WRM60/WRM90 *[SEHM]*

WARRANTY 5 YEAR · Pb LEAD-FREE · RoHS 2015/863 · made in ITALY

Descrizione prodotto

I **WRM60** e **WRM90** sono smart charge controller per la carica di batterie da moduli fotovoltaici e utilizzati in impianti domestici o grandi impianti a isola. Sono adatti per sistemi a 12V/24V/48V e la loro modularità (integrazione) permette di gestire una potenza fotovoltaica fino a 14,4kW. Gli utenti, grazie al collegamento con la rete internet possono 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.

Questi modelli implementano un circuito di ricerca della massima potenza del modulo FV **(MPPT)**. Permettono la gestione di tre **(WRM90)** o due **(WRM60)** stringhe FV indipendenti. Sono disponibili nelle versioni **CB**, ovvero compatibili con batterie dotate di **BMS** (con comunicazione **CAN**) e in versione **SB** con battery monitor integrato **(WBM)** che permette una gestione avanzata delle batterie tradizionali.

[eng]
Product description

The **WRM60** and **WRM90** are smart charge controllers for charging batteries from PV modules and used in domestic or large stand-alone systems. They are suitable for 12V/24V/48V systems and their modularity (integration) allows to manage a photovoltaic power up to 14.4kW. Users, thanks to the Internet connection, can remotely control the operation of the controller, change the settings and update the software. In fact, a dedicated platform allows different functions: monitoring, control and management of the system.

These models implement a search circuit of the maximum power of the PV module **(MPPT)**. They allow the management of three **(WRM90)** or two **(WRM60)** independent PV strings. They are available in the **CB** versions, that is compatible with batteries equipped with **BMS** (with **CAN** communication) and in **SB** version with integrated battery monitor **(WBM)** that allows advanced management of traditional batteries.

[fra]
Description du produit

Les **WRM60** et **WRM90** sont des contrôleurs de charge intelligents permettant de charger les batteries à partir de modules photovoltaïques destinés à être utilisés pour des installations domestiques ou de grande taille en site isolé. Ils sont indiqués pour des systèmes à 12/24/48V et vu leur modularité (intégration) on peut arriver à gérer des puissances jusqu'à 14,4kW. Ils se connectent à internet, cela permet aux utilisateurs de contrôler à distance le fonctionnement du contrôleur, d'en modifier les réglages et de mettre à jour le logiciel. Une plateforme dédiée permet en effet plusieurs fonctionnalités : surveillance, contrôle et gestion du système.

Ces modèles sont dotés d'un circuit de recherche de point de puissance maximale du module PV **(MPPT)** qui maximise l'énergie extraite du module et chargée en batterie. Ils permettent la gestion de trois chaînes photovoltaïques indépendantes **(WRM90)** ou deux **(WRM60)**. Ils sont disponibles en versions **CB**, compatibilité avec batteries dotées de **BMS** en communication **CAN** et dans la versions **SB** avec écran intégré **(WBM)** qui permet une gestion avancée des batteries traditionnelles.

Caratteristiche prodotto

Multiple MPPT string inputs

Advanced online data monitoring & control

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

Max PV module power:
1350W for 12V battery
2700W for 24V battery
5400W for 48V battery

Enhanced display user interface

Protections:
Low voltage load disconnect
Over temperature
Battery polarity inversion
Output overload protection

Cloud IoT Technology

Smart battery profiles

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

Portale di monitoraggio

[eng]
Monitoring platform

[fra]
Portail de suivi

WRM Monitor: portale di monitoraggio utilizzato nella gestione del proprio sistema energetico da remoto. Il portale permette anche la gestione delle impostazioni del proprio impianto o di più impianti in maniera aggregata.

WRM Monitor: monitoring platform used for the remote management of your energy system. The portal also allows the management of the settings of your plant or of more than one in an aggregate manner.

WRM Monitor: portail de surveillance utilisé dans la gestion à distance de votre système énergétique. Le portail permet également de gérer de manière agrégée les réglages de votre installation ou de plusieurs installations.

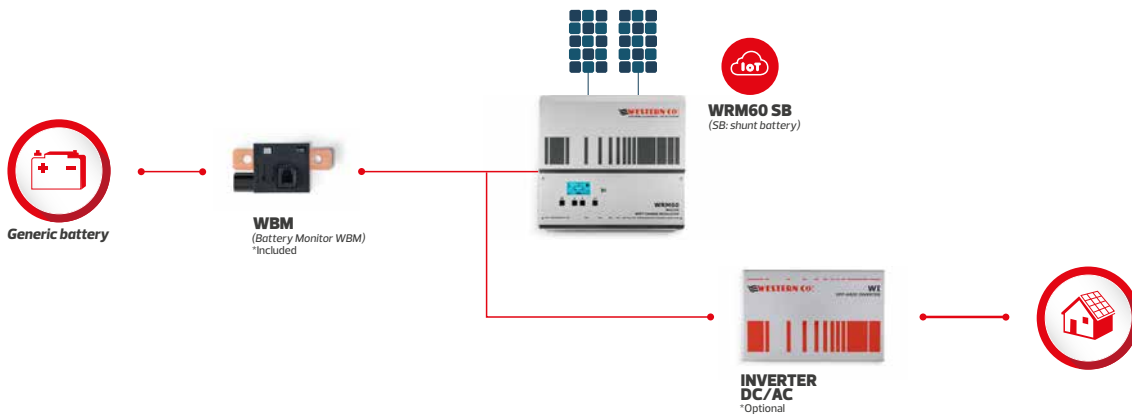# Realtime Monitoring

Energy statistics

**USER MANUAL
WRM60/90**

Schema logico

WRM60
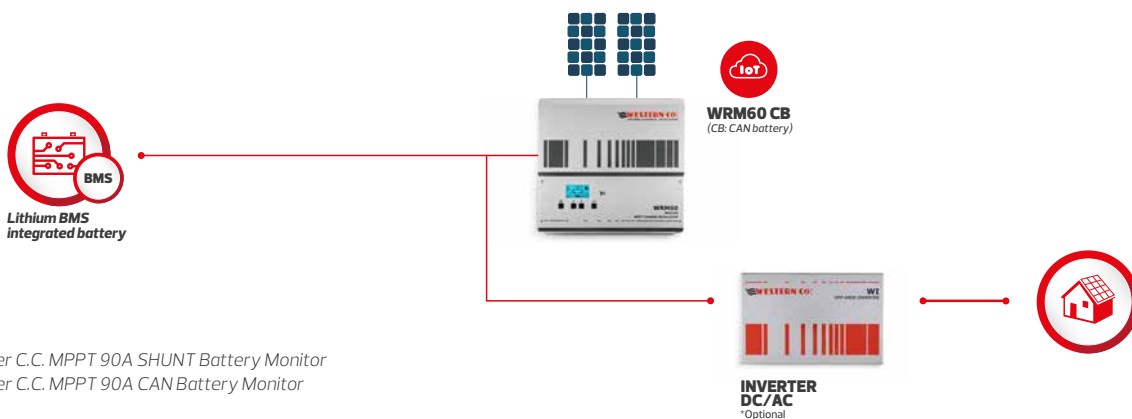
**SHUNT
Configuration**
▶ ▶

Generic battery

WBM
(Battery Monitor WBM)
*Included

WRM60 SB
(SB: shunt battery)

**INVERTER
DC/AC**
*Optional

**CAN
Configuration**
▶ ▶

*Lithium BMS
integrated battery*

WRM60 CB
(CB: CAN battery)

**INVERTER
DC/AC**
*Optional

WRM60 M – *SB IoT Smart Master C.C. MPPT 90A SHUNT Battery Monitor*
WRM60 M – *CB IoT Smart Master C.C. MPPT 90A CAN Battery Monitor*

WRM90

**SHUNT
Configuration**
▶ ▶

Generic battery

WBM
(Battery Monitor WBM)
*Included

WRM90 SB
(SB: shunt battery)

**INVERTER
DC/AC**
*Optional

**CAN
Configuration**
▶ ▶

*Lithium BMS
integrated battery*

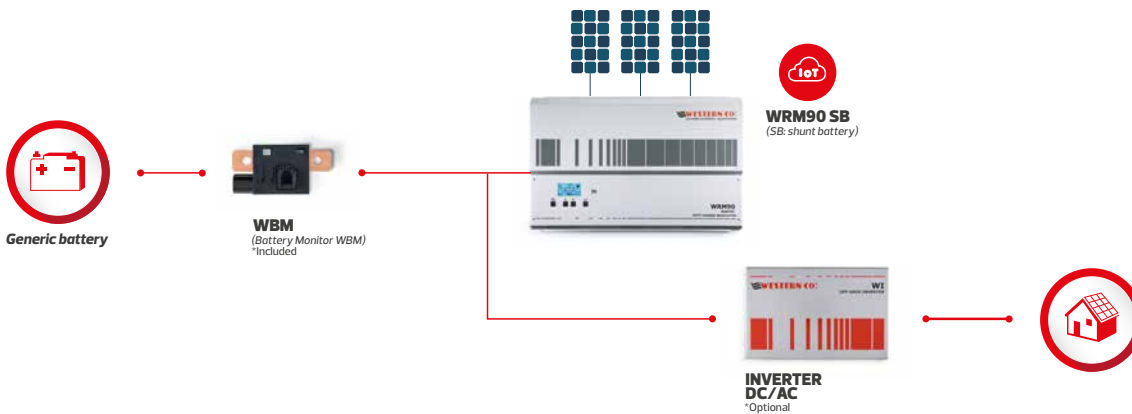**WRM90 CB**
(CB: CAN battery)

**INVERTER
DC/AC**
*Optional
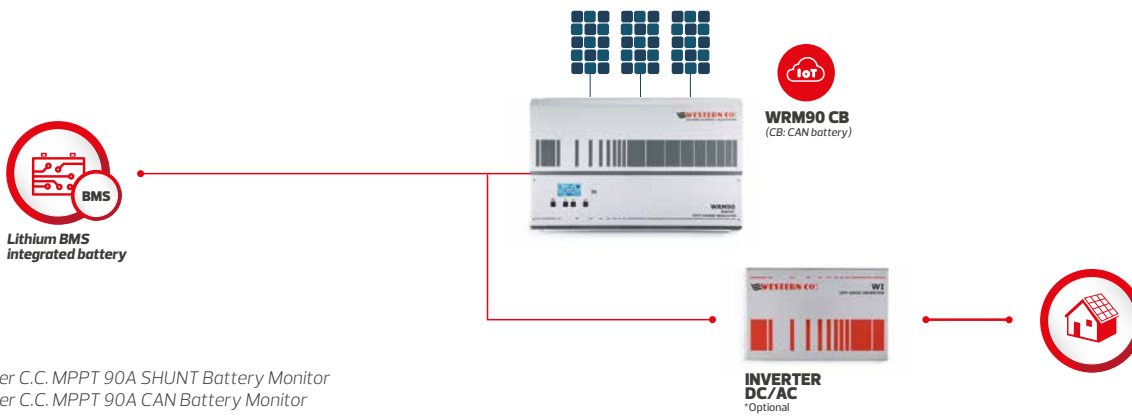
WRM90 M – *SB IoT Smart Master C.C. MPPT 90A SHUNT Battery Monitor*
WRM90 M – *CB IoT Smart Master C.C. MPPT 90A CAN Battery Monitor*

Combinazioni

Le combinazioni dei prodotti **WRM60/WRM90** e **WRM60S/WRM90S** *(Slave)*, riportate in figura, rappresentano le possibili configurazioni impiantistiche, in base alla potenza fotovoltaica impiegata.

WRM60 S *– IoT Smart Slave C.C. MPPT 90A 12/24/48V*
WRM90 S *– IoT Smart Slave C.C. MPPT 90A 12/24/48V*

WRM60

| **60 A** | *Charge Current* |
| **2** | *No. PV Strings* |

PV PLANT
MAXIMUM POWER

System voltage	12V	24V	48V
	0,9kWp	1,8kWp	3,6kWp

WRM90

| **90 A** | *Charge Current* |
| **3** | *No. PV Strings* |

PV PLANT
MAXIMUM POWER

System voltage	12V	24V	48V
	1,3kWp	2,7kWp	5,4kWp

WRM60   WRM60S

| **120 A** | *Charge Current* |
| **4** | *No. PV Strings* |

PV PLANT
MAXIMUM POWER

System voltage	12V	24V	48V
	1,8kWp	3,6kWp	7,2kWp

WRM90   WRM60S

| **150 A** | *Charge Current* |
| **5** | *No. PV Strings* |

PV PLANT
MAXIMUM POWER

System voltage	12V	24V	48V
	2,2kWp	4,5kWp	9kWp

WRM60   WRM90S

| **150 A** | *Charge Current* |
| **5** | *No. PV Strings* |

PV PLANT
MAXIMUM POWER

System voltage	12V	24V	48V
	2,2kWp	4,5kWp	9kWp

WRM90   WRM90S

| **180 A** | *Charge Current* |
| **6** | *No. PV Strings* |

PV PLANT
MAXIMUM POWER

System voltage	12V	24V	48V
	2,7kWp	5,4kWp	10,8kWp

WRM90   WRM90S   WRM60S

| **240 A** | *Charge Current* |
| **8** | *No. PV Strings* |

PV PLANT
MAXIMUM POWER

System voltage	12V	24V	48V
	3,6kWp	7,2kWp	14,4kWp

Caratteristiche elettriche

	SYMB	WRM60 M SB	WRM60 M CB	WRM60 S	WRM90 M SB	WRM90 M CB	WRM90 S
Nominal battery voltage		12/24/48V autodetect					
Battery voltage range (12/24/48V)	V_{bat}	10...16/20...32/40...64V					
Max charge current	I_{ch}	60A			90A		
Max charge power (12/24/48V)	P_{ch}	900/1800/3600W			1350/2700/5400W		
Max open circuit voltage of PV string	V_{oc}	180V					
Max short circuit current of each PV string input	I_{sc_n}	26A					
Indipendent MPPT PV string input	$PV_{\_n}$	2			3		
Max power of each PV string input (12/24/48V)	P_{pv_n}	450W/900W/1800W					
Self – consumption	P_q	1,0W			1,2W		
Operating temperature	T_{amb}	−10°C...+40°C					
Max power dissipated (12/24/48V)	P_{loss}	80/112/132W			1120/168/198W		
Efficiency @max charge current	η	90% ÷ 92%/93.5% ÷ 95.2%/96.0% ÷ 97.2%					
Parallel slave operation		controlled via W–BUS					
Weight		6,275kg			8,75kg		
Dimension		370x386x113mm			545x386x113mm		
Degree of protection		IP20					

	SYMB	WRM60/90 M–CB	WRM60/90 M–SB			WRM60/90 S
Working parameters		*read from battery via CAN–BUS*	*read from WBM via W–BUS*			*read from Master via W–BUS*
Charge algorithm		*multistage: Bulk ∕ Absorption ∕ Float*				
Generic profiles			*Pb–Flood*	*Pb–Seal– Gel*	*Lithium*	
End of charge voltage @ 25°C (12V/24/48V)	$V_{EoC\,12}$		*14.8V*	*14.4V*	*14.0÷14.7V*	
	$V_{EoC\,24}$		*29.6V*	*28.8V*	*28.0÷29.4V*	
	$V_{EoC\,48}$		*59.2V*	*57.6V*	*56.0÷58.8V*	
V EoC temperature compensation (12/24/48V)	V_{tadj}		*–24/–48/–96mV/°C*		*–*	
Float voltage (12/24/48V)	V_{fit}		V_{EoC} *(0,6/–1.2/– 2.4)V*		*–*	
Absorption time to float state	T_{abs}		*4h*		*–*	
Output LOAD topology		*open drain*				
Output LOAD voltage	V_{load}	V_{batt}				
Output LOAD current	I_{load}	*15A*				
Output ALARM topology		*relè*	*relè*			*–*
Output ALARM current	I_{ala}	*60Vdc 5A*	*60Vdc 0,1A*			*–*
Battery cable		*pair of R∕N 25mm² 1,8m with ring terminal Ø8 (supplied)*				
PV string input connection		*2/3 pairs of M/F MC4 (connector supplied)*				
Solar cable section for MC4 connectors		*4/6mm²*				
Cable section for output LOAD connector		*2,5mm² (connector supplied)*				
Internet cable connector		*RJ45 (cable supplied)*			*–*	
Battery bus interface topology		*CAN*	*W–BUS*		*–*	
External shunt device		*–*	*WBM–SHUNT (supplied)*		*–*	
Electrical protection		*Battery reverse polarity, temperature derating, overload.*				