

## LNEX 40A

# LNEX MPPT Solar Charge Controller 40A User Manual

Model: 40A

## 1. INTRODUCTION

Thank you for choosing the LNEX MPPT Solar Charge Controller 40A. This manual provides essential information for the safe and efficient installation, operation, and maintenance of your solar charge controller. Please read this manual thoroughly before installation and keep it for future reference.

This controller utilizes advanced Maximum Power Point Tracking (MPPT) technology to maximize energy harvest from your solar panels, ensuring optimal charging for various battery types including LiFePO4, AGM, Gel, Flooded, and Lithium batteries in 12V or 24V systems.

## 2. SAFETY INFORMATION

- Always connect the battery to the charge controller first, then connect the solar panel. Disconnect in reverse order.
- Ensure all wiring is secure and connections are tight to prevent loose connections that can cause excessive heat.
- Install the controller in a well-ventilated area, away from flammable materials and direct sunlight.
- Do not disassemble or attempt to repair the controller yourself. Contact qualified personnel for service.
- Use appropriate circuit breakers or fuses for both the battery and solar panel circuits.
- Wear eye protection when working with batteries.

## 3. PRODUCT OVERVIEW

### 3.1 Key Features

- **Advanced MPPT Design:** High tracking efficiency up to 99.5% and peak conversion efficiency of 98%, improving solar panel utilization by 20%-30% compared to PWM controllers.
- **Automatic Voltage Detection:** Automatically detects 12V or 24V DC system voltages.
- **Versatile Battery Compatibility:** Works with LiFePO4, LTO, GEL, AGM, Lead-Acid, Calcium, and EFB batteries. Customizable parameters available.
- **5-Stage Charging:** Features Soft Start, Bulk, Absorption, Equalization, and Float stages for extended battery life.

and improved system performance. Lithium batteries use a 4-stage charging process (Bulk and Absorption) with Lithium Reactivation.

- **Comprehensive System Protection:** Built-in over-temperature, over-voltage, over-current, over-charging, over-discharging, overload, and short-circuit protection.
- **Temperature Sensor Port:** Allows for real-time battery temperature measurement and accurate temperature compensation for stable charging (Temp Sensor sold separately).
- **User-Friendly Design:** Easy to use with an LCD screen and multiple LED indicators for displaying charging and battery information, customizable parameters, and error codes.

3.2 Components and Display

The controller features a robust design with a backlit LCD, LED bar indicators, and heavy-duty connectors. It also includes ports for an optional temperature sensor and remote display.

| SPECIFICATIONS.                 |                                                                    |                                  |
|---------------------------------|--------------------------------------------------------------------|----------------------------------|
| Mode                            | PP2430                                                             | PP2440                           |
| System Nominal Voltage:         | 12/24V Auto                                                        |                                  |
| Max PV Open Circuit Voltage:    | 100V DC                                                            |                                  |
| System Grounded:                | Negative Ground                                                    |                                  |
| Conversion efficiency:          | 98%                                                                |                                  |
| Tracking efficiency:            | 99.5%                                                              |                                  |
| Max PV Charging Current:        | 30A                                                                | 40A                              |
| Max. Recommended PV Input Power | 440 Watt (12V) / 880 Watt (24V)                                    | 580 Watt (12V) / 1160 Watt (24V) |
| Battery Type Preset:            | Crystal, Gel, AGM, WET, Calcium ,LCO, LifePO4, LTO+CUSTOM SETTING. |                                  |
| Housing Case Color:             | Grey&Black                                                         |                                  |
| IP Grade:                       | IP43 for Inside PCBA, IP22 for Connection Area                     |                                  |
| Operating temperature:          | -25 ~ 50°C / -13 ~ 122 °F                                          |                                  |
| Storage temperature:            | -40 ~ 85°C / -40 ~ 185 °F                                          |                                  |
| Operating Humidity range:       | 0-85% RH                                                           |                                  |
| Mounting:                       | Surface Mounting                                                   |                                  |
| Dimensions                      | 7.1*5.5*2.9 inches                                                 |                                  |

Image: Internal components of the LNEX MPPT Solar Charge Controller, highlighting the ARM 32-bit 72MHz MCU, Samyoung capacitors, premium inductor, heavy-duty connector, and temp. sensor port.



Image: Close-up of the controller's backlit LCD display, LED bar indicator, and buttons, along with icons representing key features like high efficiency, IP43 rating, and negative ground design.

4. SETUP AND INSTALLATION

Proper installation is crucial for the safe and efficient operation of your solar power system. Follow these steps carefully:

## 4.1 Wiring Sequence

1. **Connect the Battery:** Connect the battery to the charge controller's battery terminals first. Ensure correct polarity (+ to + and - to -). The controller will automatically detect the system voltage (12V or 24V).
2. **Connect the Solar Panel:** Connect the solar panel to the charge controller's solar input terminals. Ensure correct polarity.
3. **Connect the Load (Optional):** If using a DC load directly from the controller, connect it to the load terminals.

**Important: Always connect the battery first and disconnect the solar panel first when disassembling the system.**

## 4.2 Mounting

Mount the controller vertically on a flat, non-flammable surface in a dry, well-ventilated area. Ensure adequate clearance around the controller for heat dissipation. Avoid mounting in direct sunlight or areas with high humidity.



Image: Diagram showing the compact size and dimensions of the Lnex MPPT Solar Charge Controller, highlighting its heat sink design.

# 5. OPERATING INSTRUCTIONS

## 5.1 LCD Display and Indicators

The controller features a backlit LCD display and LED bar indicators to show real-time system status:

- **LED Bar:** Indicates PV/Charger/Battery status at a glance.
- **Backlit LCD:** Displays battery voltage, charging current, battery type, charging stage (Soft Start, Bulk, Absorption, Float), and error codes.

Your browser does not support the video tag.

Video: An official product video from Lnex Direct demonstrating the Lnex APEX MPPT solar charge controller, showing its features and operation.

## 5.2 Parameter Settings

The controller allows customization of charging parameters for different battery types. Refer to the on-screen menu for navigation and adjustment. Typically, you can select the system voltage and then choose the battery type from the available presets (8+1 options, including custom settings).



Image: Illustration showing the various battery types compatible with the LNEK MPPT Solar Charge Controller, including LiFePO4, Wet, AGM, Gel, LCO, Crystal, LTO, Calcium, and custom settings.

## 6. BATTERY TYPES AND CHARGING STAGES

The controller employs intelligent multi-stage charging algorithms to optimize battery health and lifespan.

### 6.1 Lead-Acid Battery Charging (5-Stage)

For Crystal, Gel, AGM, Wet, and Calcium batteries, the controller uses a 5-stage charging process:

1. **Soft Start:** Gradually increases charging current to protect the battery.
2. **Bulk:** Charges the battery at maximum current until voltage reaches the absorption level.
3. **Absorption:** Charges at a constant voltage to fully charge the battery.
4. **Equalization:** Periodically overcharges the battery to balance cell voltages and prevent sulfation (for certain battery types).
5. **Float:** Maintains the battery at a constant voltage to compensate for self-discharge.



Image: Graph illustrating the 5-stage charging process (Soft-Start, Bulk, Absorption, Equalization, Float) for Lead-Acid batteries, showing current and voltage curves.

### 6.2 Lithium Battery Charging (4-Stage)

For LCO, LFP, and LTO Lithium batteries, the controller uses a 4-stage charging process:

- 1. **Soft Start:** Gradually increases charging current.
- 2. **Bulk:** Charges the battery at maximum current.
- 3. **Absorption:** Charges at a constant voltage.
- 4. **Stop Charging:** Charging stops once the battery is full.

The controller also features **Battery Wake-Up Tech™** to restore fully discharged Lead-Acid or Lithium batteries, maximizing battery performance and life.



Image: Graph illustrating the 4-stage charging process (Soft-Start, Bulk, Absorption, Stop Charging) for Lithium batteries, showing current and voltage curves.

## 7. MAINTENANCE

To ensure optimal performance and longevity of your Lnex MPPT Solar Charge Controller, perform the following maintenance tasks:

- Regularly inspect all wiring and connections for signs of wear, corrosion, or looseness. Tighten any loose connections.
- Keep the controller clean and free from dust and debris. Use a dry cloth to wipe the exterior.
- Ensure the ventilation openings are not blocked to allow for proper heat dissipation.
- Check the battery terminals for corrosion and clean if necessary.
- Monitor the display for any error codes or unusual readings.

## 8. TROUBLESHOOTING

If you encounter issues with your solar charge controller, refer to the following common problems and solutions:

| Problem                              | Possible Cause                                                                      | Solution                                                                                                          |
|--------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Controller not turning on/No display | Battery not connected or low voltage; reversed polarity.                            | Check battery connections and voltage. Ensure correct polarity. Charge battery if voltage is too low.             |
| No solar charging                    | Solar panel not connected; insufficient sunlight; reversed polarity; damaged panel. | Check solar panel connections and polarity. Ensure adequate sunlight. Inspect panel for damage.                   |
| Battery not fully charging           | Incorrect battery type setting; undersized solar array; battery degradation.        | Verify battery type setting in controller. Ensure solar array size matches battery capacity. Test battery health. |

| Problem              | Possible Cause                                            | Solution                                                                                                             |
|----------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Error code displayed | Specific system fault (e.g., over-voltage, over-current). | Refer to the controller's display for the specific error code and consult the manual for its meaning and resolution. |

If the problem persists after attempting these solutions, please contact LNEX customer support.

## 9. SPECIFICATIONS

Below are the technical specifications for the LNEX MPPT Solar Charge Controller 40A (Model PP2440):

| Feature                         | Specification                                                  |
|---------------------------------|----------------------------------------------------------------|
| Model                           | PP2440                                                         |
| System Nominal Voltage          | 12V/24V Auto                                                   |
| Max PV Open Circuit Voltage     | 100V DC                                                        |
| System Grounded                 | Negative Ground                                                |
| Conversion Efficiency           | 98%                                                            |
| Tracking Efficiency             | 99.5%                                                          |
| Max PV Charging Current         | 40A                                                            |
| Max. Recommended PV Input Power | 580 Watt (12V) / 1160 Watt (24V)                               |
| Battery Type Preset             | Crystal, Gel, AGM, Wet, Calcium, LiFePO4, LTO + CUSTOM SETTING |
| Housing Case Color              | Grey & Black                                                   |
| IP Grade                        | IP43 for Inside PCBA, IP22 for Connection Area                 |
| Operating Temperature           | -25 ~ 50°C / -13 ~ 122°F                                       |
| Storage Temperature             | -40 ~ 85°C / -40 ~ 185°F                                       |
| Operating Humidity Range        | 0-85% RH                                                       |
| Mounting                        | Surface Mounting                                               |
| Dimensions                      | 7.1" x 5.5" x 2.9" (180mm x 140.7mm x 73.7mm)                  |
| Item Weight                     | 2.65 pounds (1200 Grams)                                       |
| Display Type                    | LCD                                                            |
| Material                        | Polycarbonate (PC)                                             |



Image: Detailed specifications table for the LNEX MPPT Solar Charge Controller, including model numbers PP2430 and PP2440.

## 10. WARRANTY AND SUPPORT

The LNEX MPPT Solar Charge Controller comes with a 2-Year Limited Support. For technical assistance, warranty claims, or any questions regarding your product, please contact LNEX customer support. You can find contact information and additional resources on the official LNEX website or through your purchase platform.

### ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

#### Name

#### Email

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

#### Question

#### Details

[Submit question](#)