Maintenance and troubleshooting of energy systems

Regular maintenance of energy systems is essential. It avoids costly breakdowns and improves plant efficiency.

This course will give you the skills to perform effective maintenance and intervene in the event of a failure.

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Go shop ACADEMY

Course objectives

Preventive maintenance

Learn techniques to prevent breakdowns before they happen.

Maintenance corrective

Control the necessary interventions after a breakdown.

Diagnostic

Effectively identify the root cause of technical problems.

Security

Safely work on energy installations.

Importance of preventive maintenance

1 **Failure prevention**

Identify and correct problems before they escalate.

2 **Performance Optimization**

Maintain optimal plant performance.

3 **Security**

Reduce the risk of dangerous failures.

Maintenance procedures preventive

1

Visual inspection

Check the connections and cleanliness of the device.

2

Checking settings

Control configuration via VictronConnect.

3

Firmware update

Install the latest available updates.

4

Performance testing

Perform periodic function tests
Main.

Case in point : Drop in production

Problem

A company sees a drop of energy production.

Diagnostic

Inspection reveals a build-up of dust on the panels.

Solution

A simple cleaning is carried out.

Result

Initial performance is restored.

Cleaning the solar panels

Why clean?

Dust reduces the effectiveness of the panels. Regular cleaning ensures optimal performance.

When to clean?

Every 3 to 6 months depending on the environment.

How to clean?

Use clean water and a soft cloth. Avoid harsh detergents.

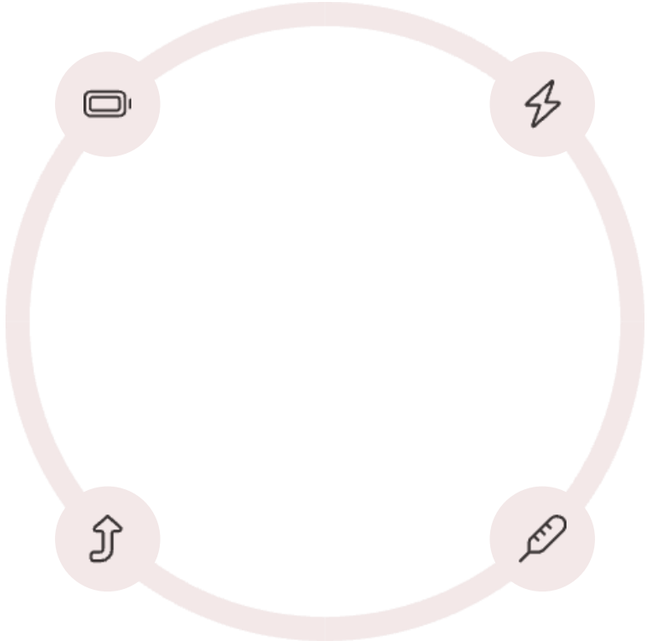
Battery control

Regular inspection

Check the condition of lithium or lead-acid batteries.

Charge Level

Avoid deep discharges to prolong service life.



Voltage check

Make sure the voltage is in accordance with the manufacturer's specifications.

Temperature control

Prevent overheating that could degrade the battery.

Case in point : Battery problem

Problem

An NGO notes a rapid decline in battery capacity.

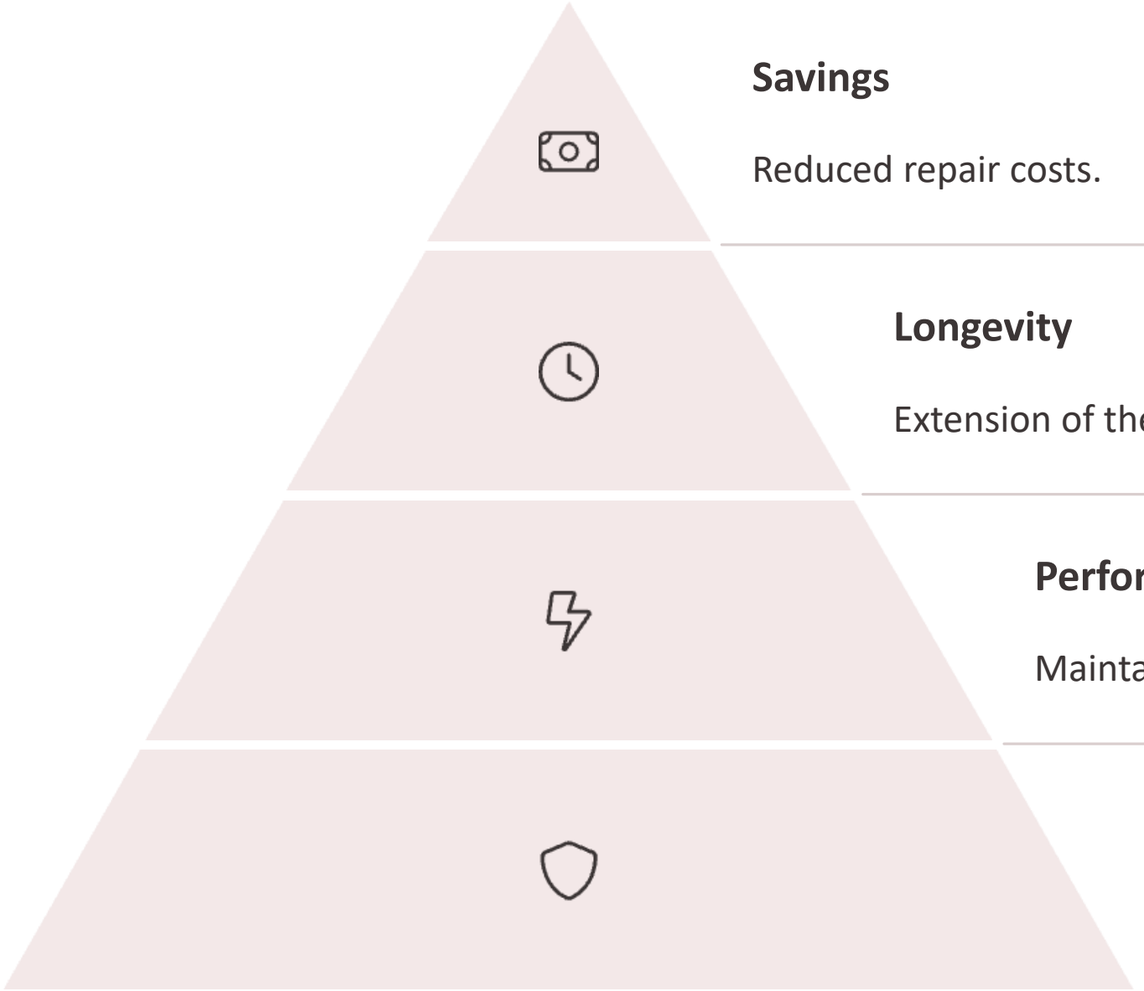
Diagnostic

The batteries are regularly discharged to 0%.

Solution

Application of minimum load thresholds.

Benefits of good maintenance



Savings

Reduced repair costs.

Longevity

Extension of the life of the installations.

Performance

Maintaining optimal system performance.

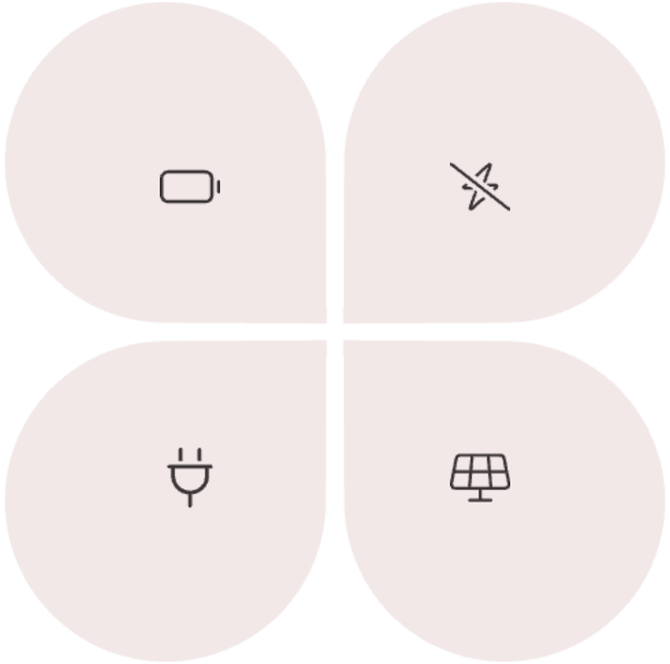
Reliability

Reduced risk of unplanned breakdowns.

Common outages

Battery failure

Over-discharge or lack of charge.



Overvoltage

Caused by a faulty regulator or incorrect connection.

Connection problem

False contact, cut cable or oxidation of connectors.

Panel failure

Reduction in the efficiency of photovoltaic cells.

Techniques troubleshooting

1

Error code analysis

Interpret status lights and error codes.

2

Checking Connections

Inspect AC, DC, and communication connections.

3

Resetting the device

Restart the device if necessary.

4

Checking Settings

Review the configuration for errors.

Dépannage de problèmes spécifiques

Problem	Solution possible
No charging	Check Settings & Connections
Faulty energy conversion	Control input/output voltages
Incorrect AC switching	Check power sources and settings

Best practices for maintenance

Documentation

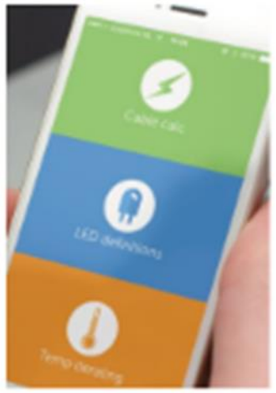
Keep a log of interventions and inspections.

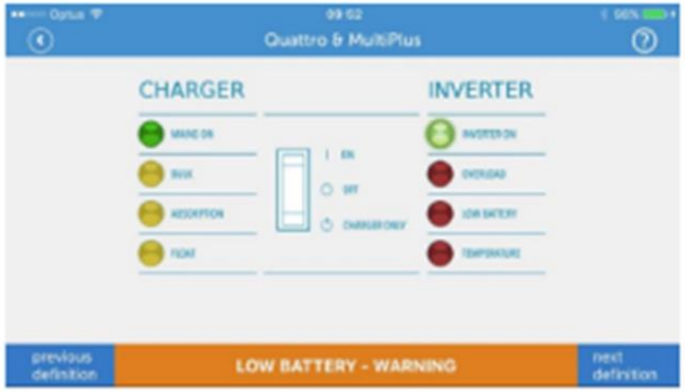
Planning

Establish a regular inspection and maintenance schedule.

Manufacturer recommendations

Follow Victron Energy's guidelines.





General error indications

Low Battery LED

Low voltage or dead battery.

LED Temperature

Environmental overheating or load excessive.

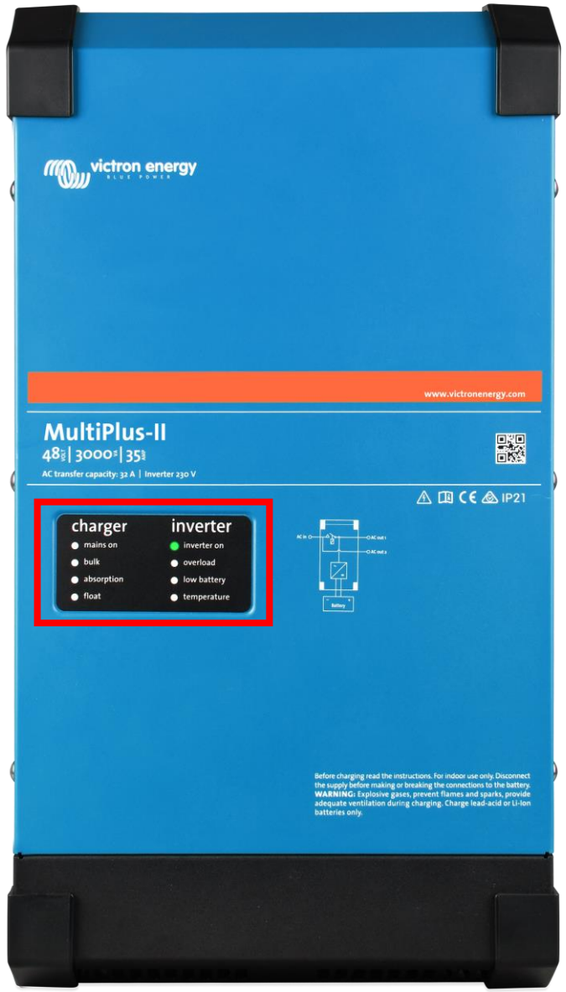
LED Surcharge

Load too high for the converter.

AC LED

Problems related to mains power.

Special LED indications



1

Synchronized flashing

May indicate probe or measurement errors.

2

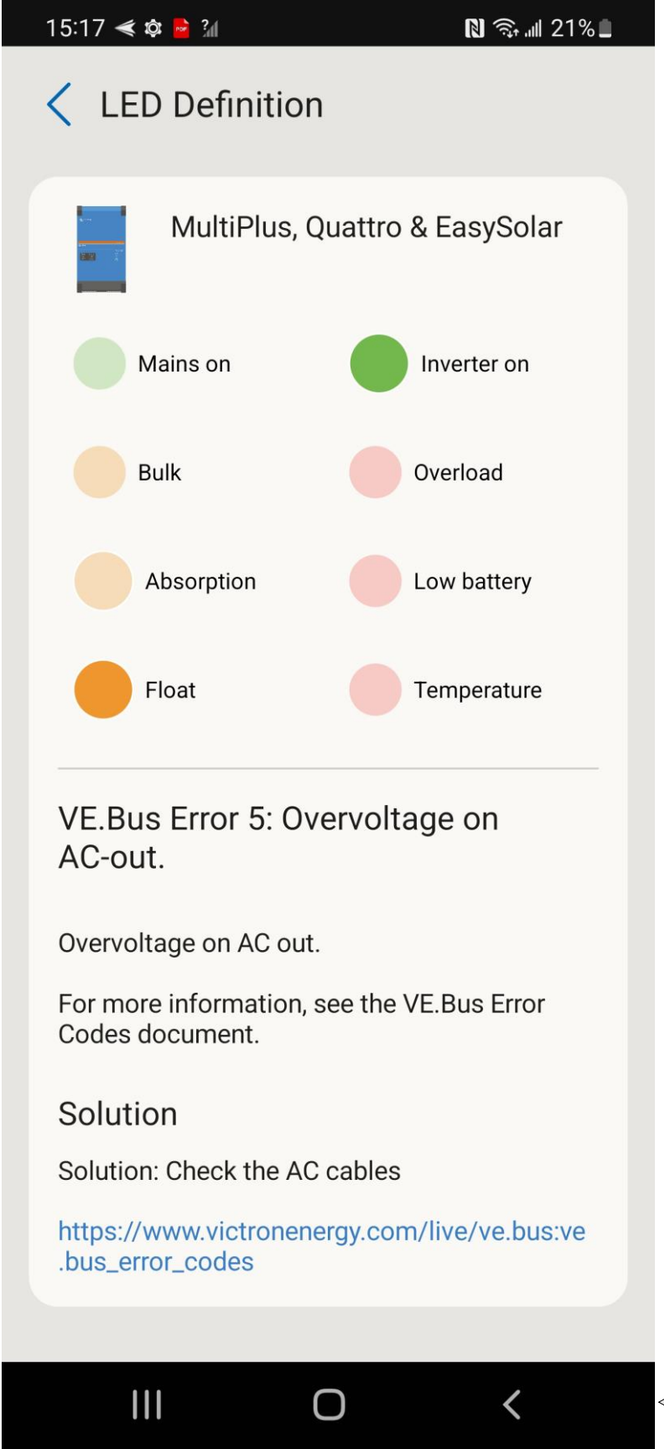
Flashing AC LED

"Load Only" mode or synchronization in progress.

3

Codes OK VE. Bus

Indicate a good internal state despite system errors.



EV error codes. Bus

1

Identification

Observe the flashing of specific LEDs.

2

Interpretation

Use the tables to decode the error.

3

Action

Apply the corresponding solution to the error code.

Application Victron Toolkit

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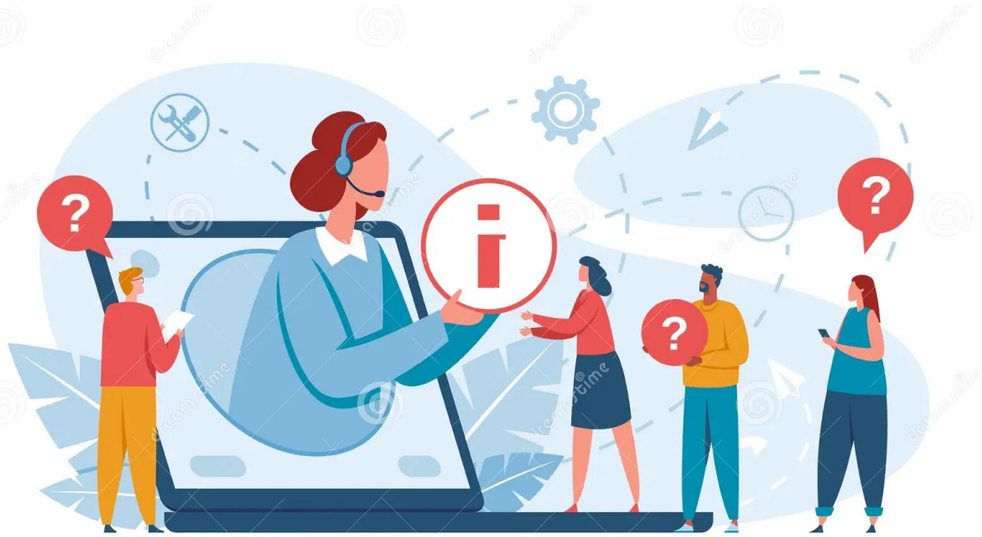
When to call a professional

Persistent outages

Issues not resolved after troubleshooting attempts.

Severe error codes

Errors indicating an internal hardware failure.



Complex issues

Situations beyond your skills or requiring internal intervention.

Repair and replacement

Testing and Diagnosis

Use a multimeter to check continuity and voltage.

Cable replacement

Change damaged wires and ensure good insulation.

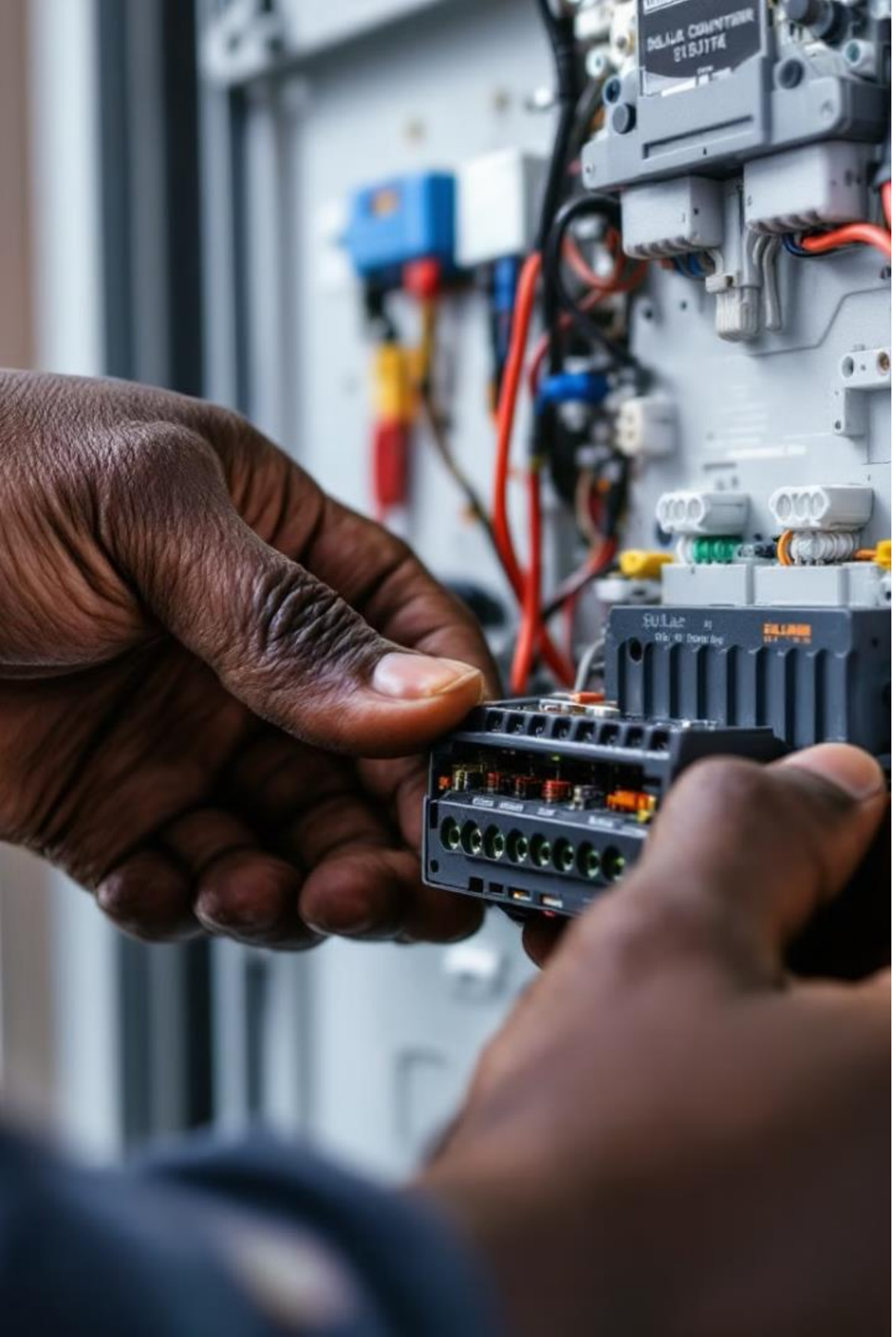
3

Changing the batteries

Follow the manufacturer's recommendations for installation.

Inverter intervention

Check settings and replace if necessary.



Concret case : Corrective maintenance

Problem

Battery that no longer charges in a solar installation.

Diagnostic

Tests revealing a faulty charge controller.

Intervention

Replacement of the regulator by a qualified technician.

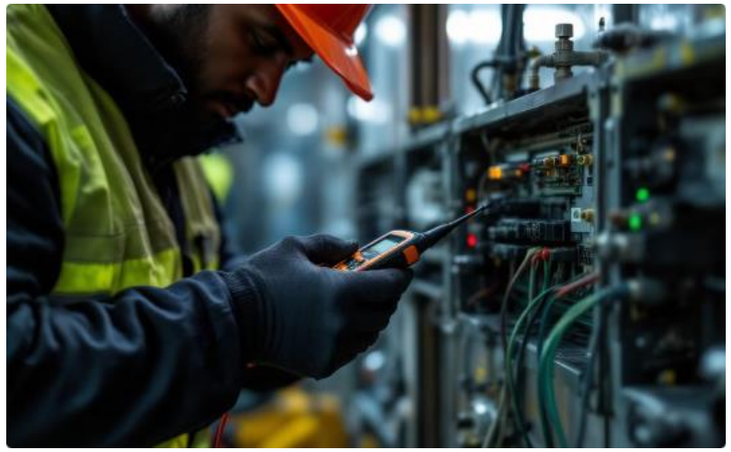
Resolution

System functional again after the operation.

Safety during interventions

Protective equipment

Wear insulating gloves, goggles and safety shoes.



Due diligence

Turn off the power supply before handling.

Battery Management

Handle with care and avoid short circuits.

Conclusion

Regular maintenance and proactive troubleshooting are essential to ensure the reliability and durability of a facility. By following guidelines and taking a methodical approach, you can prevent breakdowns, extend the life of your appliances, and maintain a high-performance energy system.