



## INSTALLATION AND OPERATION MANUAL



# NWCTRL3024

## INTELLIGENT SOLAR CHARGE CONTROLLER

Thank you for purchasing NetWave® from ComNet.

The NetWave® NWCTRL3024 controller is an intelligent and multifunctional solar charge controller. The customized LCD display screen provides a convenient interface. This controller features various control parameters that can be set to meet the application requirements. The NetWave® 3024 series controller has the following features:

- » Visual LCD graphic symbol
- » Brief key operation
- » Grade auto switch of system voltage
- » Intelligent PWM Charging Mode
- » Auto temperature compensation
- » Adjustable charging & discharging parameter
- » Settable working modes of loads
- » Accumulative function of charging & discharging AH
- » Protection for battery back discharging
- » Protection for battery low voltage
- » Overloading & short-circuit protection
- » Battery reversed protection
- » Delayed auto restart after overloading protection

## About This Guide

This guide is intended for different users such as engineers, integrators, developers, and technicians.

It assumes that users have knowledge of the following:

- » Installation of electronic equipment
- » Electrical regulations and guidelines

## Related Documentation

The following documentation is also available:

- » Solar Kit Installation manuals
- » Installation manual for mounting the solar panels
- » Solar Panel mounting instructions (included with the mounting hardware)

## Website

For information on ComNet's entire product line, please visit the ComNet website at <http://www.comnet.net>

## Support

For any questions or technical assistance, please contact your sales person ([sales@comnet.net](mailto:sales@comnet.net)) or the customer service support center ([techsupport@comnet.net](mailto:techsupport@comnet.net))

## Safety

- » Only ComNet service personnel can service the equipment. Please contact ComNet Technical Support.
- » The equipment should be installed in locations with controlled access, or other means of security, and controlled by persons of authority.
- » Do not install equipment on wet or windy days.
- » Make sure you have assistance mounting the hardware.
- » Complete as much of the setup as you can on the ground in a safe environment.

# Contents

<b>About This Guide</b>	<b>2</b>
Related Documentation	2
Website	2
Support	2
Safety	2
<b>Overview</b>	<b>4</b>
Legal Information	4
<b>Installation</b>	<b>5</b>
<b>Operation</b>	<b>6</b>
LCD Operation Status Symbols	6
Front Panel Button Functions	6
Parameter Review and Setting	7
<b>Troubleshooting</b>	<b>9</b>
Low voltage protection & disposal	9
Overloading protection & disposal	9
Short-circuit protection & disposal	9
Breakdown & disposal of solar panels	9
Current Load Breakdown	10
Other Operation Conditions	10
<b>Agency Compliance</b>	<b>11</b>
<b>GPL (General Public License) Statement</b>	<b>13</b>

## Overview

### Legal Information

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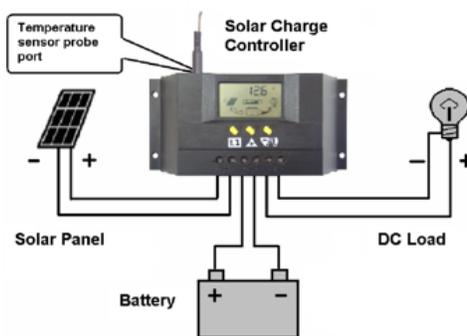
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## Installation

Prepare the necessary tools & cables. Use the appropriate cables to ensure the current density  $<4\text{A}/\text{mm}^2$  and for reducing cable voltage drop.

Recommendation 30 A using 10 mm<sup>2</sup> cable

- » Check whether installation location complies with the relative safety rules. Avoid installing and using the controller under the following conditions: wet, dusty places or places with flammable and explosive gases.
- » Install the controller at the vertical plane. In order to make the controller have good thermal dissipation, please ensure air flow space 10 cm above and below the controller.
- » Connect the loads, battery and solar panels with the controller in that order.



Connections

- » Plug the external thermal sensor into the interface of the thermal-sensor on the left of the controller.

**Attention:** It is highly recommended to set the maximum discharge voltage to 14.7 V for 12 V configurations and 29.4 V for 24 V configurations. Improperly configured maximum discharge voltage could result in poor battery performance.

**Disassembly:** To avoid damage to yourself or the unit, please dismantle the solar panels, battery, loads from the controller in exact reverse order.

**Attention:** Connecting the battery with reversed polarization will not damage the controller, but will cause safety risk on your loads.

# Operation

## LCD Operation Status Symbols

Symbol	Description	Symbol	Description
	Not supplying power for loads		Battery Not Charging
	Supplying power for loads, no current present in load loop		Battery Charging at Full Speed
	Current present in load loop		Float Charging for Battery
	Load Icon		System working normally
	Solar Panels Icon		System not working normally
	Load Light Control Icon		Battery Capacity Display
	Load Timing Control Icon		Battery Icon

## Front Panel Button Functions

Symbol	Description
	Interface button. Use this button to advance forward through the interfaces. The circular order is as follows: 
	Parameter positive (up) button. In Setting Adjustment mode, press this button for over 5 seconds to reset statistics.
	Parameter adjusting '-' button. At the main interface, this button can turn on or turn off the load.

## Parameter Review and Setting

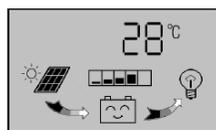
When the controller is correctly powered, it will first display battery voltage. This interface is the main interface of the controller. Press the  button to cycle through the interfaces. If the displayed interface can be adjusted, press and hold the  button for 5 seconds to enter Setting Adjustment mode. While in Setting Adjustment mode, the number on the interface will blink. You may now use the  and  buttons to adjust the displayed setting. When finished, press and hold the  button again to exit the Setting Adjustment mode, and the number will stop blinking.



**Battery Voltage** The displayed number is the current battery voltage. This is the main interface, and shows the charging and discharging state, battery capacity and battery voltage.



At this interface, you can press the  button to turn the load on or off. This button does not have this function at other interfaces.



**Environmental Temperature** Used for temperature compensation when the battery ceases charging. The displayed value is the ambient environmental temperature, in degrees Celsius, of the controller.



**Generating Current of Solar Panels** The displayed number is the generating current passing through the controller from the solar panels.



**Load Current** The displayed number is the load current.



**Cumulative Generating Ah of Solar Panels** The displayed number is the cumulative generating Ah of the solar panels. To clear the figure and begin a new count, press and hold the  button for 5 seconds..



**Cumulative Load Discharging Ah** The displayed number is the cumulative discharging Ah of loads. To clear the figure and begin a new count, press and hold the  button for 5 seconds.



**Low Voltage Protection** The displayed number is the protection voltage. If the battery voltage is lower than this voltage, the controller will disconnect the load loop to prevent the battery from over-discharging. Press and hold the  button for 5 seconds to enter Setting Adjustment mode, and the number starts to blink. Use the  and  buttons to adjust the protection voltage level. To save this new setting, press the  button for 5 seconds to exit Setting Adjustment mode.



**Review and set the recovery voltage for low voltage condition**

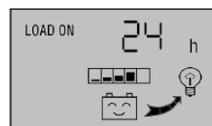
The displayed number is the recovery number. After the controller enters into low voltage protection state, and when the battery voltage recovers to be higher than the recovery voltage setting, then the controller will reconnect the load loop automatically.

Press and hold the button for 5 seconds to enter Setting Adjustment mode, and the number starts to blink. Use the and buttons to adjust the setting. To save this new setting, press the button for 5 seconds to exit Setting Adjustment mode.

**Review and set the maximum voltage charge setting**

The displayed number is the maximum voltage charge setting. When the battery voltage reaches this voltage, the controller will disconnect the charging loop to prevent the battery from overcharging. After the battery voltage drops, the controller will reconnect the charging loop.

Press and hold the button for 5 seconds to enter Setting Adjustment mode, and the number starts to blink. Use the and buttons to adjust the setting. To save this new setting, press the button for 5 seconds to exit Setting Adjustment mode.



**Load Mode**

Displayed is the review screen of the load mode. Different numbers represent different load modes.

**24h** - normal mode, wherein loads are under the condition of supplying power without breakdown;

**1h~23h** - indicates delayed mode of light control, wherein loads start to supply power after dark and shut down after working for the set number of hours.

**0h** - indicates light control, wherein loads start to supply power after dark and stop working after dawn.

Press and hold the button for 5 seconds to enter Setting Adjustment mode, and the number starts to blink. Use the and buttons to adjust the setting. To save this new setting, press the button for 5 seconds to exit Setting Adjustment mode.

## Troubleshooting

### Low voltage protection & disposal



*Low voltage protection & disposal*

If the screen appears as shown above, it means the battery voltage is lower than the protection voltage. The controller enters into the low voltage protection state and the load loop disconnects. Use the solar panels or charger to recharge the battery. When the battery voltage recovers to the protection voltage, the controller will resume normal operation and begin to supply power for load.

### Overloading protection & disposal



*Overloading protection & disposal*

If the screen appears as shown above, and the light bulb icon blinks, it means the current of the load loop is 1.2 times of the rated current within 3 seconds, and the controller has entered overload state. After removing some loads, the controller will resupply power to the loads automatically within a few seconds, or you can press  to recover the power supply manually.

### Short-circuit protection & disposal



*Short-circuit protection & disposal*

If the screen appears as shown above, and the light bulb icon blinks, there is a short-circuit detected in the load loop, and the controller has entered short-circuit protection state. Check whether the loads are damaged and whether the connecting cables are short-circuited. After eliminating the breakdown, press  to recover the power supply for the loads.

### Breakdown & disposal of solar panels

If the  icon blinks, the controller does not detect the existence of solar panels. Please check whether the connections of the solar panels is in good condition, and whether the cables connecting the solar panels and the controller are in open-circuit condition.

## Current Load Breakdown

If the  icon blinks when you turn on the load, it means the detected current is more than twice of the rated working current. Restarting the controller should correct this error.

## Other Operation Conditions

If you experience technical difficulties not described in this section, please contact ComNet for assistance.

## Agency Compliance

### FCC

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a Industrial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operations of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### Industry Canada

This Class A digital apparatus complies with Canadian ICES-003. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that permitted for successful communication. This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions:

- This device may not cause interference, and
- This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 Canada. Pour réduire le risque d'interférence aux autres utilisateurs, le type d'antenne et son gain doivent être choisies de façon que la puissance isotrope rayonnée équivalente (PIRE) ne dépasse pas ce qui est nécessaire

pour une communication réussie. Cet appareil est conforme à la norme RSS Industrie Canada exempts de licence norme(s). Son fonctionnement est soumis aux deux conditions suivantes:

### 17 Compliance

- Cet appareil ne peut pas provoquer d'interférences et

- Cet appareil doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement du dispositif.

### **RF Exposure Warning**

The antennas used for this transmitter must be installed to provide a separation distance of at least 2.52m from all persons and must not be located or operating in conjunction with any other antenna or transmitter.

Les antennes utilisées pour ce transmetteur doivent être installées en considérant une distance de séparation de toute personnes d'au moins 2.52m et ne doivent pas être localisées ou utilisées en conflit avec tout autre antenne ou transmetteur.

### **CE Marking**

CE marking on this product represents the product is in compliance with all directives that are applicable to it.

This equipment may be operated in the following countries:

Great Britain and Northern Ireland, Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Romania, Switzerland, Sweden

### **Installer Compliance Responsibility**

Devices must be professionally installed and it is the professional installer's responsibility to make sure the device is operated within local country regulatory requirements.

### **RoHS/WEEE Compliance Statement**

European Directive 2002/96/EC requires that the equipment bearing this symbol on the product and/or its packaging must not be disposed of with unsorted municipal waste. The symbol indicates that this product should be disposed of separately from regular household waste streams. It is your responsibility to dispose of this and other electric and electronic equipment via designated collection facilities appointed by the government or local authorities. Correct disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about the disposal of your old equipment, please contact your local authorities, waste disposal service, or the shop where you purchased the product.

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Contact information:

Email: [techsupport@comnet.net](mailto:techsupport@comnet.net)

Tel: 203-796-5300

Address: 3 Corporate Drive, Danbury, CT 06810 USA

We will reply within 7 working days once the request has been made through email or telephone.

**ComNet Customer Service**

Customer Care is ComNet Technology’s global service center, where our professional staff is ready to answer your questions at any time.

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