operation

1.3.1. Use plenty of fresh water to clean in case battery acid contacts skin, clothing, or eyes and consult with doctor as soon as possible.

1.3.2. The battery may generate flammable gas during charging. NEVER smoke or allow a spark or flame in vicinity of a battery.

1.3.3. Do not put the metal tool on the battery, spark and short circuit might lead to explosion.

1.3.4. REMOVE all personal metal items such as rings, bracelets, necklaces, and watches while working with batteries. Batteries can cause short-circuit current high enough to make metal melt, and could cause severe burns.

2. LMP1218-PWM INTRODUCTION

2.1 Features

- Smart battery charger 12V18A
 - ✧ Active PFC charging
 - ✧ Temperature compensated Charging
 - ✧ Voltage compensated Charging
- 16 Fused DC outputs, including water pump and lighting central control.
- Battery charging relay 12V 30A
- Battery Low Voltage Protection
- Built in Battery Switch to isolate the battery when in storage
- Support external remote battery switch
- Control one water pump with two tank probes
- Solar charger controller(PMW), 15A

2.2 LED Display

Table 1 LED indication

NO.	LED	Color	Status	Description
1	CHG	Green	ON	Battery charged
			Flashing (flash once every second)	Battery charging
			OFF	Battery discharge
2	Dischg	Orange	ON	Battery discharging
			OFF	Battery charging
3	CHG/ Dischg	Green/Orange	Both ON	Power supply

3. KEY FEATURES AND FUNCTIONS

3.1 Multiple inputs

LMP master power unit may have multiple sources at one time. These sources include the Shore power, Solar panel and Alternator (Motor battery). There is priority among these sources, but LMP allows several sources to charge auxiliary battery at the same time. The priorities are listed below.

Table 2 Energy sources priority

AC Mains	✓	✓	✓		
Solar panel	✓	✓		✓	✓
Alternator (Motor battery)	✓		✓	✓	
Dominating Source	AC mains + Solar panel	AC mains + Solar panel	AC mains	Alternator + Solar panel	Solar panel

3.2 Battery Charger of Auxiliary Battery

The charger automatically starts when the appropriate qualified power is connected, either from grid, generator. With multiple charging stages (soft start-bulk absorption float-recycle), LMP1218-PWM is designed to fully charge battery quickly. To guarantee the optimal charging for batteries of different states, the LMP1218-PWM features Microprocessor-controlled charging algorithm. The Float and Recycle charging programs guarantees the battery being charged properly upon being connected for a longer period.

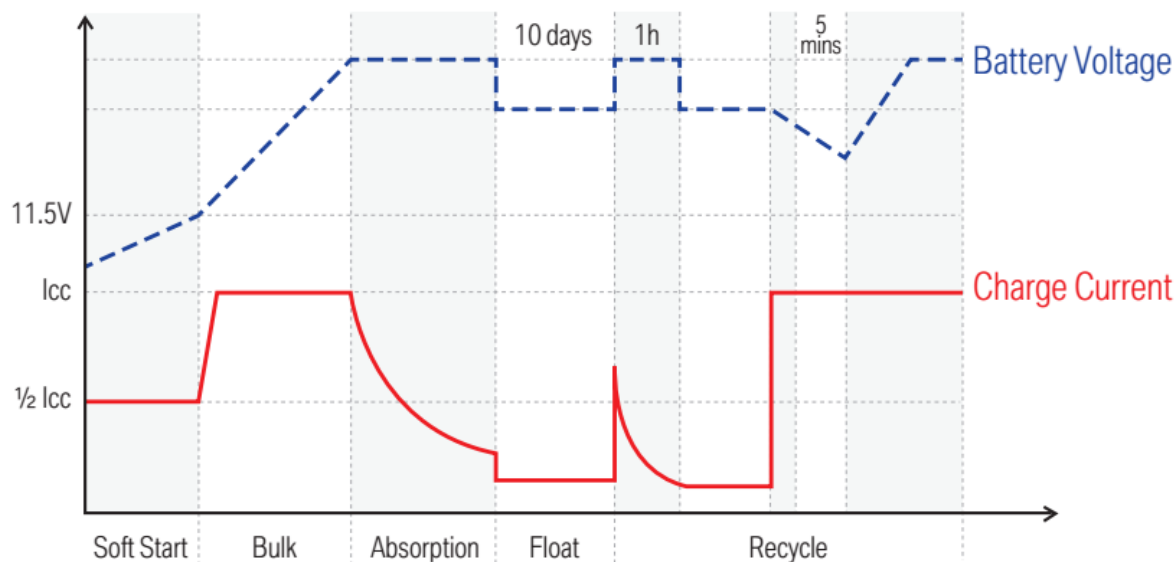


Figure 1 Charging algorithm for lead-acid battery

Lithium battery charging

The LMP1218-PWM can be configured to charge Lithium battery.

3.3 Power Supply Mode

If no battery is attached to LMP1218-PWM unit, it will work as a power supply automatically with a 12.8VDC output.

3.4 PWM Solar charger controller

LMP has a built-in PWM charger for the service battery.

- ✧ Max open voltage is 25VDC
- ✧ Max supply current is 15A
- ✧ Max power: 200W with imperative parallel connection if 2 solar panels.

The input is protected against reverse polarity and overload.

3.5 Voltage Charging Relay (VCR)

LMP1218-PWM Master Power Unit has a built-in voltage charging relay (VCR), which can get power from alternator to supply the system whilst the engine is running.

LEAD ACID BATTERY -- When the motor battery reaches 13.4VDC with threshold time delay, the VCR will be engaged to allow power from alternator to supply the system. VCR will continue being engaged until the motor battery's voltage drops under 12.8VDC.

LiFePO4 LITHIUM BATTERY -- When the motor battery reaches 14.0VDC with threshold time delay, the VCR will be engaged to allow power from alternator to supply the system. The VCR will continue being engaged until the motor battery's voltage drops under 13.5VDC.

The VCR will be disengaged when the auxiliary battery's voltage reached 14.8V.

NOTE: *If vehicle is fitted with a smart charging system (Variable Voltage or Temperature Compensating), the VCR charge system may not function correctly and a DC-DC Charging system is recommended*

Please consult your local dealer or installer for further information.

3.6 Battery Low Voltage Protection (BLVP)

LMP1218-PWM master power unit has a built-in low voltage protection relay. It will disconnect the load once the battery voltage drops below the threshold voltage. The default setting is 10.8VDC.

3.7 Main Battery Switch

The LMP1218-PWM unit provides a convenient way to switch off the output of the on-board auxiliary battery. It protects the auxiliary battery from being discharged by electronics on board, completely isolating the battery.

3.8 DC Distribution

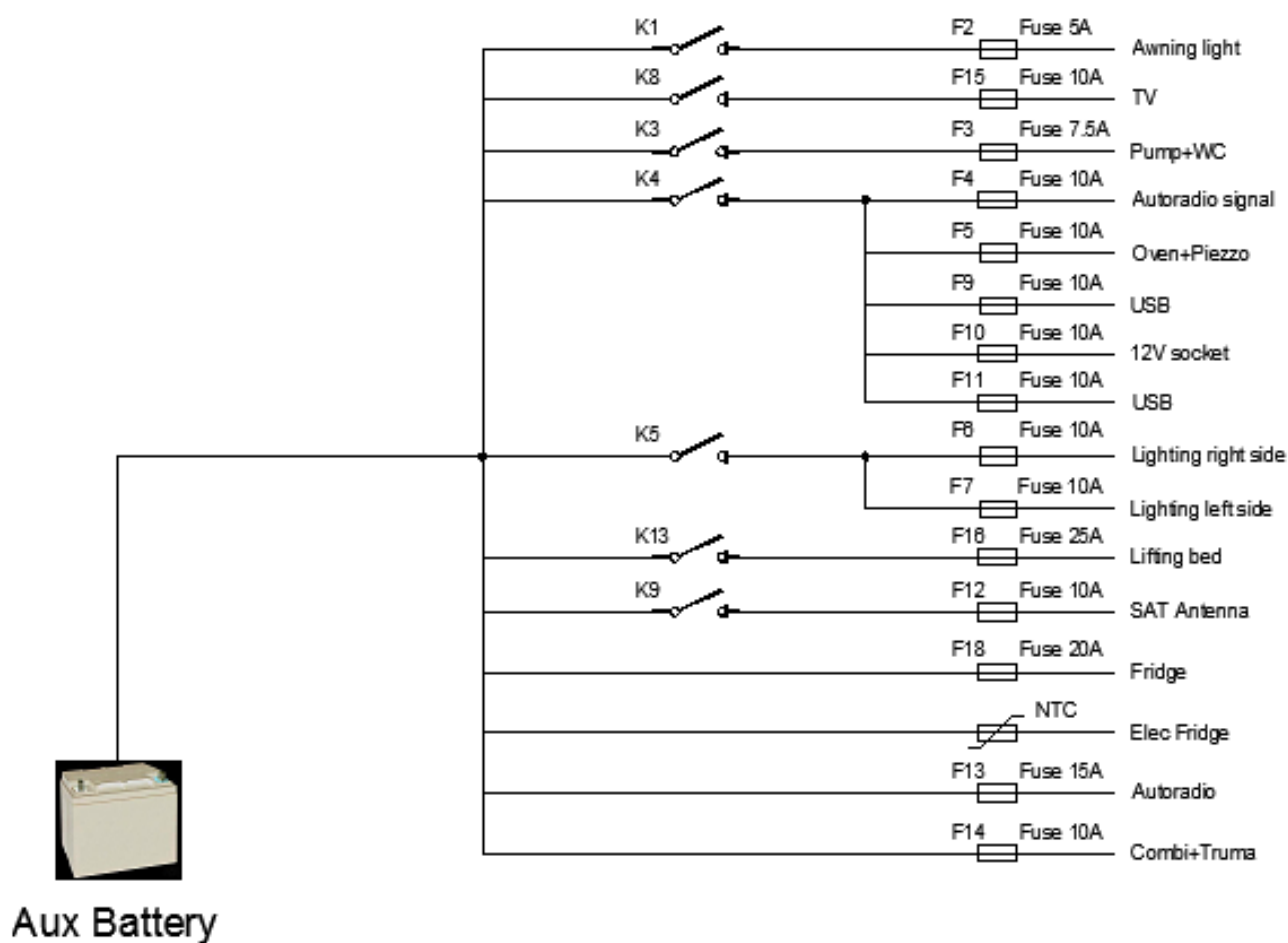


Figure 2 DC distribution schematic diagram

4. STRUCTURE AND INSTALLATION

4.1 LMP1218-PWM Master Power Unit

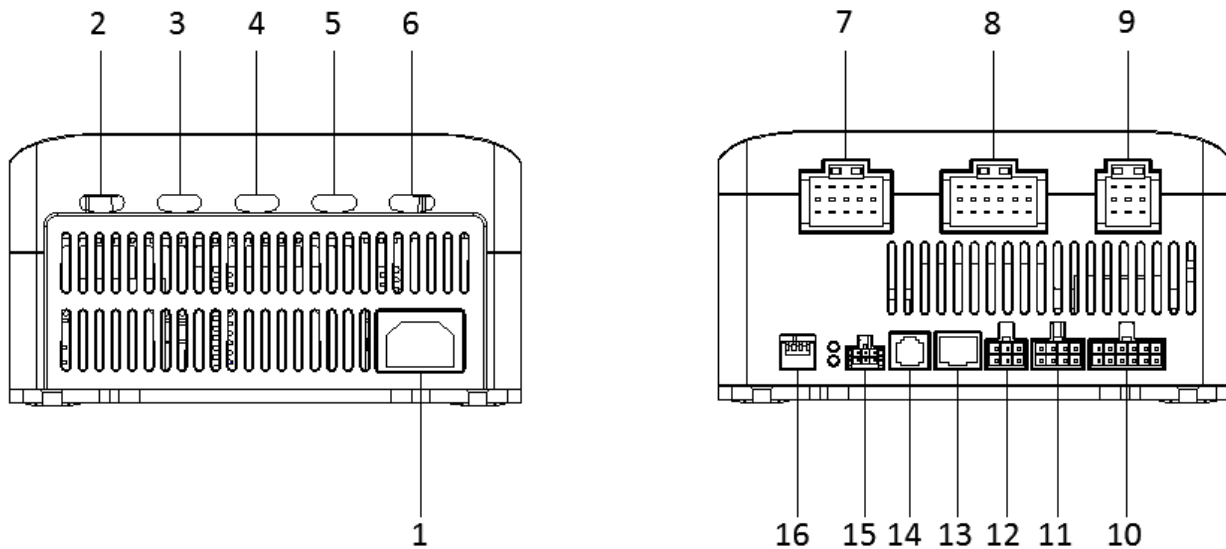


Figure 3 Connectors at front and back

Table 3 Connector description

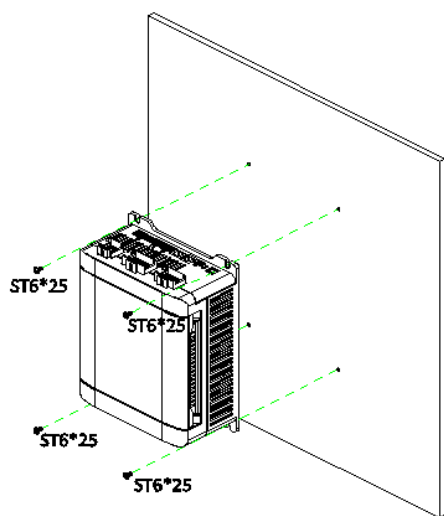
No.	DEFINITION	LABEL	DESCRIPTION
1	AC input port	/	AC input port
2	/	PV	Connect to PV Panel
3	/	Fridge	Connect to fridge
4	/	Lifting Bed	Connect to lifting bed
5	/	Motor BAT	Connect to Motor BAT
6	/	AUX BAT	Connect to AUX BAT
7	Loads	[1]1	POS : Awning lamp
		[1]2	GND :
		[1]3	POS : Info D+ Fridge
		[1]4	POS : Side lights
		[1]5	GND : Side lights
		[1]6	POS : Info D+ SAT antenna
		[1]7	POS : Pump + WC
		[1]8	GND : Pump + WC
		[1]9	POS : Info D+ Preheating pump
		[1]10	POS : Autoradio Signal
		[1]11	GND :
		[1]12	GND :
		[1]13	POS : Oven + Piezzo
		[1]14	GND : Oven +Piezzo
		[1]15	GND : Buzzer Footstep

8	Loads	[2]1	POS : Lighting Right side
		[2]2	GND : Lighting Right side
		[2]3	POS : Buzzer Footstep
		[2]4	POS : Lighting Left side
		[2]5	POS : Lighting Left side
		[2]6	GND: In/Out Footstep (COM)
		[2]7	POS : Power Tablet
		[2]8	GND : Power Tablet
		[2]9	Out Footstep (Normally Open)
		[2]10	POS + Lifting bed
		[2]11	GND - Lit électrique
		[2]12	In Footstep (Normally Open)
		[2]13	POS + Plug 12V Kitchen
		[2]14	GND - Plug 12V Kitchen
		[2]15	M1 - Footstep
		[2]16	POS + Plug USB Kitchen/Bedroom
		[2]17	GND - Plug USB Kitchen/Bedroom
		[2]18	Footstep
9	Loads	[3]1	POS : Permanent Autoradio
		[3]2	GND :
		[3]3	POS : SAT antenna
		[3]4	POS : Combi + TRUMA/ALDE control
		[3]5	GND : Combi + TRUMA/ALDE control
		[3]6	GND : Elec Fridge
		[3]7	POS : TV
		[3]8	GND : TV
		[3]9	POS : Elec. Fridge
10	Signal terminal	[7]1	D+ (active high +BAT
		[7]2	Switch ON/OFF (Main)
		[7]3	D+ (active down GND)
		[7]4	
		[7]5	Sidelights (active high +BAT)
		[7]6	+APC (active high +BAT)
		[7]7	Sidelights (active down GND)
		[7]8	+APC (active down GND)
		[7]9	Switch ON/OFF (NO)
		[7]10	Footboard End of stroke (COM)
		[7]11	Footboard End of stroke (NO)
		[7]12	
11	Grey water tank	[6]1	CW-REF
		[6]2	CW-25%
		[6]3	CW-50%
		[6]4	
		[6]5	CW-75%

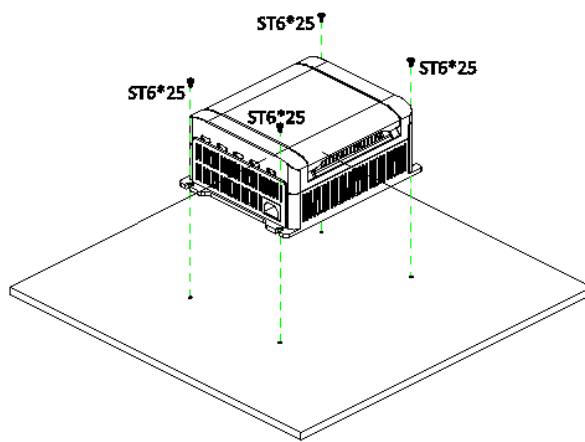
		[6]6	CW-100%
		[6]7	
		[6]8	
12	Fresh water tank	[5]1	CW-REF
		[5]2	CW-25%
		[5]3	CW-50%
		[5]4	CW-75%
		[5]5	CW-100%
		[5]6	
13	RS485 port		Connect to RS485 bus
14	CI Bus port		Connect to CI bus
15	Communication port	[4]1	Wake-up
		[4]2	GND
		[4]3	GND
		[4]4	+12V
		[4]5	CAN H
		[4]6	CAN L
16	DIP Switch	1 VCR	Set the battery type, VCR and Mode
		2 Mode	
		3 Bat type	
		4 Bat type	

4.2 Installation

Ensure the space (at least 3-5cm on the left and right side) beside the LMP1218-PWM unit for the good ventilation.



Vertical Installation



Horizontal Installation

Figure 4 Installation

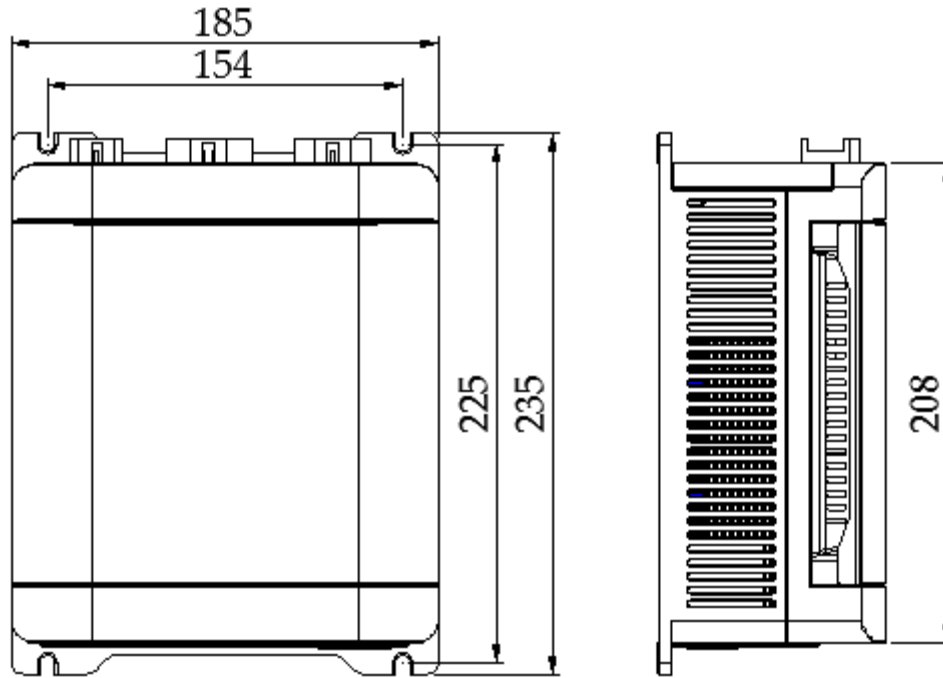


Figure 5 Dimensions of LMP1218-PWM

4.3 Fuse specification

Here is a list for the fuses installed on LMP1218-PWM. Please also take reference of Figure 2.

Table 4 Fuse specification list

Fuse No.	DC loads	Specification
F2	Awning light	5A
F3	Pump	7.5A
F4	Auxiliarie	10A
F5	Oven	10A
F6	Lighting 1	10A
F7	Lighting 2	10A
F9	USB Socket Bedroom	10A
F10	USB Socket Kitchen	10A
F11	12V Socket Kitchen	15A
F12	Permanent SAT Antenna	10A
F13	Permanent Autoradio	5A
F14	Permanent Heating System	10A
F15	Permanent TV-Demodulator	10A
F16	Lifting Bed	25A
F18	Permanent Fridge	20A
F19	Footboard	20A
F20	AUX BAT	50A

F21	Motor BAT	50A
F1	By-pass Pump	25A
F8	By-pass Lighting	25A
F17	By-pass Lifting	25A

5. OPERATION

5.1 Configuration on LMP1218-PWM

You could set the battery type, VCR and Mode through LMP1218-PWM master power unit.

5.1.1 Dip switch setting

The dip switch allows to set VCR mode, Working mode and Battery type.

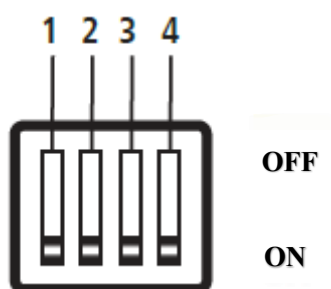


Figure 6 Dip switch

Table 5 Dip switch definition

DIP SWITCH	1	2	3	4
	VCR mode	Working mode	Battery type	

5.1.1.1 Dip switch for VCR mode and Working mode

Table 6 Dip switch for VCR mode and Working mode selection

VCR mode	off	AUTO MODE
	on	For external booster
Working mode	off	Charger
	on	Power supply

a) VCR mode

There are two VCR modes:

- VCR / OFF: when this mode is selected, the integrated VCR is working in automatic mode.
- VCR / ON: When this mode is selected, the integrated VCR is disactivated; and an external DC-DC booster can be connected in parallel.

b) Working mode

There are two working modes:

- Charger: When this mode is selected, the LMP will operate as a charger to charge the auxiliary battery.
- Power supply: when this mode is selected, the LMP will produce a stable voltage of 12.8 Vdc to power the connected DC loads.

5.1.1.2 Dip switch for battery setting

Table 7 Dip switch for battery type setting

Battery type		
Position 3	Position 4	Battery type
off	off	AGM
off	on	GEL
on	off	LEP
on	on	WET

5.1.2 External Battery Switch

LMP1218-PWM offers a possibility to connect with an external battery switch, which allows user to turn on/off the auxiliary battery output remotely.

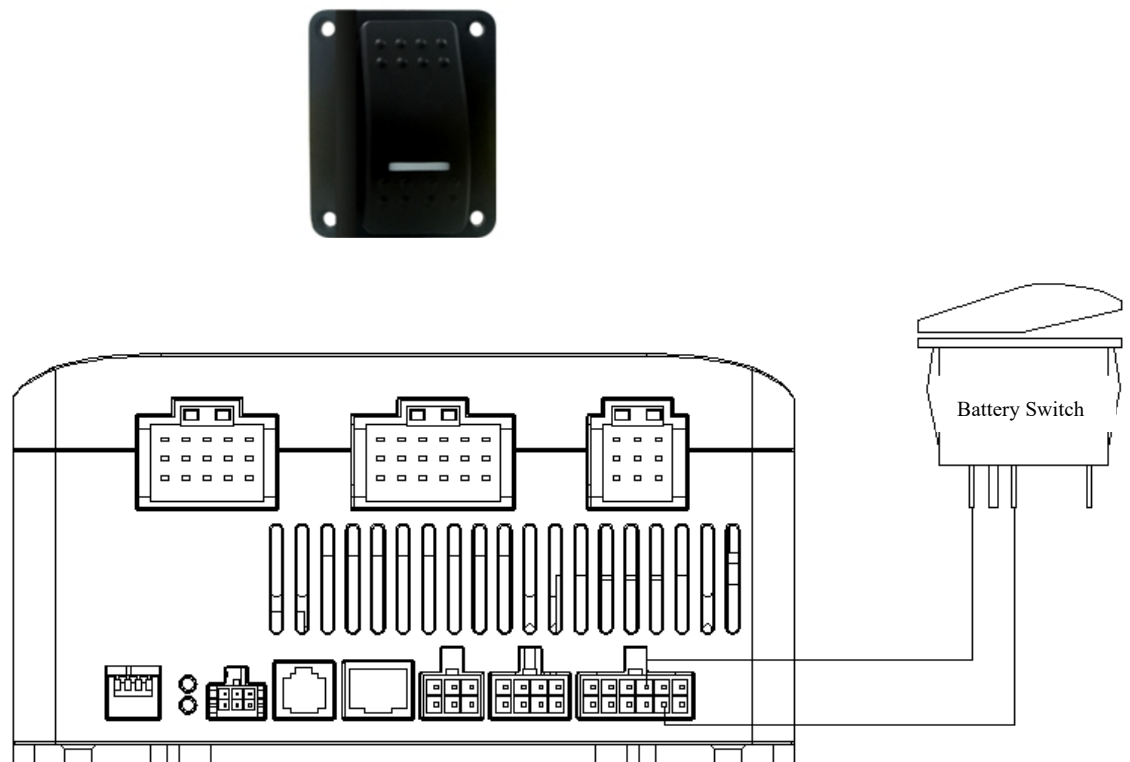


Figure 8 Wiring diagram of battery switch

5.2 Daily Maintenance

- Confirm the Battery Switch is switching on when you want to charge the battery with the AC grid.
- Check the nominal battery voltage is 12Vdc.
- When replacing the existing battery with a new one, please have the new battery fully charged by Grid for the first time to calibrate a precise battery SOC.

6. Trouble shooting

6.1 LED display on LMP-PWM Unit

Table 8 Error LED indicator of LMP-PWM

NO.	LED	Color	Status	Description
1	CHG / DISCHG	Green / Orange	Flash once per cycle	Service battery voltage low
2			Flash twice per cycle	Service battery voltage high
3			Flash 3 times per cycle	LMP-PWM unit Over temp
4			Flash 4 times per cycle	Bulk charge timeout

7. Specification

Table 9 Specification of LMP-PWM

Model		LMP1218-PWM	
Electrical Specifications			
AC Power	Nominal input voltage (V)	230±10%VAC 50/60Hz	
	Power factor	0.98	
	Input current at full load	1.3A	
Battery	Starter battery	12Vdc	
	Starter battery voltage range	12.8-14.8Vdc	
	Service battery	12Vdc	
	Service battery voltage range	10.8-16.2Vdc	
Solar Panel	Charger type	PWM	
	Open circuit voltage	25Vdc	
	Max supply current	15A	
Charging Relay	Relay specification	12Vdc 30A continuous, peak current 50A	
	Connect voltage	13.4V	
	Connect delay time	10sec	
	Disconnect voltage	12.8V	
	Disconnect delay time	60sec	
	High voltage limit	14.8Vdc	
Charger mode	Charge Algorithms	TBB premium II - 5steps	
	Battery type	AGM/GEL/LFP/WET	
	Bulk current	18A(Max)	
	Absorption voltage	(14.4/14.1/14.4/14.7)±0.2Vdc	
	Float voltage	(13.5/13.5/13.5/13.7)±0.2Vdc	
Power supply mode	Nominal output voltage	12.8±0.2Vdc	
	Rated output current	18A(Continuous)	
Efficiency(Max)		88%	
Working temperature		-20℃~+40℃	
Others			
Battery Disconnect(LVD)	Disconnect voltage	AGM/GEL/WET	10.8Vdc(default)
		LFP	11.2 Vdc(default)
	Delay off time	60sec	
	Reconnect voltage	AGM/GEL/WET	11.8Vdc(default)
		LFP	12.2 Vdc(default)
Protection	Short circuit on output	Fuse blown	
	Reverse Polarity	Fuse blown	
	Overload protection	Derate the output until overload is removed	
	Battery charger over temperature	Shut down LMP-PWM	

	Battery over voltage limits	Battery charger disconnect, loads disconnect	
Physical Specifications			
Dimensions (L*W*H)		235 × 185 × 98.5 mm	
Weight (kg)		2kgs	
Enclosure		Plastic case	
Cooling		Free cooling	
Protection category		IP20	
Approvals			
EMC		UN R10	

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