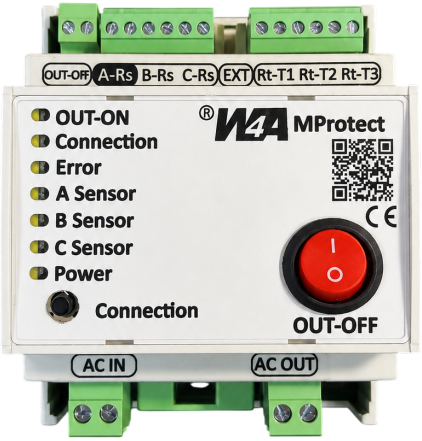
EN

W4A MProtect

User guide

W4A MProtect S20, W4A MProtect S50
W4A MProtect T20, W4A MProtect T50



1. Description

W4A MProtect controls and monitors electric motor activation. It incorporates current protection, external sensor inputs and scheduling. The app allows equipment configuration, operating supervision and viewing of operation and current records.

- Remote control and real-time monitoring.
- Sensor and current protection configuration.
- Operation logging and current history.

1.1. Package contents

- 1 W4A MProtect device.
- 3 current sensors.

1.2. Specifications

Characteristic	**S20**	**S50**	**T20**	**T50**
Power supply	230 V, 50/60 Hz		400 V, 50/60 Hz	
Maximum standby consumption	2.3 W		3.2 W	
Maximum operating consumption	3.1 W		4 W	
Channels	1			
Maximum rated current of the internal contactor	6 A		2 A	
Maximum rated current with external contactor	16 A	40 A	16 A	40 A
Voltage readings	1			
Current readings	3			
Sensor inputs	3; dry contact, impedance $< 100\,\mathrm{k}\Omega$			
Enclosure protection rating	IP20			

2. Intended use

W4A MProtect is intended to control, monitor and protect electric motors in low-voltage installations, within the electrical, environmental and functional limits specified by the manufacturer.

Installation, electrical connection and maintenance are reserved for qualified personnel, with power disconnected and in accordance with applicable regulations.

The equipment must not be used as the sole means of personal protection, emergency stopping,

safety-critical protection or primary fire protection unless expressly stated by the manufacturer. Machines and processes whose failure could cause danger require independent safety measures.

Incorrect use, unsuitable installation, unauthorised modifications or operation outside specifications may compromise safety, cause failures and invalidate the warranty under applicable terms.

3. Safety

Read product warnings, this guide, the installation manual and the electrical diagram before using the equipment. Incorrect installation or use may cause electric shock, fire, motor damage or hazardous load movement.

3.1. Electrical safety and work on the installation

> **DANGER — Hazardous electrical voltage**
>
> Depending on the model, the equipment is supplied at 230 V AC or 400 V AC. Contact with live parts may cause severe electric shock or death.

Before installing, connecting, removing, cleaning or maintaining the equipment or load:

1. Switch off and isolate all power supplies.
2. Prevent accidental reconnection.
3. Wait for stored energy to discharge.
4. Verify the absence of voltage using a suitable instrument.
5. Confirm that the load cannot move or start.

Do not touch terminals, conductors or internal components while the equipment is powered. Unlit indicators do not prove the absence of voltage.

> **WARNING — Working on the installation**
>
> Before working on the installation, use suitable switching and isolation devices to disconnect all supplies involved, prevent accidental reconnection and verify the absence of voltage.

3.2. Automatic starting

> **WARNING — Unexpected load starting**
>
> The load may start automatically. Before work, stop the system, isolate the supply and prevent accidental reconnection.

Starting may result from sensors, schedules, timers, local or remote commands, power restoration, restoration of normal conditions after an alarm or saved settings.

Loss of Bluetooth, Wi-Fi or Internet does not guarantee load stopping. Follow 3.1 Electrical safety and work on the installation and do not remain in a hazardous area when the motor may start automatically or be controlled remotely.

3.3. Installation and external protection

Mounting, commissioning, connection changes, electrical maintenance and settings affecting protection functions must be performed by qualified personnel. They must be able to identify risks, interpret diagrams, select conductors and protective devices and verify the safety of low-voltage installations.

Follow the installation manual, model diagram, national regulations and good safety practice. Mount the equipment on a DIN rail in an enclosure suitable for the environment and protected against accidental contact, according to model instructions.

> **WARNING — External protection and isolation**
>
> W4A MProtect does not replace the protective and isolation devices required for the electrical installation, motor and controlled load.

The installation must include short-circuit, overcurrent, overload, electric shock, surge and phase-loss or phase-imbalance protection, residual current protection, switching and isolation devices, emergency stops and all other required measures wherever applicable.

External devices must suit the voltage, current and load characteristics, have sufficient breaking capacity and be installed according to their manufacturers' instructions. Isolation must be identified, accessible to authorised personnel and disconnect all sources that could supply the equipment or load.

The external contactor must have characteristics and a utilisation category suitable for the motor. The designer and installer are responsible for protection selection, installation and coordination, including coordination between short-circuit protection, contactor, protective relay and motor where applicable.

3.4. Conductors, terminals and load

Check the model diagram to determine whether direct control, external contactor control or both are permitted. **Do not connect a motor directly to an output intended only for a contactor coil.** For

direct control, observe voltage, current and power limits; retain required external protective devices.

Before energising, check connections, conductor suitability, terminal tightness, load compatibility and protective devices. Incorrect or loose connections may cause heating, electrical arcing and fire.

Where necessary, protect inductive loads against surges: a flyback diode for DC coils, an RC snubber or varistor for AC coils, or another manufacturer-recommended device. Protection must not compromise contactor release, stopping times or safety functions.

3.5. Sensors and external controls

Use only level sensors, probes, pressure switches, contacts and accessories compatible with model inputs. Before connecting, isolate all supplies and check input type, permitted voltage, polarity and model diagram. Do not apply external voltage to sensor inputs unless expressly stated otherwise. Physical terminal compatibility does not guarantee electrical compatibility.

Cables must have suitable insulation, mechanical protection and routing separate from power cables where necessary. Keep them away from interference sources. Long cables or runs parallel to power conductors may cause incorrect readings and unwanted operation. Where necessary, use screened cable and connect its screen according to instructions.

Test each sensor before allowing automatic operation. Configure a safe condition for failure, disconnection, short circuit or invalid readings where this option exists. Sensors do not replace independent protection against flooding, dry running or other serious risks where required by risk assessment.

Modifying, bridging or bypassing sensors and controls may cause unexpected starting, failure to stop or loss of protection. The input A jumper described in 4 General electrical diagram requires assessment of installation behaviour and safety.

3.6. Environment, handling and storage

Observe specified environmental limits. Do not install in locations with water, rain or condensation without suitable IP protection, conductive dust, flammable or corrosive gases, excessive vibration, direct sunlight or temperatures outside limits. Do not use in potentially explosive atmospheres without explicit certification.

Do not cover heat dissipation areas or install near heat sources or flammable materials. Inside an enclosure, consider heating from other components. The housing's IP rating does not guarantee protection of terminals, cables, cable glands or the complete installation. Also observe altitude and humidity limits and avoid condensation unless expressly permitted in the specifications.

Handle carefully, avoiding drops and impacts. Store in a clean, dry place protected against dust, moisture, extreme temperatures and direct sunlight. Do not use damaged, deformed, damp or discoloured equipment, equipment with a burning smell or deteriorated terminals.

3.7. Communication and updates

Bluetooth Low Energy and Wi-Fi are subject to interference, obstacles, range limitations and network failures. Do not use wireless communication as the only safety control or emergency stop. Check that the load area is safe before sending remote commands.

Loss of communication does not necessarily interrupt saved automatic functions. If it prevents

safe supervision, make the load safe.

Use only firmware, software and updates provided or authorised by W4A, Lda. Do not modify hardware, firmware or protection functions without authorisation. Where applicable, keep the equipment and app updated.

3.8. Maintenance and emergencies

Before any maintenance, follow 3.1 Electrical safety and work on the installation. Do not open, modify or repair the equipment without express instructions from W4A, Lda. Use qualified personnel or authorised support in the event of damage, persistent failure or repair needs.

> **WARNING — Abnormal operation**
>
> In a hazardous situation, immediately switch off and isolate the equipment and load if safe to do so. Do not reconnect until qualified personnel identify and correct the cause.

This procedure applies in the event of:

- smoke, flames, a burning smell, electrical arcing or sparks;
- excessive heating, liquid ingress or damage to housing, terminals or conductors;
- loss of control, unexpected or repeated starts, or repeated protective device tripping;
- any situation hazardous to people, animals or property.

Do not touch equipment with exposed live parts, fire or water present. In an emergency, use the installation's stopping and isolation devices.

3.9. Prohibited uses and residual risks

Do not exceed electrical or environmental limits, connect loads above permitted ratings, use incompatible accessories or remove or bypass protective devices. Do not use equipment with damaged housing, terminals, conductors or insulation, or as the only protection against electric shock, fire or mechanical hazards.

Even with correct installation, risks remain from electrical voltage, unexpected starting, movement, heating, sensor or protection failures, communication loss and incorrect settings. The designer and installer must assess the complete system, provide independent protection and emergency stopping, restrict access and periodically check protective devices. Monitoring and records do not replace physical safety devices.

4. General electrical diagram

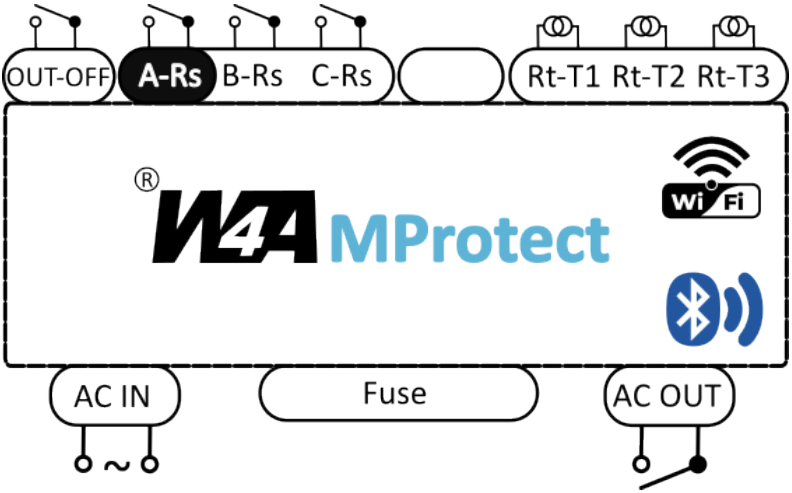


Figure 4.1: General electrical diagram

Identification	Function
AC IN	Device power supply input
AC OUT	AC output, according to model characteristics
OUT-OFF	Switch input for enabling and physically inhibiting the output relay control circuit
A-Rs	Sensor A input, with hardware cut-off
B-Rs	Sensor B input
C-Rs	Sensor C input
Rt-T1	Current sensor T1 connection
Rt-T2	Current sensor T2 connection
Rt-T3	Current sensor T3 connection
Fuse	Fuse

WARNING — Sensor A input

When sensor A is not used, fit a shunt (jumper) only if this connection is specified in the variant's diagram and installation manual. The jumper bypasses the interlock associated with input A; check that required protective measures remain in place. The connection must be made by qualified personnel with the supply switched off and isolated.

NOTE — What does hardware cut-off mean?

Hardware cut-off interrupts output operation through the electrical circuit, independently of the software.
Use A-Rs for contacts whose opening must stop the load, such as the control contact associated with a pressure tank, when this behaviour is required.

4.1. Connecting current sensors

Available operating modes depend on the W4A MProtect model. Check supported modes, connect current sensors according to the mode used and select the same mode in the app, as described in 9.2 Current protection.

Each sensor encloses only the conductor whose current is to be measured. In single-phase and two-phase modes, use only one sensor on one load supply phase and connect it to Rt-T1.

The following diagrams show conductors passing through sensors and sensor connections to measurement terminals. For W4A MProtect supply, load control, PE protective conductor and external protective devices, follow the model's installation diagram. Selecting the load mode does not change the device's required supply voltage.

Single-phase and two-phase modes

The same sensor diagram applies to both modes: L and N for single-phase; L1 and L2 for two-phase. In both, connect only one current sensor to Rt-T1 and leave Rt-T2 and Rt-T3 without sensors.

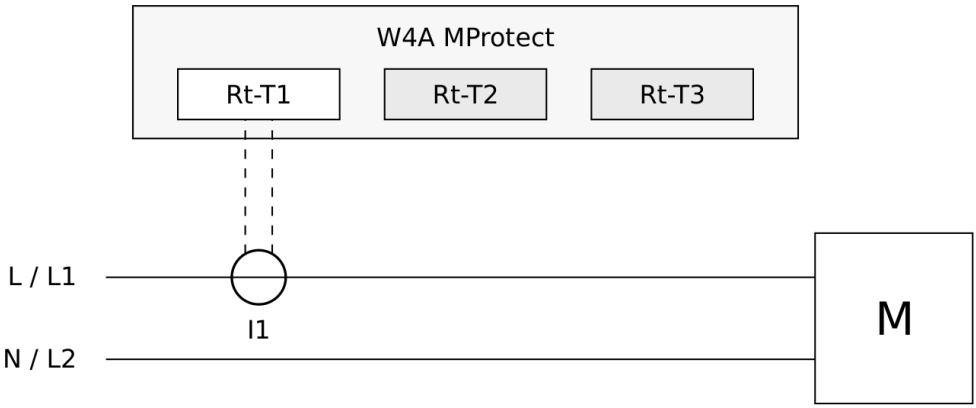


Figure 4.2: Current sensor connection in single-phase and two-phase modes.

Three-phase mode

Use one sensor per phase, connected to the corresponding terminal: Rt-T1, Rt-T2 and Rt-T3.

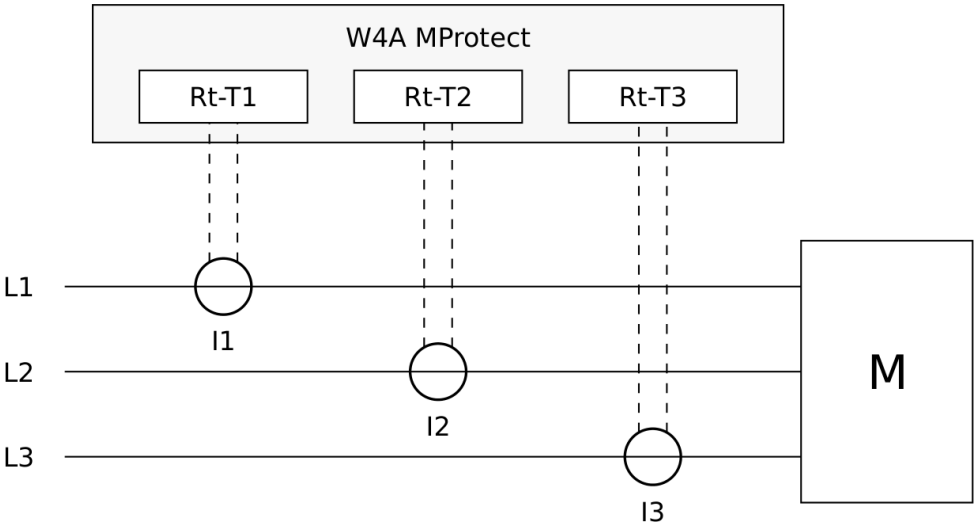


Figure 4.3: Connection of the three current sensors in three-phase mode.

5. Waste electrical and electronic equipment

At the end of its service life, take the equipment to a waste electrical and electronic equipment collection system according to applicable legislation. Do not dispose of it with unsorted household waste.

6. Simplified EU Declaration of Conformity

W4A, Lda. declares that this radio equipment complies with Directive 2014/53/EU.

The full text of the EU Declaration of Conformity is available at:

`www.w4a.pt/products/w4amprotect/legal/ce`

7. Preparing the app

W4A MProtect configuration and viewing are performed through the **W4A MProtect** app. Prepare the phone before pairing with the device.

Use a compatible phone with Android 8.0 or later or iOS 15.0 or later.

7.1. Installation and preparation

1. Scan the QR code below to access W4A MProtect app installation.
2. Install and open the app.

3. Enable phone Bluetooth and grant the requested permissions to communicate with the device.

7.2. Viewing documentation

The Installation and configuration manual and User manual are available in the app's **Instruction manual** menu. Internet access is required to view them.

This guide presents the essential steps for use. Before making electrical connections, consult the model's installation manual.

8. Device pairing

1. In the app, select **Add device**.
2. During the search, press W4A MProtect **Connection** for approximately 1 second until the Connection LED lights up. Release the button and confirm that the LED flashes, indicating pairing mode.
3. Wait for data synchronisation to finish. Then open the device to view its state and configure operation.

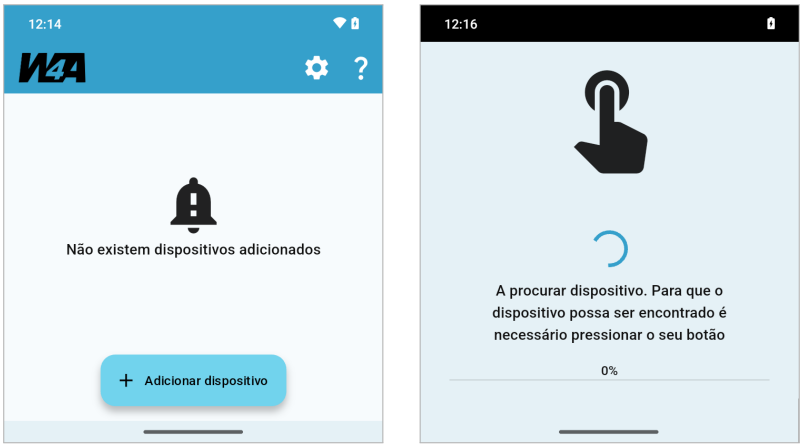


Figure 8.1: Device pairing sequence in the app.

Before allowing motor operation, complete the configuration in 9 Configuring operation and check safety conditions.

9. Configuring operation

In **Configuration**, adjust sensors, current protection and, where needed, the clock and analyser. Settings affecting protection must be configured by qualified personnel.

9.1. Sensors

Define the intended sensor behaviour so motor operation follows the required states. Use **advanced mode** when greater control over settings is needed.

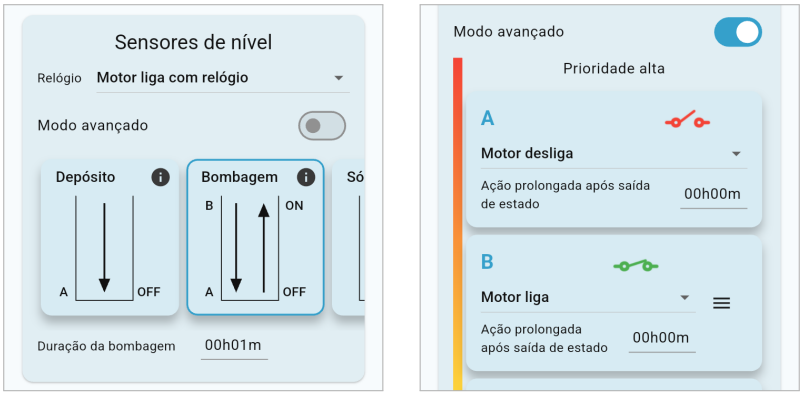


Figure 9.1: Level sensor configuration

Test each sensor individually before allowing automatic operation, as described in 3 Safety.

9.2. Current protection

Select the measurement mode corresponding to the installation and model: T1 is analysed in single-phase and two-phase modes; T1, T2 and T3 are analysed in three-phase mode. Connections are shown in 4.1 Connecting current sensors.

> **NOTE — Select single-phase mode**
>
> For a single-phase installation, select **Single-phase mode** in the app, submit the change and check the saved value before testing. Connecting a single sensor to Rt-T1 does not automatically configure measurement mode.

Settings and the **current test** must be handled by qualified personnel. The test shows starting and normal operating values; the motor runs while **Play** is held down. Release it to end operation and

confirm that the motor stops.

Set minimum and maximum current, starting time, time outside limits and reset settings from the motor nameplate, normal load conditions and test results. Do not copy values from another installation or widen limits to hide an anomaly.

> **WARNING — Test with the motor running**
>
> The test operates the motor. Beforehand, check that the installation is safe and nobody is in the load movement area.

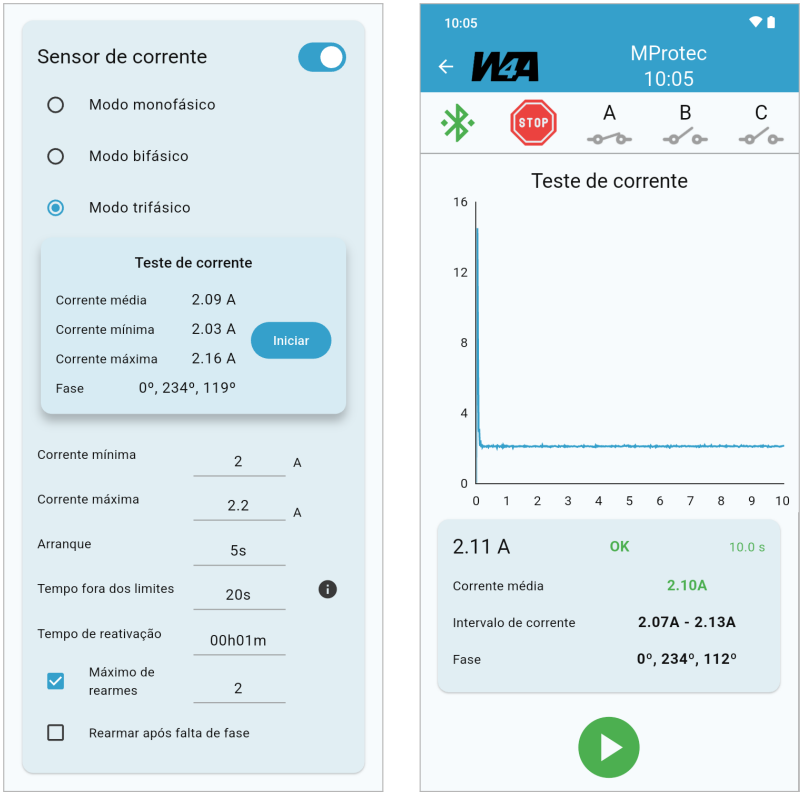


Figure 9.2: Current sensor test and configuration

9.3. Clock and timers

To schedule automatic operation, enable **Clock**. You can define weekly or repeating timers and use advanced timers when additional functions are needed.

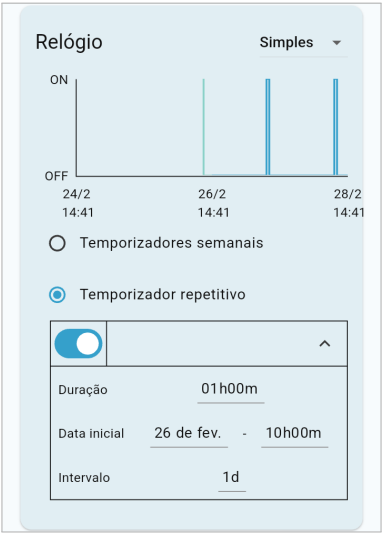


Figure 9.3: Clock and scheduling

9.4. Analyser

The **Analyser** compares operation against **Time window** limits or an **Operating pattern** representative of normal operation.

For the time window, define the period and expected minimum and maximum times. For the pattern, select a normal reference and acceptable tolerance. Depending on configuration, a deviation may generate a warning or interrupt operation and place the device in STOP-SW. Identify the cause before clearing the pause.

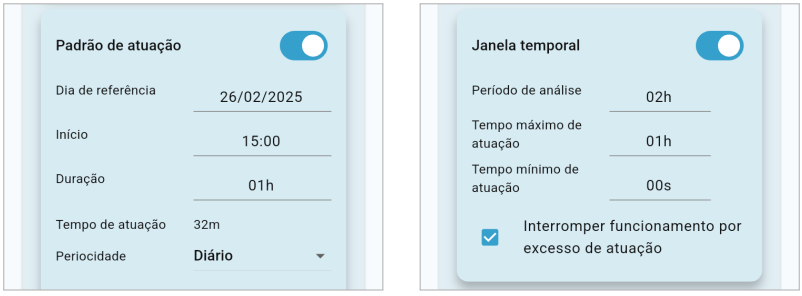


Figure 9.4: Automatic analysis configuration

9.5. Saving and checking

Before selecting **Submit**, confirm the device, review settings and ensure the motor can start safely. Wait for confirmation without interrupting communication and check saved values again. Changes are applied only after transfer to the device.

Test changed sensors, controls and timers under controlled conditions. If transfer fails, restore communication and check settings before submitting again.

10. State and history

10.1. Control

In **Control**, view current state, current, warnings, errors and available operation forecasts.

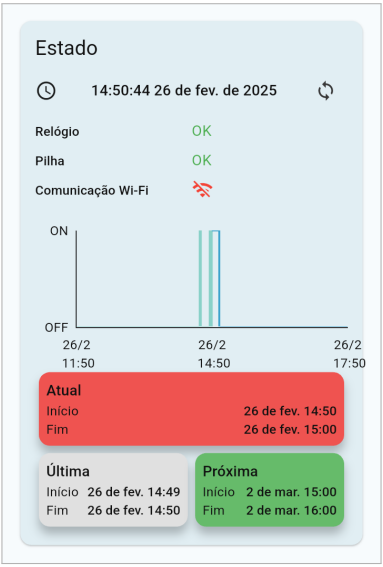


Figure 10.1: Current state and operation forecasts

A current anomaly may generate a warning, temporarily interrupt operation and start the reset waiting time. If the maximum number of resets is reached, the device enters an error state and prevents further automatic attempts. Check the cause and confirm that the motor can start safely before clearing an interlock.

10.2. Analytics

In **Analytics**, view analyses and operating history: motor operations, level sensor states and current records.



Figure 10.2: Viewing history

Displayed records and consumption values are intended for monitoring. Check the current installation state before executing commands; estimates do not replace certified meters.

11. Warranty

This product is covered by the applicable statutory conformity warranty. Any commercial warranty granted by W4A, Lda. is additional and does not affect the consumer's statutory rights against the seller.

To the extent permitted by applicable legislation, the warranty does not cover:

- damage from misuse, abuse, unsuitable installation, accidents, natural disasters or maintenance and repairs by unauthorised third parties;
- normal wear and damage to finishes or surfaces;
- products with a modified, removed or illegible serial number;
- product removal and reinstallation costs;
- indirect, incidental or consequential damage arising from use.

12. Customer support

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