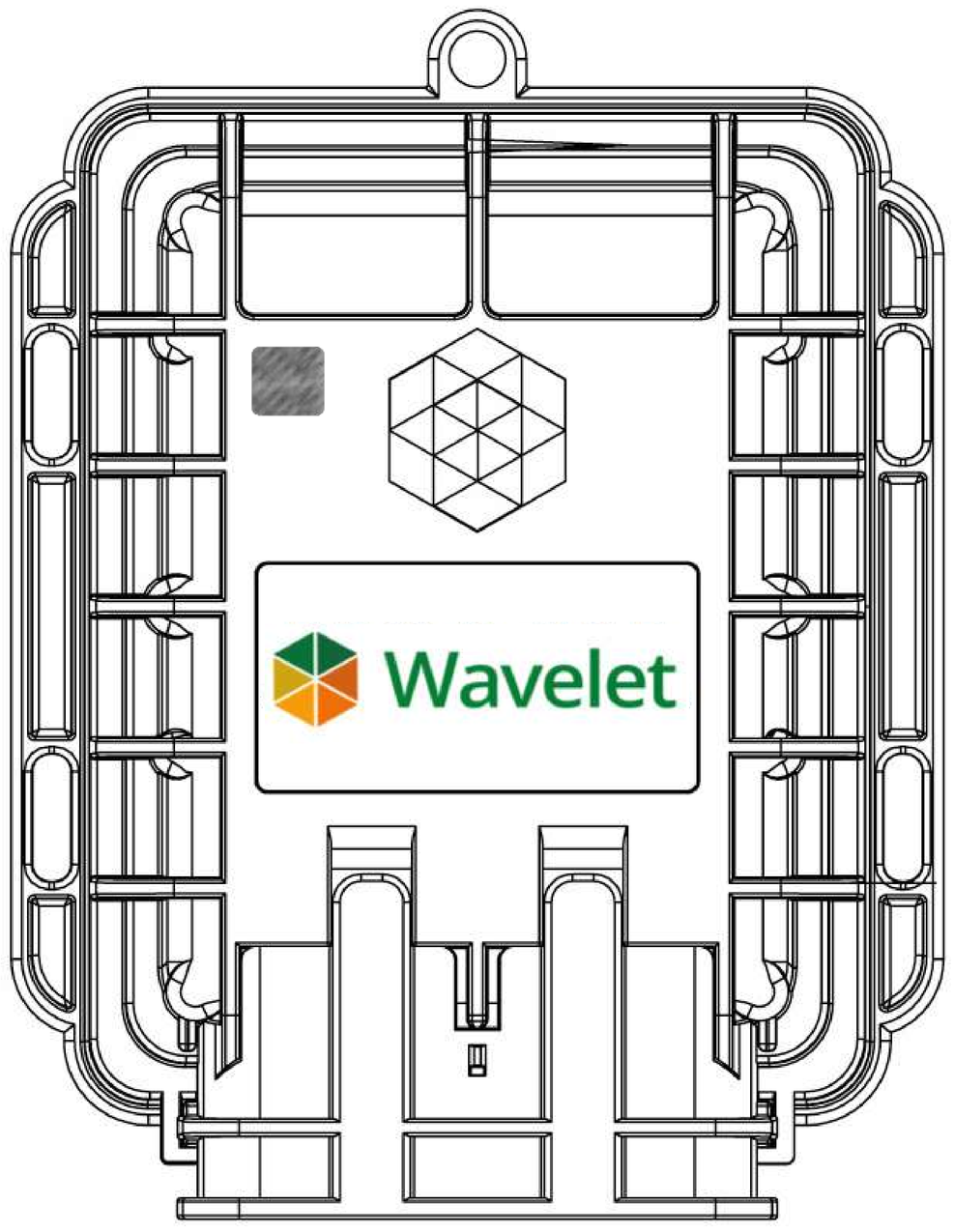
# Wavelet V2

WA1111-xx-V2

## QUICK START

## GUIDE




Feb 14, 2023

P/N 0100706

AYYEKA

It is important that you read the Quick Start Guide in a controlled environment prior to installation.

Set up, activate, and successfully test the entire system (Wavelet V2, sensors, and antenna connection) indoors, in a controlled environment, before going to the field for installation.

# IMPORTANT

Contact the Ayyeka Support Team for technical assistance:
support@ayyeka.com

+1 (310) 876-8040 (US)

+972-2-624-3732 (IL)

Always coordinate the installation with the local authority before starting installation. Installation should be completed by trained and authorized personnel. If assistance from Ayyeka Support is needed, schedule a request in advance, and make **sure that you get confirmation before the installation.**

The Ayyeka Limited Warranty covers only Ayyeka-supplied hardware and software for the duration of the warranty period as per the warranty terms and conditions.

Ayyeka is not liable for damage or injury as a result of handling, installation, or maintenance of its supplied systems.

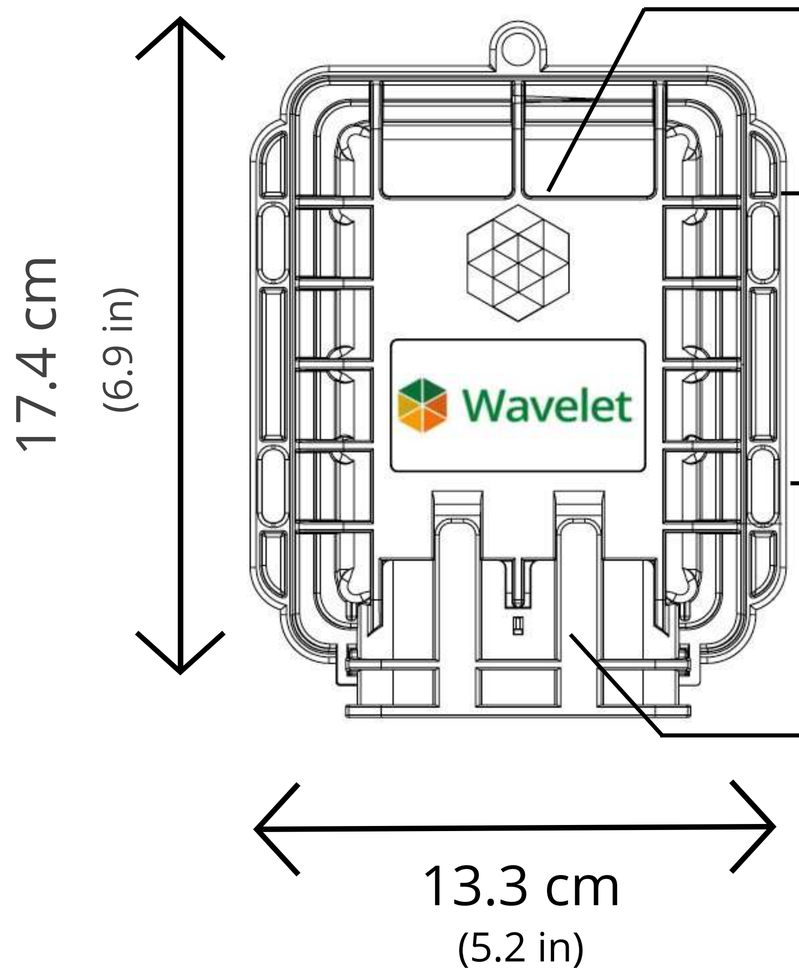
Do not throw away the device because it contains a lithium battery. Dispose of the battery properly according to local laws and regulations.

4G (LTE)/3G/2G cellular network signal is required for proper communication.

Operating temperature range: -40°C to +80°C (-40°F to +176°F)

# SCHEMATIC

## FRONT



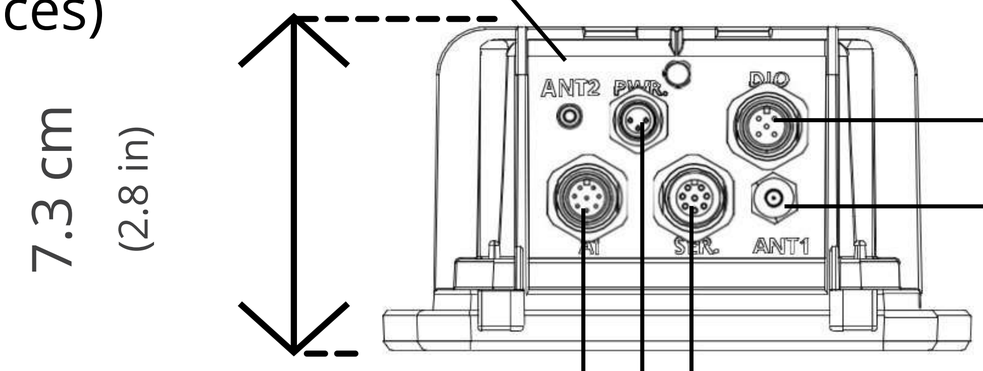

Magnetic Activator

IP 68/ NEMA 6P Wavelet mechanical enclosure

Slots for zip ties and/or bolts for mounting

Panel connectors protector

## BOTTOM




LoRaWAN antenna port (for LoRaWAN-enabled devices)

Discrete port

Cellular antenna port

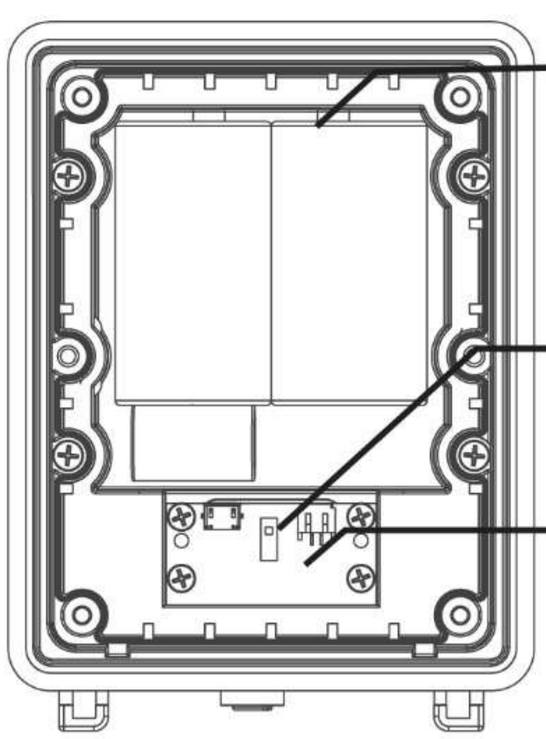
Serial port

External power port

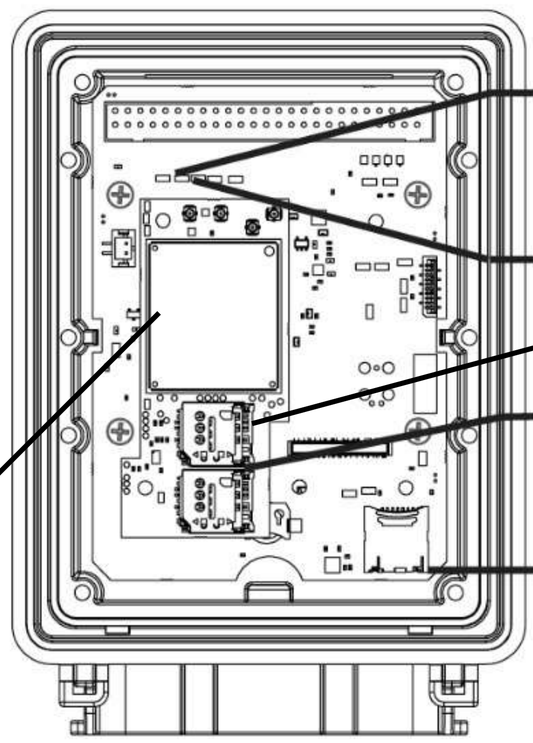
Analog port

# SCHEMATIC

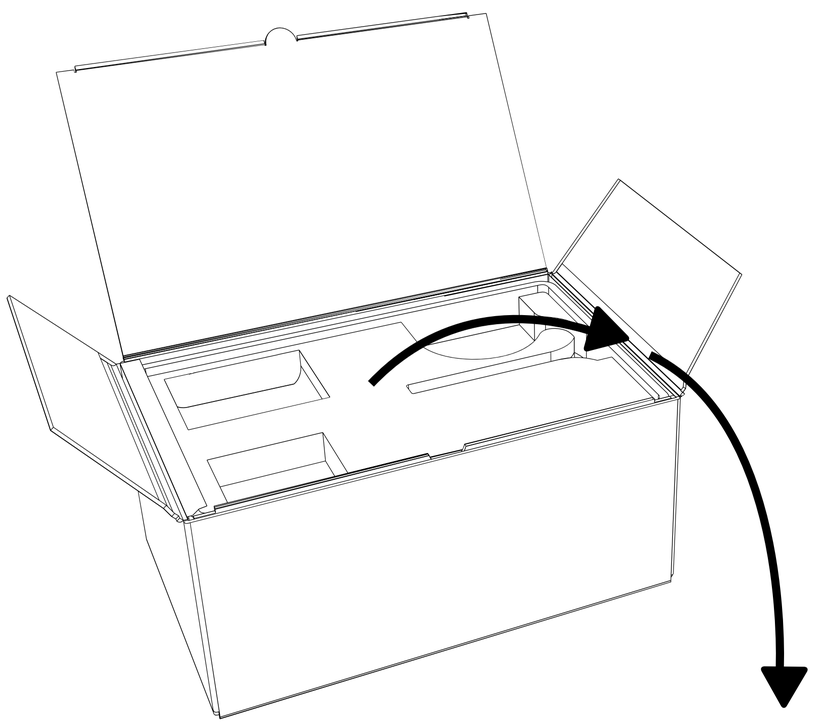
## INTERNAL
## UPPER ENCLOSURE



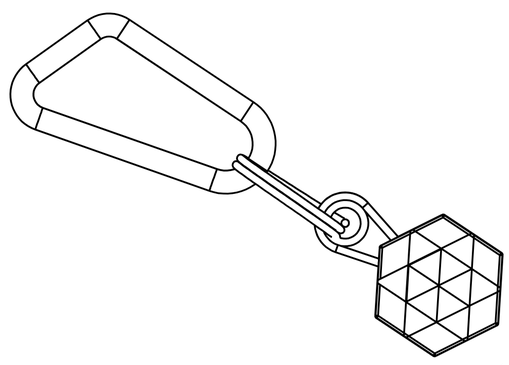

## INTERNAL
## LOWER ENCLOSURE



# COMPONENTS

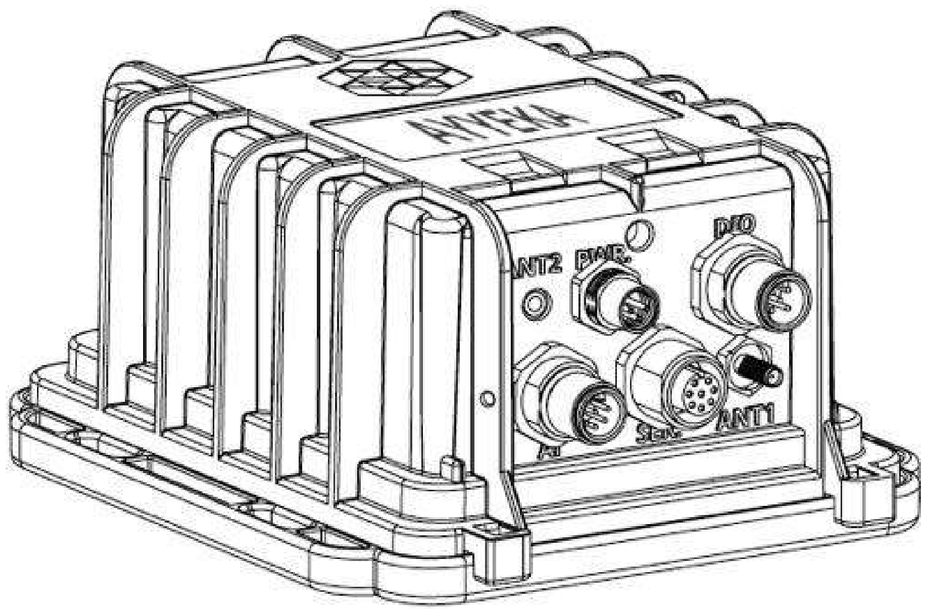


## Wavelet Activator



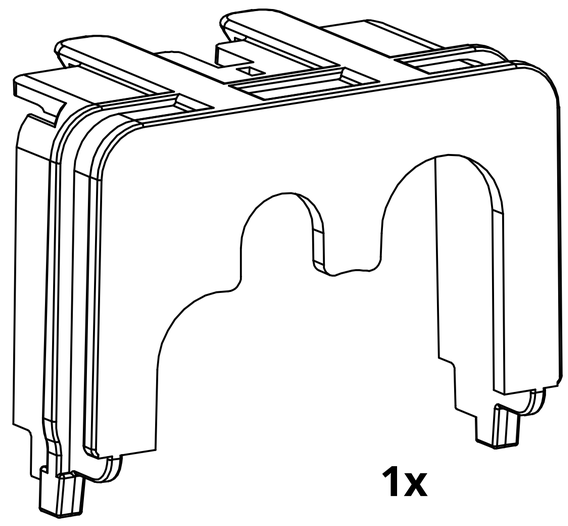
1x

## Wavelet Device




1x

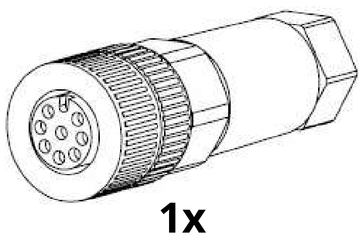
## Panel connectors protector



1x

## M12 field attachable sensor connectors

**(optional; ordered separately)**



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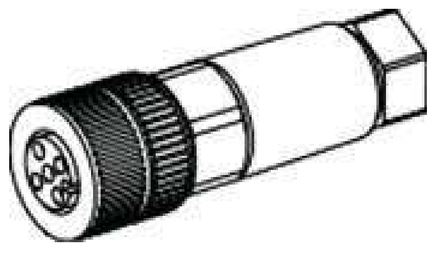

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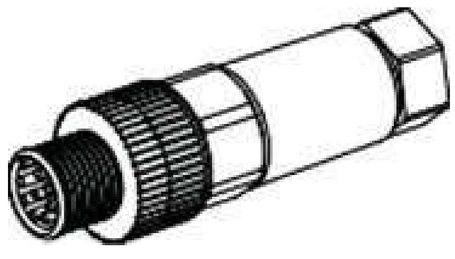
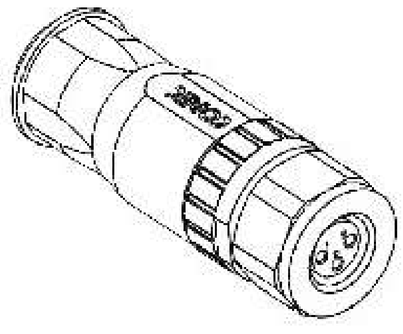


1x

3x

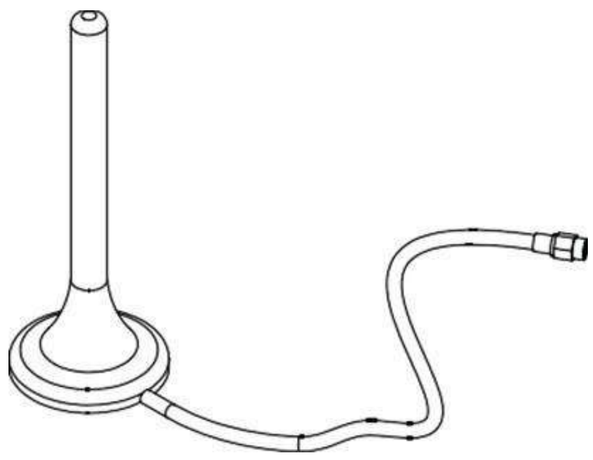
## M8 female field attachable power connector

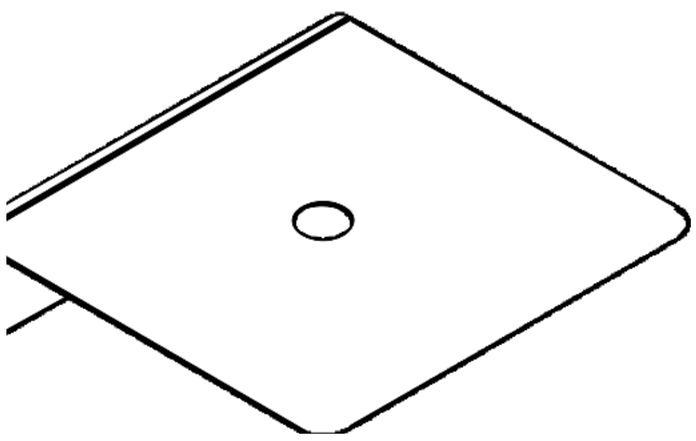
**(optional; ordered separately)**



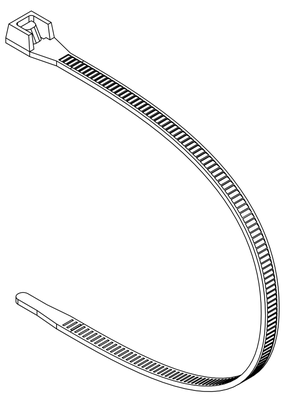
1x

## Cellular antenna and mounting bracket
**(REQUIRED and sold separately)**

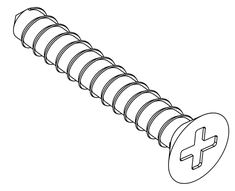




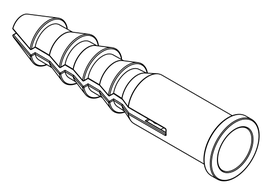
## Zip ties, screws, and anchors
**(optional; ordered separately)**



**2x**



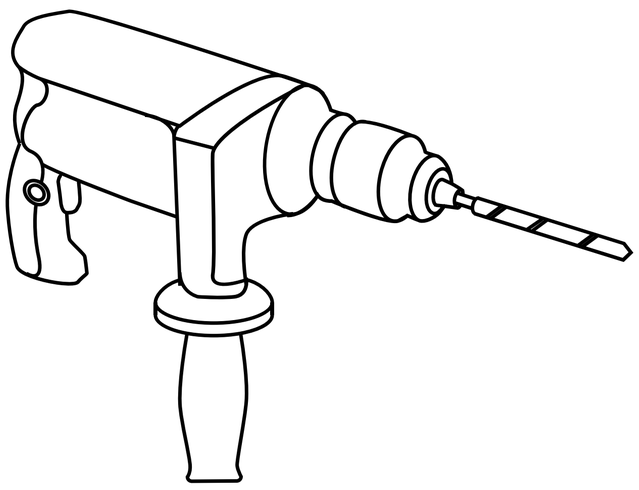
**4x**



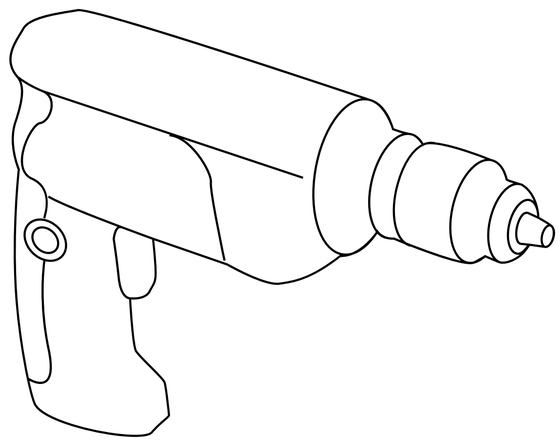
**4x**

**Additional tools and/or materials might be required (not included)**

Rotary hammer

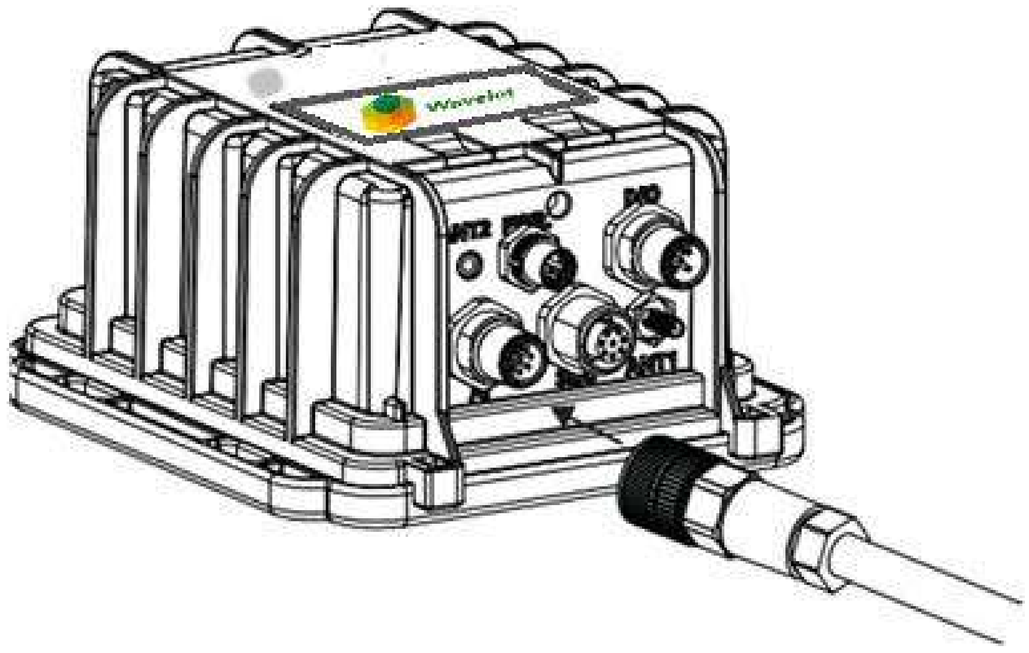


Screwdriver with Phillips PH 1 bit

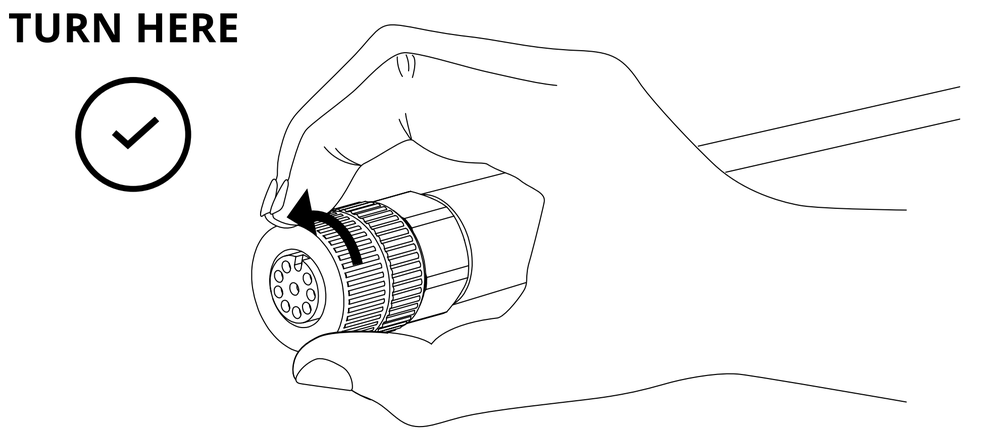


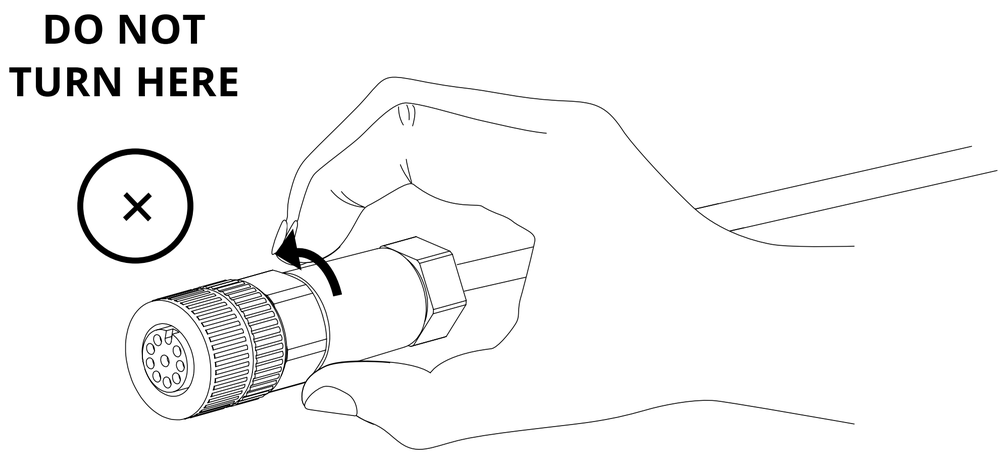
# SENSOR CONNECTION

Connect the sensor cable(s) assembly with the field attachable connector to the mating panel connector on the Wavelet. See pages 19-23 for more details. Turn the adjustable stainless-steel end piece to secure the field attachable connector to the Wavelet.



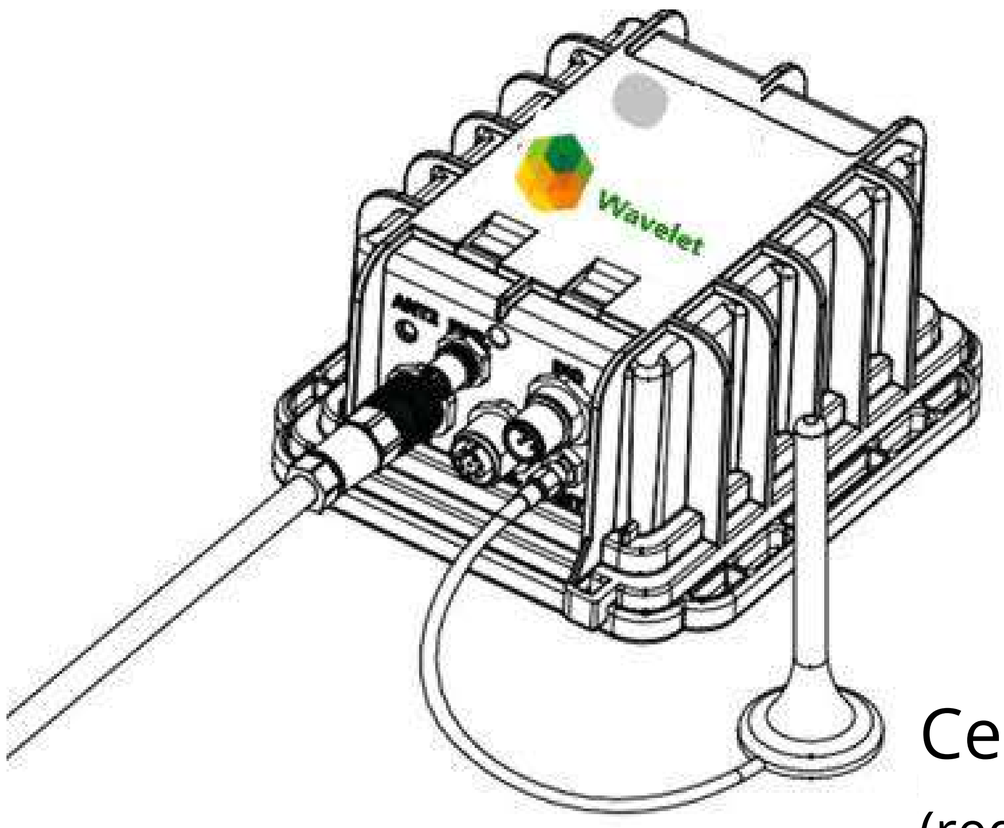
CAUTION: Do not turn the black plastic hood of the connector. Turning the black hood may cause the wires to disconnect, break, and/or damage the connector pins.



# EXTERNAL ANTENNA CONNECTION

Connect the Cellular antenna to the antenna port (ANT1).

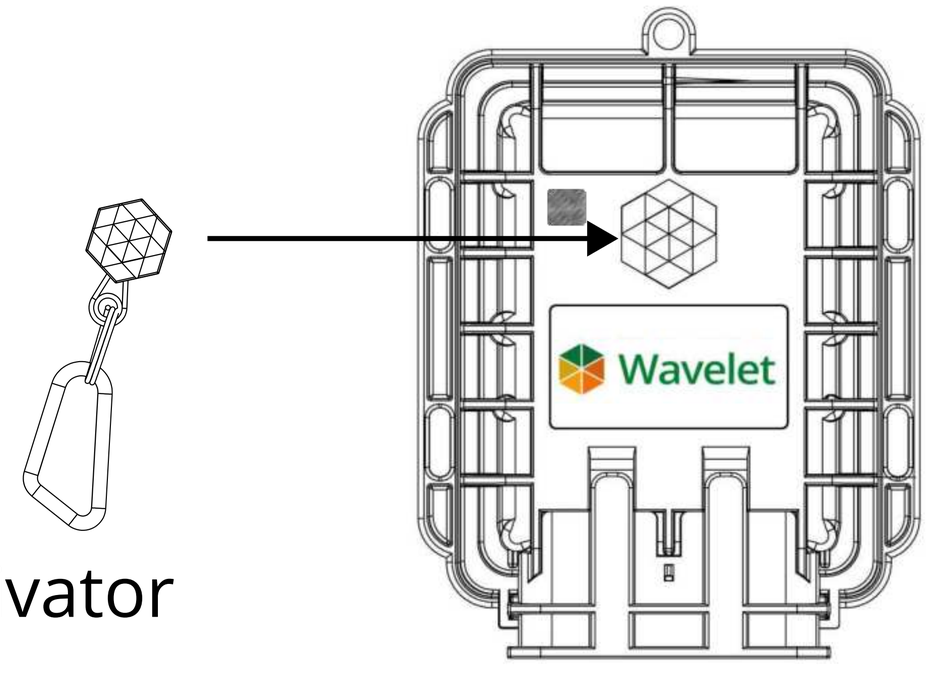



Cellular antenna
(required)

> The antenna does not appear in the remaining depictions in this guide, but it must remain connected after it is properly secured to the appropriate panel connectors.

Place the magnetic Wavelet Activator on the embossed Wavelet logo on the front of the Wavelet enclosure and hold for 3 seconds. You can verify the Wavelet has been activated using the LED on the back panel (see page 11).

The Wavelet will initiate a 15-minute test mode of sampling and send a few transmissions of data. The device will then return to its default configuration.

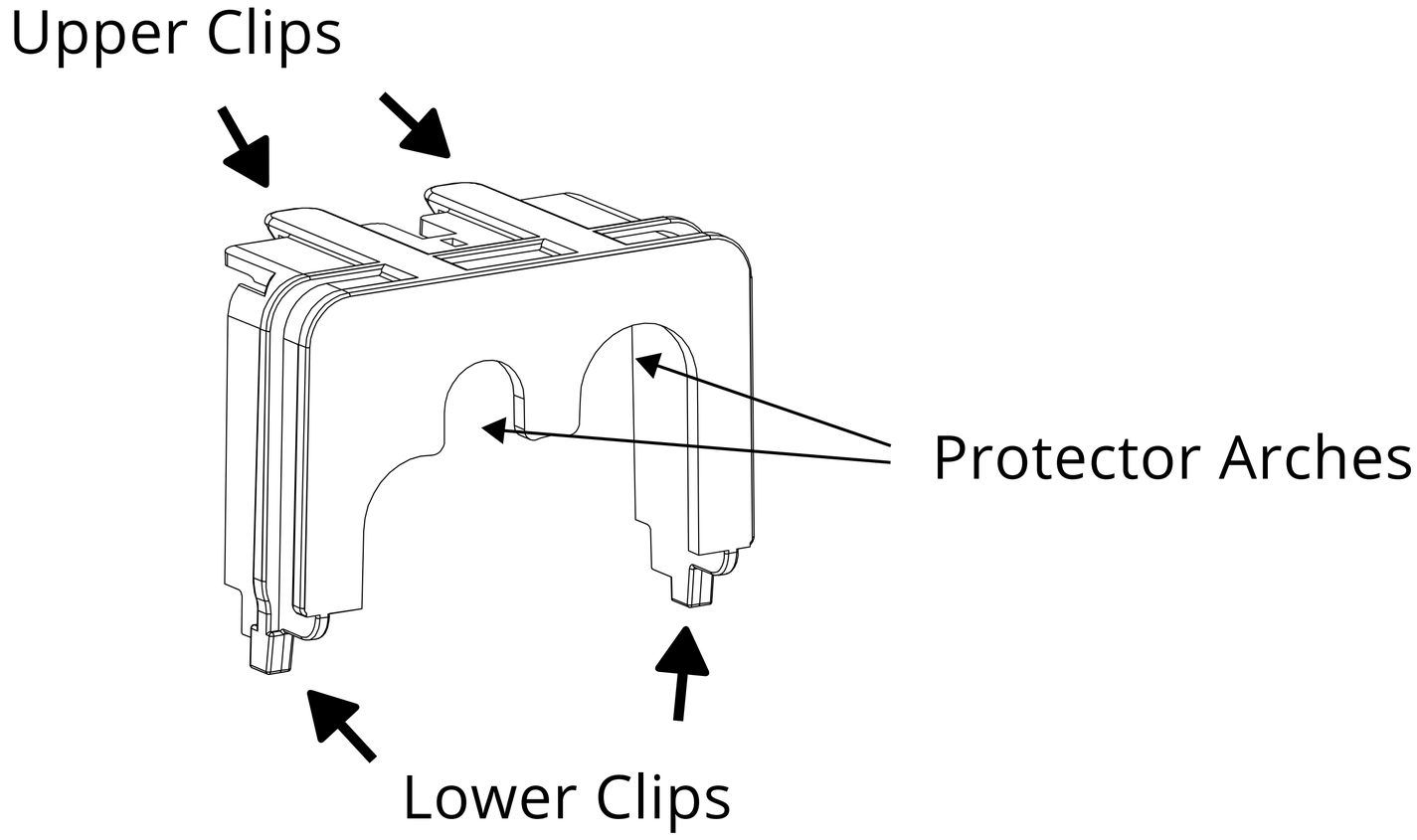



Wavelet Activator

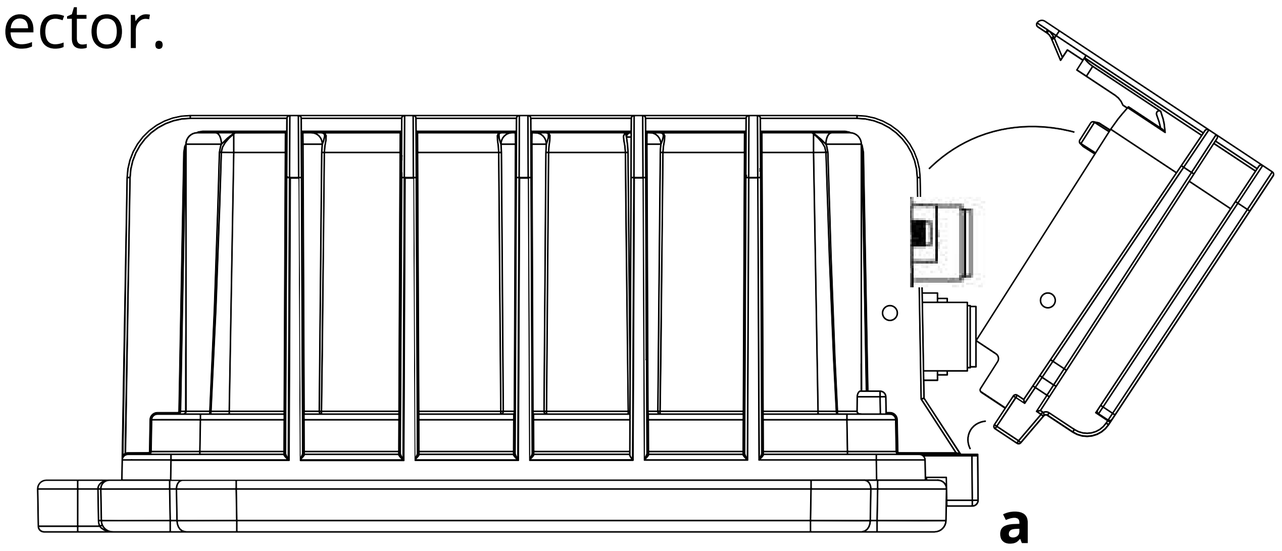
# WAVELET PROTECTOR

After connecting sensors and antenna, place the Wavelet protector above the connector ports and secure the Wavelet protector into the Wavelet enclosure.

a.Insert the two lower clips into the two lower holes of the Wavelet enclosure.




b. Snap the upper clips into place in the two grooves above the panel connector.




CAUTION: The protector is provided to shield the connector from tampering or over-exposure that could result in disconnected wiring.

If you need to remove the protector, grasp it at the protector arches and pull up. The protector will snap off.

# DEVICE ACTIVATION

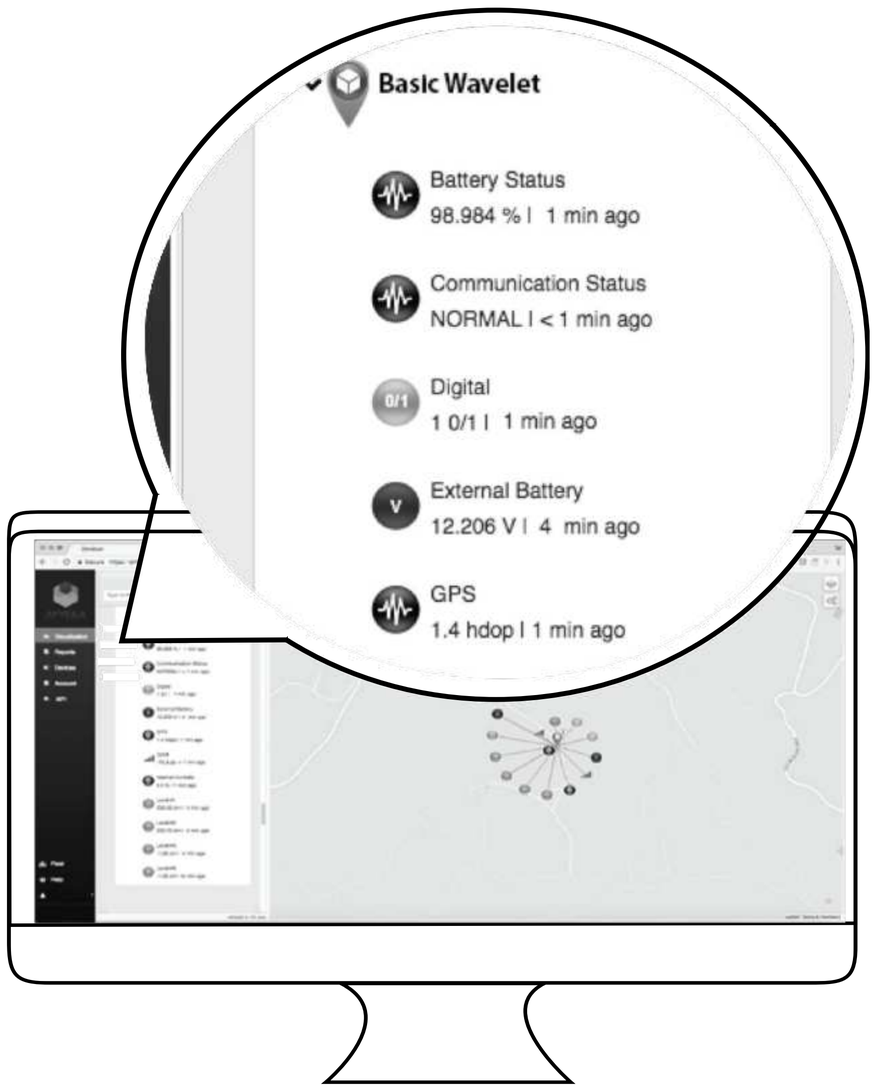
The LED light on the back cover of the Wavelet indicates the device status.

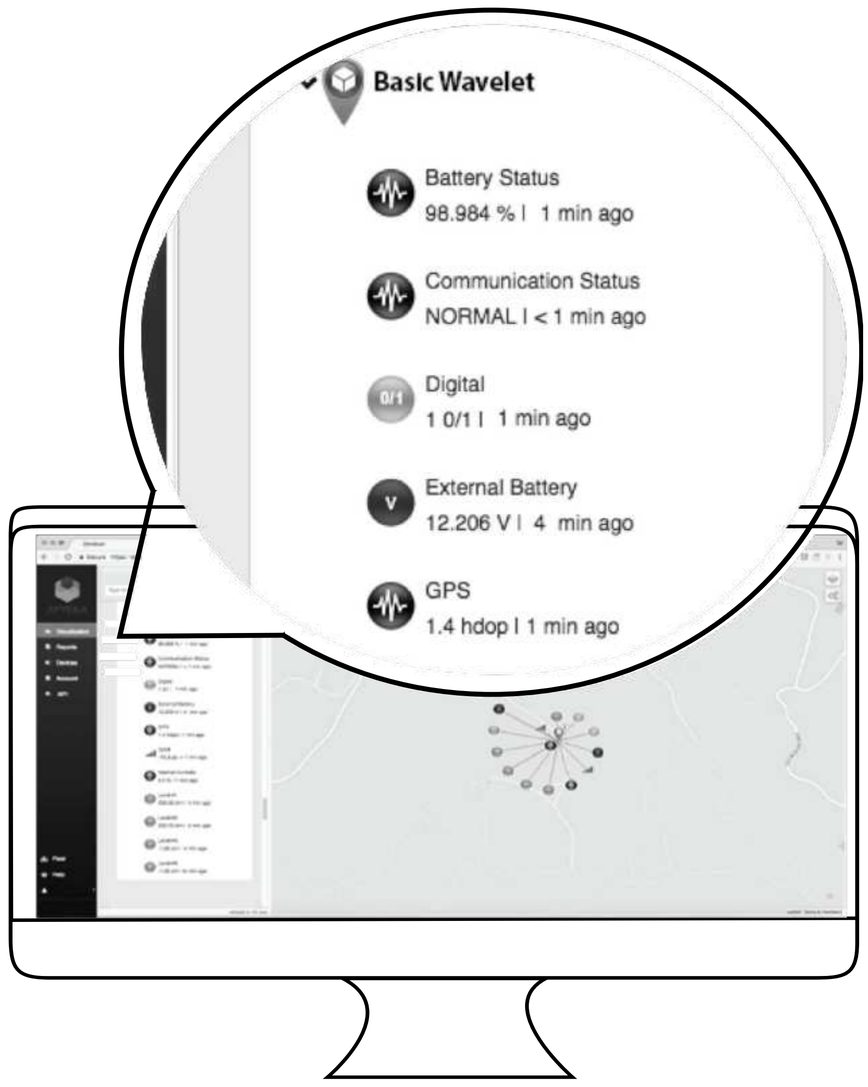
| Function | Description |
|---|---|
| All LEDs are off | Not connected to network. The LED lights do not blink when the device is sampling.<br>Note: Wavelet may be powered down (power switch is in the OFF position), in Hibernate mode, or have insufficient battery strength. |
| Green-Red-Blue-Red-Green LEDs blink sequentially 5x | Wavelet is activated using the Magnetic Activator. |
| Green LED is blinking | Attempting to connect to GSM network. |
| Green LED remains on | Transmission of data is in progress via GSM. The LED will turn off when the transmission is complete. |
| Green-Red LEDs blink 5x | GSM communication error. The device failed to transmit. |

Access the Ayyeka user interface at https://home.ayyeka.com by using your log-in credentials. Expect data to appear 5 – 10 minutes after the test mode is initiated.

# DEVICE ACTIVATION

The screen display should resemble the following:




If the Wavelet transmits properly, then the test was successful.

You can now install the Wavelet in the field and begin to collect and view your data!

If data does not transmit properly, change the Wavelet installation location and activate again.
If the problem persists, contact the Ayyeka Support Team for help:
support@ayyeka.com

+1 (310) 876-8040 (US)

+972-2-624-3732 (IL)

# AyyekaGo MOBILE APP

If you haven’t already done so, download the AyyekaGo mobile app for iOS or for Android. Search the App Store or Google Play for “AyyekaGo” or use the QR codes below.

There are two ways to pair your phone with your Wavelet:

1.Select ”Get Key Via Web”. This will direct you to enter your log-in credentials for the StreamView user interface.

2.Select ”Enter Key Manually”. The Mobile Pair Key is found in the StreamView user interface in the Devices tab.

Once connected to your Wavelet device, there are multiple display screens for different functionality.
The first screen provides essential information, including, but not limited to:

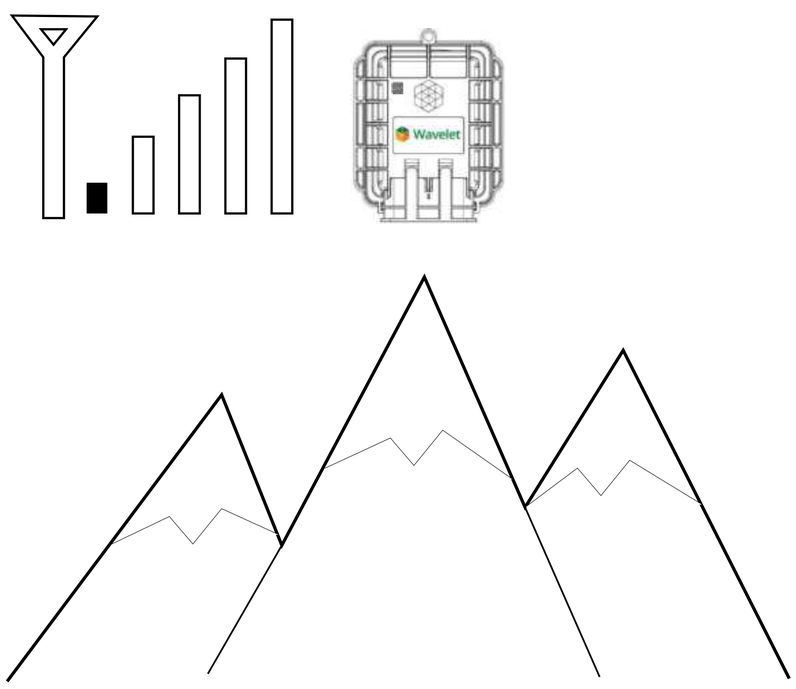
- signal strength
- cellular carrier
- confirmation of successful transmission and connection to the server

Download on the App Store

GET IT ON Google Play

# SPECIAL INSTALLATION LOCATIONS

## WEAK SIGNAL LOCATIONS

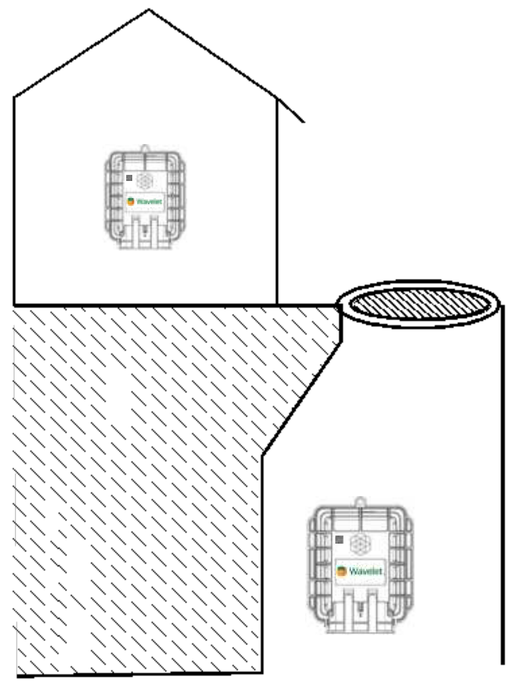



If the Wavelet is installed in an area with weak cellular signal, activate the Wavelet by using the magnetic activator.

Use the AyyekaGo mobile app to pair with the device and confirm transmission. You can also log in to the StreamView user interface using your credentials to validate that the device is transmitting.

Wait for at least15 minutes, then log in to the StreamView user interface at https://home.ayyeka.com to confirm successful transmission.

## INDOOR/UNDERGROUND



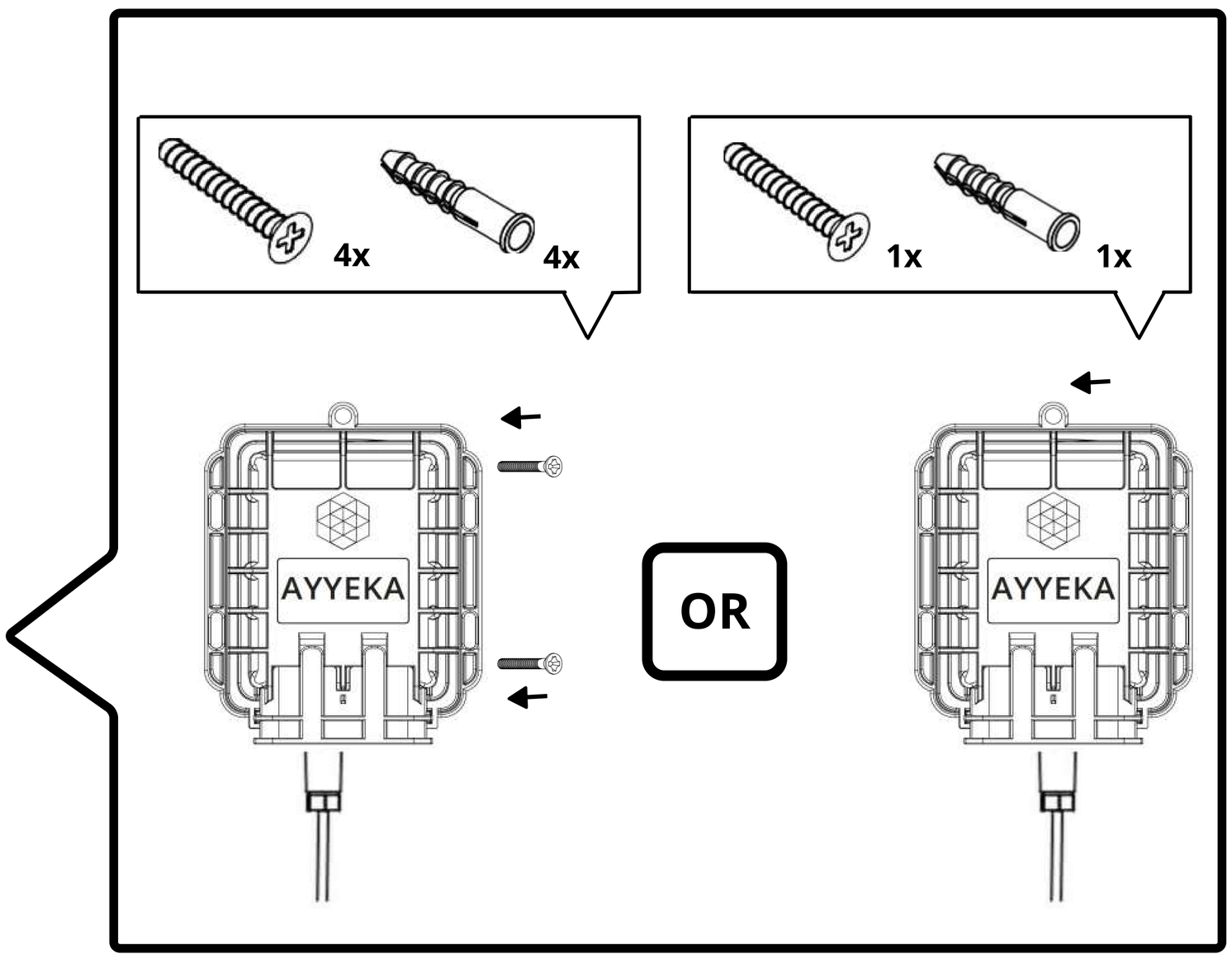

If the Wavelet is installed in an area with weak cellular signal, activate the Wavelet and place in the intended installation location with closed doors/access hatch.

Wait for at least15 minutes, then log in to the user interface at home.ayyeka.com to confirm the updated location on the map. Before installation, initiate the GPS by activating the Wavelet.

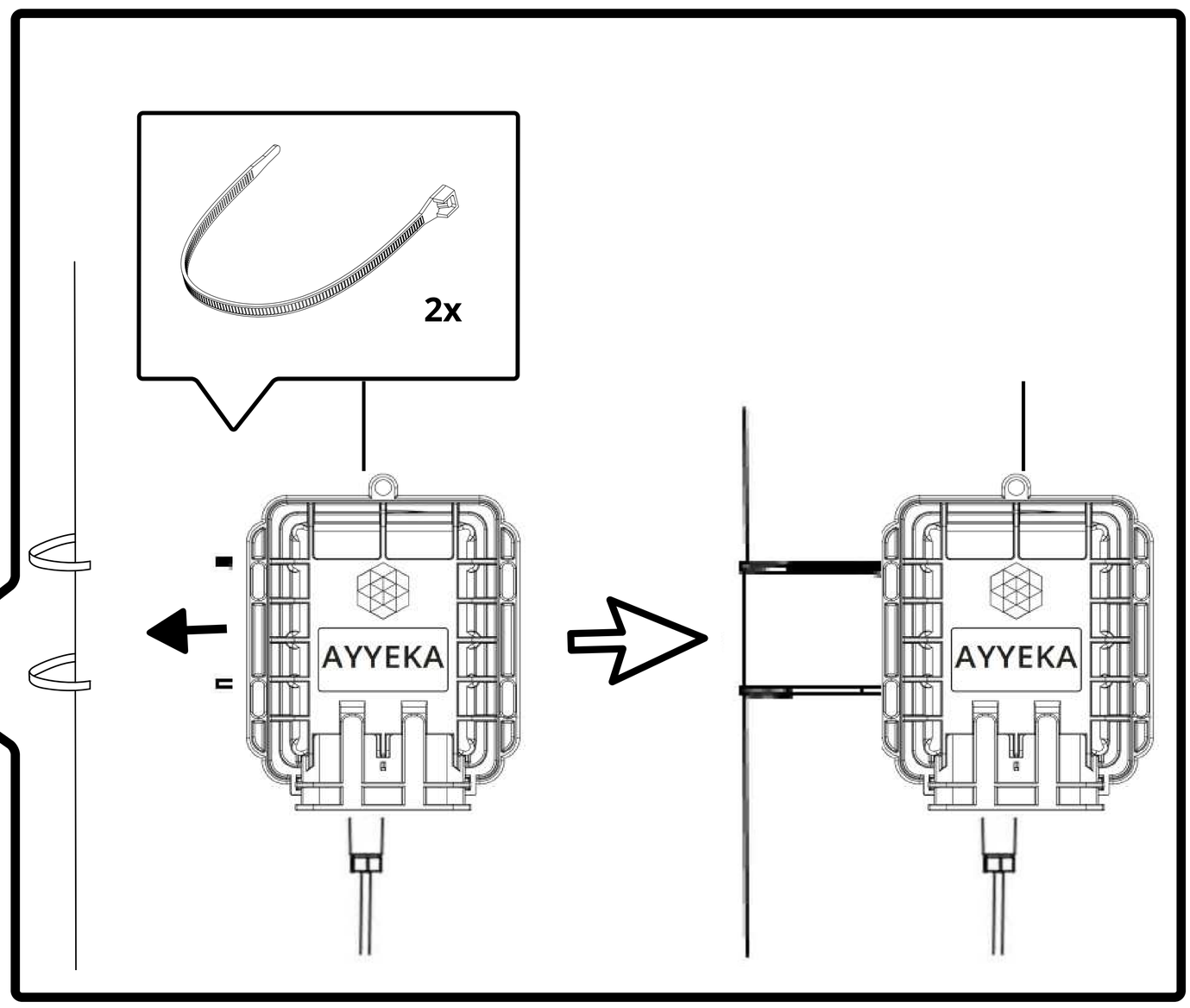
# WAVELET MOUNTING

Secure the Wavelet on a wall, pipe, or other secure mount location by using zip ties or screws.

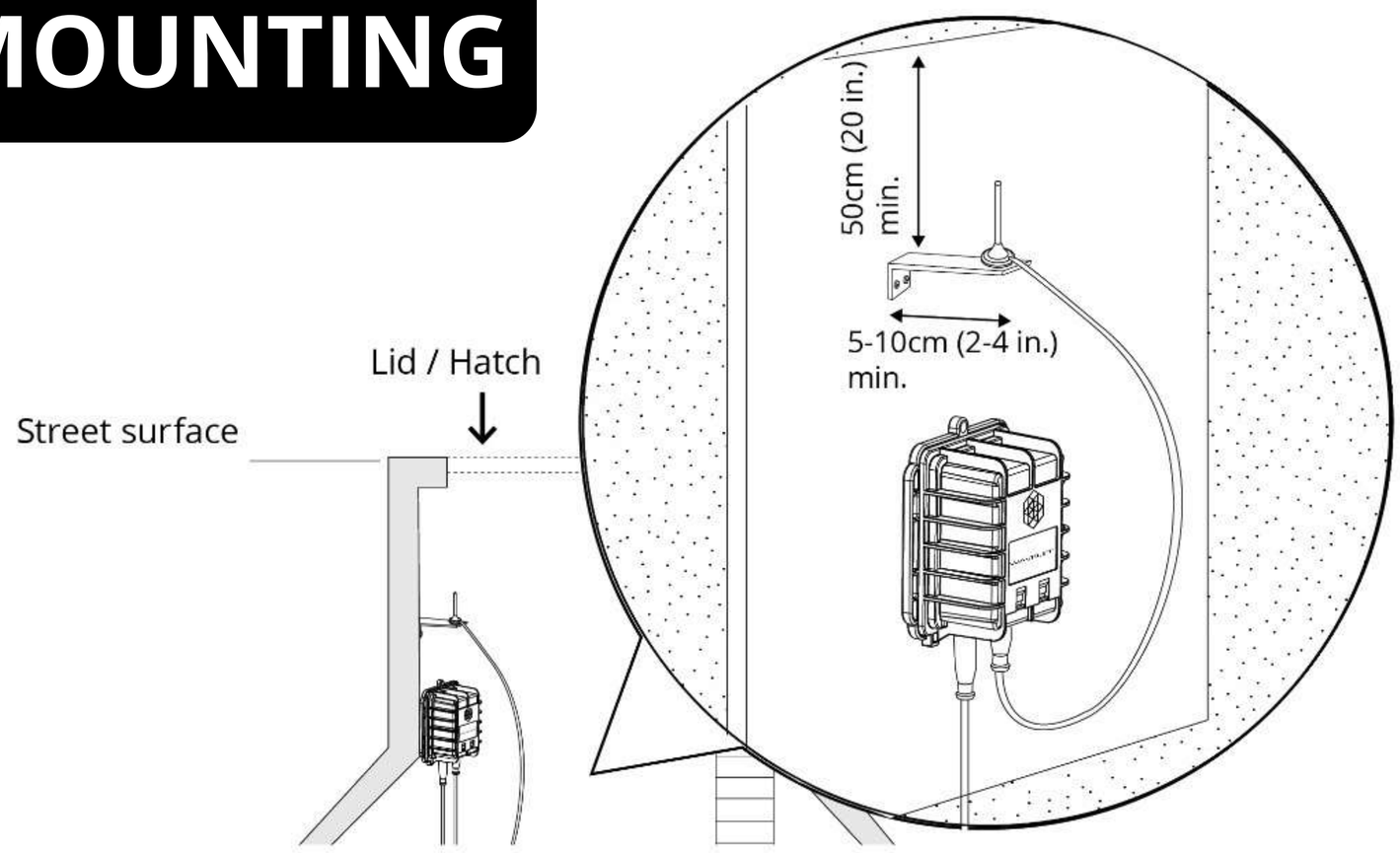
**Wall Mounted**




**Pipe Mounted**



# ANTENNA MOUNTING




**DOs**

- ✓ Ensure the antenna connector is secured tightly to the panel connector.
- ✓ Mount antenna under the open sky or at least 50cm (20in.) beneath any object.
- ✓ Mount antenna at least 5 to 10cm (2 to 4in.) away from wall.
- ✓ Mount antenna at least 5cm (2in.) away from the device.
- ✓ Finalize the antenna setup to the exact physical conditions. For example, close the lid, close the door, etc.
- ✓ Make sure you have a signal and a successful data transmission by using the mobile app.
- ✓ If needed during installation, use the Transmit Now command in the mobile app or the magnetic device activator key to initiate more rapid transmissions.

**DONTs**

- ☒ Do not attach the antenna to the Wavelet.
- ☒ Do not wrap cables, zip ties, or other items around the antenna.

**IMPORTANT NOTE: There are a few-** minutes of delay between a successful transmission and the use of either of these methods for initiating data transmission. Repeating the use of either method will not expedite data transmission.

WARNING: If installing in a highly corrosive environment such as a sewer, apply technical grease to the antenna and sensor field attachable connectors after securing them to the panel connectors. Ayyeka recommends using Dow Corning Molykote 55 O-Ring Grease, though similar products can be effective.

## ANTENNA MOUNTING - TROUBLESHOOTING

If the Wavelet does not transmit, move the antenna to a different position.

If the Wavelet still does not transmit after multiple attempts at repositioning the antenna, consider using an alternative solution, such as an in-road or a high-gain antenna.

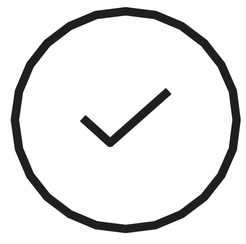
Note: Ayyeka supplies antenna wall mounting hardware and various antennas, including in-road antennas — contact Support for details.

## USING YOUR OWN ANTENNA

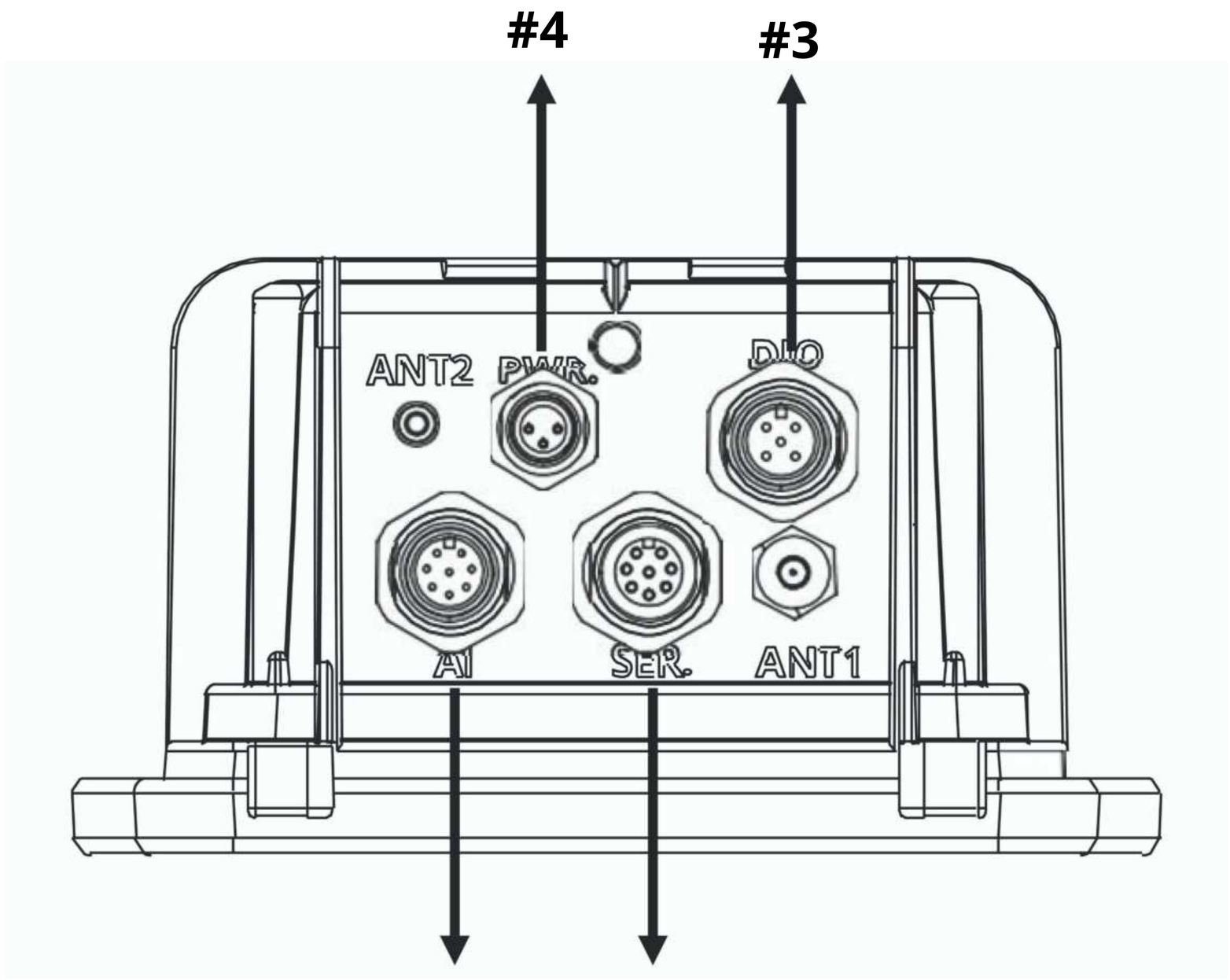
If you intend to use your own antenna, verify that the antenna uses an SMA male connector. Your antenna ideally supports all of the following frequencies (make note of the model number suffix of your Wavelet device – for example “-US”):

| Technology | -US, -SA | -EU |
|---|---|---|
| **2G** | 850, 900, 1800, 1900 MHz | 900, 1800 MHz |
| **3G** | 850, 1700, 1900 MHz | 900, 1800, 2100 MHz |
| **4G (LTE)** | 700, 850, 1700, 1900 MHz | 800, 900, 1800, 2100, 2600 MHz |

# YOUR DEVICE
# IS SUCCESSFULLY INSTALLED!



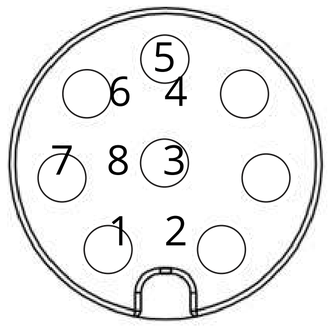
# WAVELET PINOUT




| Panel Connector | Inputs |
|---|---|
| 1 | 4x analog and 1x discrete |
| 2 | RS485, RS232, SDI-12 (16 channels) |
| 3 | 4x discrete |
| 4 | 6-24VDC |

# WAVELET PINOUT– PORT #1

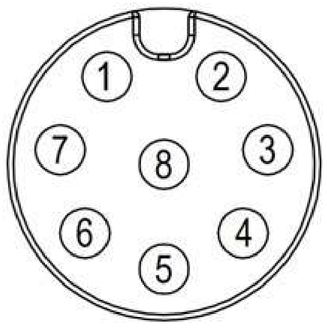
## M12 8-pin male panel connector

| Connector Pin # | Signal | Cable Connector Pin Assignment | |
|---|---|---|---|
| | | Front | Back |
| 1 | 4-20mA or 0-24V Input #1 |  | |
| 2 | IO_4 – periodic or output dry contact, open drain, 0V or 2.8V (max) | | |
| 3 | Wavelet 12V Power Supply #2 (+) | | |
| 4 | Wavelet 12V Power Supply #1 (+) | | |
| 5 | 4-20mA or 0-24V Input #4 | | |
| 6 | 4-20mA or 0-24V Input #3 | | |
| 7 | 4-20mA or 0-24V Input #2 | | |
| 8 | GND | | |

# WAVELET PINOUT– PORT #2

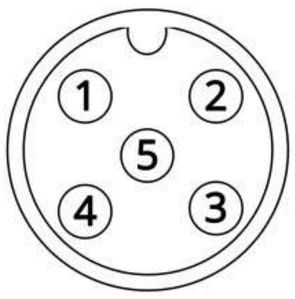
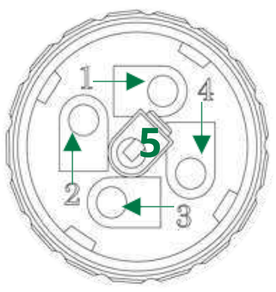
## M12 8-pin female panel connector

| Connector Pin # | Signal | Cable Connector Pin Assignment | |
|---|---|---|---|
| | | Front | Back |
| 1 | RS232 TX | | |
| 2 | Wavelet 12V Sensor Power Supply #4 (+) | | |
| 3 | Wavelet 12V Sensor Power Supply #3 (+) | | |
| 4 | SDI-12 | | |
| 5 | RS485 B | | |
| 6 | RS485 A | | |
| 7 | RS232 RX | | |
| 8 | GND | | |



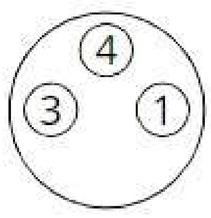
# WAVELET PINOUT– PORT #3

## M12 5-pin male panel connector

| Connector Pin # | Signal | Cable Connector Pin Assignment | |
|---|---|---|---|
| | | Front | Back |
| 1 | PCNT_0 – pulse counting, edge, periodic, output dry contact, open drain, 0V or 2.8V (max) |   |   |
| 2 | IO_3 – periodic or output dry contact, open drain, 0V or 2.8V (max) | | |
| 3 | PCNT_1 – pulse counting, edge, periodic, output dry contact, open drain, 0V or 2.8V (max) | | |
| 4 | GND | | |
| 5 | IO_2 – edge, periodic, output dry contact, open drain, 0V or 2.8V (max) | | |

# WAVELET PINOUT– PORT #4

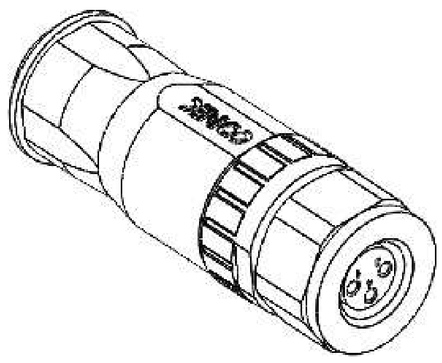
## M8 3-pin male panel connector

| Connector Pin # | Signal | Cable Connector Pin Assignment | |
|---|---|---|---|
| | | Front | Back |
| 1 | 6-24VDC |   | |
| 3 | No Connection | | |
| 4 | Negative (-) | | |

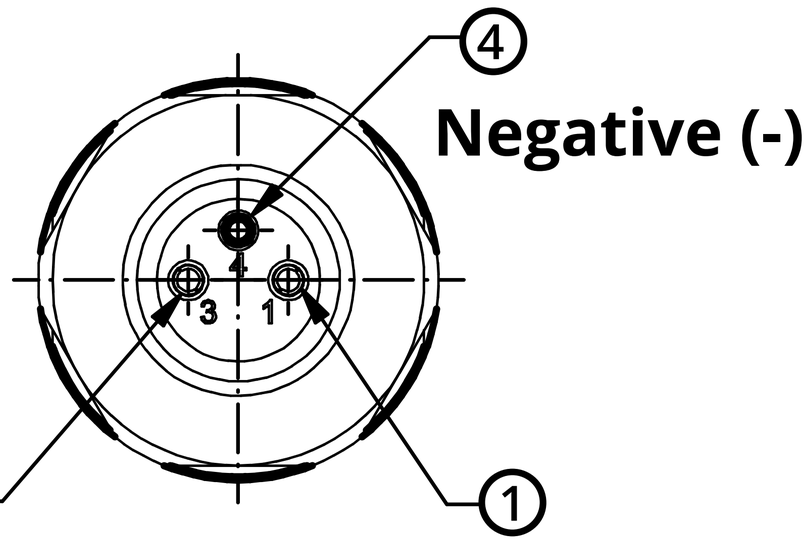
# POWER CONNECTOR PINOUT

If you are using an external power source, refer to the following pinout:

EXTERNAL POWER: M8 3-pin female power connector



Installation tool for wire termination (included)




**Wire To Connect:**

| | |
|---|---|
| Cable Wire Cross Section Surface Area | 0.14 – 0.5 mm2 |
| Wire Gauge. | AWG 26-20 |
| Cable Ø Diameter | 4 – 5.5 mm |

# NOTES

# QUESTIONS?

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