

Smart Load Balancer AC550

User Manual

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Rheidon+



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SAFETY INFORMATION

General Safety Information

Read this manual carefully before installing, operating, or servicing the product. Failure to follow the instructions in this manual may result in personal injury, property damage, or malfunction of the equipment.

Keep this manual for future reference.version and firmware updates.

Symbols Used in this Manual and on the Product

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death, serious injury, or equipment damage.

CAUTION

Indicates a situation which, if not avoided, may result in minor injury or equipment damage.

NOTICE

Provides important information regarding installation, operation, or maintenance.

The following symbols may appear on the product, packaging, or documentation:

Read Manual



CE Marking



WEEE



Qualified Personnel

Installation, commissioning, maintenance, and removal of the AC550 must be carried out by qualified electrical personnel. All work shall comply with applicable national and local electrical regulations.

SAFETY INFORMATION

Electrical Safety

DANGER Risk of Electric Shock

Before performing any installation or maintenance work:

- Disconnect all relevant circuits from the power supply.
- Verify absence of voltage using a suitable voltage tester.
- Prevent accidental re-energization.
- Follow local lockout/tagout procedures where applicable.
- Use appropriate personal protective equipment.

Failure to observe these precautions may result in serious injury or death.

PRODUCT OVERVIEW

Intended Use

The AC550 is a smart load balancing and charger group control device for compatible Rheidon EV chargers.

It monitors building power consumption, distributes available charging capacity, and coordinates up to 10 chargers within the same local network.

The integrated communication gateway enables continued local charger control even during internet outages.

Main Functions

Function	Description
Load Balancing	Prevents overload of the main supply
Group Control	Controls up to 10 chargers
Priority Charging	User-defined charging order
Power Allocation	Equal or priority distribution
PV Charging	Supports solar charging modes
Offline Operation	Local control continues without internet

Product Limitations

The AC550 is designed to manage compatible Rheidon EV chargers only.

The AC550 does not:

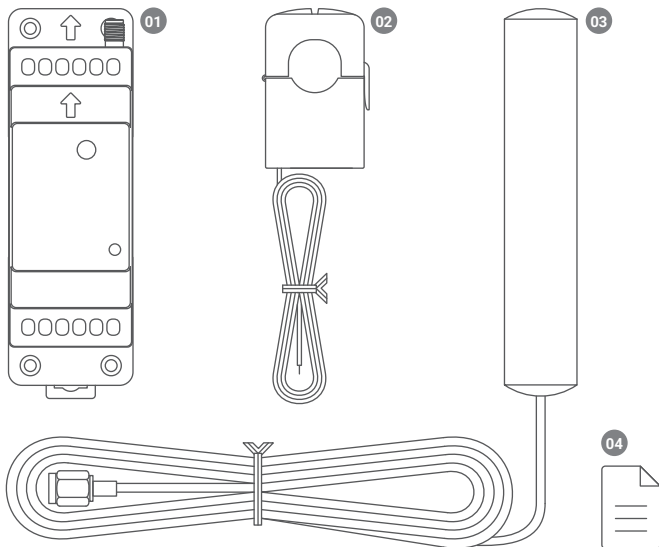
- Act as a circuit breaker, protective device, or emergency disconnect device.
- Function as a revenue-grade energy meter.
- Switch, interrupt, or disconnect the building power supply.
- Control household appliances or other external electrical loads.

Electrical protection remains the responsibility of the installation's circuit breakers, RCDs, fuses, and other protective devices.

PRODUCT OVERVIEW

Package Contents

Verify that all items are present before installation.
Standard package contents:

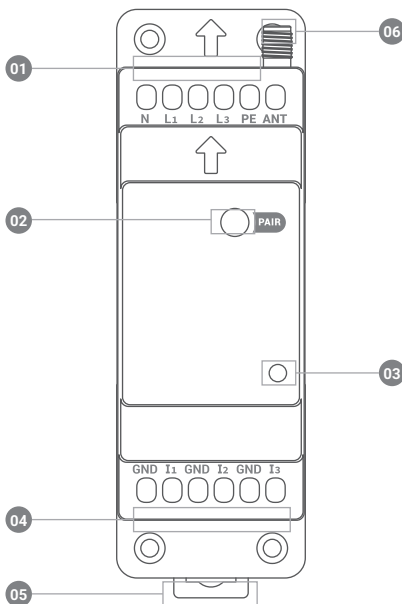


- 01** AC550 Smart Load Balancer ×1
- 02** Split-core current transformer clamps (CT) ×3
- 03** Screw-mount Wi-Fi Antenna ×1
- 04** User Manual ×1

Package contents may vary depending on product version and region.

PRODUCT DESCRIPTION

Device Overview



- 01 Power Input Terminals (N, L1, L2, L3, PE)
- 02 Multi-function Button (Pairing / Local Pause Feature)
- 03 Status LED Indicator
- 04 CT Input Terminal
- 05 DIN Rail Mounting Clip
- 06 External Wi-Fi Antenna Port (SMA Male Connectors)

Refer to "System Operation & Controls" for button functions.

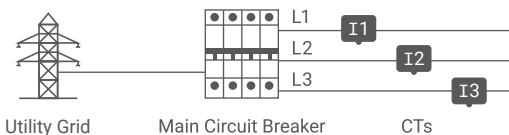
Refer to "Status & Troubleshooting" for LED meanings.

PRODUCT DESCRIPTION

Split-core Current Transformer Clamps (CT) Wiring Rules

Rule 1

The CT clamps must be installed on the incoming main supply conductors and connected as follows:

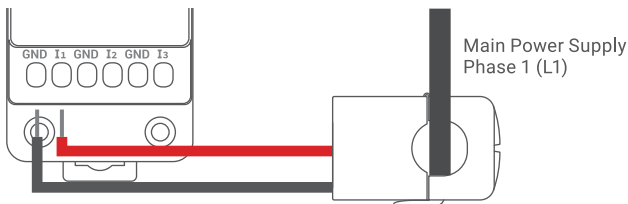


Rule 2

Connect the CT wires to the corresponding terminals:

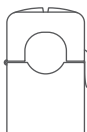
Red wire → Signal input (I1 / I2 / I3)

Black wire → GND



Rule 3

Ensure each CT clamp is fully closed and securely fitted around the conductor.



Correct CT Installation



Incorrect CT Installation

PRODUCT DESCRIPTION

WARNING

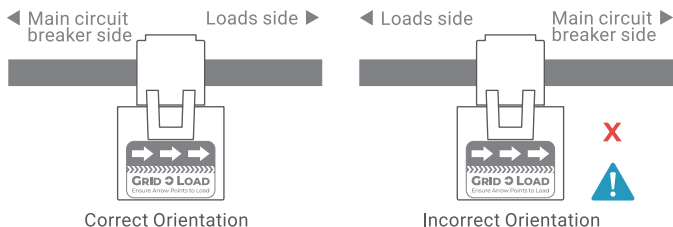
Incorrect CT installation may result in inaccurate measurements and incorrect charging power allocation.

Verify CT orientation, phase assignment, and wiring before powering on the system.

Split-core Current Transformer Clamps (CT) Direction

The CT arrow must point from the utility grid towards the building load.

Incorrect CT orientation may result in inaccurate measurements and improper load balancing operation.



NOTICE

Reversed CT orientation may cause incorrect power flow detection and reduce load balancing accuracy.

TECHNICAL SPECIFICATIONS

General Specifications

Electrical Rating	230/400 V AC, 1p / 3p, 50/60 Hz
Power Consumption	≤ 3 W
System Compatibility	Single-phase and Three-phase Systems (TN / TT Grid Configurations)
Maximum Managed Chargers	10 Units
Weight	Approx. 200 g (without packaging)

Hardware & Installation

Dimensions	112 × 37 × 70 mm (Excluding DIN rail spring)
Cable Cross-section	0.5 - 2.5 mm ²
AC Input Terminal	5-pin Screw Terminal (L1, L2, L3, N, PE)
Signal Input Terminal	6-pin Screw Terminal (GND, I1, GND, I2, GND, I3)
CT Connection	Supports 3 × Split-core CT Clamps (for L1, L2, L3)
Housing Material	PC (impact-modified), UL94 V-0
Installation Environment	Inside electrical distribution cabinet
DIN Rail Mounting	Standard 35 mm DIN Rail (2 Modules)
Status Indication	RGB LED

Operation & Access

Control Method	Mobile app (Wi-Fi / Bluetooth)
Firmware Update	OTA via Mobile App

Communication Modules

Wi-Fi Module	IEEE 802.11 b/g/n, 2.4 GHz (2412-2484 MHz, WPA2)
Bluetooth Module	BLE 5.0, 2.4 GHz
Detachable Antenna	Screw-mount Wi-Fi antenna with 3m adhesive base

System Status & Environment

Operating Temperature	-30 °C to +50 °C
Storage Temperature	-40 °C to +60 °C
Operating Relative Humidity	5% to 95% RH (Non-condensing)
Altitude Limit	≤ 3000 m

Compliance

Standards	EN 18031-1 EN 300 328 EN 301 489-1 EN 301 489-17 EN 62311 RoHS (2011/65/EU) & REACH WEEE (2012/19/EU)
Warranty	2 Years (Statutory consumer rights remain unaffected by this warranty)

Installation Requirements

The electrical enclosure must:

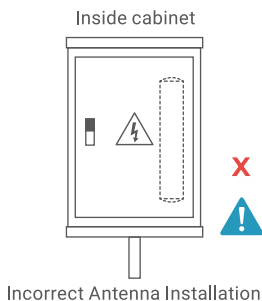
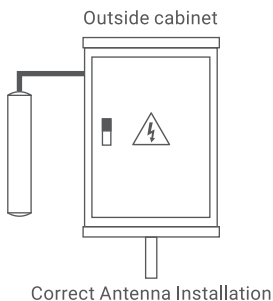
- Provide sufficient installation space.
- Support DIN rail mounting.
- Be suitable for indoor electrical installations.
- Be protected against moisture and environmental contamination.

The installer must verify correct phase assignment before commissioning.

External Antenna Placement Requirements

For reliable wireless communication, install the Wi-Fi antenna outside the electrical cabinet.

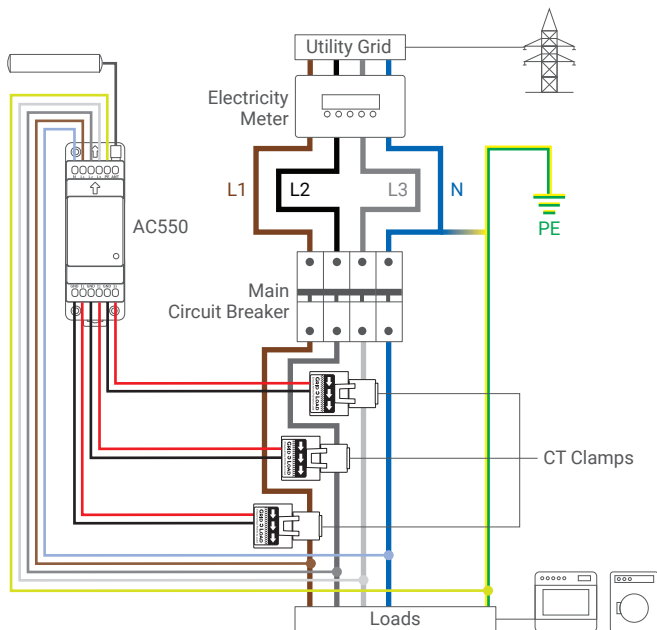
Do not install the antenna inside a closed metal enclosure, as this may reduce signal strength and communication performance.



INSTALLATION

System Wiring Diagrams

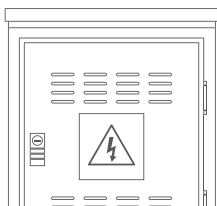
- **Grid Compatibility:** The AC550 is designed for TN and TT systems only. Do not install the device on IT systems.
- **Phase Matching:** Ensure that the CT channels correspond to the same phases shown in the wiring diagram.
- **CT Orientation:** Install the CT clamps as shown in the wiring diagram.
- **Single-Phase Setup:** Connect L1, N, and PE only, and use one CT on I1. Leave L2, L3, I2, and I3 unused.



INSTALLATION

Installation Procedure

1



Disconnect the power supply

2

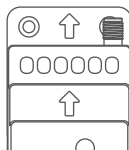


Install the Wi-Fi antenna outside the electrical cabinet

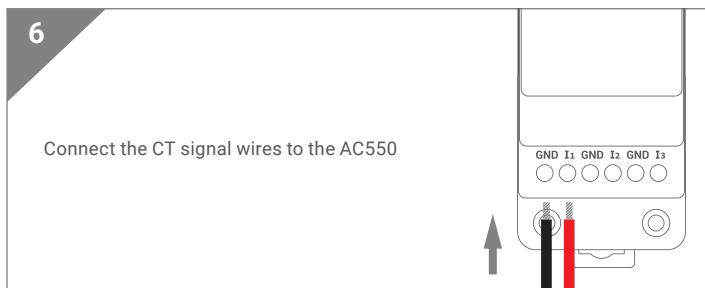
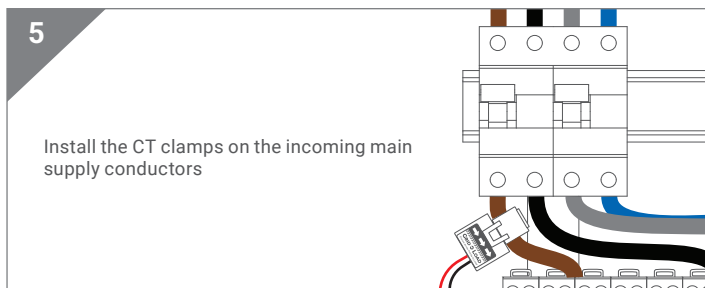
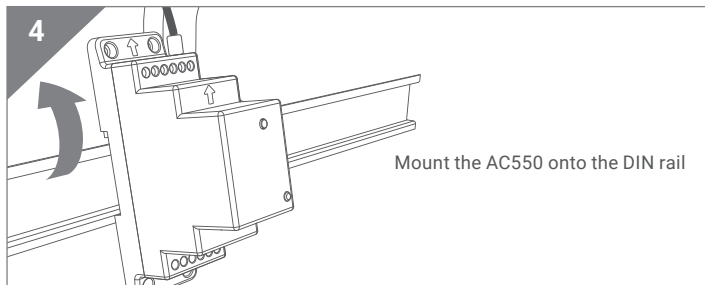
3



Route the antenna cable into the cabinet



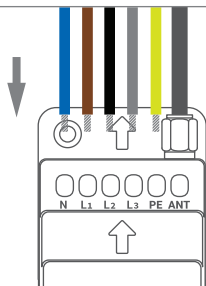
INSTALLATION



INSTALLATION

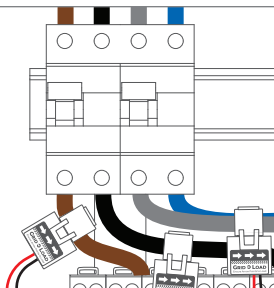
7

Connect the AC power supply terminals



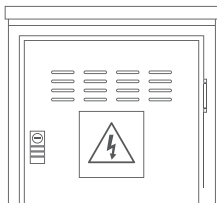
8

Verify all wiring connections



9

Restore power and verify normal operation



APP CONNECTION & PAIRING

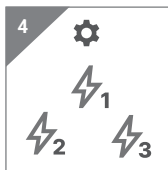
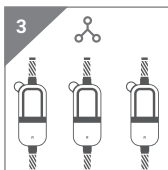
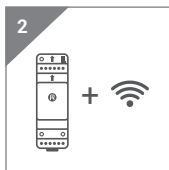
App Information

The Rheidon App is continuously updated to improve functionality and user experience. App screens, feature names, and setup procedures may change without notice. For the latest instructions and feature availability, follow the guidance provided in the current version of the Rheidon+ App.

App Connection & Pairing

Use the Rheidon+ App to:

1. Add the AC550 to your account
2. Connect the AC550 to a local Wi-Fi network
3. Link compatible Rheidon EV chargers
4. Configure load management settings



NOTICE Set a Fixed IP for AC550

After Wi-Fi setup and device pairing, we recommend assigning a **fixed (static)** IP address to the AC550 in your home router settings.

This ensures stable local communication and prevents connection issues caused by IP address changes.

Charging Management on App

The following functions can be configured through the Rheidon App:

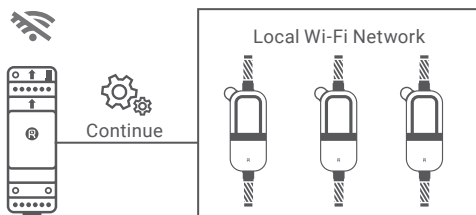
- Load Management
- Charger Group Management
- Priority Charging
- Solar (PV) Charging

APP CONNECTION & PAIRING

Offline Operation

If the internet connection is unavailable, the AC550 can continue local communication and load management functions within the local network.

Some remote monitoring and cloud-based functions may be unavailable until the internet connection is restored.



Measurement Characteristics

The AC550 uses external current transformers (CTs) to monitor electrical load and manage charging power.

Displayed electrical values, including current, voltage, power, and energy consumption, are intended for monitoring and load management purposes only.

Measurement accuracy may be affected by:

- CT accuracy class
- CT installation position and orientation
- Wiring configuration
- Power quality and environmental conditions

Minor differences between displayed values and utility meters, vehicle displays, or other monitoring devices are normal.

The AC550 is not intended for billing or revenue-grade energy measurement.

SYSTEM OPERATION & CONTROLS

Manual Override Button

The AC550 is equipped with a physical button that provides direct local control in situations where App control is unavailable or immediate manual intervention is required.

Function purpose:

Allows local control of charging behavior without relying on cloud or App connectivity.

Group Control Pause / Resume

When to use:

Use this function when centralized load balancing or group control needs to be temporarily suspended, for example during network interruption or when maximum charging power is required.

How to operate:

Double-press the physical button on the AC550.

System behavior:

Group control and power distribution management will be temporarily paused. Connected charging stations will switch to independent operation and may charge up to their configured maximum capacity.

How to restore:

Double-press the button again to resume normal group control operation.

CAUTION

During this mode, centralized load balancing is disabled. Ensure the total electrical load remains within installation limits to avoid overloading or tripping the main circuit breaker.

SYSTEM OPERATION & CONTROLS

Wi-Fi Reset

How to operate:

Press and hold the physical button for 5 seconds to reset the Wi-Fi connection.

System behavior:

The device will clear the current Wi-Fi configuration and restart the network connection process.

NOTICE

This function is not available when the device is in unpaired state.

Fail-Safe Protection (Communication Loss Behavior)

The AC550 includes an automatic safety fallback in case of local communication loss between the charging stations and the controller.

Trigger condition:

If a charging station loses communication with the AC550 due to local network failure or severe signal interference.

System behavior:

The affected charging station will automatically reduce its charging current to a safe minimum level (e.g. 6A per phase).

Safety purpose:

This ensures that charging continues in a safe mode when centralized load management is unavailable, helping to prevent electrical overload of the installation.

STATUS & TROUBLESHOOTING

LED Status Indicators

The LED indicator provides visual feedback regarding the current operational state of the system. Refer to the table below for diagnostics:



Green breathing light

- Normal Operating State

The system is running smoothly with all functions fully operational.



Red flashing light

- Wi-Fi Network Error

Incorrect Wi-Fi credentials (SSID/password), or the Wi-Fi network has lost its internet/Ethernet connection.



Green flashing light

- Bluetooth Pairing / Provisioning

The AC550 is powered on and waiting for Bluetooth pairing, or Bluetooth has successfully connected to the App during the network configuration process.



Solid green light

- Provisioning Successful

Network setup is successful. Bluetooth is now disabled, Wi-Fi is active, and the device is ready/waiting to connect to new chargers.



Alternating red and green flashing light

- Cloud Connection Lost (LAN Protection Active)

The device is controlling chargers but has lost connection to the cloud server. However, the local network (LAN) fail-safe protection remains active.



Red breathing light

- System Failure / Local Network Abnormal

The device is controlling chargers, but either the local network or its internal status is abnormal. It cannot perform its control duties, and management features are currently disabled/failing.

STATUS & TROUBLESHOOTING

Troubleshooting

- Device cannot be paired with the App

Possible causes

- Bluetooth is disabled on the mobile device.
- The AC550 is not in pairing mode.
- The mobile device is too far from the AC550.

Recommended actions

- Enable Bluetooth.
- Enter pairing mode and retry.
- Move closer to the device.

- Device cannot connect to the cloud

Possible causes

- Wi-Fi network unavailable.
- Internet connection unavailable.
- Incorrect Wi-Fi credentials.

Recommended actions

- Verify Wi-Fi availability.
- Check internet access.
- Reconfigure Wi-Fi settings if necessary.

- Group control is unavailable

Possible causes

- Communication interruption between the AC550 and charging stations.
- Local network instability.

Recommended actions

- Check local network connectivity.
- Verify charging stations are online.
- Restart affected devices if necessary.

- Device indicates a fault (LED Red breathing light)

Possible causes

- Internal system error.
- Network configuration issue.

Recommended actions

- Restart the device.
- Perform Wi-Fi reset.
- Contact technical support if the issue persists.

REGULATORY

EU Compliance

This product complies with all applicable European directives and bears the CE marking, including:

- RED (Radio Equipment Directive) 2014/53/EU
- LVD (Low Voltage Directive) 2014/35/EU
- EMC (Electromagnetic Compatibility Directive) 2014/30/EU
- RoHS Directive 2011/65/EU & (EU) 2015/863
- WEEE Directive 2012/19/EU

The EU Declaration of Conformity is available upon request via - support@rheidon.com

Disposal and Environmental Protection

Consumers are legally required to properly dispose of electrical and electronic equipment, including any integrated bulbs and batteries, at the end of their service life. These items may be returned free of charge to designated public collection points or through retailers where applicable.

Users are responsible for deleting any personal data stored on the product before returning it. Any batteries or light sources that are not permanently integrated into the equipment and can be safely removed must be removed and disposed of separately before disposing of the main product.

Detailed requirements for legally compliant disposal may vary according to applicable local regulations. The symbol of a crossed-out wheeled bin indicates that electrical and electronic equipment and batteries must not be disposed of as household waste at the end of their service life.

Where applicable, the characters displayed below this symbol indicate substances contained in the product (for example: Pb for lead, Hg for mercury, Cd for cadmium).

By separately collecting, recycling, and reusing electrical and electronic equipment and batteries, you contribute to protecting human health and the environment.

Limited Warranty

- This product is covered by a limited manufacturer's warranty for a period of 2 years from the date of purchase.
- The warranty covers defects in materials and workmanship under normal use and installation conditions.
- If a covered defect is confirmed, Rheidon may repair or replace the product at its discretion.
- The warranty does not extend the original warranty period.

Exclusions

The warranty does not cover:

- Incorrect installation or misuse.
- Failure to follow this manual.
- Unauthorized modifications or repairs.
- Damage caused by accidents, fire, flooding, lightning, or other external events.
- Normal wear and cosmetic damage.

Warranty Claims

To submit a warranty claim:

1. Prepare proof of purchase
2. Contact support@rheidon.com
3. Provide a description of the issue and relevant product information

IMPORTANT: Do not return any product without first contacting customer support. Unauthorized returns may be refused and returned at the sender's expense.

- Provider / Manufacturer: Shenzhen Rheidon Tech Limited
- Website: www.rheidon.com
- E-Mail: support@rheidon.com

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RHEIDON TECH



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