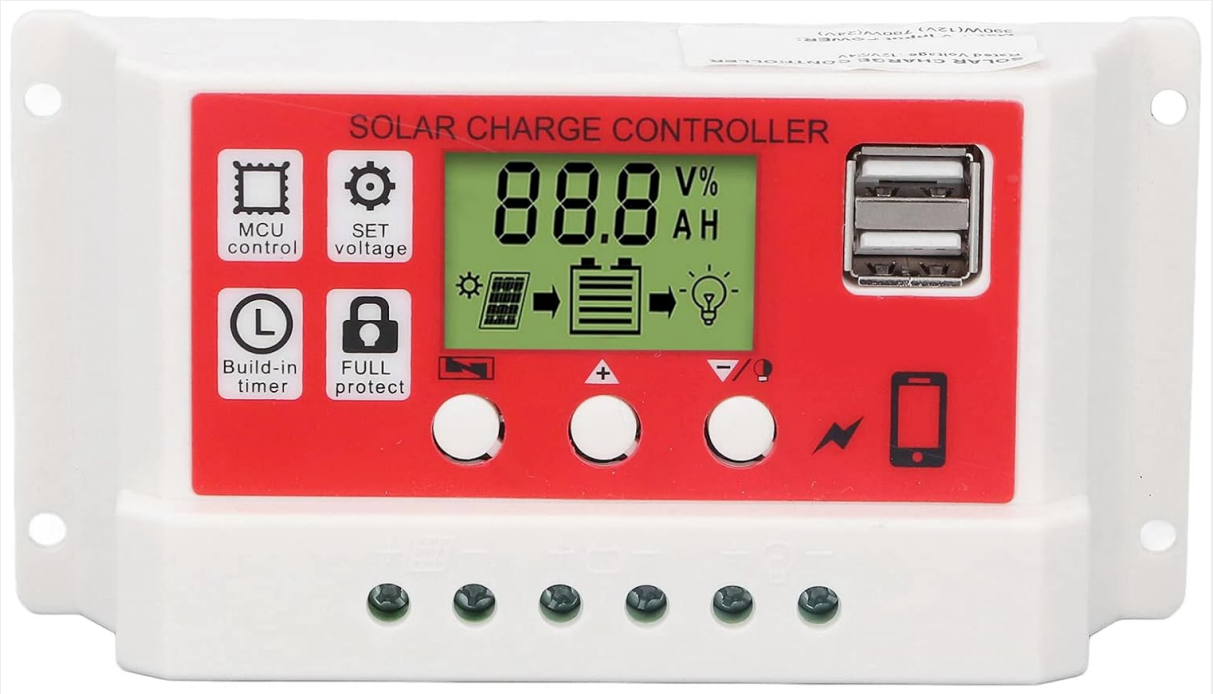
Hilitand Hilitand4qtkf9di8p6073-13

Hilitand 12V/24V Solar Charge Controller User Manual

Model: Hilitand4qtkf9di8p6073-13

1. Introduction

This manual provides detailed instructions for the installation, operation, and maintenance of your Hilitand 12V/24V Solar Charge Controller. This device is designed to manage the power flow from your solar panel to your battery and DC load, ensuring efficient charging and protecting your battery from overcharge and over-discharge. It features an LCD display for easy monitoring and dual USB outputs for charging external devices.



Front view of the Hilitand Solar Charge Controller, showing the LCD screen, control buttons, and dual USB output ports. The screen displays voltage, battery charge status, and load status.

2. Key Features

- **Comprehensive Electrical Circuit Protection:** Features protection against overcurrent, short-circuit, reverse polarity, undervoltage, and overload, ensuring safe operation and extended battery life.
- **Dual USB Output:** Equipped with two USB interface outputs (5V/2.5A maximum) for convenient charging of mobile phones, tablets, and other USB-powered devices.
- **Wide Range of Applications:** Suitable for various solar power generation systems, smart homes, solar ventilation systems, solar light boxes, advertising boards, and warning lights.
- **Three-Phase PWM Regulated Charging:** Utilizes three-phase PWM regulated charging for fast charging, strong charging, and float charging, achieving efficient and intelligent charging.
- **Automatic Management:** Integrated industrial microcontroller automatically manages the operation of the solar panel and battery, compatible with both 12V and 24V system voltages.

3. Specifications

Parameter	Value
System Voltage	12V/24V Auto Adjustment
Max PV Voltage	Up to 23V (12V system); Up to 46V (24V system)
Supported Battery Types	B1: Lead-acid battery (12V/24V) B2: Lithium-ion battery (3 strings of 3.7V = 11.1V) B3: LiFePO4 battery (4 strings of 3.2V = 12.8V)
Charge Cut-off Voltage	14.4V (B1) / 12.6V (B2) / 14.6V (B3)
Discharge Cut-off Voltage	10.7V (B1) / 9V (B2) / 10V (B3)
Discharge Recovery Voltage	12.6V (B1) / 10.5V (B2) / 12V (B3)
Light Control (PV panel)	8V
Light Control Stop Threshold (PV panel)	8V
USB Output	2-way USB, 5V/2.5A (Maximum)
Standby Current	<10mA
Operating Temperature	-35 ~ 60 °C
Dimensions	13 x 8 x 4 cm
Weight	140 grams
Display Type	LCD

4. Package Contents

- 1 x Solar Charge Controller
- 1 x English User Manual

5. Setup and Installation

5.1. Safety Precautions

- Ensure the controller is installed in a well-ventilated area, away from direct sunlight, high temperatures, and moisture.
- Always connect the battery to the charge controller FIRST.
- Then, connect the solar panel to the charge controller.
- Finally, connect the DC load to the charge controller.
- To disconnect, follow the reverse order: disconnect load, then solar panel, then battery.
- Ensure all wiring connections are tight and correct to prevent loose connections that can cause excessive voltage drop and heat buildup.
- Use appropriate wire gauges for your system's current to minimize power loss.

5.2. Wiring Diagram

The controller has clearly marked terminals for battery, solar panel, and load connections. Ensure correct polarity (+ and -) for all connections.

This image displays the side of the Hilitand Solar Charge Controller, highlighting the input and output terminals for connecting the solar panel, battery, and DC load. Ensure correct polarity when wiring.

1. Connect the battery to the battery terminals on the controller. The LCD will light up.
2. Connect the solar panel to the solar panel terminals on the controller.

3. Connect your DC load (e.g., LED lights) to the load terminals on the controller.

5.3. Battery Type Selection

The controller supports various battery types. It is crucial to select the correct battery type for optimal charging and battery longevity. To select the battery type:

- Press the 'SET' button (gear icon) to enter the parameter setting mode.
- Press the 'SET' button repeatedly until you see the battery type selection (B1, B2, or B3) on the display.
- Use the '+' or '-' buttons to cycle through the options:
    - **B1:** Lead-acid battery (12V/24V auto-detection)
    - **B2:** Lithium-ion battery (3 strings of 3.7V = 11.1V)
    - **B3:** LiFePO4 battery (4 strings of 3.2V = 12.8V)
- Once the desired battery type is selected, wait a few seconds for the setting to be saved automatically.

6. Operating Instructions

6.1. LCD Display Overview

The LCD provides real-time information about your solar power system. Key indicators include:

- **Battery Voltage:** Displays the current voltage of the connected battery.
- **Battery State of Charge:** Indicated by a battery icon and percentage (V% or AH).
- **Charging Status:** A solar panel icon indicates when the battery is being charged by the solar panel.
- **Load Status:** A light bulb icon indicates the status of the DC load output.
- **Current/Capacity:** Displays current (A) or accumulated ampere-hours (AH).

6.2. Button Functions

- **MCU Control (Square icon):** Used to navigate through different display screens or enter advanced settings.
- **SET Voltage (Gear icon):** Press to enter parameter setting mode. Use to adjust charge/discharge voltages, battery type, and load timer settings.
- **Build-in Timer (Clock icon):** Controls the operating mode of the DC load output (e.g., always on, timed, dusk-to-dawn).
- **Full Protect (Lock icon):** Indicates active protection features (e.g., overload, short circuit).
- **'+' Button:** Increases values or navigates forward in menus.
- **'-' Button:** Decreases values or navigates backward in menus.

6.3. Load Control (Timer Function)

The controller's built-in timer allows for flexible control of the DC load output, which is particularly useful for applications like solar street lights or timed lighting. To set the load control mode:

1. Press the 'Build-in Timer' button (clock icon) to cycle through the available load control modes.
2. Common modes include:
    - **24H:** Load is always on.

- **0H:** Load is always off.
- **1-23H:** Load turns on at dusk and stays on for the set number of hours.
- **D-D (Dusk-to-Dawn):** Load turns on at dusk and turns off at dawn.

3. Select the desired mode and wait for the setting to be saved automatically.

6.4. USB Charging

The Hilitand Solar Charge Controller is equipped with two USB ports, providing a convenient way to charge small electronic devices directly from your solar power system.

A close-up view of the Hilitand Solar Charge Controller, highlighting the two USB output ports located on the top right. These ports provide 5V/2.5A power for charging external devices.

- Simply connect your USB charging cable to one of the two USB ports on the controller.
- The ports provide a maximum output of 5V/2.5A, suitable for charging mobile phones, tablets, and other compatible devices.
- USB charging will typically be available as long as the battery voltage is above the low voltage disconnect threshold.

7. Maintenance

Regular maintenance ensures the longevity and optimal performance of your solar charge controller.

- **Cleanliness:** Keep the controller clean and free from dust, dirt, and debris. Use a dry, soft cloth for cleaning.
- **Connections:** Periodically check all wiring connections to ensure they are secure and free from corrosion. Loose connections can lead to overheating and poor performance.
- **Ventilation:** Ensure that the controller has adequate ventilation to dissipate heat. Do not block the

ventilation holes.

- **Battery Health:** Monitor your battery's voltage and overall health. A healthy battery is crucial for the efficient operation of the solar system.
- **Environmental Check:** Ensure the operating environment remains within the specified temperature range (-35 ~ 60 °C).

8. Troubleshooting

If you encounter issues with your Hilitand Solar Charge Controller, refer to the table below for common problems and their solutions.

Problem	Possible Cause	Solution
Controller not turning on / LCD blank	Battery not connected, reverse polarity, or battery voltage too low.	Ensure battery is connected with correct polarity. Check battery voltage; if too low, charge it externally.
No charging from solar panel	Solar panel not connected, insufficient sunlight, or panel fault.	Verify solar panel connections and polarity. Ensure adequate sunlight. Test solar panel output voltage.
Load not working	Load disconnected, battery low, overload protection active, or incorrect load mode setting.	Check load connections. Charge battery. Reduce load if overloaded. Check load control mode (e.g., timer setting).
USB ports not charging	Battery voltage too low (below discharge cut-off) or device drawing too much current.	Ensure battery voltage is sufficient. Try charging a different device to check current draw.
Incorrect voltage readings	Loose connections or faulty wiring.	Verify all wiring connections are tight and correct. Inspect wires for damage.

Note: The controller saves user-defined parameters. No reset is necessary when the battery is empty, as these settings will be retained.

9. Warranty and Support

For warranty information, technical assistance, or any questions not covered in this manual, please contact Hilitand customer service through your point of purchase or refer to the official Hilitand website for support resources. When contacting support, please have your product model number (Hilitand4qtkf9di8p6073-13) and purchase details readily available.