LDSOLAR

User's Manual

Batguard

BAT
13.6 V

12V **LIF**

MPPT Max PV input Voltage 50V

SOLAR CHARGE CONTROLLER

Tracer Dream Series

12V or 12V/24V   10A

Your battery guard

Dear users,

Thank you for choosing our product !

Important Safety Instructions
Please keep this manual for future review.

This manual contains all instructions of safety, installation and operation for Tracer Dream series Maximum Power Point Tracking (MPPT) controller ("the controller" as referred to in this manual).

General Safety Information

① Read carefully all the instructions and warnings in the manual before installation.

② No user serviceable components inside the controller. Don't disassemble or attempt to repair the controller.

③ Mount the controller indoors. Avoid exposure the components and do not allow water to enter the controller.

④ Install the controller in a well ventilated place. The controller's heat sink may become very hot during operation.

⑤ Suggest installing appropriate external fuses/breakers.

⑥ Make sure to switch off all PV array connections and the battery fuse or breakers before controller installation and adjustment.

⑦ Power connections must remain tight to avoid excessive heating from loose connection.

1. General Information

1.1 Overview

Tracer Dream 50V series controller is based on advanced MPPT control algorithm, with LCD displaying running status. The MPPT control algorithm can minimize the maximum power point loss rate and loss time, quickly track the maximum power point of the PV array and obtain the maximum energy from solar modules under any conditions;

and can increase the ratio of energy utilization in the solar system by 20%-30% compared with a PWM charging method.The newly designed screen adds the display of battery type and Bluetooth/WiFi,easy for customer to check.

Limiting the charging power and reducing charging power functions ensure the system stable with over PV modules in high temperature environment.

With comprehensive electronic fault self-detecting functions and powerful electronic protection functions built inside the controller, component damage caused by installation errors or system failures can be avoided to the greatest extent possible.

Features：

- With the advanced dual-peak or multi-peak tracking technology, when the solar panel is shadowed or part of the panel fails resulting in multiple peaks on the I-V curve, the controller is still able to accurately track the maximum power point.
- Advanced MPPT technology, with efficiency no less than 99.5%
- Maximum DC/DC conversion efficiency of 98%
- Ultra-fast tracking speed and guaranteed tracking efficiency
- Advanced MPPT control algorithm to minimize the MPP loss rate and loss time
- Limit charging power & current over rated range.When the solar panel power exceeds a certain level and the charging current is larger than the rated current, the controller will automatically lower the charging power and bring the charging current to the rated level.
- Support the lead-acid,gel,flooded with the needed Temp. compensation and support lithium batteries start from solar panel
- Power reduction automatically over temperature range
- Monitor and set the parameters via App(optional)

1.2 Characteristics

❶ PV MC4 Terminals

❷ LED Screen

❸ LED Indicator

❹ Logo

❺ Battery Terminals

❻ Temperature
Sensor

❼ Menu (Red)

❽ Operation(Yellow)

❾ Cooling Hole

Figure 1-1 Product Characteristics

★If the temperature sensor is short-circuited or damaged, the controller will charge or discharge at the default temperature setting of 25℃.
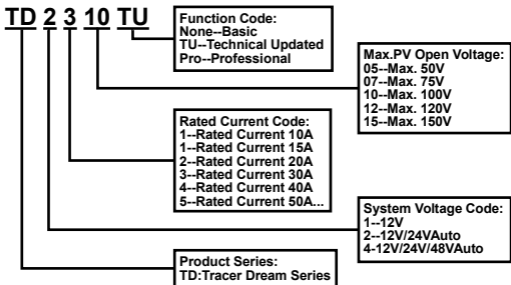
1.3 Naming Rules of Controller models

TD 2 3 10 TU

Function Code:
None--Basic
TU--Technical Updated
Pro--Professional

Max.PV Open Voltage:
05--Max. 50V
07--Max. 75V
10--Max. 100V
12--Max. 120V
15--Max. 150V

Rated Current Code:
1--Rated Current 10A
1--Rated Current 15A
2--Rated Current 20A
3--Rated Current 30A
4--Rated Current 40A
5--Rated Current 50A...

System Voltage Code:
1--12V
2--12V/24VAuto
4-12V/24V/48VAuto

Product Series:
TD:Tracer Dream Series

Figure 1-2 Example

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1.4 Battery Charging Stage

The controller has a 3 stages battery charging algorithm (Bulk Charging, Boost Charging and Float Charging) for rapid, efficient, and safe battery charging.
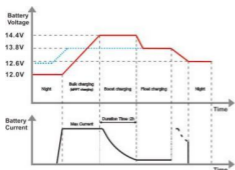

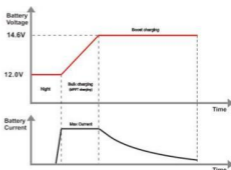**Figure 1-5 Lead acid Battery charging stage Curve**

Figure 1-6 Li Battery charging stage curve

(1) Bulk Charging

In this stage, the battery voltage has not yet reached boost voltage, the controller operates in constant current mode, delivering its maximum current to the batteries (MPPT Charging).

(2) Boost Charging

When the battery voltage reaches the boost voltage set point, the controller will start to operate in constant charging mode, this process is no longer MPPT charging, and in the meantime the charging current will drop gradually, the process is not the MPPT charging. The Boost stage maintain 2 hours in default. When the accumulate time reach to 2hours, the charging mode will turn to Float charging.

(3) Float Charging

After the boost voltage stage, the controller will reduce charging current to Float Voltage set point. This stage will have no more chemical reactions and all the charge current transforms into heat and gas at this time. Then the controller reduces the

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voltage to the floating stage, charging with a smaller voltage and current. It will reduce the temperature of the battery and prevent the gassing and charging the battery slightly at the same time. The purpose of Float stage is to offset the power consumption caused by self consumption and small loads in the whole system, while maintaining full battery storage capacity.

In Float charging stage, loads are able to obtain almost all power from solar panel. If loads exceed the power, the controller will no longer be able to maintain battery voltage in Float charging stage. If the battery voltage remains below the Recharge Voltage, the system will leave Float charging stage and return to Bulk charging stage.

2 Installation Instructions

2.1 General Installation Notes

■ Please read the entire installation instructions to get familiar with the installation steps before installation.

■ Be very careful when installing the batteries, especially flooded lead-acid battery. Please wear eye protection, and have fresh water available to wash and clean any contact with battery acid.

■ Keep the battery away from any metal objects, which may cause short circuit of the battery.

■ Explosive battery gases may come out from the battery during charging, so make sure ventilation condition is good.

■ Ventilation is highly recommended if mounted in an enclosure. Never install the controller in a sealed enclosure with flooded batteries! Battery fumes from vented batteries will corrode and destroy the controller circuits.

■ Loose power connections and corroded wires may result in high heat that can melt wire insulation, burn surrounding materials, or even cause fire. Ensure tight connections and use cable clamps to secure cables and prevent them from swaying in mobile applications.

- Lead-acid battery and lithium battery are recommended, other kinds please refer to the battery manufacturer.
- Battery connection may be wired to one battery or a bank of batteries. The following instructions refer to a singular battery, but it is implied that the battery connection can be made to either one battery or a group of batteries in a battery bank.
- Multiple same models of controllers can be installed in parallel on the same battery bank to achieve higher charging current. Each controller must have its own solar module(s).
- When selecting connection wires for the system, follow the criterion that the current density is not larger than $5A/mm^2$.

2.2 PV Array Requirements

(1) Serial connection (string) of PV modules

As the core component of PV system, controller could be suitable for various types of PV modules and maximize converting solar energy into electrical energy. According to the open circuit voltage (Voc) and the maximum power point voltage (VMpp) of the MPPT controller, the series number of different types PV modules can be calculated. The below table is for reference only.

Table 2-1 TD1105/TD2105

System voltage	36 cell Voc < 23V		48 cell Voc < 31V		54 cell Voc < 34V		60 cell Voc < 38V		72 cell Voc < 46V	
	Max.	Best	Max.	Best	Max.	Best	Max.	Best	Max.	Best
12V	2	2	1	1	1	1	1	1	1	1
24V	2	2	-	-	-	-	1	1	1	1

NOTE: The above parameter values are calculated under standard test conditions (STC (Standard Test Condition): Irradiance 1000W/m2, Module Temperature 25℃, Air Mass1.5.)

(2) Maximum PV array power

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The MPPT controller has the function of current/power-limiting, that is, during the charging process, when the charging current or power exceeds the rated charging current or power, the controller will automatically limit the charging current or power to the rated charging current or power, which can effectively protect the charging parts of controller, and prevent damages to the controller due to the connection of some over-specification PV modules. The actual operation of PV array is as follows:

Condition 1:

Actual charging power of PV array ≤ Rated charging power of controller

Condition 2:

Actual charging current of PV array ≤ Rated charging current of controller

When the controller operates under "Condition 1" or "Condition 2" , it will carry out the charging as per the actual current or power; at this time, the controller can work at the maximum power point of PV array.

⚠️**WARNING:** When the power of PV is not greater than the rated charging power, but the maximum open-circuit voltage of PV array is more than 50V(at the lowest environmental temperature), the controller may be damaged.

Condition 3:

Actual charging power of PV array > Rated charging power of controller

Condition 4:

Actual charging current of PV array > Rated charging current of controller

When the controller operates under "Condition 3" or "Condition 4", it will carry out the charging as per the rated current or power.

⚠️**WARNING:** When the power of PV module is greater than the rated charging power, and the maximum open-circuit voltage of PV array is more

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than 50V(at the lowest environmental temperature), the controller may be damaged.

According to "Peak Sun Hours diagram", if the power of PV array exceeds the rated charging power of controller, then the charging time as per the rated power will be prolonged, so that more energy can be obtained for charging the battery. However, in the practical application, the maximum power of PV array shall be not greater than 1.5 x the rated charging power of controller. If the maximum power of PV array exceeds the rated charging power of controller too much, it will not only cause the waste of PV modules, but also increase the open-circuit voltage of PV array due to the influence of environmental temperature, which may make the probability of damage to the controller rise. Therefore, it is very important to configure the system reasonably. For the recommended maximum power of PV array for this controller, please refer to the table below:

Table 2-2 maximum power of PV array for this controller

Model	Rated Charge Current	Rated Charge Power	Max. PV Array Power	Max. PV open circuit voltage
TD1105	10A	130W/12V	195W/12V	48V①
TD2105	10A	130W/12V 260W/24V	195W/12V 390W/24V	50V②

①At 25℃ environment temperature ②At minimum operating environment temperature

2.3 Wire Size

The wiring and installation methods must conform to all national and local electrical code requirements.

PV Wire Size

Since PV array output can vary due to the PV module size, connection method or sunlight angle, the minimum wire size can be calculated by the Isc * of PV array.

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Please refer to the value of Isc in the PV module specification. When PV modules connect in series, the Isc is equal to a PV modules Isc. When PV modules connect in parallel, the Isc is equal to the sum of the PV module's Isc. The Isc of the PV array must not exceed the controller's maximum PV input current. Please refer to the table as below:

> **NOTE:** All PV modules in a given array are assumed to be identical.

* Isc=short circuit current(amps) Voc=open circuit voltage.

Table 2-3 PV array must not exceed the controller's maximum

Model	Max.battery wire size	Max. PV wire size *
TD1105	6mm^2/10AWG	2.5mm^2/14AWG
TD2105	6mm^2/10AWG	2.5mm^2/14AWG

* These are the maximum wire sizes that will fit the controller terminal

2.4 Mounting

⚠️**Warning**: risk of explosion! Never install the controller and an open battery in the same enclosed space! Nor shall the controller be installed in an enclosed space where battery gas may accumulate.

⚠️**Warning**: danger of high voltage! Photovoltaic arrays may produce a very high open-circuit voltage. Open the breaker or fuse before wiring, and be very careful during the wiring process.

Note: when installing the controller, make sure that enough air flows through the controller's radiator, and leave at least 100mm of space both above and below the controller so as to ensure natural convection for heat dissipation. If the controller is installed in an enclosed box, make sure the box delivers reliable heat dissipation effect.

Figure 2-1 Mounting

2.5 Installation Procedure

Solar Panel

Battery

Wiring Sequence

No display — Check

Display

Figure 2-3 Schematic of wiring diagram

Step 1: Choose the installation site

Do not install the controller at a place that is subject to direct sunlight, high temperature or water intrusion, and make sure the ambient environment is well ventilated.

⚠ **CAUTION:** If the controller is to be installed in an enclosed box, it is important to ensure reliable heat dissipation through the box.

Step 2: Wire and Power on controller

Connect the system in the order of ❶battery ❷ PV array in accordance with Figure 2-2, "Schematic Wiring Diagram" and disconnect the system in the reverse order❷❶.

⚠**CAUTION:** While wiring the controller do not close the circuit breaker or fuse and make sure that the leads of "+" and "-" poles are connected correctly.

⚠**CAUTION:** A fuse which current is 1.25 to 2 times the rated current of the controller, must be installed on the battery side with a distance from the battery not greater than 150 mm.

⚠ **CAUTION:** If an inverter is to be connected to the system, connect the inverter directly to the battery, not to the load side of the controller.
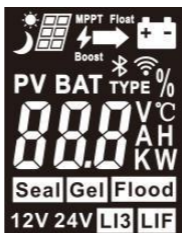
Step 3: Install

Fix a screw at a suitable position with 5mm left, and

prepare a double-sided adhesive. Hang the controller and stick it on the double-sided adhesive.

3. Operation

3.1 Button

Mode	Note
Clear Fault	Long press the **"OPERATION"** button(🟡)
Browsing Mode	Short press the **"MENU"** button(🔴).
Setting Mode	Browse to the settings page,Press the **"MENU"** button. and hold on 5s to enter the setting mode Short Press the **"OPERATION"** button. to set the parameters, Long Press the **"MENU"** button to confirm the setting parameters or no operation for 10s, it will exit the setting interface automatically.

3.2 Interface

(1) Status Description

Item	Icon	Status
PV array	☀️🔲	In daytime and PV connected correctly
	🌙	At night or no PV connect or reverse connect
	☀️🔲 🔋	No Charging
	☀️🔲 MPPT ⚡➡️ 🔋	Charging In MPPT
	☀️🔲 ⚡ Float	In Float Charging Mode
	☀️🔲 ⚡ Boost	In Boost Charging Mode
	PV	PV Voltage, Current and Power
Battery	🔋	Battery icon
	12V 24V	Current System Voltage
	BAT	Battery Voltage and Current
	BAT TYPE	Battery Type
	✳ 📶	Bluetooth or WiFi connection instruction
	Seal Gel Flood LI LIF	battery type instruction

(2) LED Indicator

Color	Status	Explanation
Green (Change from	**6 LED Slow Scroll**	In Charging, and the charging current is less than 1 / 3 of the rated current

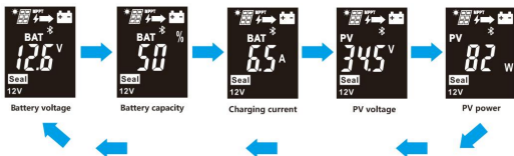| orange to green according to battery capacity)	**6 LED Fast Scroll**	In Charging, and the charging current is more than 1 / 3 of the rated current
	6LED Slow Flash	The battery is about to be fully charged and enters the constant voltage charging state, and the charging current is less than 2.5A
Blue	**1LED Slow Flash**	No charge, the controller is in standby
Red	**6LED Fast Flash**	Battery over voltage or PV over voltage
	1LED Slow Flash	Battery Low voltage or over temperature protection

Note: the LED screen has a sleep function to save power. When it is detected that the solar panel cannot be charged, the controller will turn off the display after a delay of 5 minutes.Press any key or Restart charging can wake up the LED screen again.

(3) Fault Indication

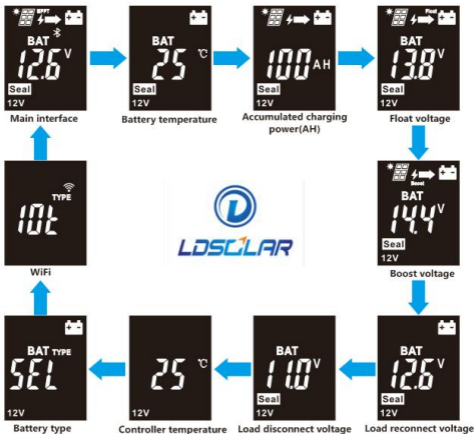| Status	Icon	Explanation
Low Voltage		Battery Icon flash
Over Voltage		
Over Temperature Protection	℃	Temperature Icon Flash
PV Over Voltage		PV Icon Flash
Over Current or Power Limited	**MPPT**	MPPT Icon Flash
Bluetooth/WIFI unconnected	✳ 📶	Bluetooth/WIFI Icon Flash

(4) Browse interface

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①If there is no operation within 20s in any interface or after powered on within 10s, The main interface will cycle to display the battery voltage, Battery capacity,charging current,PV voltage and charging power every 3s.Long press the **"OPERATION "** button (🟡) can speed up the cycle display time.

BAT **12.6** V	BAT **50** %	BAT **6.5** A	PV **34.5** V	PV **82** W
Seal 12V	Seal 12V	Seal 12V	Seal 12V	Seal 12V
Battery voltage	Battery capacity	Charging current	PV voltage	PV power

②At main interface(cycle display),long press **menu(🔴)** and **operation(🟡)** button at same time to enter working record status,it can show times of low voltage,working days and times of full charging

BAT **000**	**000**	BAT **000**
Times of low voltage	Working days	Times of full charge

③At main interface(cycle display),Press the **"MENU"** button(🔴) and enter menu interface

Main interface | Battery temperature | Accumulated charging power(AH) | Float voltage | Boost voltage | Load reconnect voltage | Load disconnect voltage | Controller temperature | Battery type | WiFi

3.3 Setting

(1) Clear the charging power (AH)

Operation:

Step 1: Press the **"OPERATION"**button and hold for 5s under the PV generated charging power interface and the value will be cleared.

(2) Float Voltage Setting

Operation:

Step 1: At main interface(cycle display),Press the "**MENU**" button to enter float voltage interface

Step 2: Long press the "**MENU**" button(≥5S) until the value is flashing,then it enters the setting state.

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Step 3: Press the **"MENU"** and **"OPERATION"** button to change the value

Step 4: After setting,Long press the **"MENU"** button(≥5S) to save the new setting.If there is no operation within 20S,the controller will enter the main interface and cycle to display automatically.

Float voltage

(3) Setting of boost voltage, low voltage reconnect voltage and low voltage disconnect voltage

Operation:At main interface(cycle display),Press the **"MENU"** button to enter the relevant interface below：

The operation method of setting is the same as float voltage setting,Please refer to the above **"(2)"**.

■ **The following rules must be observed when modifying the parameter values in User**

Ⅰ.Charging Limit Voltage >Boost Charging Voltage >Float Charging Voltage > Boost Reconnect Charging Voltage.

Ⅱ.Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage(BMS+0.2V)

Ⅲ. Boost Reconnect Charging voltage > Low Voltage Reconnect Voltage> Low Voltage Disconnect Voltage(BMS+0.2V)

Boost voltage   **Load reconnect voltage**   **Load disconnect voltage**

■ **Battery Voltage Control Parameters**

Below parameters are in 12V system at 25 ºC, please double the values in 24V system

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Battery Type	SEL 24V*2	GEL 24V*2	FLD 24V*2	LF4(LiFePO4 4S/12V) LF8 (LiFePO4 8S/24V*2)	LI3 (Li(NiCoMn) O2 3S/12V) LI6 (Li(NiCoMn) O2 6S/24V*2)	LI7 (Li(NiCoM n)O2 7S/24V)
Over Voltage Disconnect	16.0 V	16.0 V	16.0 V	16.0V	17.0 V	32.0V
Charging Limited Voltage	15.0 V	15.0 V	15.0 V	14.8V	17.0 V	30.0V
Over Voltage Reconnect	15.0 V	15.0 V	15.0 V	14.8V	17.0 V	30.0V
Boost charge	14.4 V	14.2 V	14.6 V	14.6V	12.6V	29.4V
Float charge	13.8 V	13.8 V	13.8 V	14.4V	12.4V	29.0V
Boost Restart Voltage	12.6V	12.6V	12.6V	13.0V	11.5V	26.0V
Low voltage reconnect	12.6V	12.6V	12.6V	12.6V	11.0V	25.2V
Low voltage disconnect	11.0V	11.0V	11.0V	10.5V	9.0V	21.0V

(4) Battery type

①support battery types

Lead-acid battery	Sealed(default)/Gel/Flooded/User
Lithium battery	LiFePO4　LF4/12V;LF8/24V;
	Li(NiCoMn)O2 LI3/12V;LI6/24V;LI7/24V;

②Setting the battery type via LCD
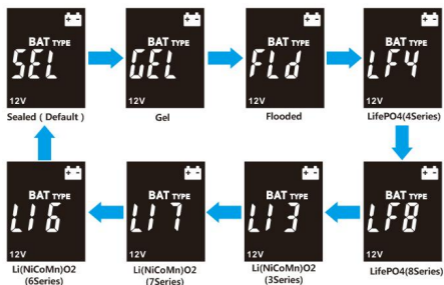
Step 1: At main interface(cycle display),Press the "**Red**" button to enter battery type mode interface.

Step 2: Long press the "**Red**" button(≥5S) until the "**SEL**" is flashing,then it enters the setting state.

Step 3: Press the "**Red**" and "**Yellow**" button to confirm the battery type below:

Step 4: Long press the "**Red**" button(≥5S) to save the new setting.If there is no operation within 20S,the controller will enter the main interface and cycle to

display automatically.

SEL	GEL	FLd	LF4
Sealed (Default)	Gel	Flooded	LifePO4(4Series)

LI6	LI7	LI3	LF8
Li(NiCoMn)O2 (6Series)	Li(NiCoMn)O2 (7Series)	Li(NiCoMn)O2 (3Series)	LifePO4(8Series)

(5)Bluetooth Module(Optional)

Step 1:Turn on the Bluetooth switch of the mobile phone, and open the iConnect App-- select wireless communication--device--communication selection-Bluetooth.

Step 2:Click the "**Search Device**" button--select the device whose name

begins with **BT04**--enter the password **0000/1234**--

connection succeeded.

Step 3:If the Bluetooth is connected, the Bluetooth icon on the main interface will stop flashing.

(6) WiFi Mode(Optional)

WiFi mode is divided to WiFi direct connection mode and WiFi networking **IOT** mode(default)

①**How to switch to WiFi direct connection?**

Step 1: Press the **Red** button of the controller to select the communication mode design interface.

Step 2: Hold down the"**Red**"button,then

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press the **Yellow** button once,.Two seconds later, the LCD display will switch from **IOT** to **AP**,Then release the "Red"button.It has switched to WiFi direct connection mode.

WiFi IOT mode   WiFi AP mode
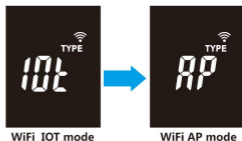
②**How to switch back to WiFi networking IOT mode?**

Press the Red button of the controller to enter the WiFi setting interface, press the **Yellow** button, and the LCD display will switch from AP to IOT,then switch to the WiFi networking **IOT** mode.

③**How to enter configuration state**

Press the "**Red**"button to enter WiFi mode interface(shows on the right).then press and hold the "**Red**"button for more than 10s, LCD interface switches and flashed between IOT and AP interface.Now it enters the distribution network state.

•How to connect WiFi with app? Please scan the QR code on the left with the browser. And refer to the instructions of iConnect app 2.2.3/3.2.1

•In Wi-Fi direct connection mode, the Wi-Fi connected to the mobile phone can't connect to the Internet, so App upgrade and mobile phone WiFi Internet access are not available.

(7) App Setting

All the above settings can be set through the iConnect app, but the controller needs to be equipped with Bluetooth or WiFi module

①**App Download**

·**Android/Harmony System**

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Method 1: Scan the following QR code with your mobile browser and enter the App download page. Click the latest version of the download file directly, and then install it directly (if prompted during the installation process, please select "Trust" and "Allow" to continue the installation. Harmony system should not turn on pure mode)

Method 2: The mobile phone web page can be downloaded and installed directly by logging in to **https://www.ldsolarpv.com/jszc#** or **https://www.ldsolar.com/download**.

Method 3: Google Play application market download

Search for **"LD iConnect"** in Google Play Application market and find ldsolar's app. The icon is as follows. Just download and install it directly.

·**IOS for Apple**

Search for **"LD iConnect"** in the Apple store, and find ldsolar's app, with the icon above, just download and install it directly.

Note:

•After downloading the App, please check the application update in My iConnect -- click Automatic Update to the latest version. In this way, you can enjoy the latest application functions.

②**Installation of communication module**

If equipped with inbuilt communication module, it does not need to be installed. The external Bluetooth or WiFi module needs to be equipped with a controller with RJ45 interface. After the controller is connected in the system successfully, plug the module into the RJ45 interface and the indicator light on the module will be on.

③How to use App?

Please refer to the instruction manual of iconnect app for details.Scan the QR code or download from the iConnect App

4.　Protections,　Troubleshooting　and Maintenance

4.1 Protection

PV Over Current/power	When the charging current or power of the PV array exceeds the controller's rated current or power, it will be charged at the rated current or power. **NOTE: When the PV modules are in series, ensure that the open-circuit voltage of the PV array does not exceed the "maximum PV open-circuit voltage" rating. Otherwise the controller may be damaged.**
PV Short Circuit	When not in PV charging state, the controller will not be damaged in case of a short-circuiting in the PV array.
PV Reverse Polarity	When the polarity of the PV array is reversed, the controller may not be damaged and can continue to operate normally after the polarity is corrected.
Night Reverse Charging	Prevents the battery from discharging through the PV module at night.

Battery Reverse Polarity	Fully protected against battery reverse polarity; no damage will occur for the battery. Correct the wrong wiring to resume normal operation. **NOTE: Limited to the characteristic of lithium battery, when the PV connection is correct and battery connection reversed, the controller will be damaged.**
Battery Over Voltage	When the battery voltage reaches the over voltage disconnect voltage, it will automatically stop battery charging to prevent battery damage caused by over-charging.
Battery Over Discharge	When the battery voltage reaches the low voltage disconnect voltage, it will automatically stop battery discharging to prevent battery damage caused by over-discharging. (Any controller connected loads will be disconnected. Loads directly connected to the battery will not be affected and may continue to discharge the battery.)
Controller Overheating	The controller is able to detect the temperature inside the battery. The controller stops working when its temperature exceeds 85 °C and restart to work when its temperature is below 65 °C.
TVS High Voltage Transients	The internal circuitry of the controller is designed with Transient Voltage Suppressors (TVS) which can only protect against high-voltage surge pulses with less energy. If the controller is to be used in an area with frequent lightning strikes, it is recommended to install an external surge arrester.

★When the internal temperature is 75℃, the reducing power charging mode which reduce the charging power of 5% every increase 1 ℃ is turned on. If the internal temperature is greater than 85℃, the controller will stop charging. When the temperature declines to be below 65 ºC, the controller will resume.

4.2 Troubleshooting

Possible reasons	Faults	Troubleshooting
PV array disconnection	LCD display during daytime	Confirm that PV wire connections are correct and tight.
Battery voltage is lower than 8V	Wire connection is correct, the controller is not working.	Please check the voltage of battery. At least 8V voltage to activate the controller.
Battery over voltage	Battery level shows full, battery frame blink, fault icon blink	Check if battery voltage is higher than OVD(over voltage disconnect voltage), and disconnect the PV.
Battery over discharged	Battery level shows empty ,battery frame n blink	When the battery voltage is restored to or above LVR(low voltage reconnect voltage), the load will recover

4.3 Maintenance

The following inspections and maintenance tasks are recommended at least two times per year for best performance.

■ Make sure controller firmly installed in a clean and dry ambient.
■ Make sure no block on air-flow around the controller. Clear up any dirt and fragments on radiator.
■ Check all the naked wires to make sure insulation is not damaged for solarization, frictional wear, dryness,

insects or rats etc. Repair or replace some wires if necessary.

- Tighten all the terminals. Inspect for loose, broken, or burnt wire connections.
- Check and confirm that LED is consistent with required. Pay attention to any troubleshooting or error indication .Take corrective action if necessary.
- Confirm that all the system components are ground connected tightly and correctly.
- Confirm that all the terminals have no corrosion, insulation damaged, high temperature or burnt/discolored sign, tighten terminal screws to the suggested torque.
- Check for dirt, nesting insects and corrosion. If so, clear up in time.
- Check and confirm that lightning arrester is in good condition. Replace a new one in time to avoid damaging of the controller and even other equipments.

⚠**WARNING：Risk of electric shock!**

Make sure that all the power is turned off before above operations, and then follow the corresponding inspections and operations.

5. Technical Specifications

5.1 Electrical Parameters

Item	TD1105	TD2105
System nominal voltage	12V DC	12/24VDC Auto ①
Rated charge current	10A	10A
Battery voltage range	8 ~ 16V	8 ~ 32V
Max. PV open circuit voltage	② 50V ③ 48V	
MPP voltage range	(Battery voltage +1V) ~ 45V	
Battery Type	Sealed(Default)/Gel/Flooded/LiFePO4/ Li(NiCoMn)O2/ User	
Rated charge power	130W/12V	130W/12V 260W/24V
LVD	11.0V ADJ 9V....12V；×2/24V；	
LVR	12.6V ADJ 11V....13.5V；×2/24V；	
Float voltage	13.8V ADJ 13V....15V；×2/24V；	
Boost voltage	14.4V ； ADJ14V….17V；×2/24；Battery Voltage less than Boost Restart Voltage Start Boost charging for 2hours	
Self-consumption	≤15mA(12V) ≤10mA(24V)	
Temperature compensate Coefficient ④	-4mv/℃/2V	
Working environment temperature◆	-20℃ ~ +50℃(100% input and output)	
Storage temperature range	-20℃ ~ +70℃	
Relative humidity	≤95%, N.C.	
Enclosure	IP30	

①When a lithium battery is used, the system voltage can't be identified automatically.

② At minimum operating environment temperature
③ At 25℃ environment temperature
④ When a lithium battery is used, the temperature compensate coefficient will be 0.

◆ The controller can work under full load in the working environment temperature, When the internal temperature is more than 80℃, the reducing power charging mode is turned on.

5.2 Mechanical Parameters

Item	TD1105	TD2105
Dimension (L*W*H)	120*75*43mm	120*75*43mm
Terminal Scale	6mm²/10AWG	6mm²/10AWG
Mounting hole size	Φ4mm	
Weight	255g	285g
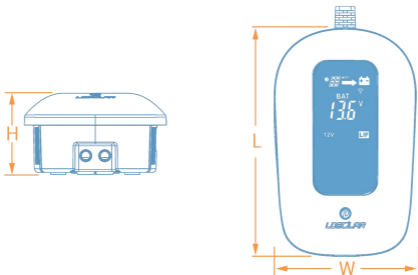
Any changes without

prior notice

Version:TD50V V1.2