

RAK9155 Quick Start Guide

Overview

Safety Instructions

This manual contains important instructions and warnings that must be followed during the installation and maintenance of the RAK Battery Plus system.

RAK9155 installation and service require knowledge of DC electricity and should only be performed by certified installers (either locally or by RAKwireless). RAKwireless assumes no liability for injury or property damage due to repairs attempted by unqualified individuals or a failure to properly follow the instructions provided.

Used Symbols

These symbols indicate important safety information in this guide or on the equipment:

Documentation

-  **WARNING** - Indicates a hazardous situation that if not avoided, could result in injury.
-  **CAUTION** - Indicates a hazardous situation that, if not avoided, could result in minor injury or damage to the equipment.
-  **NOTE** - Indicates an important step or tip that leads to the best results, but is not safety or damage-related.

Equipment



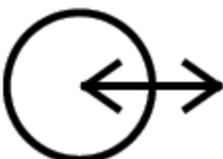
- **REFER TO THE OPERATING INSTRUCTIONS:** Indicates that the user should refer to operating or installation instructions before proceeding.



- **RISK OF ELECTRIC SHOCK:** Indicates components that present a risk of electrical shock.



- **5 minutes CAUTION, RISK OF ELECTRIC SHOCK, ENERGY STORAGE TIMED DISCHARGE:** Discharge time is 5 minutes from de-energization.



- **BIDIRECTIONAL TERMINAL:** Indicates the location of the combined input/output connector on the equipment.



- **PROTECTIVE CONDUCTOR TERMINAL:** Indicates the location of the grounding connection on the equipment.

General Warnings and Cautions

WARNING

- Read this entire document before installing or using RAK9155. Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, or damage to the device, potentially rendering it inoperable.
- A battery can present a risk of electrical shock, fire, or explosion from vented gases. Observe proper precautions.
- RAK9155's installation must be carried out only by certified well trained professionals.
- Use RAK9155 only as directed.
- Do not use RAK9155 if it is defective, cracked, broken, damaged, or fails to operate.
- Before beginning the installation, ensure that the RAK9155 is switched off. Open any associated circuit breakers and disconnect switches (if applicable for the installation).
- Do not attempt to open, disassemble, repair, tamper with or modify the device. The batteries, BMS PCBA, bus board, and solar charger in RAK9155 are replaceable. Contact RAKwireless or the certified installer who installed it for any repairs.
- Handle with care to protect RAK9155 and its components from damage when transporting. Do not impact, pull, drag, or step on RAK9155. Do not subject RAK9155 to any strong force. To prevent damage, leave RAK9155 in its shipping packaging until it is ready to be installed.
- Do not insert foreign objects into any part of RAK9155.
- Do not expose RAK9155 or its components to direct flame.
- Do not install RAK9155 near heat sources.
- If there is a chance for the ambient temperature to reach 55 °C or higher, make sure to shield RAK9155 from direct sunlight either by placing the device under the solar panel or other type of shield.
- Do not immerse RAK9155 or its components in water or other fluids.

CAUTION

- Do not use solvents to clean RAK9155, or expose RAK9155 to flammable or harsh chemicals or vapors.
- Do not use fluids, parts, or accessories other than those specified in this manual including the use of non-genuine RAKwireless parts or accessories, or parts or accessories not purchased directly from RAKwireless or a RAKwireless-certified party.
- Do not keep RAK9155 in storage conditions for more than one month without performing a charge-discharge cycle.
- Do not connect RAK9155 directly to the utility wiring.
- When installing RAK9155 in a garage or near vehicles, keep it out of the driving path. If possible, install RAK9155 on a sidewall and/or above the height of vehicle bumpers.

Environmental Conditions

WARNING

- Install RAK9155 in a location that prevents damage from flooding.
- Operating or storing the RAK9155 in temperatures outside its specified range might cause damage to the device.
- Do not expose RAK9155 to an ambient temperature above 45 °C or below -20 °C.

Safety Precautions

RAK9155 is designed with full consideration for safety. However, all electrical appliances can be dangerous if used inappropriately; **it can cause a fire or electric shock that leads to severe injury. For your protection, please read these safety precautions thoroughly.**

- **Instructions**

Use designated cable. A non-designated cable use can cause an electric shock. Be sure to use the cable designated in this manual.

- **Prohibitions**

Do not damage cables. If you damage a cable, it can cause a fire or electric shock.

1. Do not work over or damage a cable.
2. Do not place heavy objects on a cable or pull the cable.
3. Do not place a heater near the cable, which may result in the cable overheating.
4. Do not tuck down a cable when installing in a rack.

- **Instructions**

Connect the power cable and the communication cable properly.

If you connect a power cable improperly, contact resistance will increase and it may damage the parts or cause a fire.

Insert the connector of the communication cable all the way in. If it is connected improperly, the system may be deactivated.

- **Prohibitions**

1. Do not install in a closed area. If the module/controller is installed in a closed area with no air-conditioning, heat may build up inside the set and cause a fire.
2. Do not place the set in direct sunlight or near a heater. Doing so can cause deformation, a breakdown, or a fire. Pay extra attention when you place the set near windows.
3. Do not install the set where excessive oil smoke, steam, moisture, or dust is contained in the air. If the set is installed in such a place, it may cause a fire or electric shock.

- **Instructions**

1. Wear insulating gloves and protection glasses during installation and connection
2. Wear insulating gloves and protection glasses during the installation and connection of the set to prevent electric shock or other injuries.

- **Keep Dry**

1. Do not allow water and/or foreign objects inside the battery.
2. Water or foreign objects inside the battery can cause a fire or electric shock.
3. If any water or foreign objects inside the battery, in case any malfunction happens, please turn off the POWER ON/OFF switch in order to shut down, and remove the power connector from **RAK9155**.

- **Do not disassemble**

Do not open the set unnecessarily. Opening and modifying the unit can cause a fire or electric shock.

⚠ CAUTION

If you ignore any of the following instructions, it can cause injury or damage to nearby products.

- **Prohibitions**

Do not cover the vent. If the vent is covered, heat may build up inside the set and cause an accident.

1. Remove any dust buildup in the vent.
2. Do not place it on a shag carpet.
3. Do not cover the vent with a cloth, etc.

- **Instructions**

Install in a stable place.

1. If you install the set in an unstable place, such as an unstable rack, it may fall and cause injury.
2. Do not install upside down or sideways. The set may drop and cause injury.

- **Instructions**

Use the designated packaging materials for transportation. If you do not use the designated packaging materials, the packaging material may be damaged by vibration during transportation and it may cause injury.

- **Instructions**

Install based on the designated way of installation. If you do not follow the designated way of installation, the set may drop due to the strength poverty and can cause injury.

- **Keep Dry**

Do not touch with wet hands. If you touch the set with wet hands, it may cause an electric shock.

- **Instructions**

Install other equipment or accessories properly. If you inadequately install other equipment or accessories sold separately, they may fall and cause injury. When you install any of the following accessories, install it properly based on this manual.

- **Instructions**

Set up cables properly If your foot is caught by a cable, the set may fall and cause injury. Connect and install cables carefully.

- **Instructions**

Power off at a malfunction. If any malfunction happens, please turn off the power switch to shut down and remove the power connector from the power connector terminal.

- **Prohibitions**

Do not put anything, stand or sit on the set. If you put anything heavy on the set, it may damage the product.

- **Instructions**

Follow the related laws or ordinances for disposal. When you dispose of this product, do not dispose of the product as general waste.

- **Instructions**

Disposal with specified method Contact technical vendor when you discard. Do not disassemble, destroy, or dispose of in fire.

⚠ WARNING

If liquid is leaking from the product, observe the following measures.

Do not allow the liquid to come in contact with skin or clothing.

1. If the liquid comes in contact with skin or clothing, wash thoroughly with plenty of water.
2. If the liquid gets into the eyes or mouth, flush immediately with clean water, and immediately seek medical treatment.
3. Contact customer service.

Precautions for Use

In the case of a failure, or any of the abnormalities shown below, turn off the unit and contact RAKwireless customer service.

- Abnormal sound, smell, or smoke.
- Water or particles inside the product.
- The product is dropped, or the outer shell is damaged.

Replace the module with a new one if discharge time at room temperature is noticeably short, even from fully charged.

DO NOT

- Disassemble.
- Modify the product (Modification may destroy the protection function inside, or cause abnormal charge/discharge, heat generation, gas eruption, or fire).
- Touch the rear output terminal except for the installation.
- Throw the product into fire or heat, or otherwise expose the set to heat or naked flame.
- Submerge the product in liquid or allow it to become wet.
- Apply strong shock, crush, or drop.
- Use for medical purposes.
- Place any foreign objects inside.
- Connect any devices that exceed the operating voltage and current range.
- Unplug the power connector from the terminal while the power is on.
- Hammer a nail or punch a hole in the product.
- Touch the output positive and negative cable ends together.

Specifications

Specifications

Parameter	Value
Cell Type	LiFePO4 (LFP)
Rated Voltage (V)	12.8
Rated Capacity (Ah)	50
Rated Energy (Wh)	600
Usable Battery Capacity (Ah)	50
Usable Battery Energy(Wh)	600
Battery Depth of Discharge	100%
Battery Max Charge/Discharge Power(W)	128/128
Configuration	1P4S
Working Voltage Range (V)	10.0~14.6
Standard Charge Current (A)	8
Max. Continuous Charge Current (A)	10
Standard Discharge Current (A)	8
Max Continuous Discharge Current(A)	10
Rated DC Power(W)	102.4
The short circuit current	40A
Standard Charging Method	0.1C CC to 14.6V
Working Temperature (°C)	Charging: 0 ~55; Discharging: -15~55
Heating at Low Temperature	Start heating at 0°C; Stop heating at 3°C.
Heating Power (W)	60
Working ROH	20%~80%
Storage Temperature (°C)	-20~50
Self-discharging rate	≤5% (25 °C, 50% SOC)
SOC at the end of product line	50%

Parameter	Value
Voltage Difference in each module (mV)	≤20
IP Rating	IP65
Recommended Usage (indoor/outdoor)	Outdoor
Net Weight (kg)	~8 kg
Dimension (L/W/H, mm)	499x280x75 (±3) mm

Interfaces

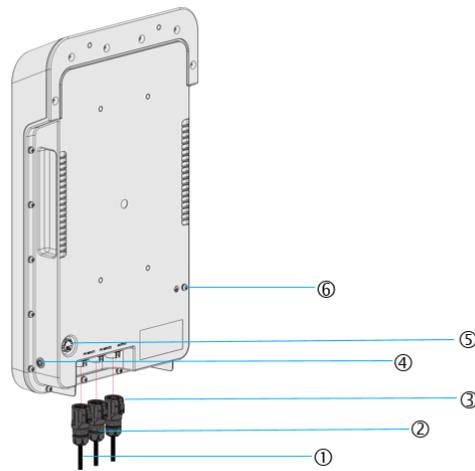


Figure 1: Right-Rear View of L051100-A

Item	Name	Model	Remarks
1	PV Input 1	LP-16-C02PE-02-001	IP67, 2pins, Pin1-Positive; Pin2-Negative, Max. current 10A
2	PV Input 2	LP-16-C02PE-02-001	IP67, 2pins, Pin1-Positive; Pin2-Negative, Max. current 10A
3	Output	LP-16-C04PE-02-001	IP67, 4pins, Pin1-Positive (Red), Pin2-Negative (Yellow-green), Pin3-RS485A (Brown), Pin4-RS485B (Blue)
4	Power Switch	MPB12-SL4P-FRG3-B7	Turn on/off the battery
5	Valve	GLS-VTB-M12	Safety valve
6	GND	M4	Yellow-Green

Installation

Pre-Installation Preparation

The equipment is heavy, please ensure personal safety when carrying it. During installation, please ensure the installer complies with all the necessary safety regulations to ensure personal safety. Do not place equipment and mounting kit on pedestrian walkways to avoid accidental damage to equipment.

Carry the Equipment

You can carry the equipment with both hands. If the equipment is lifted with one hand, a handle needs to be installed. The handle is fixed to the equipment with two M6 screws. Before lifting the equipment, please confirm that the screws are fixed securely. You can remove the handle before installing the device.

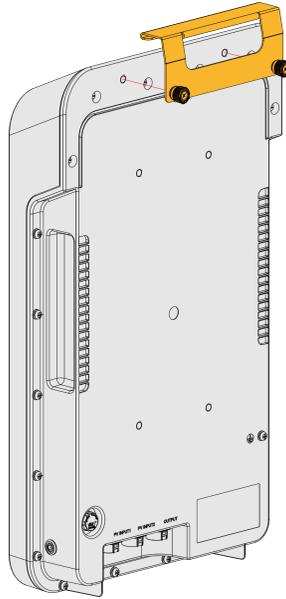


Figure 2: Handle installation

Installation

 **NOTE**

The diameter of the pole that is supported by the brackets is 50-75mm. If the pole diameter is more than this value, larger hose clamps can be used. The standard mounting kit does not include larger hose clamps. If needed, they should be purchased separately.

1. Fix the mounting bracket on the pole with three hose clamps.

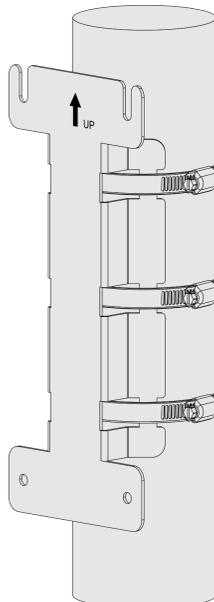


Figure 3: Fix mounting bracket

2. Install two M6 screws on the back of the equipment, leave a gap of about 3 mm.
3. Connect the Cables to the circular connectors. The other terminal of 2pin cables (PV INPUT1 and PV INPUT2) are connected to the PV panel outputs.

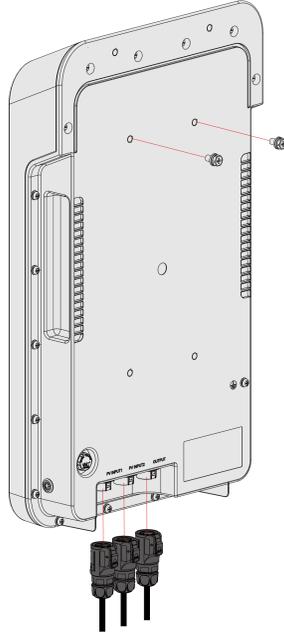


Figure 4: Install screws and connect cables

 **NOTE**

The cables should be connected before installing equipment on the pole, otherwise it is difficult to do it. Before cable connection, make sure the pin definition of the cables connected to PV panels is correct.

4. First, hang the equipment on the mounting bracket, then tighten the two screws that were left loose and screw the other two screws to secure the mount.

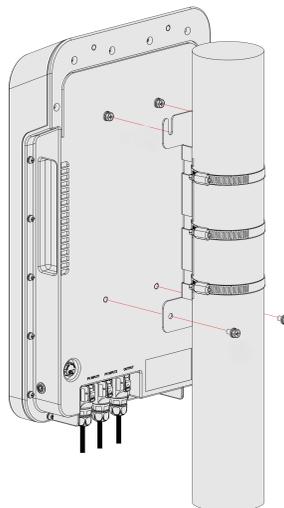


Figure 5: Fixing the equipment to the pole

5. Loosen the screw at the lower-left corner of the equipment (there is a Ground indicator on the side), connect the ground wire using the screw provided to the equipment. To complete the ground connection, lead the ground wire to the ground.

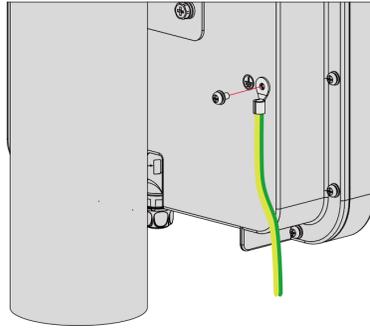


Figure 6: Grounding

 **NOTE**

The ground wire is not provided with the kit. Determine the actual distance needed before purchasing/procuring the ground cable.

Power ON and OFF

 **NOTE**

Double-check the precautions for use in section **Precautions for Use**.

System Power ON

1. Press the Power Switch button, green LED should be blinking.

 **NOTE**

When RAK9155 is connected to the solar panel during the day, it's normal to see a green LED blinking without turning on the Power Switch button. Turn on the Power Switch even though the green LED is blinking. If RAK9155 does not connect to either the load or the solar panel, the green LED would be off in 2 minutes.

System Power OFF

 **WARNING**

Confirmed that the system is off before taking off the DC cables.

1. Press the Power Switch button, the green LED should turn off.
2. Remove the PV INPUT cables first, and then the OUTPUT cable.

Transportation and Storage

Transportation

It is forbidden to encounter serious vibrations and shock during transportation.

Storage

If the system is not placed to use, it must be properly stored.

- It should be stored in 60% SOC status.
- It should be stored in a well-ventilated environment, Temp. < 35 °C, ROH <65%.
- It should be stored avoiding humid conditions.
- It should be stored in a place where it can be monitored by a professional.

Disclaimer

It should be noted that RAKwireless shall not be liable if any necessary materials are added to this user's manual without further informing the already existing customers.

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