## Introduction

This e-SMART MPPT (maximum Power Point Tracking) solar charge controller is a smart solar controller with automatic recognition function, smart charging and discharging function, three stages charging function to protect battery. It can increase 30%~60% efficiency than traditional PWM controller. It supports many kinds of batteries. It also have RS232 communication function.



Remarks:DC12V/24V/48V battery system automatic recognised.

#### Features

1. MPPT charging mode, peak efficiency up to 99%, saving 30%~60% solar panel than traditional PWM controller.

2. DC12V/24V/48V battery system automatic recognition, users can use it in different system conveniently.

3. Maximum PV input voltage up to DC100V.

4. Three stages charge: fast charge(MPPT), constant voltage charge,floating charge, It can protect batteries well .

5. Three option of discharge: on mode and off mode and PV voltage(solar) control mode.

6. Users can choose 4 kinds of commonly standard batteries(Sealed lead acid, Vented, Gel, NiCd). Other kinds of batteries can be defined by users.

7. Digital tube can display battery voltage and charging current. The software can display various parameters such as model number, PV input voltage, battery type, battery voltage, charging current, charging power, working condition.

8. RS232 communication, we can offer communication protocol also, it's convenient for user's integration management.

9. This controller can be paralleled infinitely.

- 10. CE and RoHS Certifications are approved.We can help clients to approve other certifications.
- 11. 2 years warranty; 3~10 years extended technical service.

## Parameters

$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	MPPT solar controller modes		15A	20A	25A	30A	40A	
Charge mithed Three stages: constant current/WP7), constant voltage, floating charge System type DC12V/24V/48V Automatic recognition 12V system DC30V - DC30V 48V system DC30V - DC60V Soft start time 12V/24V/48V system 500us Proceeding the stages: constant current/WP7 (monthesister) 12V/24V/48V system 500us MPPT efficiency 12V/24V/48V system 500us MPPT efficiency 12V/24V/48V system 296.5%, ≤99% INPUT CHARACTERISTICS MPPT working 24V system DC30-DC100V Voltage ange 48V system DC30-DC100V 12V system DC30-DC100V 12V system DC30-DC100V 12V system DC30-DC100V 12V system DC30V 12V system WW 213 284 355 426 568 710 852 1136 42V system WW 425 568 710 852 1136 42V system Soft the batteries also can be defined)]] CharGC CHARCTRESTICS Sealed lead acid. Vented, GeI, NiCd battery Cytopt Vo1age 12V/24V/48V system form. 12V/24V/48V system form. 12V/24V/48V system form. 12V	Charge mode	or point track						
Charly enterfload  Inities stages, constant contract, constant voltage, nothing charly e    12V system type  DC12V/24V/48V    12V system  DC3V-DC15V    System type  DC3V-DC15V    System voltage  24V system    DC18V-DC60V  12V/24V/48V system ≤ 35    Dynamic response  12V/24V/48V system ≤ 35    POPT efficiency  12V/24V/48V system ≥ 96.5%, ≤99%    INPUT CHARACTERISTICS  DC30-DC100V    MPPT efficiency  12V/system    12V system  DC30-DC100V    voltage range  48V system    DC30-VC100V  24V system    Voltage  12V system    protection point  48V system    DC30V  24V system    DC14V  24V system    DC100V  24V system	Charge mothed	Three stages, consta	el point track	DT) constant v	voltago flo	ating charge		
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System    DC3V=DC3V      24V system    DC3V=DC3V      44V system    DC36V=DC60V      Soft start time    12V/24V/48V system ≤ 35      Dynamic response    12V/24V/48V system ≥06.5%,≤99%      INPUT CHARACTERISTICS    DC30V=DC100V      MPPT efficiency    12V/24V/48V system ≥06.5%,≤99%      INPUT CHARACTERISTICS    DC30-DC100V      Using range    48V system      DC30-DC100V    24V system      I/2V system    DC34V      Ago system    DC34V      Ago system    DC34V      Secovery point    12V/24V/48V system      12V/24V/48V system    DC100V      recovery point    12V/24V/48V system      12V/24V/48V system    DC100V      24V system (W)    213    254    256	System type	DC12V/24V/40V						
244 System  DC16V~DC30V    488 System  DC36V-DC60V    Soft start time  12V/24V/48V system    Dynamic response  12V/24V/48V system    I2V/24V/48V system  S00us    MPPT efficiency  12V/24V/48V system    I2V/24V/48V system  DC14V-DC100V    MPT working  12V system    Q48 System  DC30-DC100V    tow input voltage range  48V system    DC60-DC100V  12V system    DC60-DC100V  12V system    DC60-DC100V  12V system    DC60V  12V system    DC60V  12V system    DC60V  12V system    DC60V  12V system    DC65V  12V system    High input voltage  12V/24V/48V system    12V/24V/48V system  DC100V    CharGE CHRECTRESTICS  Sealed lead acid, Vented, Gel, NiCd batt	Custom valtage	12V System						
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protection point  48V system  DC60V    Low input voltage  12V system  DC18V    Recovery point  48V system  DC65V    High input voltage  12V/24V/48V system  DC100V    recovery point  12V/24V/48V system  DC100V    Galaximum PV power  12V/24V/48V system  DC100V    24V system (W)  426  568  710  852  1136    Maximum PV power  12V/24V/48V system  Sealed lead acid, Vented, Gel, NiCd battery  (Other types of the batteries also can be defined)□    Constant Voltage  12V/24V/48V system  Please check the charge voltage according to the battery type    Voltage  12V/24V/48V system form.  20A  25A  30A  40A    Current-limit  12V/24V/48V system  15A  20A  25A  30A  45A    Temperature	Low input voltage protection point	24V system	DC30V					
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High input voltage recovery point  12V/24V/48V system DC100V    12V system (W)  213  284  355  426  568    Maximum PV power  24V system (W)  426  568  710  852  1136    48V system (W)  852  1136  1420  1704  2272    CHARGE CHRECTRESTICS  Sealed lead acid, Vented, Gel, NICd battery  2072    Voltage  12V/24V/48V system  Sealed lead acid, Vented, Gel, NICd battery  12V/24V/48V system    Constant Voltage  12V/24V/48V system  Please check the charge voltage according to the battery type    Voltage  12V/24V/48V system form.  Rated Input Current 12V/24V/48V system form.  30A  40A    Current-limit  12V/24V/48V system 20A  25A  30A  40A    Current-limit  12V/24V/48V system ±0.02%/°C  Temperature  12V/24V/48V system 14.2V-(The highest temperature-25°C)*0.3    Output  12V/24V/48V system  200mV  12V/24V/48V system ≤±1.5%     Precision  12V/24V/48V system ≤±1.5%      Output Voltage  Base on battery voltage      Output Voltage output  Default 10.5V; Recovery 11V	High input voltage	12V/24V/48V system	DC110					
12V system (W)  213  284  355  426  568    Maximum PV power  24V system (W)  426  568  710  852  1136    HARGE CHRECTRESTICS  480 system (W)  852  1136  1420  1704  2272    CHARGE CHRECTRESTICS  Sealed lead acid, Vented, Gel, NiCd battery  12V/24V/48V system  Sealed lead acid, Vented, Gel, NiCd battery  12V/24V/48V system    Constant Voltage  12V/24V/48V system  Please check the charge voltage according to the battery type    Ioating Charge  12V/24V/48V system form.  Please check the charge voltage according to the battery type    Yoltage  12V/24V/48V system 15A  20A  25A  30A  40A    Current-limit  12V/24V/48V system 20A  25A  30A  45A    Temperature  12V/24V/48V system ±0.02%/°C  Temperature-25°C)*0.3  Temperature-25°C)*0.3    Output Voltage  12V/24V/48V system  14.2V-(The highest temperature-25°C)*0.3  Toutput Voltage    Stability  12V/24V/48V system  200mV  Sealed in to 5V; Recovery 11V; It can be adjustable.    Output Voltage  Base on battery voltage  Low voltage output  Default 10.5V; Recovery 11V; It can be	High input voltage	12V/24V/48V system	DC100V					
Maximum PV power 24V system (W) 426 568 710 852 1136 48V system (W) 852 1136 1420 1704 2272 CHARGE CHRECTRESTICS Selectable Battery Types (Default Gel battery) Constant Voltage 12V/24V/48V system form. Sealed lead acid, Vented, Gel, NiCd battery (Other types of the batteries also can be defined)] Constant Voltage 12V/24V/48V system form. Rated Input Current 12V/24V/48V system 15A 20A 25A 30A 40A Current-limit 12V/24V/48V system 20A 25A 30A 45A Temperature Factor 12V/24V/48V system 14.2V-(The highest temperature-25°C)*0.3 Output Voltage 12V/24V/48V system 14.2V-(The highest temperature-25°C)*0.3 Output Voltage 12V/24V/48V system 20M 20MV Output Voltage 12V/24V/48V system 20MV Association 12V/24V/48V system 20MV Output Voltage 12V/24V/48V system 20MV Association 12V/24V/4		12V system (W)	213	284	355	426	568	
ABV system (W)  852  1136  1420  1704  2272    CHARGE CHRECTRESTICS  Sealed lead acid, Vented, Gel, NiCd battery  12V/24V/48V system  Sealed lead acid, Vented, Gel, NiCd battery  12V/24V/48V system  Sealed lead acid, Vented, Gel, NiCd battery  12V/24V/48V system  12V/24V/48V system  Please check the charge voltage according to the battery type    Constant Voltage  12V/24V/48V system form.  Please check the charge voltage according to the battery type  12V/24V/48V system form.    Rated Input Current  12V/24V/48V system form.  20A  25A  30A  40A    Current-limit  12V/24V/48V system 20A  25A  30A  45A    Temperature Factor  12V/24V/48V system ±0.02%/°C  14.2V-(The highest temperature-25°C)*0.3  0utput Voltage    Output Voltage  12V/24V/48V system  20MV  20MV  12V/24V/48V system  20MV    Output Voltage  12V/24V/48V system  14.2V-(The highest temperature-25°C)*0.3  0utput Voltage  12V/24V/48V system  <	Maximum PV power	24V system (W)	426	568	710	852	1136	
CHARGE CHRECTRESTICS  Sealed lead acid, Vented, Gel, NiCd battery    Selectable Battery  12V/24V/48V system    Yppes  12V/24V/48V system    Constant Voltage  12V/24V/48V system    Floating Charge  12V/24V/48V system    Please check the charge voltage according to the battery type    Yoltage  12V/24V/48V system    Rated Input Current  12V/24V/48V system    Protection  12V/24V/48V system    Yeaperature Factor  12V/24V/48V system    Yeaperature  12V/24V/48V system    Compensation  12V/24V/48V system    Output  12V/24V/48V system    Ripples(peak)  12V/24V/48V system    Output Voltage  200mV    Stability  12V/24V/48V system    Precision  12V/24V/48V system    Output Voltage  Base on battery voltage    Output voltage  Base on battery voltage    Low voltage output		48V system (W)	852	1136	1420	1704	2272	
Selectable Battery    Types    (Default Gel    battery)    Constant Voltage    12V/24V/48V system    Floating Charge    Voltage    12V/24V/48V system    Please check the charge voltage according to the battery type    Voltage    12V/24V/48V system    Floating Charge    Voltage    12V/24V/48V system    form.    Rated Input Current    12V/24V/48V system    20A  25A    30A  40A    Current-limit    12V/24V/48V system  20A    25A  30A    45A    Temperature Factor  12V/24V/48V system    Compensation  12V/24V/48V system    12V/24V/48V system  200mV    Output  12V/24V/48V system    12V/24V/48V system  20mV    Output  12V/24V/48V system    12V/24V/48V system  20mV    Output Voltage  \$\frac{\fr	CHARGE CHRECTRE	STICS	002	1100	1120	1,01		
Science barry propertion  12V/24V/48V system  Sealed lead acid, Vented, Gel, NiCd battery (Other types of the batteries also can be defined)]    Sealed lead acid, Vented, Gel, NiCd battery (Other types of the batteries also can be defined)]  Please check the charge voltage according to the battery type    Constant Voltage  12V/24V/48V system  Please check the charge voltage according to the battery type    Rated Input Current  12V/24V/48V system  15A  20A  25A  30A  40A    Current-limit  12V/24V/48V system  20A  25A  30A  45A    Protection  12V/24V/48V system  20A  25A  30A  45A    Temperature Factor  12V/24V/48V system  14.2V-(The highest temperature-25°C)*0.3  12V/24V/48V system    Output  12V/24V/48V system  200mV  200mV  200mV  200mV    Output Voltage  12V/24V/48V system  200mV  200mV  200mV  200mV    Output Voltage  12V/24V/48V system  ≤±1.5%  5  5  5    Output Voltage  Base on battery voltage  5  5  5    Output voltage output  Default 10.5V; Recovery 11V; It can be adjustable.  5  5	Selectable Battery	51105						
Constant Voltage12V/24V/48V systemPlease check the charge voltage according to the battery typeFloating Charge Voltage12V/24V/48V system form.12V/24V/48V system form.Rated Input Current12V/24V/48V system15A20A25A30A40ACurrent-limit Protection12V/24V/48V system20A25A30A45ATemperature Factor12V/24V/48V system ±0.02%/°C12V/24V/48V system14.2V-(The highest temperature-25°C)*0.3Output Ripples(peak)12V/24V/48V system200mVOutput Voltage Stability12V/24V/48V system200mVOutput Voltage Stability12V/24V/48V system≤±1.5%Output Voltage Doutput VoltageBase on battery voltageOutput voltage output PrecisionDefault 10.5V; Recovery 11V; It can be adjustable.Rated output Current30A30A	Types (Default Gel battery)	12V/24V/48V system	Sealed lead acid, Vented, Gel, NiCd battery (Other types of the batteries also can be defined)[]					
Floating Charge  12V/24V/48V system form.    Nated Input Current  12V/24V/48V system form.    Rated Input Current  12V/24V/48V system 15A  20A  25A  30A  40A    Current-limit  12V/24V/48V system 20A  25A  30A  45A    Temperature Factor  12V/24V/48V system ±0.02%/°C  14.2V-(The highest temperature-25°C)*0.3    Output  12V/24V/48V system 200mV  14.2V-(The highest temperature-25°C)*0.3    Output  12V/24V/48V system 200mV  20mV    Output Voltage  12V/24V/48V system ≤±1.5%  200mV    Output Voltage  12V/24V/48V system ≤±1.5%  200mV    Output voltage  Base on battery voltage  200mV    Output voltage  Base on battery voltage  200mV    Output voltage  Base on battery voltage  200mV    Output voltage  Default 10.5V; Recovery 11V; It can be adjustable.    Rated output Current  30A	Constant Voltage	12V/24V/48V system	Plassa chack	the charge ve	ltano accu	ording to the	hattory type	
Rated Input Current12V/24V/48V system15A20A25A30A40ACurrent-limit Protection12V/24V/48V system20A25A30A35A45ATemperature Factor12V/24V/48V system ±0.02%/°CTemperature Compensation12V/24V/48V system14.2V-(The highest temperature-25°C)*0.3Output Ripples(peak)12V/24V/48V system200mVOutput Voltage Stability12V/24V/48V system≤ ±1.5%Output Discharge CharacteristicsBase on battery voltageLow voltage output Protection pointDefault 10.5V; Recovery 11V; It can be adjustable.Rated output Current30A	Floating Charge Voltage	12V/24V/48V system	form.	the charge ve	ntage acco		battery type	
Current-limit  12V/24V/48V system  20A  25A  30A  35A  45A    Protection  12V/24V/48V system  ±0.02%/°C	Rated Input Current	12V/24V/48V system	15A	20A	25A	30A	40A	
Total Temperature  12V/24V/48V system  ±0.02%/°C    Temperature  12V/24V/48V system  14.2V-(The highest temperature-25°C)*0.3    Output  12V/24V/48V system  200mV    Output Voltage  12V/24V/48V system  200mV    Stability  12V/24V/48V system  ≤±1.5%    Precision  12V/24V/48V system  ≤±1.5%    Output Discharge Characteristics  0utput voltage    Low voltage output  Base on battery voltage    Low voltage output  Default 10.5V; Recovery 11V; It can be adjustable.    Rated output Current  30A	Current-limit Protection	12V/24V/48V system	20A	25A	30A	35A	45A	
Temperature  12V/24V/48V system  14.2V-(The highest temperature-25°C)*0.3    Output  12V/24V/48V system  200mV    Ripples(peak)  12V/24V/48V system  200mV    Output Voltage  12V/24V/48V system  200mV    Stability  12V/24V/48V system  ≤±1.5%    Precision  12V/24V/48V system  ≤±1.5%    Output Discharge Characteristics  Base on battery voltage    Output voltage  Base on battery voltage    Low voltage output  Default 10.5V; Recovery 11V; It can be adjustable.    Rated output Current  30A	Temperature Factor	12V/24V/48V system	+0.02%/°C					
Compensation12V/24V/48V system14.2V-(The highest temperature-25°C)*0.3Output12V/24V/48V system200mVRipples(peak)12V/24V/48V system200mVOutput Voltage12V/24V/48V system≤±1.5%Precision12V/24V/48V system≤±1.5%Output Discharge Characteristics0utput voltageOutput voltageBase on battery voltageLow voltage outputDefault 10.5V; Recovery 11V; It can be adjustable.Rated output Current30A	Temperature	12 4/2 1 4/ 10 4 5 3 5 5 5 6 11	_0.02 /0/ 0					
Output  12V/24V/48V system  200mV    Ripples(peak)  12V/24V/48V system  200mV    Output Voltage  12V/24V/48V system  ≤±1.5%    Stability  12V/24V/48V system  ≤±1.5%    Precision  12V/24V/48V system  ≤±1.5%    Output Discharge Characteristics  Sase on battery voltage  Ease on battery voltage    Output voltage output  Base on battery voltage  Default 10.5V; Recovery 11V; It can be adjustable.    Protection point  30A  30A	Compensation	12V/24V/48V system	14.2V-(The highest temperature-25°C)*0.3					
Output Voltage  12V/24V/48V system  ≤±1.5%    Precision  12V/24V/48V system  ≤±1.5%    Output Discharge Characteristics  Output Voltage  Base on battery voltage    Output voltage output  Protection point  Default 10.5V; Recovery 11V; It can be adjustable.    Rated output Current  30A	Output Ripples(peak)	12V/24V/48V system	200mV					
Output Discharge Characteristics    Output voltage  Base on battery voltage    Low voltage output  Default 10.5V; Recovery 11V; It can be adjustable.    Protection point  30A	Output Voltage Stability Precision	12V/24V/48V system	≤±1.5%					
Output voltageBase on battery voltageLow voltage outputDefault 10.5V; Recovery 11V; It can be adjustable.Protection point30A	Output Discharge Ch	naracteristics						
Low voltage output Protection point Rated output Current 30A	Output voltage		Base on batte	ery voltage				
Rated output Current 30A	Low voltage output Protection point		Default 10.5V; Recovery 11V; It can be adjustable.					
	Rated output Curren	t	30A					

The output control	On mode, Off mode, PV voltage control mode			
Output control set mode	Controller button or PC software			
Display				
LED digital tube display	Battery voltage, Charge current			
LED light display	Charging indicator light, LOAD indicator light			
PC communication port	RS232			
Protection				
Low input voltage protection	Check the input characteristics			
High input voltage protection	Check the input characteristics			
Charge overpower protection	yes			
Discharge low voltage protection	yes			
Discharge high current protection	yes			
Temperature protection	yes			
Other Parameters	-			
Noise	≤40dB			
Thermal heat-dissipating method	Itself cooling	Fan cooling		
Components	Imported material With EU standards.			
Certification	CE\FCC\RoHS			
Physical				
Measurement D x W x H(mm)	205*168*60			
package size D x W x H(mm)	265*196*110			
N.G(KG)	1.8kg			
G.N(KG)	2kg			
Mechanical Protection	IP25			
Environment				
Humidity	0~90%RH ( no condense)			
Altitude	0~3000m			
Operating Temperature	-20°C ~ +50°C			
Storage Temperature	-40°C ~ +75°C			
Atmospheric Pressure	70~106kPa			

#### Remarks

The specification is only for reference. Subject to change without prior notice We provide OEM and ODM service. The 36V/72V/96V model also can be customized for you.

# Products Package

Number	quantity	Items included	
1	1 pc	Controller color (blue or green is optional OEM ODM order is highly welcome )	
2	2 pc	Hangers (used for controller hanging on the wall)	
3	4 set	Screw	
4	1 pc	RJ45 to RS232 cable	
5	1 pc	Battery temperature sensor wire	
6	2 pc	Fuse[]DC output[]	
7	1 pc	User instruction[]manual[]	
8	1 pc	CD	

**1.**Controller PC upper software and testing software can display information. Users can set parameters via PC upper software.





Graphical: PC upper software

Graphical: testing software

1.1 The first picture show solar controller working status(charge and discharge), PV voltage, charge voltage, charge current etc. Users can choose the type of the batteries, DC-load output control method.1.2 We provide PC upper software. Testing software is not including. (user's PC has software development platform, if needed, please apply for it)

### 2. Information display and parameter setting.



Figure 2.1 Figure 2.2

2.1 ENTER1 button: press left ENTER1 show 2 digital battery voltage [] if it is charging, then shows 2 digital charge voltage), for example, the battery voltage or charge voltage is 13.5V, it shows13, please see Figure 2.1; Press ENTER1 a little bit longer, users can set battery types.

2.2 ENTER2 button: press right ENTER2 show 2 digital battery current (if it is not charging, then it display 00, if the charge current is 22.5A, then it shows 22,please see Figure 2.2); press ENTER2 button a little bit longer, DC load control can be set (On mode, Off mode, PV voltage control mode) Please see more details in the user manual.

Other detailed parameters

Please see the outline of the design, technical documents, user manuals etc. Research and development department made 2th version on May 5, 2014.