#### Summary

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  $30\%\sim60\%$  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

MPPT solar controller modes□ I-P-e-SMART-12V/24V/48V-series		15A	20A	25A	30A	40A	
		I	lrin a)				
Charge method	ŭ	ee stages: constant current(MPPT),constant voltage,floating charge 2V/24V/48V Automatic recognition					
System type							
		DC9V~DC15V					
	24V system	DC18V~DC30V					
		DC36V~DC60V					
Soft start time	12V/24V/48V system	≤3S					
Dynamic response recovery time	12V/24V/48V system	500us					
MPPT efficiency	12V/24V/48V system	≥96.5%,≤99	%				
INPUT CHARACTER		,					
	12V system	DC14V~DC1	00V				
MPPT working		DC30~DC10					
voltage range	- v	DC60~DC100V					
		DC14V					
Low input voltage protection point	24V system	DC30V					
		DC60V					
		DC18V					
Low input voltage	24V system	DC34V					
Recovery point	J	DC65V					
High input voltage	Ü						
protection point	12V/24V/48V system	DC110					
High input voltage recovery point	12V/24V/48V system DC100V						
<u> </u>	12V system (W)	213	284	355	426	568	
Maximum PV		426	568	710	852	1136	
power	- v	852	1136	1420	1704	2272	
CHARGE CHRECTR					!	!	
Selectable Battery							
I.m.	Sealed lead acid, Vented, Gel, NiCd battery						
(Default Gel	12V/24V/48V system Sealed lead acid, Vented, Gel, NiCd battery (Other types of the batteries also can be defined)						
battery)			5, F 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5				
Constant Voltage	12V/24V/48V system	Dlagas algasla	+la - ala	.14		h - 44	
Floating Charge	12V/24V/48V system Please check the charge voltage according to the battery 12V/24V/48V system type form.		battery				
Voltage	12V/24V/48V System	type form.	pe form.				
Rated Input	1277/2477/407/	15A 2	20A	25A	30A	40A	
Current	12V/24V/48V system						
Current-limit	12V/24V/40V/ oxistom	204	25.4	30A	35A	45A	
Protection	12V/24V/48V system	ZUA	25A				
Temperature Factor	12V/24V/48V system	±0.02%/°C					

Temperature Compensation Output Ripples(peak) Output Voltage Stability Precision Output Discharge Characteristics Output Discharge Characteristics Output Voltage Stability Precision Output Voltage Stability Precision Output Voltage Stability Precision Output Voltage Low voltage output Protection point Rated output Current 30A The output control On mode, Off mode, PV voltage control mode Output voltage tight shades Controller button or PC software Display LED digital tube display EED digital tube display EED digital tube display Charging indicator light, LOAD indicator light PC[Communication port] RS232 Protection Low input voltage protection High input voltage protection Check the input characteristics High input voltage protection Uses Discharge low voltage protection PSCASTAGE Discharge high current protection Ves Temperature protection University by Stability Stability Stability Stability And to adjust the display Battery voltage Protection Check the input characteristics High input voltage protection Uses Discharge low voltage protection Uses Discharge high current protection Uses Temperature protection Uses  Storage Stability Stabil	Tomporature				
Output Ripples(peak)     12V/24V/48V system       Output Voltage     12V/24V/48V system       Stability     12V/24V/48V system       Precision     2V/24V/48V system       Output Discharge Characteristics     0       Output Voltage     Base on battery voltage       Low voltage output Protection point     Default 10.5V; Recovery 11V; It can be adjustable.       Rated output Current     30A       The output control     On mode, Off mode, PV voltage control mode       Output control set mode     Controller button or PC software       Display     Charging indicator light, LOAD indicator light       LED digital tube display     Battery voltage, Charge current       LED light display     Charging indicator light, LOAD indicator light       PC[communication port[]     RS232       Protection     Check the input characteristics       Low input voltage protection     Check the input characteristics       High input voltage protection     Check the input characteristics       Discharge low voltage protection     yes       Discharge low voltage protection     yes       Discharge ligh current protection     yes       Temperature protection     yes       Other Parameters     Noise       Temperature by X W X H(mm)     205*168*60       Deck FCC/RoHS     Physical       Measurement	1 -	12V/24V/48V system	14.2V-(The highest temperature	e-25°C)*0.3	
Ripples(peak)   127/247/40 v system   200m v   Output Voltage   127/247/48 v system   ≤±1.5%   Precision   2127/247/48 v system   ≤±1.5%   Output Discharge Characteristics   Default 10.5 v; Recovery 11 v; It can be adjustable.   Protection point   Default 10.5 v; Recovery 11 v; It can be adjustable.   Protection point   On mode, Off mode, PV voltage control mode   Output control   On mode, Off mode, PV voltage control mode   Output control set mode   Controller button or PC software   Display   ED digital tube display   Battery voltage, Charge current   LED light display   Charging indicator light, LOAD indicator light   PC[Communication port[]   RS232   Protection   Check the input characteristics   High input voltage protection   Check the input characteristics   High input voltage protection   ves   Discharge low voltage protection   ves   Discharge low voltage protection   ves   Discharge high current protection   ves   Discharge high current protection   ves   Other Parameters   Soise   ≤40dB   Thermal heat-dissipating method   Itself cooling   Fan cooling   Components   Imported material With EU standards.   Certification   CEFFCCR6HS   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)   2kg   Mechanical Protection   IP25   Environment   Humidity   0~90%RH (no condense)   Altitude   0~3000m   Operating Temperature   40°C ~ +50°C   Force   40°C ~ +50°C   Force   40°C ~ +75°C   Force   40°C					
Output Voltage       12V/24V/48V system ≤±1.5%         Precision       Sase on battery voltage         Output Discharge Characteristics       Default 10.5V; Recovery 11V; It can be adjustable.         Low voltage output       Default 10.5V; Recovery 11V; It can be adjustable.         Rated output Current       30A         The output control       On mode, Off mode, PV voltage control mode         Output control set mode       Controller button or PC software         Display       Display         LED digital tube display       Charging indicator light, LOAD indicator light         LED light display       Charging indicator light, LOAD indicator light         PC[communication port]       RS232         Protection       Check the input characteristics         Low input voltage protection       Check the input characteristics         High input voltage protection       yes         Discharge low voltage protection       yes         Discharge high current protection       yes         Discharge high current protection       yes         Other Parameters       Noise         Temperature protection       Imported material With EU standards.         Certification       CEYFCCKnHS         Physical       Measurement D x W x H(mm)       205*168*60         package si		12V/24V/48V system	200mV		
Stability Precision    2V/24V/48V system   ≤±1.5%					
Precision		12V/24V/48V system	≤±1.5%		
Output voltage     Base on battery voltage       Low voltage output Protection point     Default 10.5V; Recovery 11V; It can be adjustable.       Rated output Current     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       LED digital tube display     Battery voltage, Charge current       LED light display     Charging indicator light, LOAD indicator light       PC[Communication port[]     RS232       Protection     Check the input characteristics       Low input voltage protection     Check the input characteristics       High input voltage protection     yes       Discharge low voltage protection     yes       Discharge high current protection     yes       Other Parameters     **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     **Open					
Default 10.5V; Recovery 11V; It can be adjustable.	Output Discharge C	haracteristics			
Protection point Rated output Current 30A The output control On mode, Off mode, PV voltage control mode Output control set mode Display LED digital tube display LED light display Protection Low input voltage protection Charge overpower protection Discharge low voltage protection Discharge high current protection Premathre protection Discharge high current protection Temperature protection Cherk the input characteristics Discharge high current protection Discharge high current protection Discharge low voltage protection Discharge low voltage protection Discharge high current protection Discharge high current protection Discharge high current protection Discharge high current protection Discharge low voltage protection Discharge high current prot	Output voltage		Base on battery voltage		
Rated output Current  Rated output control  On mode, Off mode, PV voltage control mode  Output control set mode  Display  LED digital tube display  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  Charge overpower protection  Discharge low voltage protection  Pemperature protection  Temperature protection  Ves  Other Parameters  Noise  40dB  Thermal heat-dissipating method  Testification  Certification  Certification  Measurement D x W x H(mm)  Dackage size D x W x H(mm)  Cef**196**110  N.G(KG)  RS240**  Rated output control  On mode, Off mode, PV voltage control mode  Charge output on PC software  Charge output ou			Default 10 5V. Decovery 11V. It can be adjustable		
The output control Output control set mode Output control set mode Display  LED digital tube display 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 Charge overpower protection Discharge low voltage protection Ves Discharge high current protection Ves Other Parameters Noise Temperature protection Components Imported material With EU standards. Certification Certification CE\FCC\RoHS Physical Measurement D x W x H(mm) Dischage size D x W x H(mm) Conyonents CNG(KG) CN(KG) C	Protection point		Default 10.5v; Recovery 11v; it can be adjustable.		
Output control set mode       Controller button or PC software         Display       Battery voltage, Charge current         LED light display       Charging indicator light, LOAD indicator light         PC□[communication port□]       RS232         Protection       Check the input characteristics         Low input voltage protection       Check the input characteristics         High input voltage protection       yes         Discharge low voltage protection       yes         Discharge ligh current protection       yes         Discharge high current protection       yes         Other Parameters       ✓         Noise       ≤40dB         Thermal heat-dissipating method       Itself cooling       Fan cooling         Components       Imported material With EU standards.         Certification       CEVFCC\RoHS         Physical       Measurement D x W x H(mm)       205*168*60         package size D x W x H(mm)       265*196*110         N.GKG)       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	Rated output Curre	nt	30A		
Display  LED digital tube display  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  Charge overpower protection  Discharge low voltage protection  Discharge ligh current protection  Femperature protection  Ves  Other Parameters  Noise  Inpermal heat-dissipating method  Cettification  CettfCC\RoHS  Physical  Measurement D x W x H(mm)  N.G(KG)  G.N(KG)  Mechanical Protection  Discharge loye voltage protection  Discharge loye voltage protection  Ves  Fan cooling  Fan cooling  Fan cooling  Fan cooling  Fan cooling  Components  CetyFCC\RoHS  Physical  Measurement D x W x H(mm)  Dackage size D x W x H(mm)  N.G(KG)  G.N(KG)  Alskg  G.N(KG)  Mechanical Protection  IP25  Environment  Humidity  D~90%RH (no condense)  Altitude  O~3000m  Operating Temperature  -20°C ~ +50°C  Storage Temperature  -40°C ~ +75°C			On mode, Off mode, PV voltage control mode		
LED digital tube display       Battery voltage, Charge current         LED light display       Charging indicator light, LOAD indicator light         PC[communication port[]       RS232         Protection       Check the input characteristics         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         Other Parameters       Other Parameters         Noise       ≤40dB         Thermal heat-dissipating method       Itself cooling       Fan cooling         Components       Imported material With EU standards.       Certification         Certification       CE\FCC\RoHS       Physical         Measurement D x W x H(mm)       205*168*60       Physical         Measurement D x W x H(mm)       265*196*110       N.G(KG)       I.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°	Output control set n	node	Controller button or PC softwar	e	
LED digital tube display       Battery voltage, Charge current         LED light display       Charging indicator light, LOAD indicator light         PC[communication port[]       RS232         Protection       Check the input characteristics         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         Other Parameters       Other Parameters         Noise       ≤40dB         Thermal heat-dissipating method       Itself cooling       Fan cooling         Components       Imported material With EU standards.       Certification         Certification       CE\FCC\RoHS       Physical         Measurement D x W x H(mm)       205*168*60       Physical         Measurement D x W x H(mm)       265*196*110       N.G(KG)       I.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°	Display				
LED light display       Charging indicator light, LOAD indicator light         PC[communication port]       RS232         Protection       Check the input characteristics         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         Other Parameters       Section         Noise       ≤40dB         Thermal heat-dissipating method       Itself cooling       Fan cooling         Components       Imported material With EU standards.       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	LED digital tube dis	play	Battery voltage, Charge current	,	
Protection  Low input voltage protection	LED light display				
Low input voltage protection  High input voltage protection  Check the input characteristics  Charge overpower protection  Discharge low voltage protection  Discharge high current protection  Discharge high current protection  Ves  Temperature protection  Other Parameters  Noise  Sequence of the standards of the standards of the standards of the standards.  Certification  CetyFCC\RoHS  Physical  Measurement D x W x H(mm)  Dackage size D x W x H(mm)  N.G(KG)  Sequence of the standard of th		port[]	RS232	-	
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$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			Check the input characteristics		
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 $CE\FCC\BOHS$ Physical  Measurement $D \times W \times H(mm)$ $205*168*60$ package size $D \times W \times H(mm)$ $265*196*110$ N.G(KG) $1.8kg$ G.N(KG) $2kg$ Mechanical Protection IP25  Environment  Humidity $0\sim90\%RH$ ( no condense)  Altitude $0\sim3000m$ Operating Temperature $-20^{\circ}C \sim +50^{\circ}C$ Storage Temperature $-40^{\circ}C \sim +75^{\circ}C$			ves		
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Noise $≤40  \mathrm{dB}$ 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 $-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$ Storage Temperature $-40^{\circ}\text{C} \sim +75^{\circ}\text{C}$	Temperature protect	ction	yes		
$ \begin{array}{ c c c c c } \hline Thermal heat-dissipating method & Itself cooling & Fan cooling \\ \hline Components & Imported material With EU standards. \\ \hline Certification & CE\FCC\RoHS \\ \hline Physical & & \\ \hline Measurement D x W x H(mm) & 205*168*60 \\ \hline package size D x W x H(mm) & 265*196*110 \\ \hline N.G(KG) & 1.8kg \\ \hline G.N(KG) & 2kg \\ \hline Mechanical Protection & IP25 \\ \hline Environment & & \\ \hline Humidity & 0 \sim 90\% RH \ (no condense) \\ \hline Altitude & 0 \sim 3000m \\ \hline Operating Temperature & -20°C \sim +50°C \\ \hline Storage Temperature & -40°C \sim +75°C \\ \hline \end{array} $	Other Parameters				
ComponentsImported material With EU standards.Certification $CE\FCC\RoHS$ PhysicalMeasurement 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 ProtectionIP25EnvironmentIPunidity $0 \sim 90\%RH$ (no condense)Altitude $0 \sim 3000m$ Operating Temperature $-20^{\circ}C \sim +50^{\circ}C$ Storage Temperature $-40^{\circ}C \sim +75^{\circ}C$	Noise		≤40dB		
$ \begin{array}{c cccc} Certification & CE\FCC\RoHS \\ \hline Physical & 205*168*60 \\ \hline Measurement D x W x H(mm) & 265*196*110 \\ \hline N.G(KG) & 1.8kg \\ \hline G.N(KG) & 2kg \\ \hline Mechanical Protection & IP25 \\ \hline Environment & \\ \hline Humidity & 0~90\%RH ( no condense) \\ \hline Altitude & 0~3000m \\ \hline Operating Temperature & -20°C ~ +50°C \\ \hline Storage Temperature & -40°C ~ +75°C \\ \hline \end{array} $	Thermal heat-dissip	ating method	Itself cooling	Fan cooling	
Physical  Measurement D x W x H(mm)  package size D x W x H(mm)  N.G(KG)  1.8kg  G.N(KG)  Mechanical Protection  Environment  Humidity $0 \sim 90\%$ RH (no condense)  Altitude $0 \sim 3000$ m  Operating Temperature  -20°C ~ +50°C  Storage Temperature  -40°C ~ +75°C	Components		Imported material With EU standards.		
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$\begin{array}{llll} N.G(KG) & 1.8kg \\ G.N(KG) & 2kg \\ Mechanical Protection & IP25 \\ Environment \\ Humidity & 0 \sim 90\% RH \ (no \ condense) \\ Altitude & 0 \sim 3000m \\ Operating Temperature & -20°C \sim +50°C \\ Storage Temperature & -40°C \sim +75°C \\ \end{array}$	package size D x W x H(mm)		265*196*110		
Mechanical ProtectionIP25Environment $0 \sim 90\%$ RH ( no condense)Humidity $0 \sim 3000$ mAltitude $0 \sim 3000$ mOperating Temperature $-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$ Storage Temperature $-40^{\circ}\text{C} \sim +75^{\circ}\text{C}$			1.8kg		
Environment  Humidity $0 \sim 90\%$ RH ( no condense)  Altitude $0 \sim 3000$ m  Operating Temperature $-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$ Storage Temperature $-40^{\circ}\text{C} \sim +75^{\circ}\text{C}$	G.N(KG)				
Humidity $0 \sim 90\%$ RH ( no condense)Altitude $0 \sim 3000$ mOperating Temperature $-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$ Storage Temperature $-40^{\circ}\text{C} \sim +75^{\circ}\text{C}$	Mechanical Protection		IP25		
Altitude $0\sim3000\mathrm{m}$ Operating Temperature $-20^{\circ}\mathrm{C}\sim+50^{\circ}\mathrm{C}$ Storage Temperature $-40^{\circ}\mathrm{C}\sim+75^{\circ}\mathrm{C}$	Environment				
Operating Temperature $-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$ Storage Temperature $-40^{\circ}\text{C} \sim +75^{\circ}\text{C}$	<u> </u>		0~90%RH ( no condense)		
Storage Temperature -40°C ~ +75°C			0~3000m		
0 1	Operating Temperature		-20°C ~ +50°C		
Atmospheric Pressure 70~106kPa	Storage Temperature		-40°C ~ +75°C		
10000 1000 1000 100 100 100 100 100 100	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.

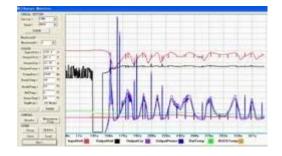
# Products Package

Number	quantity	Items included
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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 2.2

- 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 shows 13, 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.