

# User Manual

DX series

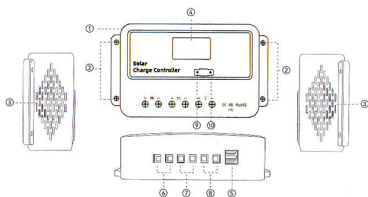
## Recommendations for safe use

1. This controller is a 12V24V (50A60A with 48V) controller, when installing for the first time, please make sure that the battery has enough voltage so that the controller can recognize the battery type.
2. The controller is suggested to install as close as possible to the battery in order to avoid voltage drop caused by long wires, which will affect the normal voltage judgment.
3. This controller is suitable for charging lithium ternary batteries, lithium iron phosphate batteries, lead-acid batteries, please select the corresponding battery type according to the menu.
4. This controller can only use photovoltaic panels as a charging source, please hurry to use DC or other power sources as a charging source.
5. This controller will heat up when running, so please be careful to install the controller on a flat, well-ventilated surface.

## Product Features

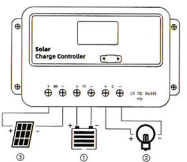
1. Adopting industrial-grade 32-bit high-speed main control chip.
2. Large LCD display, adjustable charging and discharging parameters, flexible settings.
3. Complete multi-stage charging management for longer battery life.
4. Built-in overcurrent/short-circuit protection (can be set), open-circuit protection, reverse connection protection, high-temperature protection, PV over-voltage protection, all of which are self-recovery and do not damage the controller.
5. Dual MOS anti-back-charge controller, ultra-low heat generation.
6. Dual USB output, maximum current up to 3A.

## Product Description



Serial Number	Name (Of A Thing)	Serial Number	Name (Of A Thing)
1	Housings	6	Solar Panel Interface
2	Mounting Hole	7	Battery Connector
3	Heat Sink	8	Load Interface
4	LCD Display	9	Menu Key
5	USB Port	10	Function Buttons

## System Connection



1. Connect the positive and negative terminals of the battery to the controller as shown in the diagram, taking care not to reverse the connection.
  2. Connect the positive and negative terminals of the load to the controller as shown in the diagram, and be careful not to reverse the connection.
  3. Connect the positive and negative poles of the solar panel to the controller as shown in the diagram, and be careful not to reverse the connection.
- NOTE: Please follow the sequence of wiring strictly, otherwise the controller may be damaged. The disassembly sequence is the reverse of the connect sequence.

## Key Function

### Menu Key

- Function 1: In the main interface, press the button to cycle through the function menu.
- Function 2: Tap in the parameter setting interface for upward flip function.
- Function 3: Press and hold for 3 seconds during parameter setting to confirm the save function.

### Function Key

- Function 1: Tap the key in the main interface for load switch function.
- Function 2: Tap in the parameter setting interface for the scroll down function.
- Function 3: Long press for 10 seconds under the main interface is the function of restoring factory settings.



Menu 1

System voltage selection interface: U—V automatic identification, U12V 12V system, U24V 24V system, U48V 48V system, only 50A60A models have) Multiple mode selection, the factory default selection of automatic adaptation.

Select the automatic recognition mode: the machine will automatically recognize 12V/24V/48V (only 50A60A model with 48V system) system when powering on the machine.

Select 12V system: the machine works only on 12V system parameters.

Select 24V system: the machine operates only on 24V system parameters.

Select 48V system: the machine works only on 48V system parameters (only 50A60A models have 48V system).

Setting mode: in the main interface, lightly press the menu key to select the system voltage setting interface, and then long press the menu key for 3 seconds to enter the setup mode (setup mode screen display is blinking), in the setup mode, lightly press the menu or function key up/down to select the setup parameter, and long press the menu key for 3 seconds to save and exit the setup after completion of the selection, or do not move the key for 3 seconds, then automatically save and exit.



Menu 2

Battery type setting interface:

b01: Sealed lead-acid battery (factory default b01)

b02: Gel batteries

b03: Open lead-acid batteries

b04: Lithium ternary battery

b05: Lithium iron phosphate battery

b01/b02/b03 are multi-stage charging

b04/b05 are two-stage charging

Setting mode: in the main interface, press menu key lightly to select to the battery type setting interface, then long press menu key for 3 seconds to enter the setting mode (the screen display of the setting mode is blinking), in the setting mode, lightly press the menu or function key lightly to turn up/down to select the setting parameter, after selecting the setting, press menu key for 3 seconds to save and exit the setting, or press the key without moving it for 3 seconds to save and exit it automatically.



Menu 3

Load setup interface:

(24H) Load Long On Mode, in which the load can be switched on and off by pressing the function key (factory default 24H).

(00H) Load pure light control mode, off during the day and on at night.

(1-) Load for light control delay mode, if the selection is 1H, that 15H) is, the negative in the open after working for 1 hour to turn off the output.

Setting mode: in the main interface, lightly press the menu key to select the load setup interface, then long press the menu key for 3 seconds to enter the setup mode (the screen display of the setup mode is blinking), in the setup mode, lightly press the menu or function key to turn up/down to select the setup parameter, after the selection is completed, long press the menu key for 3 seconds to save and exit the setup, or do not move the key for 3 seconds to automatically save and exit.



Menu 4

Temperature display interface: Displays the current temperature of the machine.



Menu 5

Charging current display interface: Displays the machine charging current.



Menu 6

Discharge current display interface: Displays the machine discharge current.



Menu 7

Raise the charging voltage setting interface: Boost charging voltage setting is only effective for b04,b05, when the battery voltage reaches the setting value, PWM charging is enabled. The arrow is long in during normal charging, and the arrow is slow flashing when it enters float charging.

Setting mode: in the main interface, press menu key lightly to select to enhance the charging voltage setting interface, then long press menu key for 3 seconds to enter the setting mode (the screen display of the setting mode is blinking), in the setting mode, press menu or function key lightly to turn up/down to select the setting parameter, after the selection is completed, press menu key for 3 seconds to save and exit the setting, or press the key without moving it for 3 seconds, then it will save and exit automatically.

Setting recommendation: it is recommended to keep the default value.



Menu 8

Load discharge recovery voltage setting interface: When the machine load turns off the output due to low battery voltage, it needs to wait for the battery voltage to return to the set value before turning on.

Setting mode: in the main interface, lightly press the menu key to select the load discharge recovery voltage setting interface, and then long press the menu key for 3 seconds to enter the setting mode (setting mode screen display blinking), in the setting mode, lightly press the menu or function key up/down to select the setting parameter, after the selection is completed, long press the menu key for 3 seconds to save and exit the setup or not to move the key for 3 seconds to automatically save and exit.

Setting recommendation: it is recommended to keep the default value.

Load discharge cutoff voltage setting interface: Turns off the load output when the battery voltage falls below the set value.

Setting mode: under the main interface, press menu key lightly to select the load discharge cut-off voltage setting interface, then press menu key for 3 seconds to enter the setting mode (the screen display of the setting mode is blinking), in the setting mode, press menu or function key lightly to turn up/down to select the setting parameter, and after the selection is completed, press menu key for 3 seconds to save and exit the setting, or press the key without moving it for 3 seconds to save and exit automatically.

Setting recommendation: it is recommended to keep the default value.

Optical switch threshold voltage setting interface: In light control or time control mode, when the controller detects that the PV panel voltage is less than this setting, it enters the time delay to open the load, and vice versa to close the load. At night, if the ambient light around the solar panel is too bright, it will cause the solar panel output voltage to become high, which will make the controller automatically turn off the load. At this time, it can be adjusted to a certain extent by this setting.

Setting mode: in the main interface, press menu key lightly to select the threshold voltage setting interface of the light control switch, then press menu key for 3 seconds to enter the setting mode (the screen display of the setting mode is blinking), in the setting mode, press menu or function key lightly to turn up/down to select the setting parameter, and when the selection is completed, press menu key for 3 seconds to save and exit the setting, or press the key without moving it for 3 seconds to save and exit it automatically.

Setting recommendation: it is recommended to keep the default value.

Optical switch delay time setting interface: When the controller detects that the photovoltaic voltage is lower than the threshold voltage, then the delay will open the load and close it vice versa (time delay).

Setting mode: In the main interface, press menu key lightly to select to the optical switch delay time setting interface, then press menu key for 3 seconds to enter the setting mode (the screen display of the setting mode is blinking), in the setting mode, press menu or function key lightly to turn up/down to select the setting parameter, after the selection is completed, press menu key for 3 seconds to save and exit the setting, or press the key for 3 seconds without moving it to save and exit automatically.

Setting recommendation: it is recommended to keep the default value.



Menu 12

Short circuit protection setting interface: Certain inductive or capacitive loads will have a high current at the moment of starting, which may trigger the machine short-circuit protection to shut down the load. At this time the user can turn off the protection function.

Sc: Close protection

Sc: open protection (factory default open)

Setting mode: in the main interface, press menu key lightly to select the short circuit protection setting interface, then press menu key for 3 seconds to enter the setting mode (the screen display of the setting mode is blinking), in the setting mode, press menu or function key lightly to turn up/down to select the setting parameter, and when the selection is completed, press menu key for 3 seconds to save and exit the setting, or press the key without moving it for 3 seconds to save and exit it automatically.

Setting recommendation: it is recommended to keep the default value.



Menu 13

PWM charge switch setting interface: PWM charging switch setting only works for b04,b05

Pon/Turn on PWM charging (factory default on)

Off: Off PWM charging

Setting mode: under the main interface, press menu key lightly to select to PWM charging switch setting interface, then long press menu key for 3 seconds to enter setting mode (setting mode screen display blinking), under the setting mode, press menu or function key lightly to turn up/down to select the setting parameter, after selecting, long press menu key for 3 seconds to save and exit the setting, or don't move the key for 3 seconds to save and exit automatically.

Setting recommendation: it is recommended to keep the default value.

## Fault Code

E01	Battery low voltage state, when the battery voltage over to discharge out-off voltage, the controller automatically shut down the load, when the battery voltage back to discharge recovery value value when the load automatically open.
E02	Battery high-voltage state, when the battery voltage for some reason exceeds the high-voltage protection value, the controller will automatically shut down the output, and when the battery voltage falls back to the high-voltage recovery value, the controller automatically opens the load.
E03	Load overcurrent state, when the load output current exceeds the rated value, if it is not restored to the safe value within 60S, it will be automatically converted to short circuit state.
E04	Load short-circuit protection state, the controller will turn off the load output immediately after a short-circuit occurs at the load end and recover after 60S. When the load protection mode is set to Sc, the controller will turn off the load output if the output current is not restored to a safe value within 10S after the controller displays the E04 alarm and restored after 60S.

E05	High temperature protection, when the temperature inside the controller reaches 80 degrees, the controller will shut down the charging and load output, and resume normal operation when the temperature falls back to 75 degrees.
E06	Solar panel over-voltage protection, 12V system PV voltage greater than 28V turns off charging and resumes charging when the voltage falls back to 25V. 24V system PV voltage greater than 53V turns off charging and resumes charging when the voltage falls back to 50V. 48V system PV voltage greater than 100V turns off charging and resumes charging when the voltage falls back to 97V.

## Technical Parameters

Model	DX2110	DX2120	DX2130	DX2140	DX2150	DX2160
System Voltage	12V/24V/Automatic adaptation			12V/24V/48V/Automatic Adaptation		
Rated charging current	10A	20A	30A	40A	50A	60A
Rated discharging current	10A	20A	30A	40A	50A	60A
Maximum PV input voltage	12V system +28V protection <25V recovery;			24V system +53V protection <50V recovery;		
Charging method	Default PWM charging, b04/b05 can be set to on-off charging					
USB output	3A					
Standby Current	<10mA					
Product Size	165*92*36	192*114*55		211*126*59		
Product weight	286g	610g		806g		

Battery Type	b01 sealed lead-acid batteries	b02 gel-type lead-acid batteries	b03 open lead-acid batteries	b04 lithium ternary battery	b05 lithium iron phosphate battery
High Voltage Protection HVD				16V	
High Voltage Protection HVR				15V	
Boost charging voltage	14.4V	14.2V	14.6V	(12.6V)	(14.6V)
Equalize charging voltage	14.6V	/	14.8V	/	/
Float Charge Voltage	13.8V			/	/
Boost Charge Return Voltage	13.2V			/	/
Discharge recovery voltage		(12.6V)		(10.5V)	(12.6V)
Discharge cutoff voltage		(11.1V)		(9.5V)	(11.1V)
Enhanced charging time	2H			/	/
Equalize charging time	2H	/	2H	/	/

1. The above parameter value only corresponds to 12V system, if you use 24V system, please \*2, 48V system, please \*4.
  2. When and only when the discharge undervoltage protection occurs, b01/b03 will enter over-equalization charging, and after the equalization charging is finished, it will directly transfer to float charging.
  3. Parameters marked with "brackets" can be modified by pressing the key, while the rest of the parameters cannot be modified.
- \*Product specifications are subject to change without notice.\*