

## MPPT SMART CHARGE CONTROLLER



2 independent MPPT string inputs



Max module power:

- 900W for 12V battery voltage
- 1800W for 24V battery voltage
- 3600W for 48V battery voltage



Cloud IOT Technology



Advanced online data monitoring & control



Enhanced display user interface



Smart Battery profiles



12V / 24V / 48V battery auto-detect voltage



Protections:

- Low battery
- Over-temperature
- Battery polarity inversion
- Output overload protection



Pb-lead acid, Pb-AGM,  
Pb-gel batteries and Lithium batteries

Il **WRM60** è un regolatore per la carica di batterie da modulo fotovoltaico da impiegare in impianti domestici o grandi impianti ad isola. E' adatto per sistemi a 12V/24V/48V e può gestire una potenza fotovoltaica fino a 3,6kW. Il WRM60 inoltre è connesso ad internet: questo permette agli utenti di controllare da remoto il funzionamento del regolatore, modificare le impostazioni e aggiornare il software.

Una piattaforma dedicata permette, infatti, diverse funzionalità: monitoraggio, controllo e gestione del sistema.

Questo modello di regolatore di carica implementa un circuito di ricerca della massima potenza di modulo PV (**MPPT**), che massimizza l'energia estratta dal modulo e caricata in batteria. Il regolatore permette la gestione di due stringhe PV indipendenti.

Il WRM60 è disponibile nella versione **Smart**, ovvero compatibile con batterie dotate di BMS (con comunicazione CAN) e in versione con battery monitor integrato (**WBM**) che permette una gestione avanzata delle batterie tradizionali.

***WRM60** is a charge controller designed for residential or big stand-alone systems. It's designed for 12V/24V/48V batteries and handles up to 3,6kW PV module power. WRM60 is connected to the internet: in this way the users can remotely control the functionalities of the system and change the settings, besides update remotely the device firmware.*

*A dedicated online platform allows monitoring, control and management of the system.*

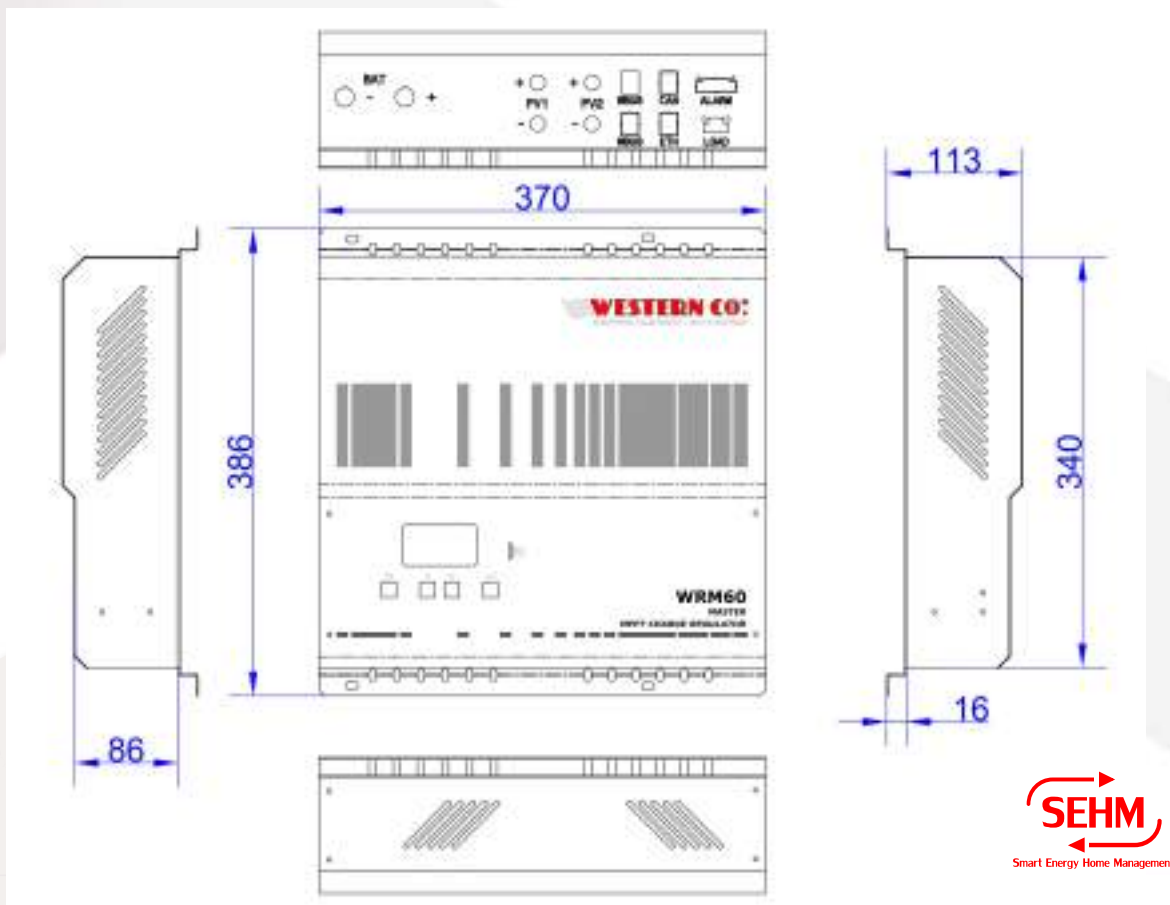
*This type of charge controller implements a Maximum Power Point Tracker (**MPPT**) circuit to exploit the maximum PV power available to charge the battery. The controller manages two separated PV strings.*

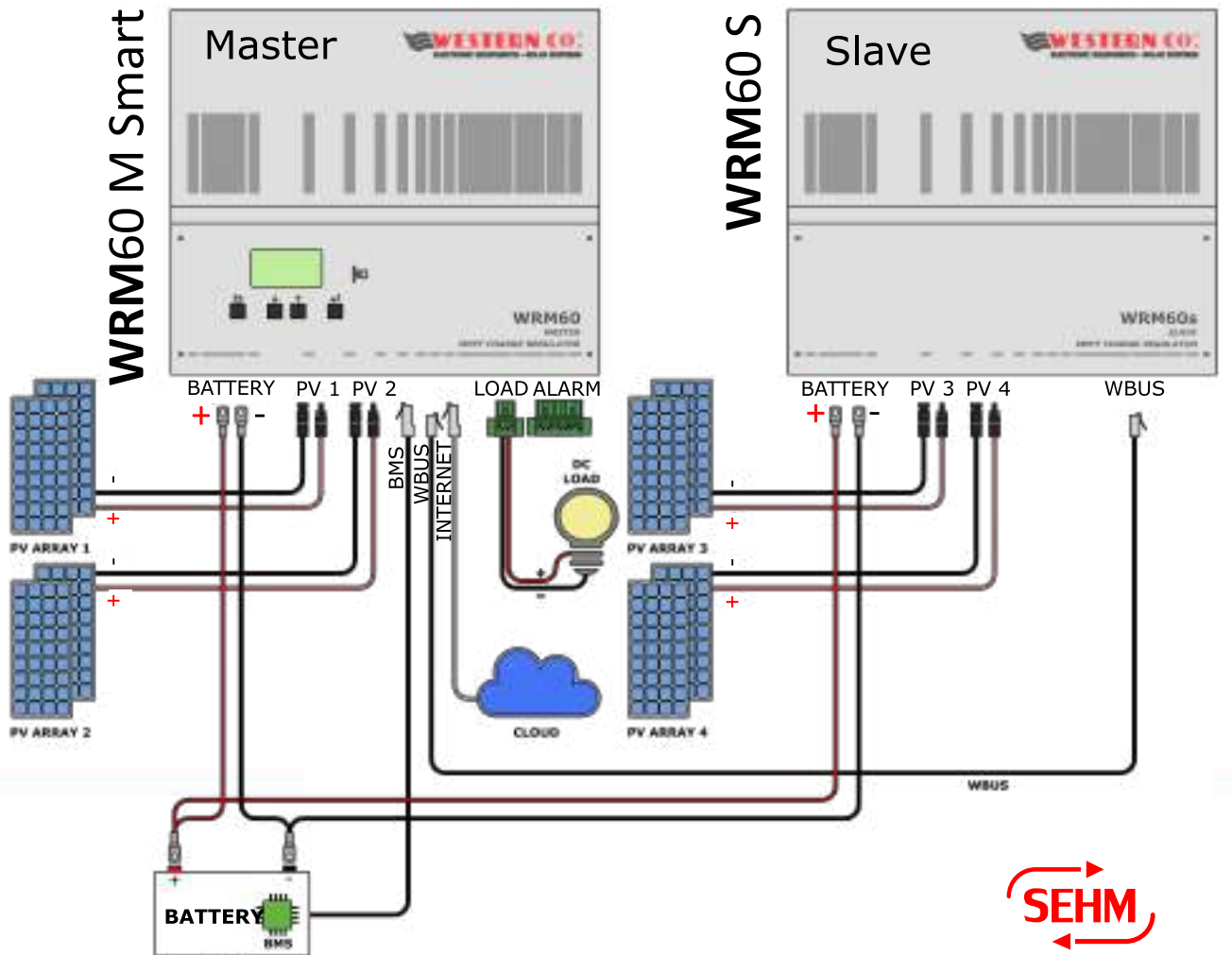
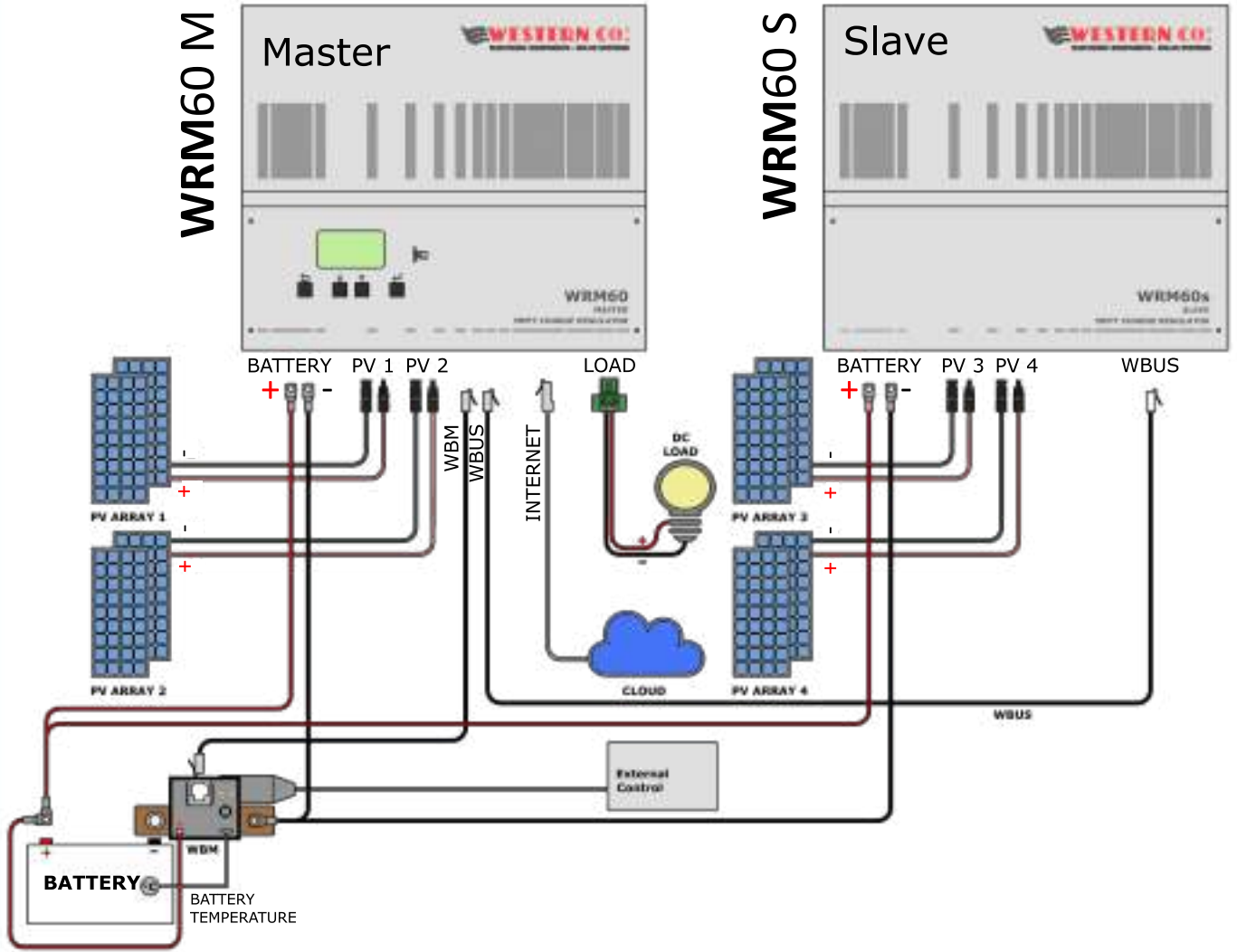
*The WRM60 is available in the **Smart** version, capable of communicating (using CAN protocol) with BMS-integrated batteries, and in the battery monitor (**WBM**) version, specifically designed to monitor and manage traditional batteries.*

## Online data Monitoring



## Mechanical Dimensions





# Electrical/Mechanical characteristics

# WRM60

TECHNICAL SPECIFICATIONS

		WRM60 Smart Master	WRM60 Master	WRM60s Slave	U.M.		
Nominal battery voltage		12 / 24 / 48 autodetect			(V)		
Battery voltage range (12/24/48V)	V <sub>bat</sub>	10 ÷ 16/ 20 ÷ 32 / 40 ÷ 64			(V)		
Max charge current <sup>1</sup>	I <sub>ch</sub>	60			(A)		
Max charge power (12/24/48V)	P <sub>ch</sub>	900 / 1800 / 3600			(W)		
Max open circuit voltage of PV string	V <sub>oc</sub>	180			(V)		
Max short circuit current of each PV string input	I <sub>sc_n</sub>	26			(A)		
Independent MPPT PV string input	PV <sub>n</sub>	2					
Max power of each PV string input (12/24/48V)	P <sub>pv_n</sub>	450 / 900 / 1800			(W)		
Self consumption	P <sub>q</sub>	1,0			(W)		
Operating temperature	T <sub>amb</sub>	-10 ÷ +40			(°C)		
Max power dissipated (12/24/48V)	P <sub>loss</sub>	80 / 112 / 132			(W)		
Efficiency @ 60A (12/24/48V)	η	90 ÷ 92 / 93,5 ÷ 95,2 / 96,0 ÷ 97,2			(%)		
Parallel slave operation		controlled via W-BUS					
Weight		6,25			(kg)		
Dimension LWH		545 x 386 x 113			(mm)		
Degree of protection		IP20					
Smart Battery profiles		- LG Chem RESU 48V - TAWAKI BATTERY - BYD B-BOX PRO 48V	- FIAMM RES	sent from Master via W-BUS			
Working parameters		sent from BMS via CAN-BUS	sent from WBM via W-BUS				
Charge algorithm <sup>2</sup>		multistage: Bulk / Absorption / Float					
Generic profiles			Flood	Seal-Gel	Lithium	parameters sent from Master via W-BUS	
End of charge voltage @ 25°C (12V/24/48V)	V <sub>EoC_12</sub> V <sub>EoC_24</sub> V <sub>EoC_48</sub>		14,8 29,6 59,2	14,4 28,8 57,6	14,0 ÷ 14,7 28,0 ÷ 29,4 56,0 ÷ 58,8		(V)
V <sub>EoC</sub> temperature compensation <sup>3</sup> (12/24/48V)	V <sub>tadj</sub>		-24 / -48 / -96		(mV/°C)		
Float voltage (12/24/48V)	V <sub>fit</sub>		V <sub>EoC</sub> - (0,6 / -1,2 / -2,4)		(V)		
Absorption time to float state	T <sub>abs</sub>		4		(h)		
Output LOAD topology <sup>4</sup>		open drain					
Output LOAD voltage	V <sub>LOAD</sub>	V <sub>batt</sub>			(V)		
Output LOAD current	I <sub>LOAD</sub>	15			(A)		
Output ALARM topology		relè	relè				
Output ALARM current	I <sub>ALA</sub>	60Vdc 5A	60Vdc 0,1A				
Battery connection		terminal M8					
Battery cable		pair of R/N 25mm <sup>2</sup> 1,5m with ring terminal Ø8 (supplied)					
PV string input connection		2 pairs of M/F MC4 (supplied)					
Solar cable section for MC4 connectors		4/6mm <sup>2</sup>					
Cable section for output LOAD connector		2,5mm <sup>2</sup>					
Cable section for output ALARM connector		1,5mm <sup>2</sup>	2 pairs of 0,5mm <sup>2</sup> 1,8m (supplied)				
Internet cable connector		RJ45					
Control bus interface connector		RJ12					
Control bus interface topology		W-BUS					
Battery bus interface connector <sup>5</sup>		RJ12	RJ12				
Battery bus interface topology		CAN	W-BUS				
External shunt device			WBM-Shunt				
Battery connector on WBM-Shunt (negative)			hole Ø7 (18x20mm)				
Supply cable on WBM-Shunt			1mm <sup>2</sup> 1,8m with ring terminal Ø8 (supplied)				
Electrical protection		Battery reverse polarity, temperature derating, overload.					

<sup>1</sup> The maximum charging current is limited to 30A for each PV input.

<sup>4</sup> Positive in common.

<sup>2</sup> With the Li program, the Float stage does not exist.

<sup>5</sup> Refer to the manual for pinout.

<sup>3</sup> With the Li program, the V<sub>EoC</sub> is not compensated in temperature.



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