

### Overview

DuoRacer MPPT charge controller is made for charging two batteries (shown as BATT1 and BATT2 below) at the same time in a solar system. This controller supports multiple life battery (BATT1) types, including Sealed, Gel, Flooded, LiFePO4, and Li-NiCoMn, which is suitable for RV, Camper, Boat, and so on. The device recognizes the start battery (BATT2) system voltage automatically, and trickle charges the battery when the conditions are satisfied.

The controller adopts the advanced MPPT control algorithm, which will minimize the maximum power point loss rate and loss time, also fast track the maximum power point (MPP) of the PV array, and obtain the maximum energy from solar array under any conditions. The energy utilization in the MPPT solar system is increased by 20-30% compared with PWM charging method. When there is no manual operation for a long time, and the charging conditions cannot be reached, the controller will turn to low-power mode, which reduces the loss and battery power waste to enhance the products life. The system parameters are shown and set by LED/LCD or the MT11 remote meter (Accessory).

The AES control signal of the car refrigerator is built in the controller, which will supply the surplus solar power to the refrigerator to avoid energy waste. The controller comes with IP33 protection level, which is waterproof and dustproof. Multiple protection features, including battery overcharge protection, over discharge protection, and reverse connection protection of the PV and battery, which effectively ensure the solar system safety, stability, and lifetime.



### Features

- Maximum Power Point Tracking technology with ultra-fast tracking speed and the tracking efficiency is no less than 99.5% guaranteed
- Advanced MPPT control algorithm to minimize the MPPT loss rate and lost time
- The wider range of the MPP operation voltage to improve the PV module utilization
- Auto control function of charging power & charging current limitation (BATT1)
- High quality and low failure rate components of ST, TI and Infineon to ensure the product life
- Digital circuit control of adaptive three-stage charging mode to enhance BATT1 life.
- BATT1 type can be set via LED/LCD.
- Product runs into the low-power mode when there is no manual operation for a long time, and charging conditions are not satisfied (PV < 5V).
- 100% charging and discharging in operation environmental temperature range.
- LED and LCD display units selectable.
- AES control signal for car refrigerator to avoid energy waste.
- Standard Modbus protocol, and RS485 (5V/200mA) communication port for the customer to expand the application area.

① Life battery (BATT1) is the energy storage battery for powering the household loads in the off-grid system, which supports Sealed, Gel, Flooded, LiFePO4, and Li-NiCoMn batteries (the controller can NOT recognize the system voltage automatically).

② Start battery (BATT2) is the energy storage battery which usually built in the vehicle for powering the system such as RV and Boat, and only supports lead-acid battery (the controller will recognize the system voltage automatically).

NOTE: the BATT1 and BATT2 must be at the same voltage level.



## Technical specifications

Item	DR1206N-DDB DR1206N-DDS	DR2210N-DDB DR2210N-DDS	DR3210N-DDB DR3210N-DDS
BATT1 rated voltage	12/24VDC		
BATT2 rated voltage	12/24VDC Auto		
Rated Charge Current	10A	20A	30A
Battery Input Voltage Range	8.5~32V		
Max. PV Open Circuit Voltage	60V(At min. operating environment temp.) 46V(At 25℃ environment temp.)	100V(At min. operating environment temp.) 92V(At 25℃ environment temp.)	
MPP Voltage Range	(Battery Voltage+2V)~36V		(Battery Voltage+2V)~72V
Rated Charge Power	130W/12V 260W/24V	260W/12V 520W/24V	390W/12V 780W/24V
Max. conversion efficiency	97.40%	97.50%	98%
Full load efficiency	97%	96%	96%
Self-consumption	12mA/12V;8mA/24V 4mA/12V;3mA/24V(Low-power mode)	26mA/12V;15mA/24V 19mA/12V;10mA/24V(Low-power mode)	
Temperature compensate coefficient <sup>①</sup>	-3mV/℃/2V(default)		
Grounding	Common negative		
BATT2 Full voltage	13.8V/12V;27.6V/24V(default)		
BATT2 Charge return voltage	13V/12V;26V/24V(default)		
AES signal port <sup>②</sup>	5VDC/Max.200mA(3.81-4P)		
RS485 com. port <sup>②</sup>			
Com. baud rate <sup>③</sup>	115200(default)		
LCD backlight time <sup>④</sup>	60S(default)		

### Mechanical Parameters

Item	DR1206N-DDB DR1206N-DDS	DR2210N-DDB DR2210N-DDS	DR3210N-DDB DR3210N-DDS
Dimension	227.2×143×58.1mm	243.7×158×63mm	247.2×165×68.5mm
Mounting dimension	160×134mm	180×149mm	180×156mm
Mounting hole size	φ5mm		
Terminal	12AWG/4mm <sup>2</sup> (BATT1) 12AWG/4mm <sup>2</sup> (BATT2)	6AWG/16mm <sup>2</sup> (BATT1) 12AWG/4mm <sup>2</sup> (BATT2)	
Recommended cable size	12AWG/4mm <sup>2</sup> (BATT1) 12AWG/4mm <sup>2</sup> (BATT2)	10AWG/6mm <sup>2</sup> (BATT1) 12AWG/4mm <sup>2</sup> (BATT2)	8AWG/6mm <sup>2</sup> (BATT1) 12AWG/4mm <sup>2</sup> (BATT2)
Weight	0.8kg	1.1kg	1.4kg

### Environmental Parameters

Item	DR1206/2210N-DDB DR1206/2210N-DDS	DR3210N-DDB DR3210N-DDS
Working environment temperature(100% input and output)	- 20℃~+50℃(DDS) - 30℃~+50℃(DDB)	- 20℃~+45℃(DDS) - 30℃~+45℃(DDB)
Storage temperature range	-30℃~+80℃	
Relative humidity	≤95%, N.C	
Enclosure	IP33 3-protection against solid objects: protected against solids objects over 2.5mm. 3-protected against sprays to 60°from the vertical.	
Pollution degree	PD2	

①The Temperature compensate coefficient is zero and not changeable when the life battery type is lithium battery.

②If the AES signal port and RS485 communication port are used in the same time, the total current is no greater than 200mA.

③The communication baud rate can only be set via PC software.

④The LCD backing time can only be set via PC software, setting range is 0~999S and the 0s means the LCD is on all the time.

DDB:DuoRacer Display Basic (LED)

DDS:DuoRacer Display Standard (LCD)