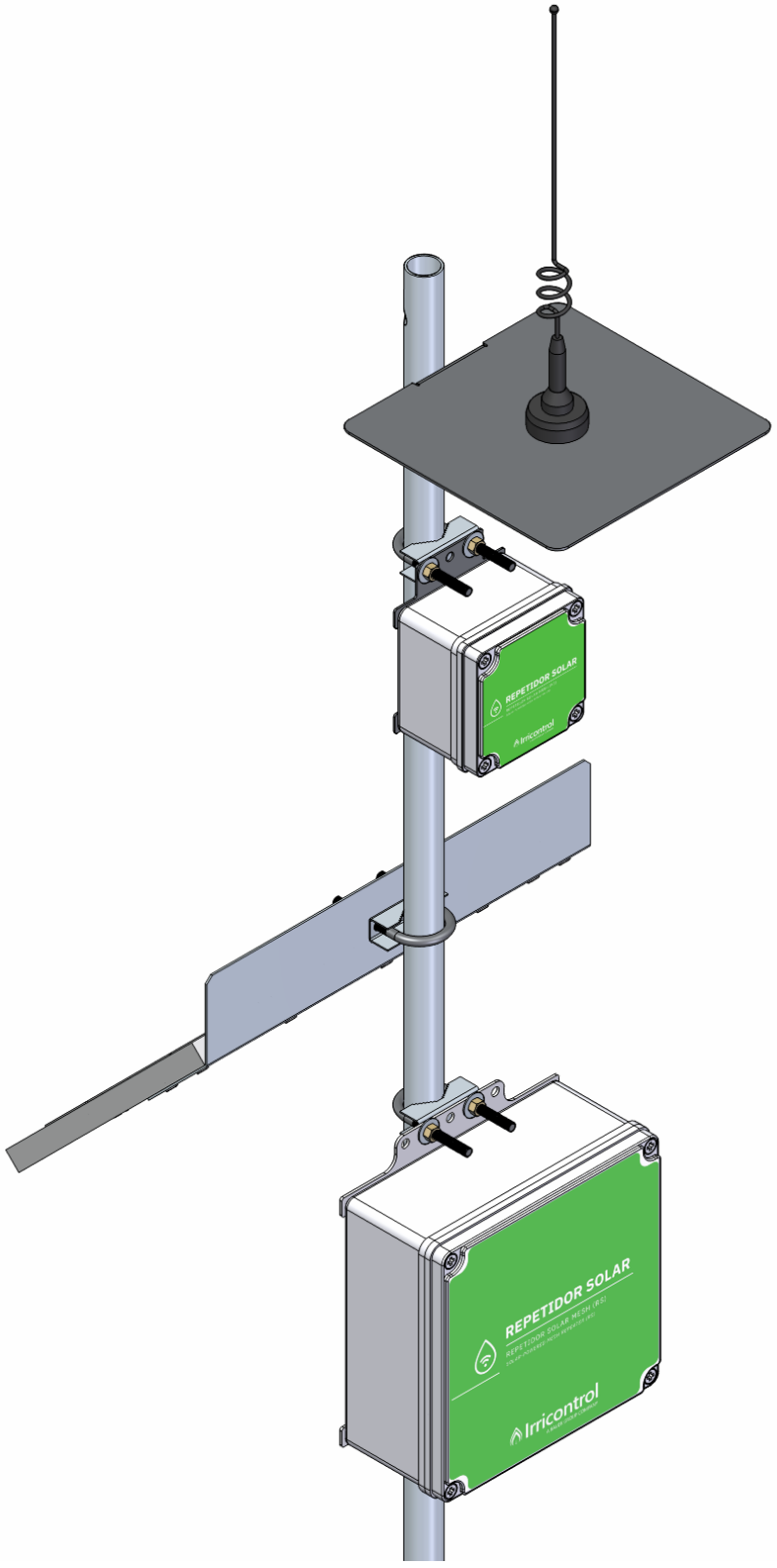
Installation, Operation and Maintenance

MANUAL



SOLAR REPEATER

v. 00

MANUFACTURER:

IRRICONTROL CONTROLE INTELIGENTE DE IRRIGACAO S.A

CNPJ: 26.941.490/0002-03

Rua Eislében Cereja Correa Fonseca, 117 - Lote 01-A Quadra Galpão 02 - Parte A

Distrito Industrial, São João da Boa Vista - São Paulo, Brasil

Zip Code: 13877-776

Phone: +55 (019) 3634-1212

Email: contato@irricontrol.com.br

Website: www.irricontrol.com.br

TECHNICAL SUPPORT:

In case of problems or additional questions, contact Irricontrol Technical Support using the following channels:

Irricontrol Platform: Available on the Google Play Store (Android) and App Store (Apple).

Phone: +55 (019) 2112-9856

Email: suporte@irricontrol.zendesk.com

A dedicated section is also available on the **Irricontrol Knowledge Platform (Zendesk)**, where customers can access the digital version of this manual, additional product information, and possible updates.

Zendesk can be accessed through the following link:

https://irricontrol.zendesk.com/hc/en-us

DATE	REVISION	DESCRIPTION	REVISED BY	APPROVED BY
02.2026	00	- Start of the document.	a.fernandes	l.óboli

CONGRATULATIONS! You have just acquired an IRRICONTROL product!

Our solutions allow the entire irrigation process to occur in a more efficient, sustainable, and controlled way. Enjoy the benefits of smart irrigation.

Share this idea! **#ForAGreenWorld**

NOTES

This document uses notes to organize and highlight critical information related to the operation and maintenance of the equipment. The notes are categorized according to their purpose, as described below:

SUPPLEMENTARY NOTE – Provides additional information that helps in understanding or performing a task but is not essential for the safety or functionality of the equipment.

WARNING NOTE – Draws attention to potential equipment damage or critical details that may impact system performance.

DANGER NOTE – Highlights situations that pose risks to the physical safety or life of the operator. These notes must be strictly followed to prevent serious injury or death.

SCHEDULING NOTE – Specifies recommended time intervals for tasks such as preventive maintenance or operational adjustments.

Pay attention to these notes throughout the manual, as they are designed to enhance understanding and ensure safety and efficiency when using the equipment.

SUMMARY

LIST OF FIGURES 7

1. Introduction 9

2. Warranty 10

3. Technical Data Sheet 11

4. Product Overview 12

5. Product Composition 14

5.1. Mounting Kit - TOWER 15

5.2. Mounting Kit - WALL 15

5.3. Mounting Kit - PIVOT 16

6. Installation 17

6.1. Mechanical Installation 17

6.1.1. TOWER Support 18

6.1.2. WALL Support 20

6.1.3. PIVOT Support 22

6.1.4. Plastic Boxes 23

6.1.5. Antenna 24

6.1.6. Solar Panel 25

6.2. Electrical Installation 27

7. Parameter Configuration 30

8. Tests 32

8.1. Device Scan 32

9. Failures and Possible Causes 34

9.1. Repeater does not communicate with the Central/Irricontrol Platform 34

10. Additional Information and Precautions 35

10.1. Product Serial Number 35

10.2. Product Storage 36

10.3. Disposal of the Product and/or Components 37
10.4. Periodic Maintenance 38
10.4.1. Replacement of the Stationary Battery..... 38
10.4.2. Cleaning the Interior of the Equipment 38
10.4.3. Solar Panel Maintenance 39
10.4.4. Checking the Silica Gel 39
10.4.5. Checking the Seals 39

LIST OF FIGURES

Figure 1 - Solar Repeater in the Irricontrol Automation and Telemetry solution. 13
Figure 2 - Components of the Solar Repeater. 14
Figure 3 - Mounting Kit - TOWER. 15
Figure 4 - Mounting Kit - WALL. 15
Figure 5 - Mounting Kit - PIVOT. 16
Figure 6 - Mounting the Tower Support on a straight-profile tower. 18
Figure 7 - Mounting the Tower Support on a tubular-profile tower. 19
Figure 8 - Mounting the Support Tube on the Tower Support. 19
Figure 9 - Mounting the Wall Support. 20
Figure 10 - Mounting the Support Tube on the Wall Support. 21
Figure 11 - Mounting the Pivot Support. 22
Figure 12 - Mounting the plastic boxes on the Support Tube. 23
Figure 13 - Antenna Support Installation. 24
Figure 14 - Antenna Installation on the support. 24
Figure 15 - Antenna Connector on the Solar Repeater. 25
Figure 16 - Mounting the Solar Panel on the Support Tube. 25
Figure 17 - Solar Repeater Installation on Tower, Wall, and Pivot Supports. 26
Figure 18 - Solar Repeater Electrical Installation. 27
Figure 19 - Opening of the plastic box. 28
Figure 20 - Verifying the Solar Repeater Power Supply. 29
Figure 21 - Closing of the box. 29
Figure 22 - XBee module label of the Solar Repeater. 30
Figure 23 - Solar Repeater registration on the Irricontrol Platform. 31
Figure 24 - Device Scan - Accessing the “Devices” page. 32
Figure 25 - Device Scan - Search Radios. 33
Figure 26 - Device Scan - In Progress. 33
Figure 27 - Scan Result: Device (a) not detected and (b) detected. 33
Figure 28 - Location of the labels with Repeater Solar serial number. 35
Figure 29 - Product Storage Instructions. 36

1. Introduction

This manual provides the necessary information for the installation, operation, and maintenance of the Solar Repeater, manufactured by Irricontrol. It is essential that all individuals involved in any of these stages carefully study this manual before starting any procedure. Keep it in a safe, known, and accessible location so that the entire team can consult it whenever needed.

All information contained in this manual is based on the most up-to-date data available for Irricontrol's product portfolio at the time of printing. Due to the continuous development of its equipment, the company reserves the right to modify the contents of this manual without prior notice and disclaims any responsibility for consequences arising from such changes. To keep customers informed, the company maintains a section on its knowledge base and on the Irricontrol/Zendesk Platform, where updates and other relevant information about the equipment are published.

The images included in this manual are for illustrative purposes only and may differ from the actual equipment. Their inclusion is intended to facilitate the understanding of the equipment and its operation.

To ensure clarity, and given the wide range of possibilities, this manual does not cover every conceivable situation related to operation and maintenance. Should further clarification be required, Irricontrol technical support may be contacted.

2. Warranty

Irricontrol offers a warranty for its entire product line, covering manufacturing defects and malfunctions. In such cases, the company is committed to providing full support by performing repairs and/or replacements, either partially or fully, at Irricontrol's discretion.

For the warranty to be valid and enforceable, it is essential that all conditions and rules described and agreed upon in the **WARRANTY TERMS** are fully observed.

We recommend consulting the **PURCHASE AND SALE AGREEMENT** for further details and information regarding duration, coverage, claim procedures, exclusions, and the documentation required to initiate the warranty process.

It is recommended to properly file all documents related to the equipment purchase, such as the INVOICE and WARRANTY TERMS. This will expedite any warranty service process.

The information contained in this manual does not replace, add to, or modify any agreement established by the PURCHASE AND SALE AGREEMENT and/or WARRANTY TERMS.

Modifying or replacing any components of the product may cause malfunction and affect the product warranty. Therefore, it is always recommended to consult the manufacturer or an authorized representative before carrying out such interventions.

3. Technical Data Sheet

DESCRIPTION	INFORMATION			
Product Name	Solar Repeater			
Manufacturer Code (SKU) [1]	2801, 2802, 2803, 2904, 2905, 2906, 2945, 2946, 2947, 6760, 6761, 7036, 7037, 7047			
Short Description	Equipment responsible for extending the range of the Irricontrol network to more remote locations. Powered by solar energy and integrated with the Irricontrol Platform.			
Protection Rating (IP)	IP65			
Dimensions (H × W × D)	Box A: 100 × 100 × 75 mm / Box B: 200 × 200 × 95 mm			
Materials and Finish	Plastic box with label.			
Connector Type	WAGO Connectors and Female Faston Terminals.			
Installation Environment	External			
Weight [1]	~ 6 to 11 kg			
Included Accessories	Small Plastic Box (Solar Repeater) and Large Plastic Box (Battery), Solar Panel, Antenna with Cable, Support Tube, Support Kit, Mounting Kit, and Manual.			
Communication Radio	Model [2]	DIGI XBEE-PRO 900HP (XBP9B-DMST-012)	DIGI XBEE SX 868 (XB8X-DMUS-001)	DIGI XBEE XR 868 (XB-8XR-DMUT-101)
	Operating Frequency	902 to 928 MHz	863 to 870 MHz	863 to 870 MHz
	RF Data Rate	10 kbps or 200 kbps (software selectable)	10 kbps or 80 kbps (software selectable)	10 kbps or 80 kbps (software selectable)
	Receive Current	29 mA	40 mA	26 mA
	Transmit Current	215 mA	55 mA	76 mA
	Receiver Sensitivity	-101 dBm (200 kbps) -110 dBm (10 kbps)	-106 dBm (80 kbps) -113 dBm (10 kbps)	-107 dBm (80 kbps) -112 dBm (10 kbps)
	Output Power	Up to 24 dBm (250 mW)	Up to 13 dBm ERP	Up to 13 dBm ERP
	Supply Voltage	2.1 to 3.6 VDC	2.4 to 3.6 VDC	2.1 to 3.6 VDC
	Operating Temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
	Modulation	FHSS (Frequency Hopping Spread Spectrum)	FHSS (Frequency Hopping Spread Spectrum)	FHSS (Frequency Hopping Spread Spectrum)
	Networking Topologies	DigiMesh, Point-to-Point, Point-to-Multipoint, Peer-to-Peer	DigiMesh, Repeater, Point-to-Point, Point-to-Multipoint, Peer-to-Peer	DigiMesh, Repeater, SX protocol compatible
	Digital I/O	15 digital I/O pins	13 digital I/O pins	13 digital I/O pins
	Analog Inputs	4 analog inputs (10-bit ADC)	4 channels 10-bit	4 channels 10-bit
	Sleep Current	2.5 µA	1.8 µA	1.5 µA
	Maximum Line-of-Sight Range	Up to 15,5 km with 2.1 dBi antenna	Up to 14.5 km with 2.1 dBi antenna	Up to 14.5 km with 2.1 dBi antenna
	Internal Module Encryption	AES-128 (Digi internal security layer)	AES-128 (Digi internal security layer)	AES-256 (Digi internal security layer)
	Certifications	FCC, IC, CE/RED (Europe), RCM, RoHS	CE/RED, RoHS	CE/RED (Europe), RoHS
Battery	Model		Unipower Sealed Stationary Battery - 12V 5Ah [UP1250]	
	Nominal Voltage		12 V	
	Nominal Capacity (C10)		5 Ah	
	Terminal		Faston 187 (4.8 mm)	
	Weight		1.70 kg ± 4%	
	Dimensions		106 × 101 × 90 mm ± 2%	
	Battery Warranty [3]		1 year	
Solar Panel	Model		Resun 10 W (RSM010P)	
	Nominal Power		10 Wp	
	Voltage at Maximum Power		18.20 V	
	Current at Maximum Power		0.55 A	
	Open Circuit Voltage		21.6 V	
	Short Circuit Current		0.61 A	
	Efficiency		11.9 %	
	Cell Type		Polycrystalline Silicon (36 cells - 4 × 9)	
	Dimensions		240 × 350 × 15 mm	
	Weight		1 kg	
Packaging	Cardboard box (423 × 413 × 240 mm)			
Manufacturer / Technical Contact	Irricontrol Controle Inteligente de Irrigação LTDA / Luiz Roque			

[1] Depending on the version purchased (type of support) and the installation region.
[2] Defined according to the installation region.
[3] The battery warranty period is counted from the date of purchase by Irricontrol.

4. Product Overview

The Solar Repeater is part of Irricontrol's Automation and Telemetry solution and is responsible for extending the communication signal range.

This product amplifies and retransmits the received signal to other devices in the network, ensuring that information reaches the Central and, subsequently, the Irricontrol Platform. As a result, it provides an efficient solution to overcome connectivity challenges commonly faced in agricultural properties.

The Central is the device responsible for managing communication between the devices that comprise the Irricontrol Telemetry and Automation solution and the Irricontrol Platform.

Exclusively powered by solar energy generated by its own panel, the equipment is an excellent option for remote areas without access to the electrical grid.

Communication is based on mesh technology, used by all products in the Irricontrol Automation and Telemetry solution. In this type of network, device radios operate both as data receivers and transmitters. This enables the creation of an interconnected network in which information is transmitted efficiently, even across large areas or in the presence of obstacles, without relying on a single central point.

The coverage and performance of the mesh network depend on the signal study carried out during the design phase. Physical obstacles, distance between devices, and interference can affect communication.

Changes to the environment after the design phase, such as the construction of new structures or vegetation growth, may create unplanned obstacles and affect communication.

Figure 1 highlights the positioning of the Solar Repeater within the solution and its relationship with the other devices.

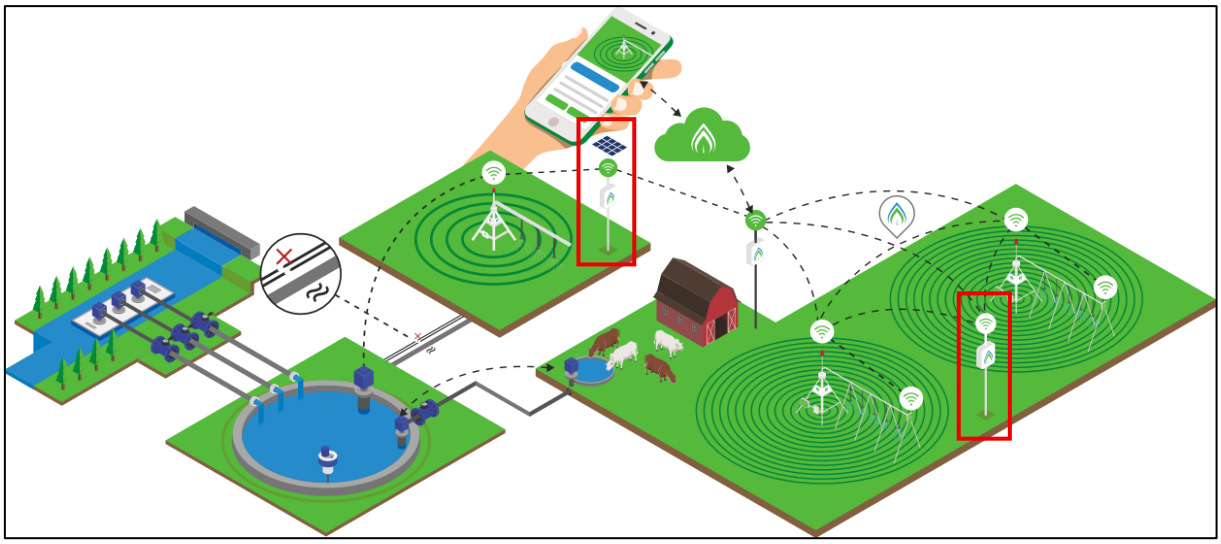


Figure 1 - Solar Repeater in the Irricontrol Automation and Telemetry solution.

5. Product Composition

The components that make up the Repeater Solar are listed below.

Before starting the installation, all items must be checked, and any damage or missing parts must be immediately reported to the authorized dealer or directly to Irricontrol.

ITEM	CODE	DESCRIPTION	QTY.
A	-	SMALL PLASTIC BOX (100 × 100 × 75 MM) - SOLAR REPEATER	1.00
B	-	LARGE PLASTIC BOX (200 × 200 × 95 MM) - BATTERY	1.00
C	2588	SOLAR PANEL - 10W	1.00
D	5277	MOBILE ANTENNA UHF 5/8 WAVE 900 MHZ NMO BASE (AP3900)	1.00
E	6766	COAXIAL CABLE WITH NMO CONNECTOR 1M 95% SMA REVERSE MALE - AP56757	1.00
F	6413	SUPPORT TUBE 2000MM	1.00
G	7478	ANTENNA BASE SUPPORT GLV	1.00
H	-	MOUNTING KIT (TOWER, WALL OR PIVOT) [1]	1.00
I	2156	U-BOLT CLAMP	5.00
J	2135	NYLON CABLE TIE 2.5×160MM	3.00

[1] Defined according to the customer's requirements.

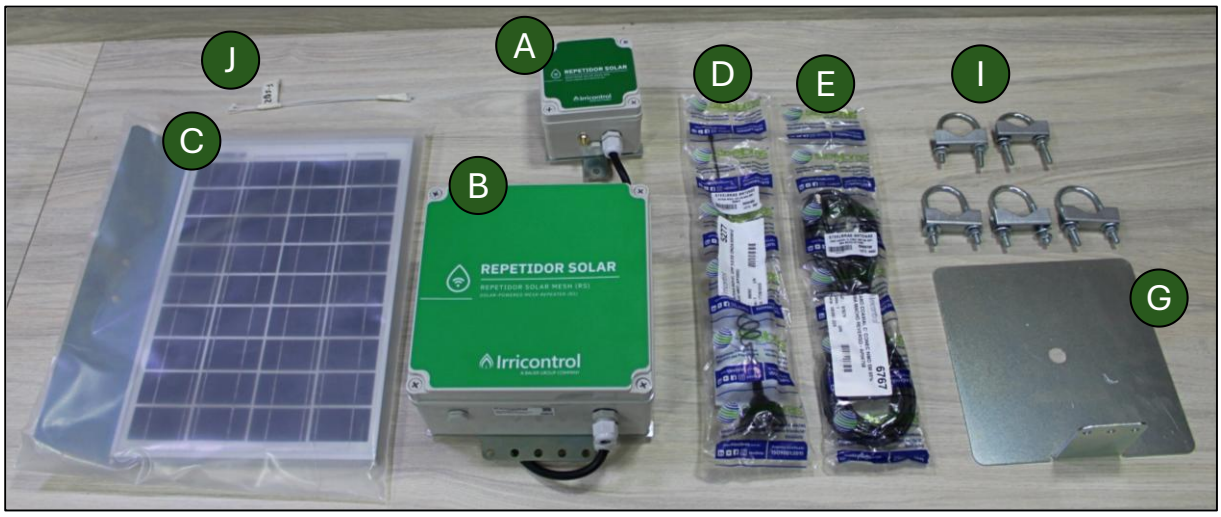


Figure 2 - Components of the Solar Repeater.

The MOUNTING KIT (TOWER, WALL or PIVOT) is included with the Solar Repeater in the same package.

The SUPPORT TUBE 2000MM is packaged separately from the other items due to its size.

5.1. Mounting Kit - TOWER

The Mounting Kit - TOWER (code 2649) consists of the following items:

ITEM	CODE	DESCRIPTION	QTY.
A	2326	TOWER SUPPORT FOR 3/4" TUBE + SCREWS	2.00
B	2373	H PLATE FOR TOWER SUPPORT [1]	2.00
C	2328	ZINC-PLATED HEX SCREW 8 × 60 (MET) [1]	8.00
D	6495	SELF-LOCKING HEX NUT DIN 985 - M8×1.25 - A2 - 70 [1]	8.00
E	2156	U-BOLT CLAMP [2]	4.00

[1] For straight-profile towers.
[2] For tubular-profile towers.

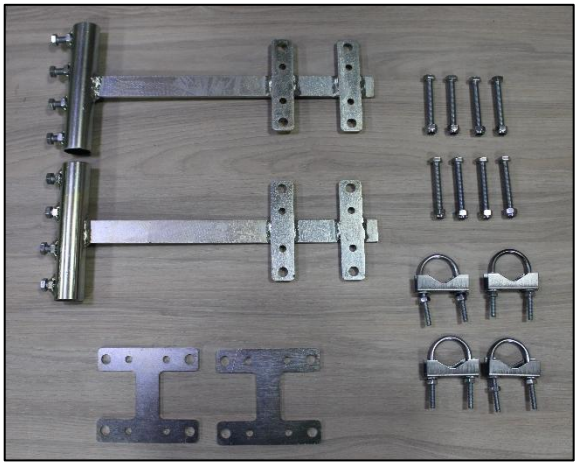


Figure 3 - Mounting Kit - TOWER.

5.2. Mounting Kit - WALL

The Mounting Kit - WALL (code 2650) consists of the following items:

ITEM	CODE	DESCRIPTION	QTY.
A	3017	WALL SUPPORT STAND FOR 3/4" TUBE + SCREWS	1.00
B	2490	SELF-LOCKING PHILLIPS PAN HEAD SCREW 4.8 × 45 (MET) ZINC-PLATED	4.00
C	2340	PLASTIC WALL ANCHOR - SIZE 8	4.00

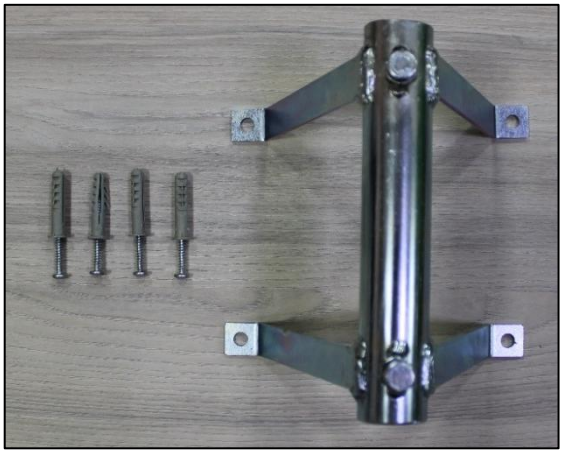


Figure 4 - Mounting Kit - WALL.

5.3. Mounting Kit - PIVOT

The Mounting Kit - PIVOT (code 2651) consists of the following items:

ITEM	CODE	DESCRIPTION	QTY.
A	2371	PIVOT SUPPORT FOR 3/4" TUBE + SCREWS	2.00

Figure 5 - Mounting Kit - PIVOT.

6. Installation

6.1. Mechanical Installation

The Solar Repeater can be installed on walls, towers, and pivot piping. For each installation environment, there is a specific support type:

- Tower Support.
- Wall Support.
- Pivot Support.

The choice of support should be made according to the customer's needs and/or preferences and in coordination with the sales team, to ensure the appropriate installation kit is provided.

In addition to installing the support, the mechanical installation of the Solar Repeater includes the installation of the small and large plastic boxes, the antenna, and the solar panel.

Regardless of the type of support used, the screws must be tightened with the proper torque to avoid looseness, ensuring that all mechanical components remain secure.

6.1.1. TOWER Support

The tower-type mounting support allows the installation of the Solar Repeater on both tubular-profile towers and straight-profile towers.

It should be installed on the side of the tower facing the direction of highest solar incidence to ensure maximum energy capture by the solar panel.

The direction that maximizes solar energy capture varies depending on the hemisphere. In the Southern Hemisphere, the solar panel should be installed facing north, while in the Northern Hemisphere, it should face south.

The use of a compass is recommended to assist with positioning.

To do this:

A. **Straight-profile tower:** Attach the TOWER SUPPORTS FOR 3/4" TUBE using the H PLATES FOR TOWER SUPPORT, ZINC-PLATED HEX SCREW 8 × 60 (MET) and SELF-LOCKING HEX NUT DIN 985 - M8×1.25 - A2 - 70.

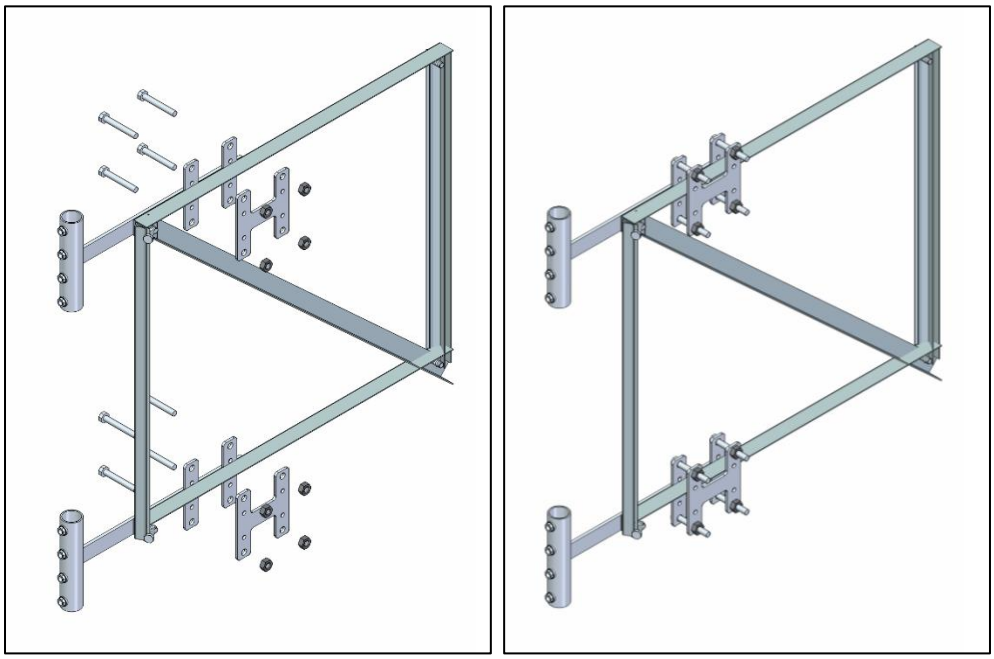


Figure 6 - Mounting the Tower Support on a straight-profile tower.

B. **Tubular-profile tower:** Attach the TOWER SUPPORTS FOR 3/4" TUBE using U-BOLT CLAMPS.

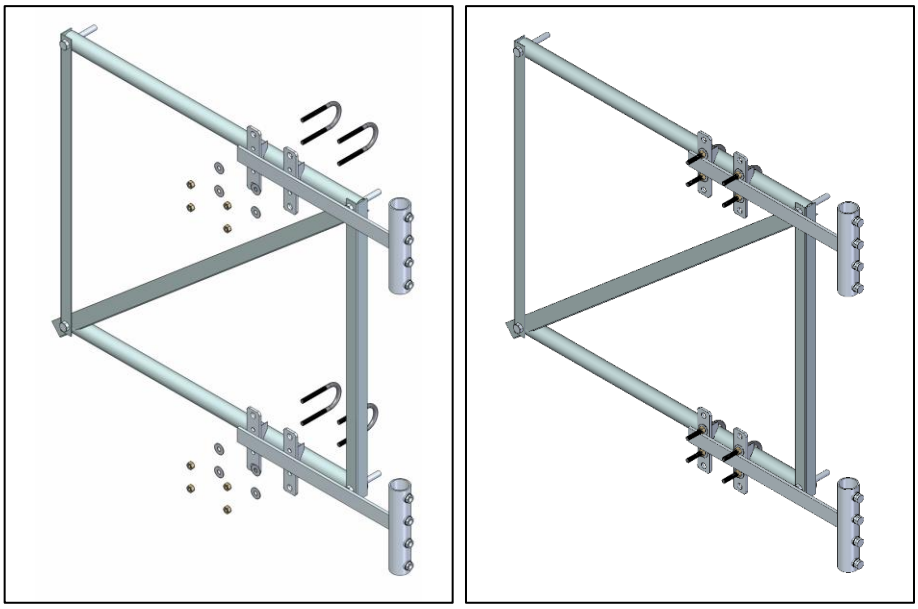


Figure 7 - Mounting the Tower Support on a tubular-profile tower.

C. Pass the SUPPORT TUBE 2000MM through the supports and secure it using the support's screws.

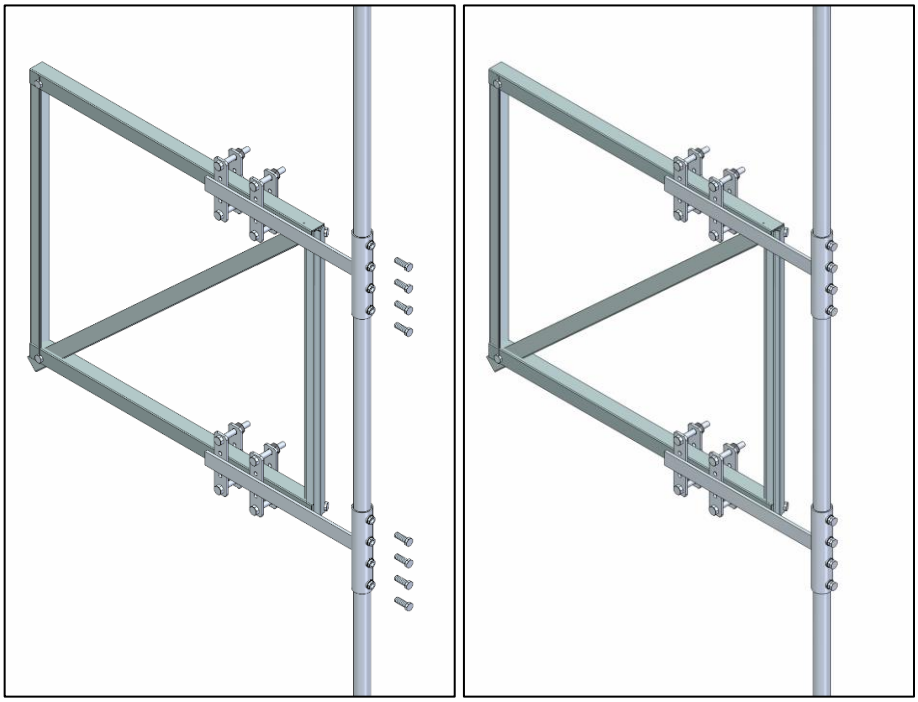


Figure 8 - Mounting the Support Tube on the Tower Support.

The tube should be positioned so that approximately 40 centimeters of its length remain exposed at the bottom, ensuring proper weight distribution of the mechanism.

6.1.2. WALL Support

The wall-type mounting support allows the installation of the Solar Repeater on walls. To install it:

It should be installed on the side of the tower facing the direction of highest solar incidence to ensure maximum energy capture by the solar panel.

The direction that maximizes solar energy capture varies depending on the hemisphere. In the Southern Hemisphere, the solar panel should be installed facing north, while in the Northern Hemisphere, it should face south.

The use of a compass is recommended to assist with positioning.

To do this:

A. Determine the installation point for the WALL SUPPORT STAND FOR 3/4" TUBE.

B. Drill 4 holes to secure the WALL SUPPORT STAND FOR 3/4" TUBE.

To ensure the correct spacing between them, use the support itself as a guide for marking.

It is recommended to use a level to ensure the best positioning of the support.

C. Insert the PLASTIC WALL ANCHORS - SIZE 8 into the holes.

D. Fasten the WALL SUPPORT STAND FOR 3/4" TUBE using the SELF-LOCKING PHILLIPS PAN HEAD SCREW 4.8 × 45 (MET) ZINC-PLATED.

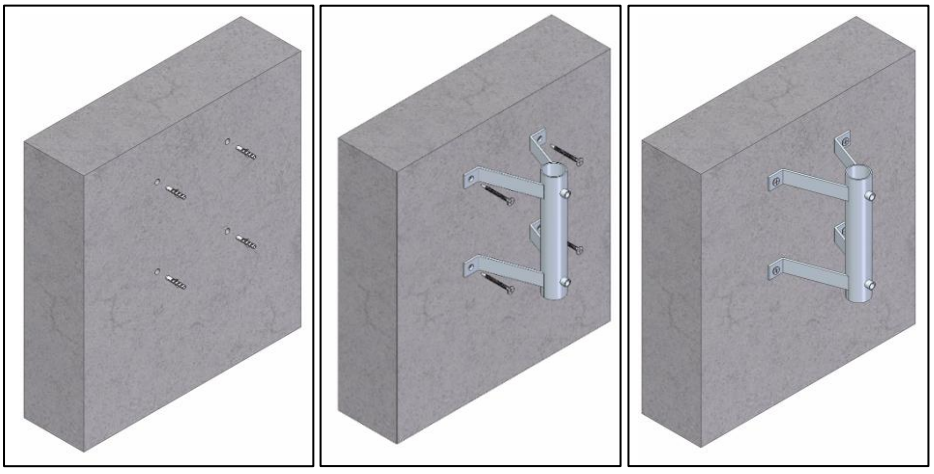


Figure 9 - Mounting the Wall Support.

E. Pass the SUPPORT TUBE 2000MM through the support and mount it using the support's screws.

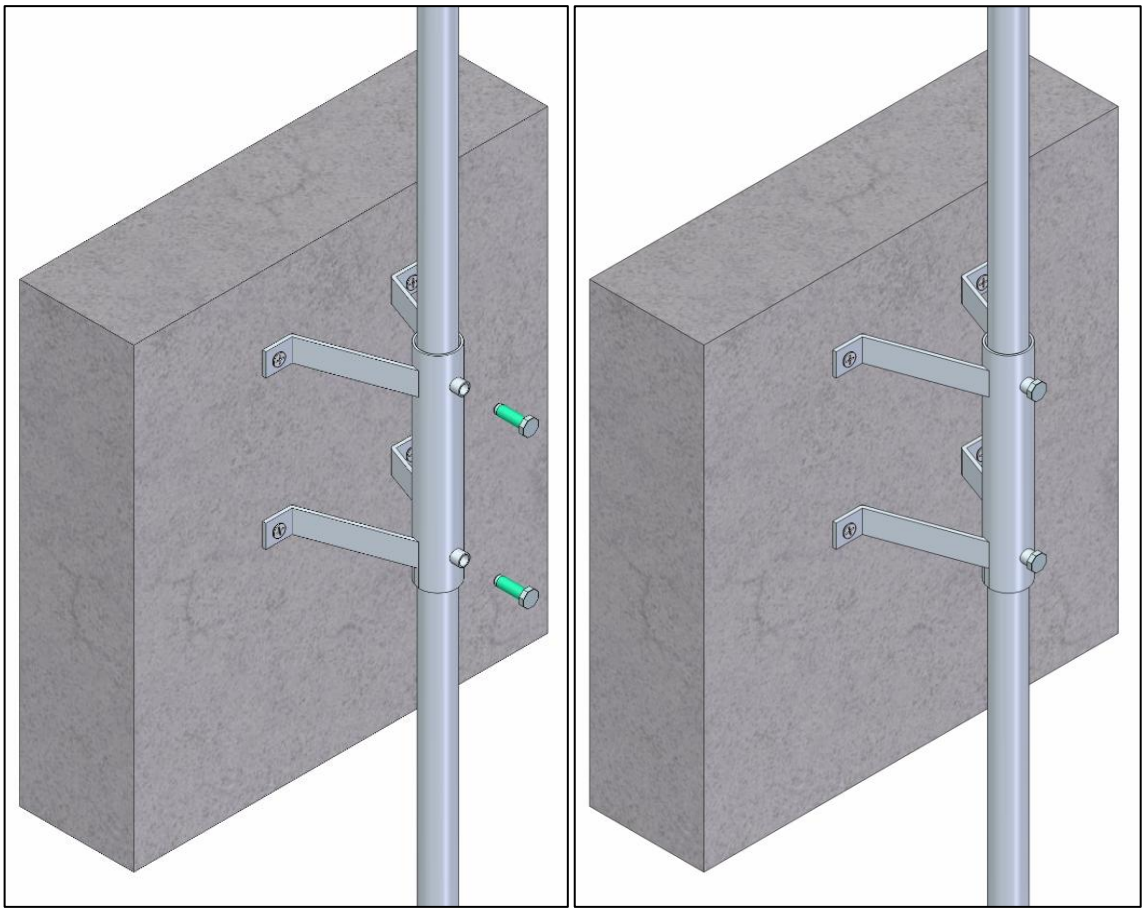


Figure 10 - Mounting the Support Tube on the Wall Support.

The tube should be positioned so that approximately 40 centimeters of its length remain exposed at the bottom, ensuring proper weight distribution of the mechanism.

6.1.3. PIVOT Support

The pivot-type mounting support allows the Solar Repeater to be installed on the pivot pipe. To install it:

A. Loosen the bolts at the junction of two pivot pipes to attach the two PIVOT SUPPORTS FOR 3/4" TUBE.

B. Insert the SUPPORT TUBE 2000MM through the supports and secure it using the bolts.

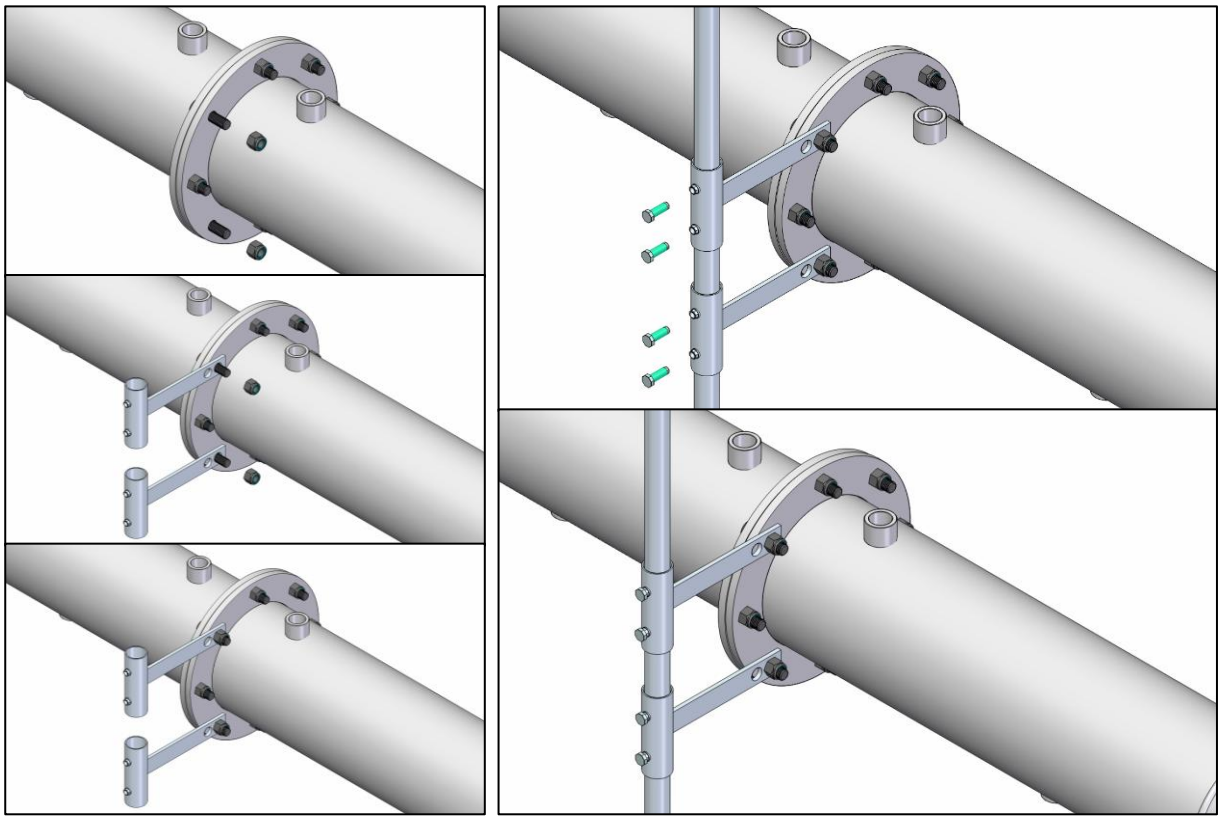


Figure 11 - Mounting the Pivot Support.

The Solar Repeater is typically installed between the first and second pipes of the first span of the pivot, near the central tower.

The tube should be positioned so that approximately 40 centimeters of its length remain exposed at the bottom, ensuring proper weight distribution of the mechanism.

6.1.4. Plastic Boxes

The plastic boxes that make up the Solar Repeater must be mounted on the SUPPORT TUBE 2000MM:

A. **Small Plastic Box (100 × 100 × 75 mm) - Solar Repeater:** Position it at the top end of the tube using a U-BOLT CLAMP.

B. **Large Plastic Box (200 × 200 × 95 mm) - Battery:** Position it below the Small Plastic Box using two U-BOLT CLAMPS.

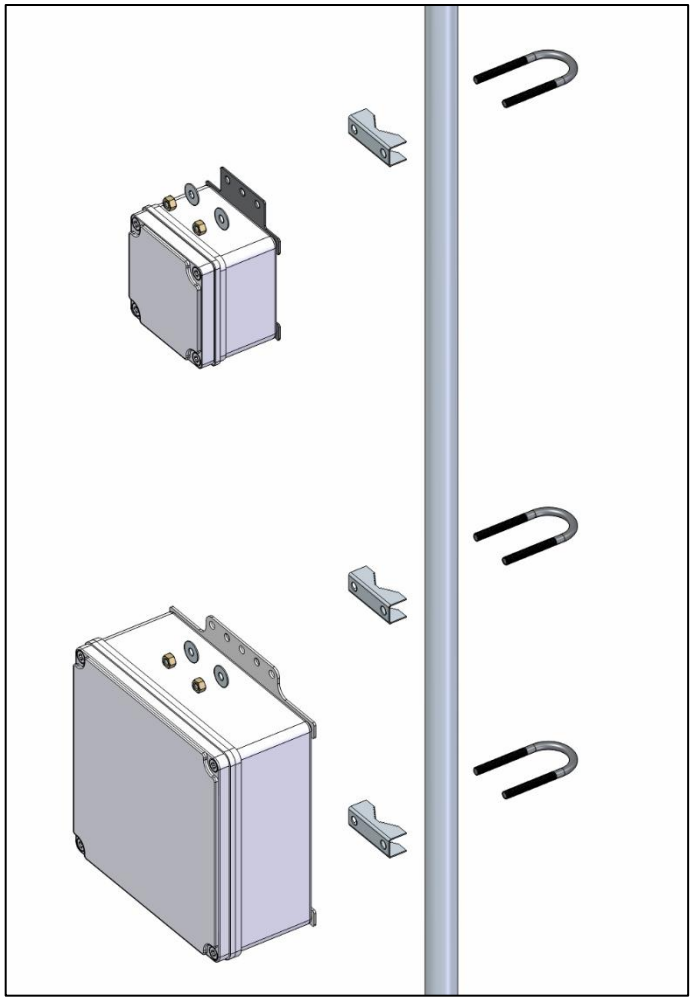


Figure 12 - Mounting the plastic boxes on the Support Tube.

The Small Plastic Box must be installed at the top end of the tube, leaving enough space above it for mounting the Antenna Support.

The Large Plastic Box must be positioned below the Small Plastic Box, leaving enough space for installing the solar panel between them.

6.1.5. Antenna

A. Attach the ANTENNA BASE SUPPORT GLV to the top end of the pipe using a U-BOLT CLAMP.

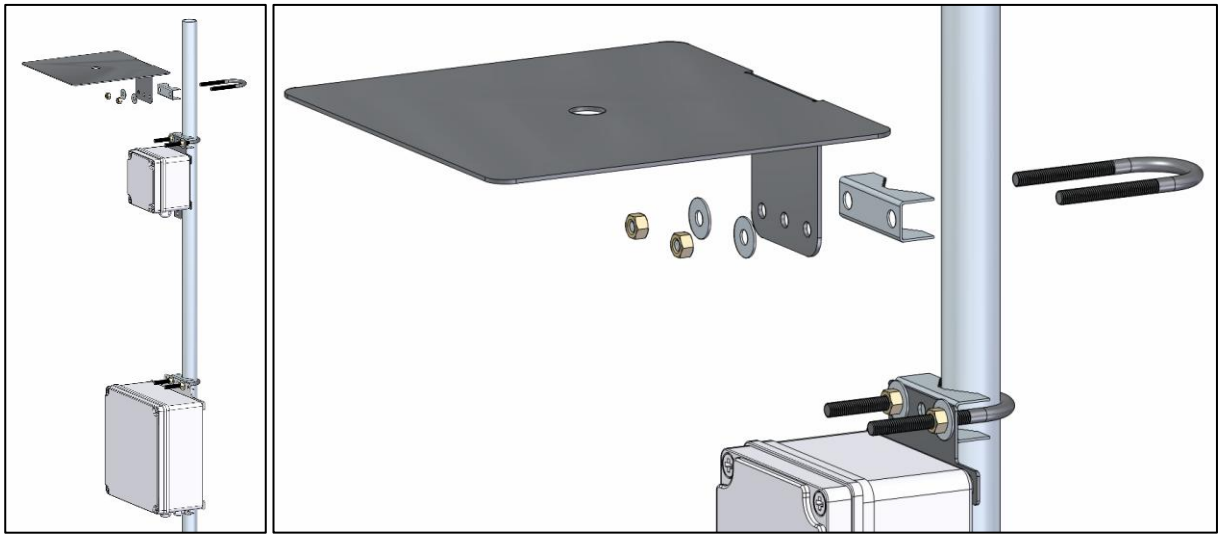


Figure 13 - Antenna Support Installation.

B. Position the NMO base (metal threaded part) over the hole in the bracket.

C. Insert the antenna cable NMO connector from underneath the hole and thread it onto the NMO base.

D. Thread the antenna onto the NMO base.

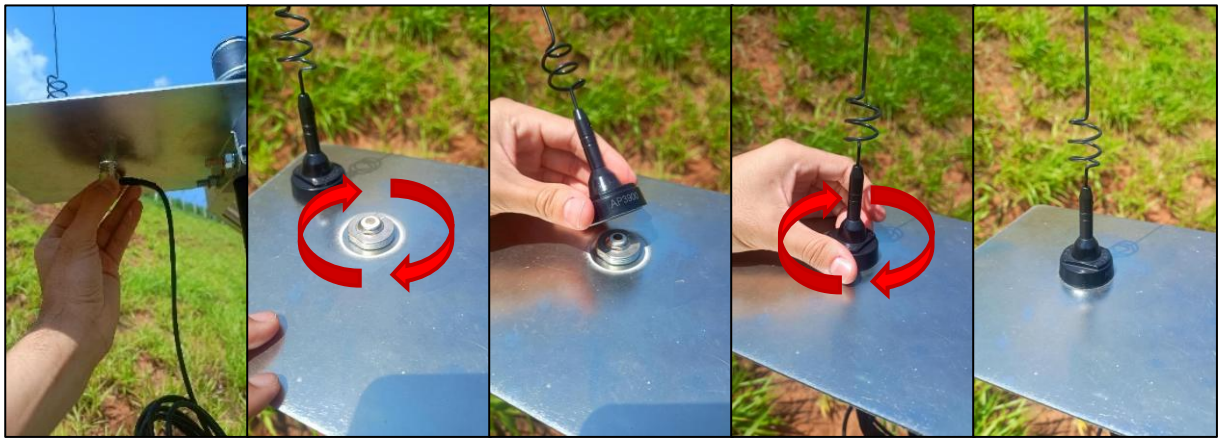


Figure 14 - Antenna Installation on the support.

The NMO base must be installed with the side containing the sealing O-ring facing downward, in contact with the bracket, to ensure proper sealing.

E. Screw the other end of the antenna cable (male SMA connector) into the female SMA connector located at the bottom of the Small Plastic Box (Solar Repeater).

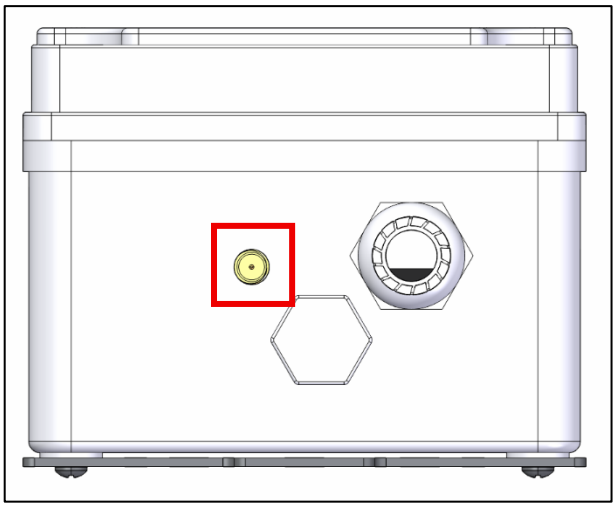


Figure 15 - Antenna Connector on the Solar Repeater.

Keep metal or conductive objects away from the antenna and always ensure it is pointing upward.

Avoid sharp bends in the antenna cable and ensure that all connections are properly seated, without twisting or excessive tension, to prevent communication issues.

6.1.6. Solar Panel

Using a U-BOLT CLAMP, attach the Solar Panel to the SUPPORT TUBE 2000MM between the Small and Large Plastic Boxes, oriented to maximize solar energy capture.

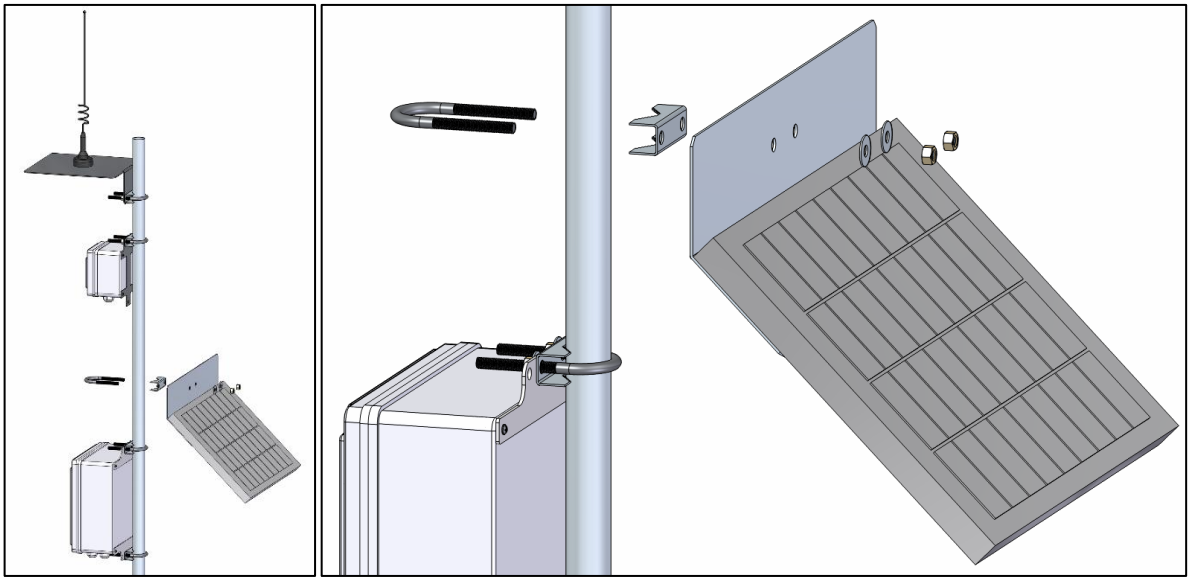


Figure 16 - Mounting the Solar Panel on the Support Tube.

The direction that maximizes solar energy capture varies depending on the hemisphere. In the Southern Hemisphere, the solar panel should be installed facing north, while in the Northern Hemisphere, it should face south.

The use of a compass is recommended to assist with positioning.

When the Solar Repeater is installed using a pivot support, orienting the solar panel toward the direction of highest solar incidence does not apply, due to the pivot's movement during operation.

The following figure illustrates the completed installation of the Solar Repeater on each of the available supports.

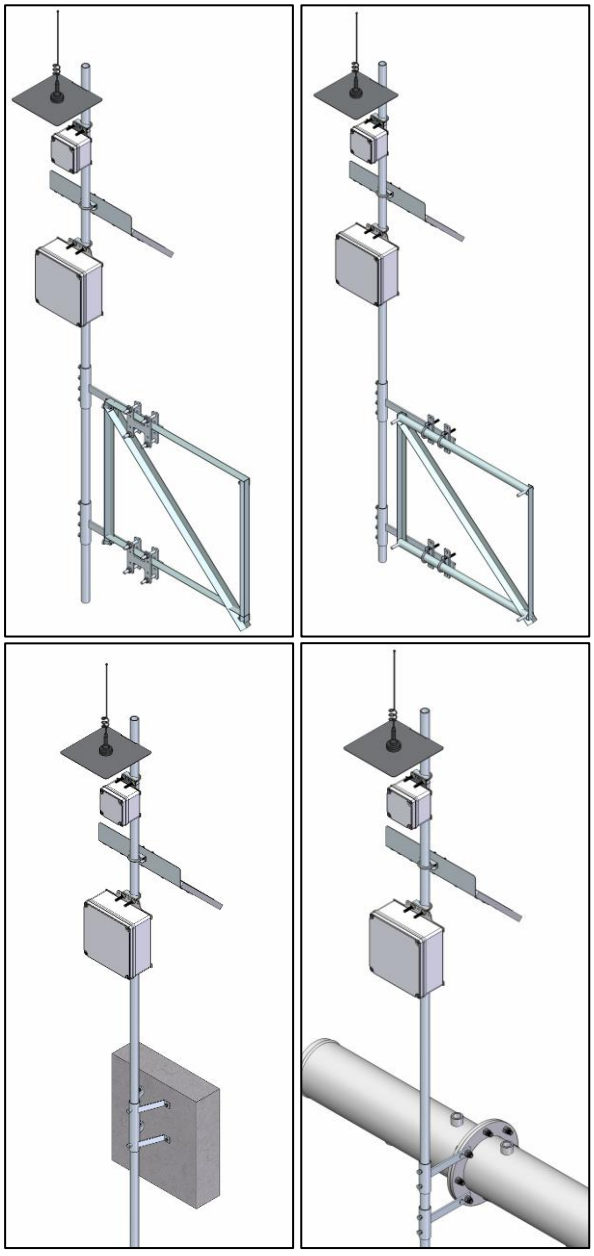


Figure 17 - Solar Repeater Installation on Tower, Wall, and Pivot Supports.

6.2. Electrical Installation

The electrical installation of the Solar Repeater consists of connecting the charge controller to the solar panel and the battery, as shown in the following figure.

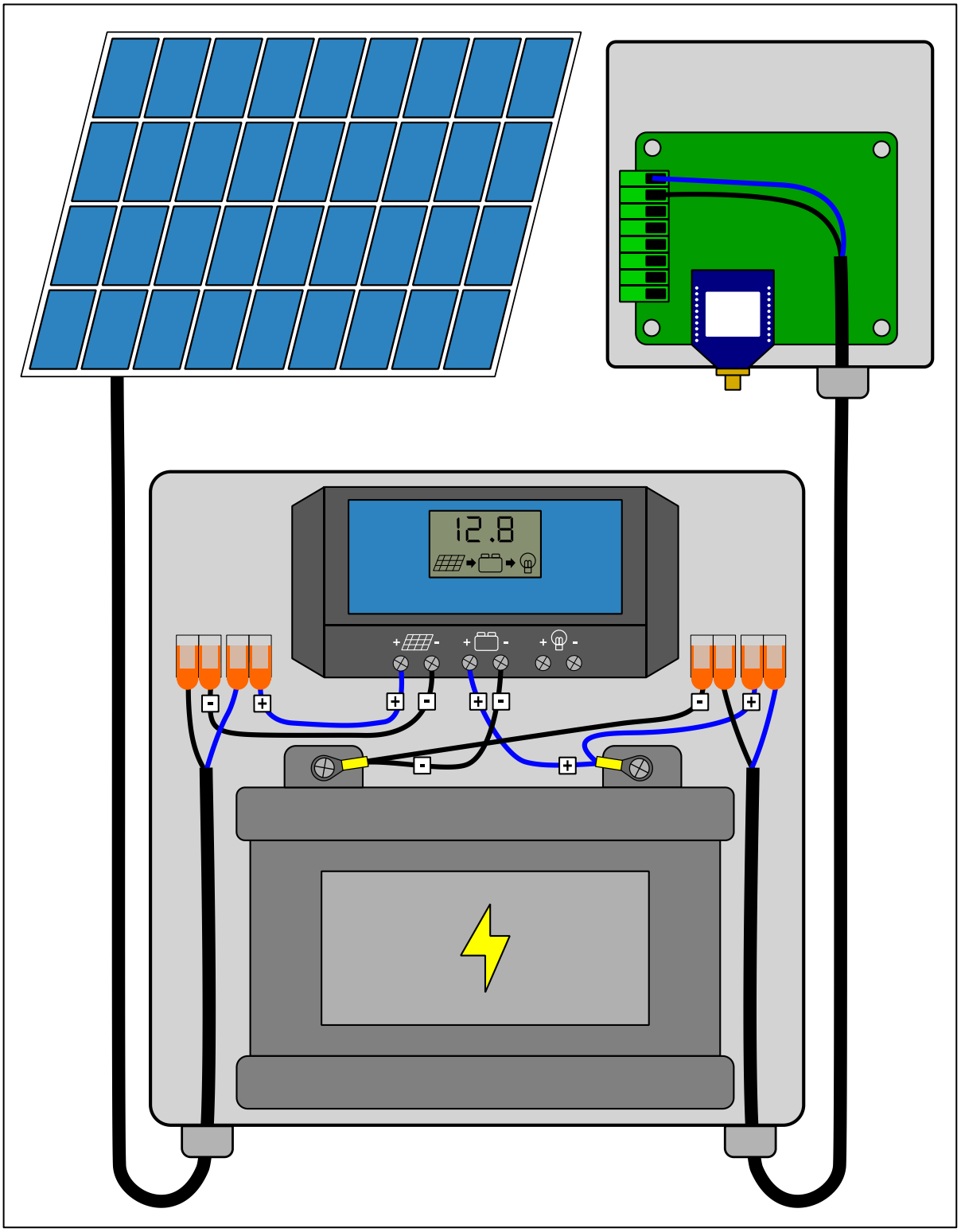


Figure 18 - Solar Repeater Electrical Installation.

To do this:

A. Open the Large Plastic Box (Battery) cover by unscrewing the screws counterclockwise

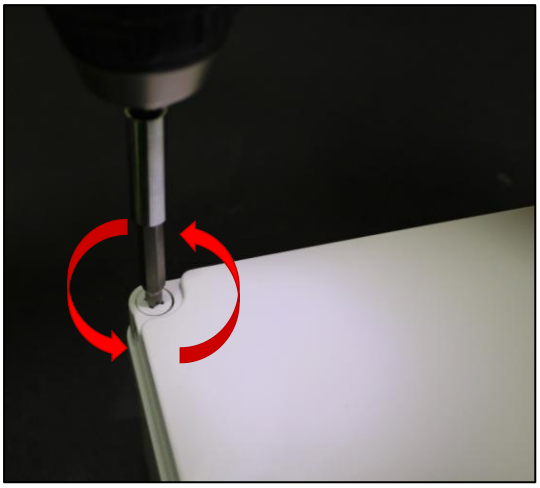


Figure 19 - Opening of the plastic box.

The opening must be done carefully to avoid damaging the screws. It is recommended to always use tools that are compatible with the model and size of the box screws.

The opening can be performed using either a Philips screwdriver or a power drill with a Philips bit. If a power drill is used, the torque and speed must be properly adjusted to prevent unwanted wear on the screws.

B. Connect the charge controller cables intended for the solar panel (cables with WAGO connectors) to the solar panel cables:

CHARGE CONTROLLER Solar Panel - WAGO Connectors	SOLAR PANEL
Blue (+)	Positive (Red)
Black (-)	Negative (Black)

C. Connect the charge controller cables intended for the battery (cables with Faston terminals) to the battery terminals:

CHARGE CONTROLLER Battery - Faston Terminals	BATTERY
Blue (+)	Positive Terminal
Black (-)	Negative Terminal

To ensure a proper connection, do not force the wiring.

D. Verify that the installation was successful:

- Check if the charge controller display shows the voltage and indicates the flow of power from the solar panel to the battery and from the battery to the Solar Repeater's electronic board.
- Check if the "3V3" and "12V" LEDs on the Solar Repeater's electronic board are lit, indicating that the equipment is receiving power correctly.

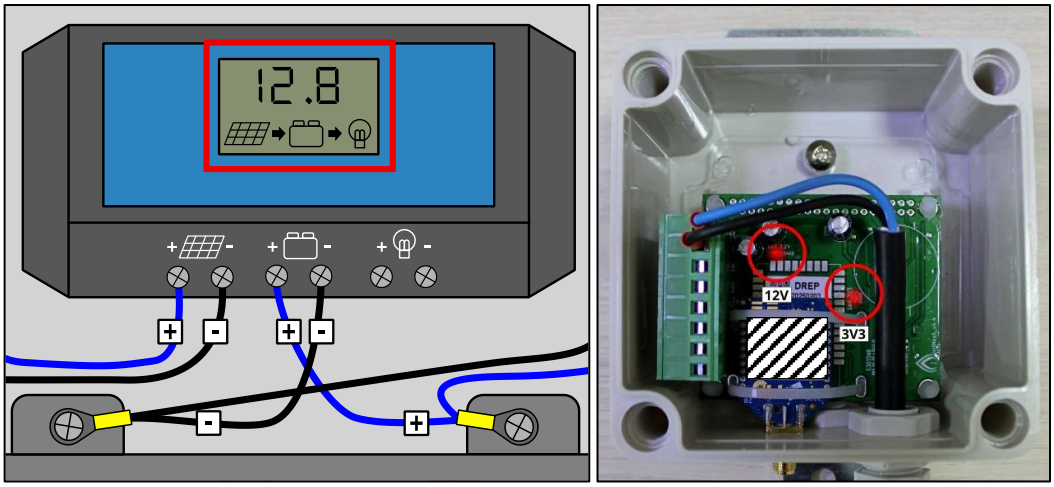


Figure 20 - Verifying the Solar Repeater Power Supply.

E. Close the Large Plastic Box, by evenly tightening the four cover screws with the recommended torque.

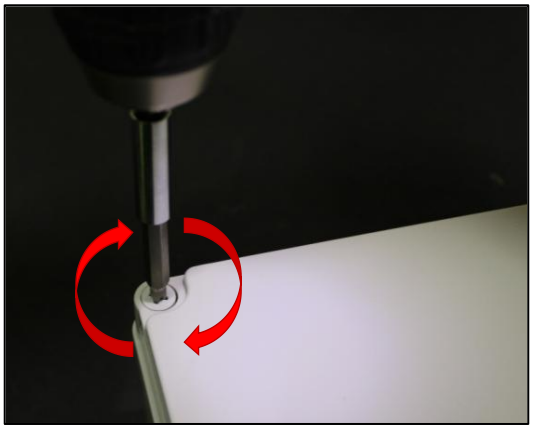


Figure 21 - Closing of the box.

Apply a torque of approximately 4 to 5 Nm to the four screws of the plastic box. This value must not be exceeded to avoid premature wear of the threads and/or damage to the box itself.

This torque setting is based on the parameters of the DeWalt screwdriver model DCD7781, adjusted to position 1 and speed 1.

7. Parameter Configuration

The Solar Repeater setup consists of registering the equipment on the Irricontrol Platform

> The registration step on the platform must be carried out exclusively by authorized technicians and/or Irricontrol personnel.

> The screenshots shown in this manual refer to the web version of the Irricontrol Platform. The mobile version may present slight variations.

> For more information about the operation of the Irricontrol Platform, refer to the support materials available on the Irricontrol Knowledge Platform (Zendesk).

To do this:

A. Open the Small Plastic Box (Solar Repeater) to obtain the radio serial number (ID) of the Solar Repeater, located on the label attached to the XBee module, as shown below.

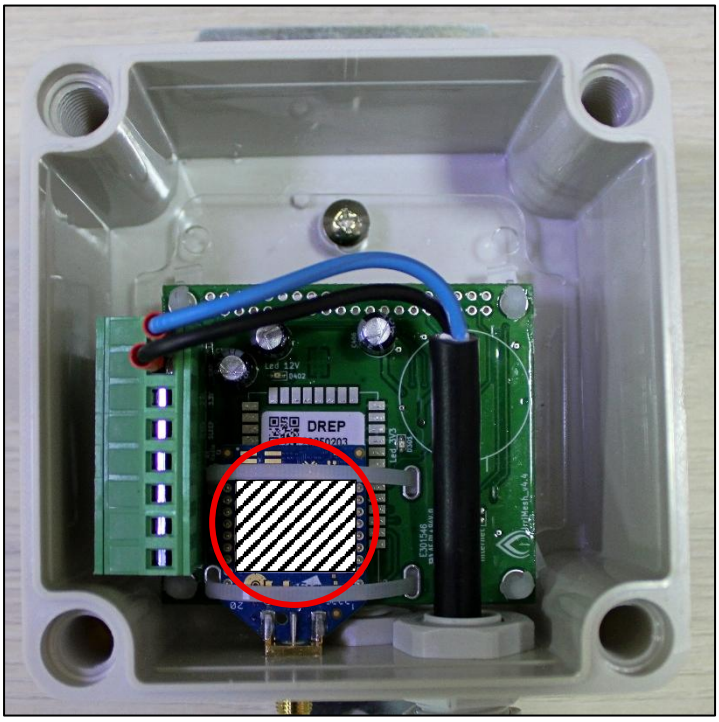


Figure 22 - XBee module label of the Solar Repeater.

B. On the platform, access the farm where the Solar Repeater was installed.

C. On the farm page, select “Register Equipment” and choose “Repeater”.

D. Fill in the fields with the appropriate information and select the repeater type (Solar).

E. Click “CREATE”.

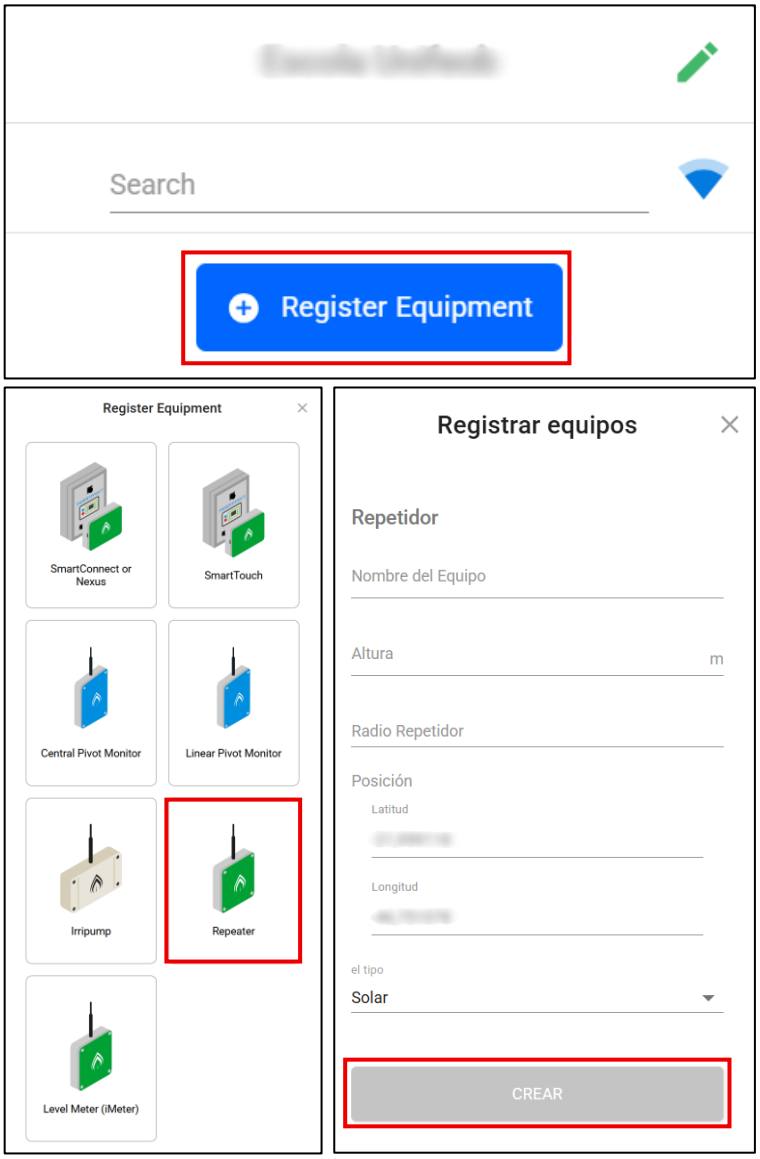


Figure 23 - Solar Repeater registration on the Irricontrol Platform.

In the “Type” field, select “Solar,” which is the power mode of the Solar Repeater.

8. Tests

All products manufactured and sold by Irricontrol Controle Inteligente de Irrigação S/A undergo rigorous quality tests to ensure their full functionality. However, due to the characteristics of field installation and the need for integration with other devices, it is necessary that, after being installed and parameterized, the Solar Repeater undergo new tests.

This section presents the recommended tests to verify that Solar Repeater has been correctly installed, parameterized, and is being recognized by the Central/Platform Irricontrol. It is recommended to perform these tests after product installation, whenever any modifications are made, and/or in case of failures.

8.1. Device Scan

The device scan is a function within the platform that searches for the radio signals of the devices in the Irricontrol Telemetry and Automation system. In other words, this procedure, like the configuration upload, also verifies which devices are communicating with the Central. To do this:

A. Open the left side menu and access the “Devices” option.

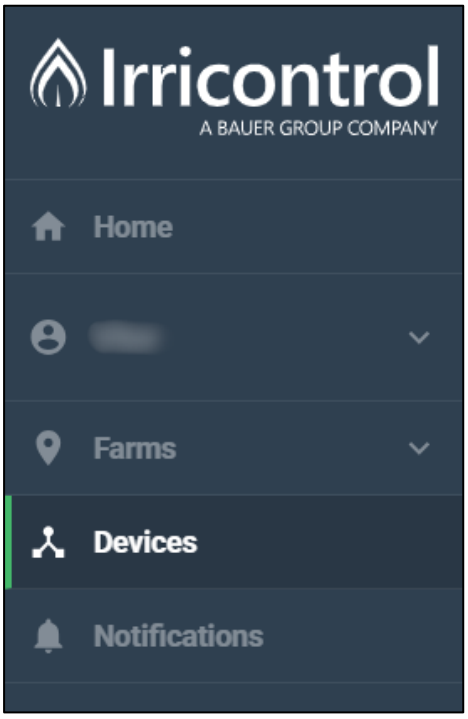


Figure 24 - Device Scan - Accessing the “Devices” page.

B. At the top of the open page, click “SEARCH RADIOS” to start the scan.

Figure 25 - Device Scan - Search Radios.

C. Wait until the percentage reaches 100%.

Figure 26 - Device Scan - In Progress.

D. Check the map for the color of the circle representing the pump where the Solar Repeater was installed:

- Red: The device was not detected by the Central.
- Green: The device was detected by the Central.

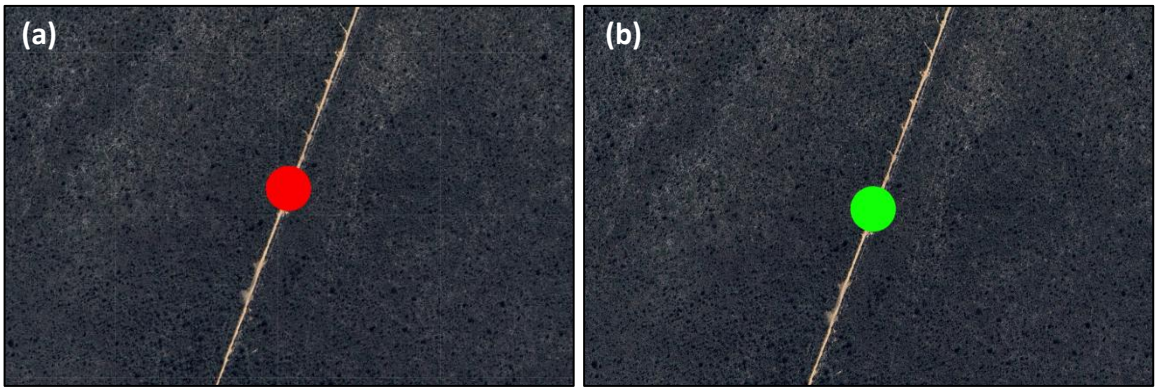


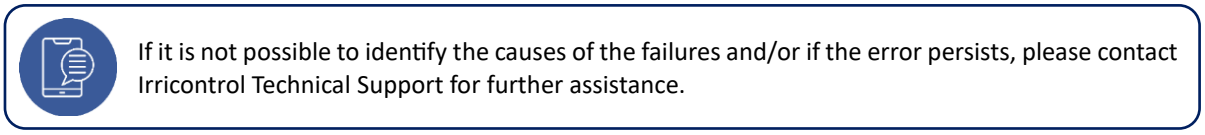
Figure 27 - Scan Result: Device (a) not detected and (b) detected.

If the configuration upload fails, refer to section **9. Failures and Possible Causes** for potential reasons and solutions.

9. Failures and Possible Causes

Due to the technical characteristics of the Irirpump and the environment in which it is installed, the equipment is subject to various factors that may cause operational failures. These can occur due to local conditions, operational errors, or, in exceptional cases, product-related issues.

This section lists the most common failures, their causes, and how to resolve them.



9.1. Repeater does not communicate with the Central/Irricontrol Platform

The Central/Irricontrol Platform does not recognize the equipment during the scan procedure (the circle representing the Repeater appears in red).

POSSIBLE CAUSES	SOLUTION
Incorrect/inadequate electrical connections	- Check all electrical connections of the Solar Repeater. - Tighten the cables in the WAGO connectors.
Cable damaged by rodents and/or birds	- Replace the damaged cable.
Antenna improperly positioned or defective	- Check if the antenna is in a vertical position. - Check if the antenna cable is properly screwed into the Solar Repeater box. - Replace the antenna with a spare or from another device for testing purposes. - Contact Irricontrol Technical Support.
Power system issues (defective charge controller, stationary battery with insufficient charge)	- Check that the Solar Repeater board is properly powered with 12 V from the charge controller. - Review the electrical connections of the solar panel, battery, and charge controller. - Ensure the solar panel is not obstructed. - Clean the solar panel. - Contact Irricontrol Technical Support.
Defective XBee radio	- Contact Irricontrol Technical Support.

10. Additional Information and Precautions

This section contains essential additional information and precautions for the use and maintenance of your equipment. These guidelines are crucial to ensure not only optimal performance but also durability and safety. Attention to these complementary details contributes to a better user experience and maximizes the benefits of your investment.

10.1. Product Serial Number

The equipment's serial number is essential for product control and traceability. It allows the individual identification of the unit, facilitating technical support, maintenance history records, and possible warranty processes.

The serial number label is located on the product packaging (cardboard box) and on the outside of the Large Plastic Box (Battery), near the cable glands.

Figure 28 - Location of the labels with Repeater Solar serial number.

10.2. Product Storage

To preserve the integrity of the equipment until installation, it is essential to ensure proper storage and handling. Always follow the instructions provided on the equipment packaging.

- Keep away from heat and moisture.
- This side up.
- Handle with care - Fragile.

Figure 29 - Product Storage Instructions.

The boxes should be stored in a dry, well-ventilated, and preferably covered area, following all instructions provided on the packaging. Failure to comply with these guidelines may compromise the integrity of the equipment.

10.3. Disposal of the Product and/or Components

At the end of the product's life cycle, or in the event of component replacement, proper environmentally responsible disposal must be ensured in accordance with current legislation (e.g., National Solid Waste Policy – Law No. 12,305/2010).

- **Electronic items (boards, cables, modules, power supplies, connectors):** Must be taken to authorized collection points or companies specialized in electronic waste recycling to prevent soil and water contamination by heavy metals.
- **Batteries and accumulators:** Should never be disposed of in regular trash. Take them to designated battery collection points in accordance with CONAMA Resolution No. 401/2008.
- **Plastics and polymer materials (cabinets, supports, connectors):** Should be separated and sent for recycling according to material classification.
- **Metals (supports, screws, fasteners):** Can be directed to scrap metal recycling.
- **Packaging:** Should be disposed of in selective collection, whenever available, according to the material type (cardboard, plastic, etc.).

Improper disposal of electronic components can cause significant environmental impacts and is subject to legal penalties.

10.4. Periodic Maintenance

Performing periodic maintenance is essential to maintain the product's good performance and ensure its durability and safety. This section provides guidance on when to perform maintenance, which procedures to follow, and how to ensure all components are in perfect working condition. Adopting this maintenance routine contributes to system longevity, prevents unexpected failures, and guarantees operational continuity.

10.4.1. Replacement of the Stationary Battery

If it is necessary to purchase or replace the battery, the recommended specifications are available in section **3. Technical Data Sheet**. For further information, contact Irricontrol Technical Support.

The lifespan of batteries similar to the one used in the product can range from 3 to 5 years, but it depends on several factors, such as climatic conditions, proper use, and other characteristics of the installation site.

10.4.2. Cleaning the Interior of the Equipment

The inside of the equipment must remain free of dust, moisture, and debris to prevent damage to internal components, avoid short circuits, and extend its service life. Use a soft, dry cloth to remove dirt, and avoid applying chemical products, water jets, or metallic objects.

The frequency of this procedure should be defined according to the local conditions where the equipment is installed (level of exposure to dirt) and the availability of qualified personnel. It may also be performed whenever system maintenance is carried out.

10.4.3. Solar Panel Maintenance

The surface of the solar panel must be kept free of dust, leaves, or other impurities, as well as any obstacles that may cast shadows, in order to prevent losses in electrical energy generation.

It is recommended to clean the panel periodically using a soft cloth moistened with water only, without the use of abrasive chemicals. This procedure should preferably be performed during hours of low solar incidence to avoid thermal shocks that could damage the glass.

The frequency of this procedure should be determined according to the local conditions where the equipment is installed (level of exposure to dirt) and the availability of qualified personnel. It may also be performed whenever maintenance is carried out on the system.

10.4.4. Checking the Silica Gel

All Irricontrol modules are supplied with silica gel inside, responsible for absorbing internal moisture and preventing condensation and damage to electronic components.

Therefore, always keep the silica gel inside the equipment. In addition, periodically check whether it is still active and replace it as necessary to ensure continued moisture absorption.

The frequency of this procedure must be established according to the local conditions where the equipment is installed (level of exposure to moisture and condensation). It may also be performed whenever system maintenance is carried out.

10.4.5. Checking the Seals

To prevent the entry of moisture, dirt, animals, or other contaminants that could damage the equipment, it is important to ensure that the plastic boxes of the equipmanet is properly sealed.

Whenever the boxes are opened, check that the external covers are properly closed, ensuring the correct tightening of the screws. In addition, make sure that all cable glands are properly secured.

Irricontrol

A BAUER GROUP COMPANY