

ATLAS 2



User Manual: **Atlas 2**

SPHERAG

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1. DEVICE DESCRIPTION

INTRODUCTION

The ATLAS 2 IoT device is an irrigation controller capable of collecting and sending data in real time, equipped and designed to control and automate irrigation installations. It is completely self-contained, connects in real-time, and does not need any additional connectivity installations, such as gateways or repeaters, to perform its function.

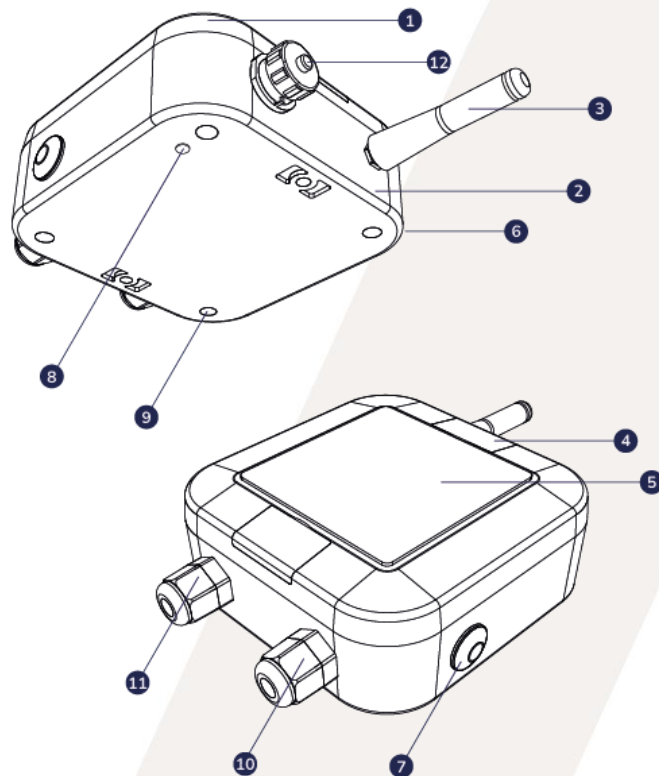
It includes two outputs for acting on solenoids or interlock relays, two inputs for reading pulse counters, and a port for reading up to four I²C sensors.

Each device is equipped with a micro-SIM card that allows it to connect to the mobile network via EGPRS or NB-IoT networks.

The control and management of all the functionalities available for the ATLAS 2 device can be carried out from the SPHERAG platform:

<https://portal.spherag.com/>

DEVICE PARTS



1. Cover.
2. Body.
3. Antenna.
4. Access tabs to the support holes.
5. Solar panel.
6. Device identification label.
7. On/off button.
8. Led.
9. Warranty stickers.
10. Connector 1 (input and output).
11. Connector 2 (input and output).
12. I²C sensor connector.

TECHNICAL SPECIFICATIONS

| General Specifications | |
|------------------------------------|---|
| Inputs | 2 (pulse counter or digital inputs) |
| Outputs | 2 (relay or solenoid, interlock) |
| Output Voltage | 14 Vdc |
| Sensor Inputs | 1 (I ² C) |
| Remote Configuration | SPHERAG Platform |
| Led | Seeking: 1 flash/ second Connecting: 1 flash/ 6 seconds Connected: 2 flash/ 6 seconds |
| Available Sensors | |
| Pressure Sensor | I ² C (1 a 30 bar) |
| Soil Temperature & Moisture Sensor | I ² C (Soil Temperature, VWC) |
| Ambient Sensor | I ² C (temperature, humidity) |
| Water Level Sensor | I ² C (10m) |
| Mechanical Specifications | |
| Dimensions | 130 x 100 x 45 mm |
| Weight | 320g |
| Material | ASA, ETFE |

| Connectivity | |
|---------------------------------|---------------------------|
| Communication Network | EGPRS o NB-IoT |
| Antenna | External |
| SIM card | Inside the device |
| Electrical Specifications | |
| Power Supply | Built-in 0.5W solar panel |
| Maximum Voltage | 4.2 Vdc |
| Minimum Voltage | 3.4 Vdc |
| Nominal Voltage | 3.7 Vdc |
| Nominal Current | 4 mA |
| Solar Panel Voltage | 5 Vdc |
| Solar panel Current | 340 mA |
| Sending data | |
| Upload Communications (Sensors) | 1 h ⁽¹⁾ |
| Upload Communications (Other) | Asynchronous |
| Downstream Communications | Asynchronous |

⁽¹⁾ Check with us for other synchronization options.

| Other Specifications | |
|------------------------------|--------------|
| Operating Temperature | -20 ~ +50 °C |
| Operating Humidity | 45% ~ 75% RH |
| Operating Altitude | 0 ~ 2000 m |
| Storage Temperature | -20 ~ +50 °C |
| Storage Humidity | 45% ~ 75% RH |
| Storage Altitude | 0 ~ 2000 m |

2. OPERATION

ACTION

The ATLAS 2 device has two outputs. Each of the outputs can be connected through an interlocking relay or solenoid to the element of the installation to be controlled, such as:

- Valve.
- Pump.
- Fertilizer.
- Mixer.

Each of the two connectors on the device intended for the outputs (100. Connector 1 input and output) and (111. Connector 2 (input and output)) has four cables, the red and black ones are intended for the outputs.

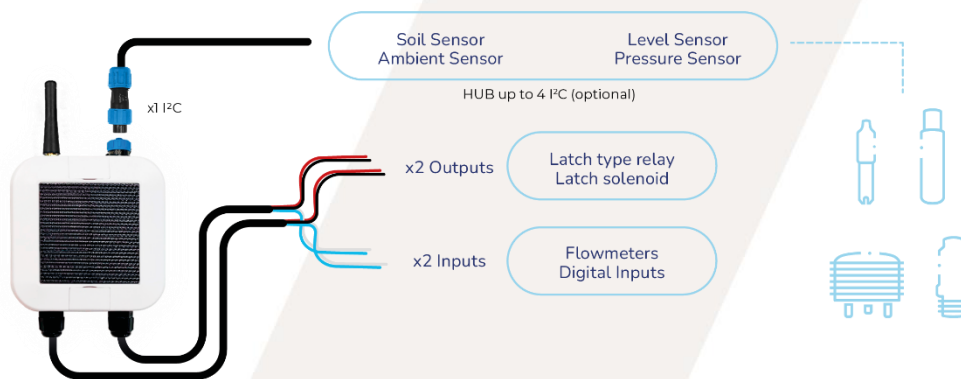


Figure 1. ATLAS 2 device inputs and outputs.

After registering the device on the SPHERAG platform, the functionality to be associated with each output can be selected, as well as its mode: manual or automatic.

As mentioned, each output can be used in manual or automatic mode. In other words, it is possible to open or close the installation element by manually changing the state of the output, or automatically, by means of a command sent by a program stored in the computer's memory.

MONITORING

LOCAL SENSOR MONITORING

The ATLAS 2 includes a port ⁽²⁾ for connecting I²C sensors. For example:

- Pressure sensor.
- Temperature and VWC (volumetric water content) sensor.
- Ambient temperature and humidity sensor.
- Water level sensor.
- Other ⁽³⁾.

Through the platform, the unit of measurement of the sensors can be configured, as well as setting up alerts that act and send notifications based on the measured values, in order to control and keep track of the installation over time.

On the other hand, it is possible to create custom graphs with the selected sensors to obtain a complete monitoring of everything that happens in your crops, such as, for example, to keep track of the field capacity.

² The connection of multiple sensors is done through a specific "hub" for each of the technologies.

³ Only sensors marketed by Spherag are compatible. Sensors are purchased separately.

MONITORING OF VOLUMETRIC METERS

The ATLAS 2 includes two inputs for reading pulse counters. The device has two blue and white cables for each input (Figure [¡Error! No se encuentra el origen de la referencia.](#))

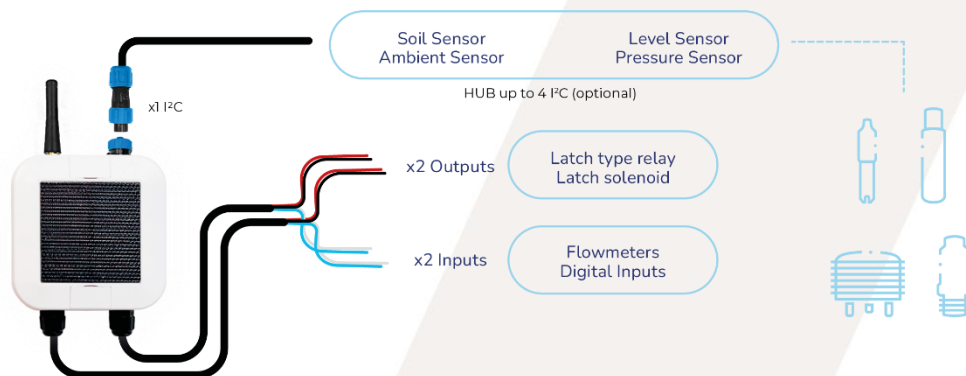


Figure 2. Outputs and inputs ATLAS 2 device.

Through the SPHERAG platform the user can register the connected elements and configure the unit of measurement (m³, L or Gal) and the value of each pulse (1, 10, 100) for them, as well as the current price of water to know what is the cost that is being produced in that flowmeter.

Note: If the installed flowmeter contains previous readings, the current value of the flowmeter must be entered in the platform, to synchronize the platform with the current amount that the flowmeter shows.

Note: To make sure the meter reads the emitter's pulses correctly, follow these tips:

- Reduce the cable distance used.
- Move the cable away from other electrical cables, motors, coils, fluorescent tubes, etc., along its entire length.
- Increase the cable section (depending on the distance used).

DIGITAL INPUTS

The device has the possibility of connecting up to two digital inputs that indicate an all-nothing event in the installation. For example:

- Mechanical pressure reading equipment.
- Flowmeters.
- Adjustable pressure reading equipment..
- Rain sensors.
- Level sensors.

To receive the information from these elements, they must be registered in the SPHERAG platform, as is the case with the rest of the elements connected to the device inputs. The ATLAS 2 device will inform the platform of possible changes in the installation. These devices are connected, like the pulse emitters, to each of the ATLAS 2 inputs (blue and white wires).

3. ALERTS & NOTIFICATIONS

The digitization and monitoring of irrigation installations allows the execution and sending of pop-up notifications via e-mail to the user registered on the platform in the event of any anomalous reading, such as an excess or deficit of pressure.

FLOW ALERT

The ATLAS 2 device has a pulse flowmeter reading, which allows to know if the irrigation is running with a flowmeter out of the established flow rate.

WARNING: It is necessary to carry out a calibration beforehand to know the nominal flow rate and to be able to set a flow alarm. This calibration can be done either manually or automatically.

Through the platform, it is necessary to indicate the limits within which the flow rate of the installation must be located for the chosen flowmeter and the limits that execute the shutdown of the equipment for safety in case this option is selected. If you select this option.

Notifications are sent via email so that the user is aware of when the alert has been given and reviews the installation.

PRESSURE ALERT

Thanks to the pressure monitoring functionality of the device ⁽⁴⁾, the user can set up pressure alerts that prevent possible failures in the installation.

Through the platform, two different types of alerts can be programmed, one that simply notifies of an anomaly in the pressure of the installation (*Notification*) or an alert that, in addition to notifying of a problem with the pressure, stops the installation (*Notification and stoppage*).

To set a pressure alert, the user must set the time he wants to allow the installation pressure to be out of the set range (Out of range time). If the pressure goes out of the marked pressure range for longer than the set time, the user will receive a notification indicating a problem in the installation.

It is also necessary to select on which output of the device the pressure alert is to be linked so that, in case of selecting the *Notification and stoppage* alert, the elements connected to that output will stop their operation.

On the other hand, the *Supervision time* must be indicated. This is the time it will take for the alert to come into operation. That is, it may take, for example, a few minutes for

the installation to reach the nominal pressure. To avoid false pressure alerts appearing during these minutes of pipe filling, this time can be added to the *Monitoring time*.

NOTE: If this time interval is not required, it can be set to 0.

4. INSTALLATION & GETTING STARTED

Please read the following instructions carefully and execute them in the order described. Failure to follow the guidelines set forth in this manual does not guarantee the effect of the warranty.

WARNING: None of the device's wires should be electrically connected to each other. Unused cables should be left electrically insulated.

Make sure you have good coverage in the installation area before connecting the equipment. Screw the antenna onto the top of the ATLAS 2 and press the button on the side to turn it on (7. On/Off button).



Figure 2. ATLAS 2 Installation Steps.

The LED (8. LED light) on the device will flash continuously with a blue light first at 1-second intervals and while connecting at 6-second intervals. Subsequently, once you have connected the device it will flash twice every 6 seconds. (Figure 4.)

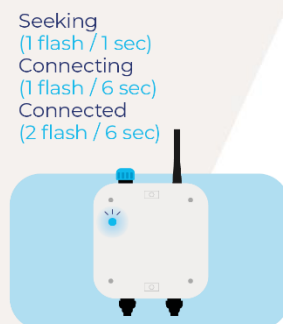


Figure 3. ATLAS 2 Connection Sequence.

Connect the output wires (red and black) to the solenoid wires of the installation element (Figure 5). Repeat the process with the blue and white wires for the inputs.

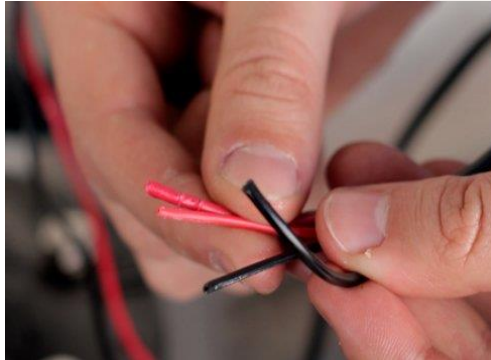


Figure 4. Connectors from an interlocking solenoid to an ATLAS 2.

Note: The use of watertight connectors is recommended (Figure 56). ⁽⁴⁾.

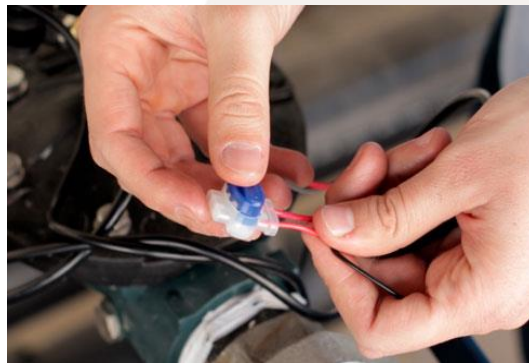


Figure 5. Connection of the positive polarity by means of a watertight connector.

(Optional) If you have a 3-way valve coupled to the valve of the installation, it must be placed in the "AUTO" position (Figure 67).

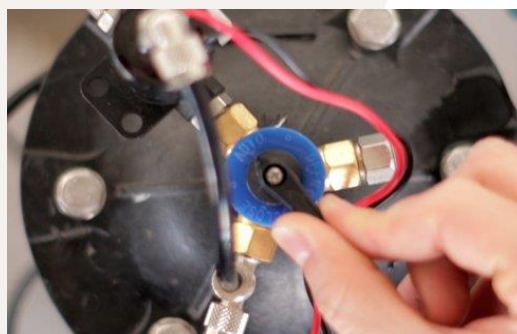


Figure 6. 3-way valve, "AUTO" position.

Unscrew the watertight plug covering the adapter for the device's sensor connector.

⁴ They are purchased separately.

Connect the sensor to the device and close the safety thread.

WARNING: Make sure the notches and number of pins match and the connector is in the correct position when connecting. It only has one correct position.

Thread the connector nut all the way down to prevent possible water leaks that could cause the device to fail.

Verify that the device is turned on and has a correct connection (Point 0). Position the ATLAS 2 device facing the equator to ensure proper solar charging.

NOTE: By lifting the tabs located on the device box (4. It has holes to place it through screws to the surface on which you are going to place the equipment (wood, wall, metal...)).

Important Considerations for Placement:

Do not cover the solar panel (5. Solar panel) with zip ties, glass, or any other item and periodically make sure that the solar panel is not covered with dust or dirt.

There should be no elements (houses, trees, etc.) that provide shade to the device during the day. The solar panel should receive at least 7 hours of direct sun daily.

It is not recommended to place the device on concave surfaces or terrain, where water may accumulate.

Do not cut or manipulate the cable of any sensor in order to reduce or extend its distance.



Figure 8. ATLAS 2 Placement.

5. TROUBLESHOOTING

| Problem | Reason | Solution |
|---|--|---|
| Battery does not charge | Poor installation. | Follow the installation recommendations. 4. INSTALLATION AND FIRST STEPS. |
| | Absence of sunny days (especially in winter) | Turn off the device and keep it 4-5 days receiving at least 6h of direct sunlight. Then, turn the device back on. |
| The status of the solenoid (ON/OFF) does not correspond to the one displayed by the platform. | Platform synchronization has not been performed. | Open and close the installation element from the platform. |
| | Solenoid polarity is not properly connected to the device's output. | Change the polarity of the connection. |
| Readings fictitious of flow rate | The wires connected to the transmitter are not electrically insulated. | Insulate using non-conductive elements. |

| | | |
|--|--|--|
| The LED does not light up when the device is turned on | Dead battery. | Turn off the device and keep it 4-5 days receiving at least 6h of direct sunlight. Then, turn the device back on. |
| Watering is not carried out at the indicated time | Computer in the wrong mode. | Put the device's output in automatic mode. |
| | Dead battery. | Turn off the device and keep it 4-5 days receiving at least 6h of direct sunlight. Then, turn the device back on. |
| | Program Not Received on Device Due to Poor Signal Quality. | Place it on a high point, so that the quality of the coverage is better. |
| | Device failure due to possible short circuit. | Contact SPHERAG Technical Support: <ul style="list-style-type: none"> - Telephone: +34 684 464 107 - Email: support@spherag.com |
| The flow of water is not interrupted | Improperly installed valve. | Install the valve so that the arrow on the valve points in the direction of the water flow. |
| | Solenoid averiado. | Reemplaza el solenoide. |
| No water flow | Valve blocked by dirt or scale. | Replace the valve. |

6. GLOSSARY OF TERMS

1. **IoT (Internet of Things):** It is a concept that refers to the digital interconnection of everyday objects with the internet, allowing these objects to send and receive data.
2. **NB-IoT (Narrowband IoT):** It is a low-power, narrow-bandwidth communications technology, designed to connect IoT devices through narrowband cellular networks.
3. **EGPRS (Enhanced General Packet Radio Service):** It is an evolution of the GSM (Global System for Mobile Communications) mobile data transmission system that provides higher data rate and spectrum efficiency.
4. **Interlocking relay or solenoid:** A type of relay or solenoid that remains in its activated or deactivated state even after the control signal is removed. Also known as latch relays or solenoids.
5. **Field capacity:** This refers to the maximum moisture capacity of the crop field.
6. **All-Nothing Event:** Refers to an event with two statuses: "all" (yes/on) or "nothing" (no/off).
7. **Nominal Flow Rate:** This is the flow that can pass through a device/pipe under normal operating conditions.
8. **Nominal Pressure:** This is the pressure that a device/pipe can withstand under normal operating conditions.

7. PRODUCT RECYCLING

Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) according to Annex I indicates that “COMPUTER AND TELECOMMUNICATIONS EQUIPMENT” should not be recycled with other municipal waste. These appliances should be disposed of separately, in order to optimize the recovery and recycling of materials and thus reduce the impact they may have on human health and the environment. The crossed-out wheeled garbage can symbol reminds you of your obligation to dispose of this product correctly. If the product in question is equipped with a battery or battery pack for its electrical autonomy, it must be removed before disposal and treated separately as a waste of a different category. For detailed information about the most appropriate way to dispose of your appliances and/or the corresponding batteries, the consumer should contact the local authorities.


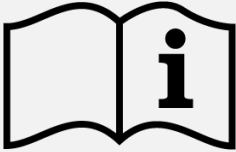



8. GUARANTEE

Consult the General Warranty and Repair Conditions of our devices through the following link:

<https://spherag.com/general-warranty-and-repair-conditions/>

9. EXPLANATION OF SYMBOLOGY

| | |
|---|--|
|  | <p>It complies with Directive 89/336/EEC for Electro-magnetic Compatibility and Low Voltage Directive 73/23/EEC for Product Safety Compliance. Compliance with the following specifications was demonstrated as indicated in the Official Journal of the European Communities.</p> <p>Responsible within the European Union:</p> <p>SPHERAG TECK IOT S.L.</p> <p>Av. Alcalde Gómez Laguna, 25, Planta 10, Oficina B1, 50009 Zaragoza</p> |
|  | <p>To identify where the instruction manual is stored or to identify information related to the operating instructions. To indicate that operating instructions should be taken into account when using the device or control near where the symbol is placed. ISO 7000-1641</p> |
|  | <p>It states that electrical and electronic equipment (EEE) should not be disposed of together with household waste at the end of its useful life. The product shall be taken to the appropriate collection point for recycling and proper treatment of electrical and electronic equipment in accordance with national legislation.</p> |