User Guide

Worldsensing mobile app

Version 2.6.1

Document Information

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Version	Date	Author	Description
2021-01	20/07/2021	Customer Success	Version 1.0.4
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Contents

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The content presented in this document will be binding only after the signature of a formal contract between the parties.

Purpose

The purpose of this document is to explain the functionalities of the Worldsensing Mobile App necessary for the configuration and connection of the Worldsensing nodes currently compatible with the gateway or Connectivity Management Tool (CMT).

Initial steps

App installation

Before installing the app, please check if your device complies with these points:

- Android device is USB-OTG compatible.
- Android version 5.1 or Lollipop or higher.
- Unknown sources software installation must be enabled.

The app will be installed independently so it is necessary to accept the installation of third-party APKs.

To ensure the correct operation of the app, we recommend purchasing one of the models Worldsensing has in stock.

For more information about tested models please contact the technical support team.

To download the latest version of the Worldsensing App contact the technical support team.

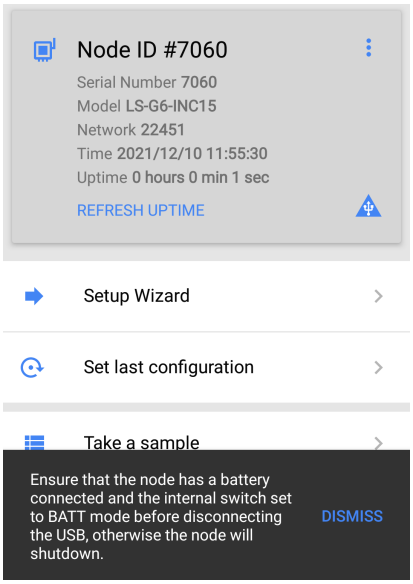
Edge device power supply

Some Worldsensing nodes can be powered by both batteries and USB but others only allow battery power. The following nodes **CAN NOT** be powered through USB:

Edge devices		BATT	USB
LS-G6-TIL90-X	Wireless tiltmeter with an external antenna. 3-axis. Range: ± 90°	x	
LS-G6-TIL90-I	Wireless tiltmeter with an internal antenna. 3-axis. Range: ± 90°	x	
LS-G6-TIL90-XE	Wireless tiltmeter with an external antenna. 3-axis. Range: ± 90°. Configured to operate in event detection mode	x	
LS-G6-PICO	Piconode analog 1-channel + 1 thermistor + 1 pulse counter data logger	x	

It is important to note that these require the use of batteries for configuration and use. Attempting to configure them with drained batteries or without batteries will result in erratic behavior and inability to operate.

For the other nodes, which can be powered via USB by using the switch between BATT and EXT PWR to choose the power mode, take note that if the configuration is done without batteries, the node will be powered from the wired connection to the mobile device. Once the configuration is finished, when the cable is disconnected, the node will shut down.
Therefore, we recommend that configuration be done with the batteries inserted and, if applicable, the switch is on BATT mode.



If the configuration is being done in EXT PWR mode or without batteries, being powered by the connection to the mobile phone, two warnings will be displayed in the main page:

- Warning at the bottom of the screen which will be displayed until DISMISS is clicked.

- Connection icon in the node information (blue, bottom right corner). This warning will be displayed until the power mode is switched to battery power and click REFRESH UPTIME updating the node data.

For more information, please refer to the node user guide.

Connection

To connect the Android device to the node, you need to use the USB On-The-Go (OTG) cable with a mini USB connection for the node provided by Worldsensing. The other end of the cable can have either a *micro USB or USB C* connection depending on the model of the Android device.
If you do not have a cable with the required connection, please contact the technical support department before purchasing one to ensure that it is compatible.

NOTE: Some Android devices have the option of the USB OTG locked. Each make/model follows a different shape to be able to unlock it. In case of doubt, check the specifications of your device or contact its technical service.

Coexistence with the Dlog App

Dlog configuration application is discontinued, and no longer supported.

Please update the configuration app to the new Worldsensing app in case you have not done it yet, and remove the old Dlog application from your Android device.

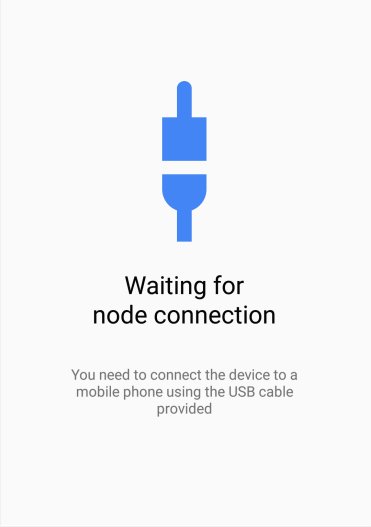
Getting started

Connect the node to the Android device via the OTG cable to open the Worldsensing App, if it is set as the default app. Otherwise, select your preferred app once you see the prompt.

Once the app opens, you will see different prompts depending on the status of the app and the node.

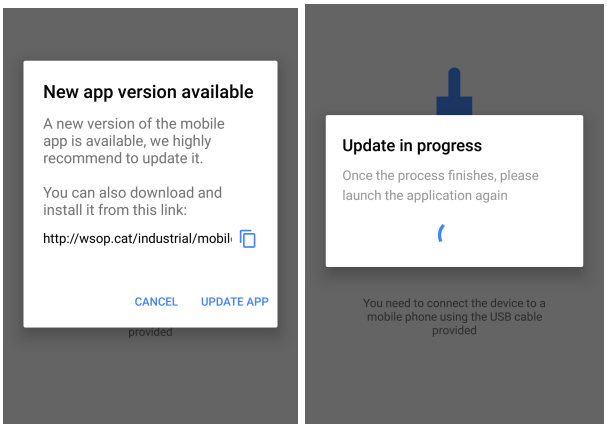
No connection

When disconnecting a node or in case of a connection problem, the following screen will be displayed indicating that there is no connection but the app will remain open with the prompt **Waiting for a new connection** to a node.

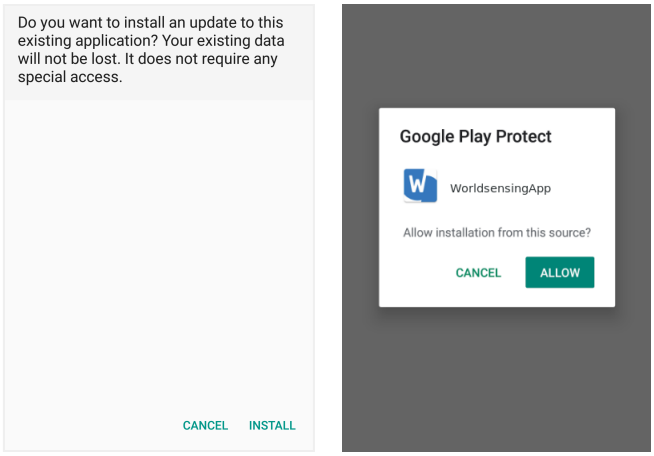


Updating the app

If the Android device is connected to the Internet, you will receive a notification if there is a new app version available.



Click **INSTALL** and **ALLOW** to finish the app update.



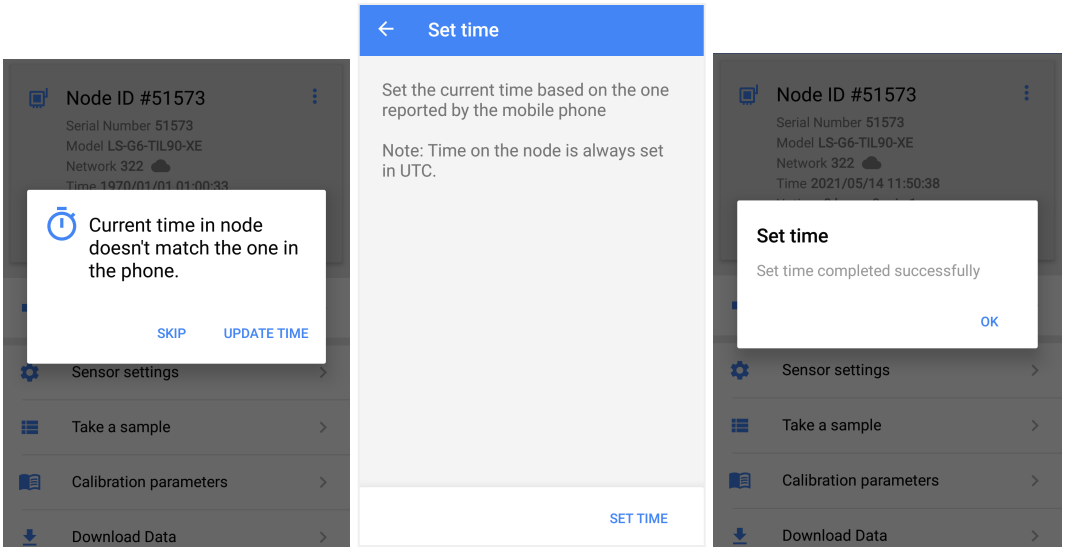
Once the installation is completed, reopen the app to finish the process and to be able to use the latest version.

We recommend always using the latest app version to take advantage of new features, new node firmware versions and to correct previous bugs.

Set the correct date and time

The Android device always checks if the date of the connected node matches the system date and displays a prompt to correct it if needed.

It is important to do this because if the node date is not correct, the node will send data dated 1970 which will be discarded by the gateway and will not be shown in the CSV files.

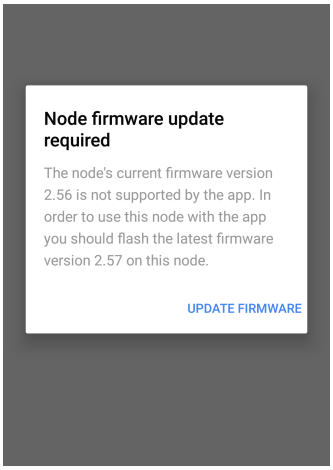


NOTE: The date and time correction can also be done later in the SET CURRENT TIME menu.

Update the edge device firmware

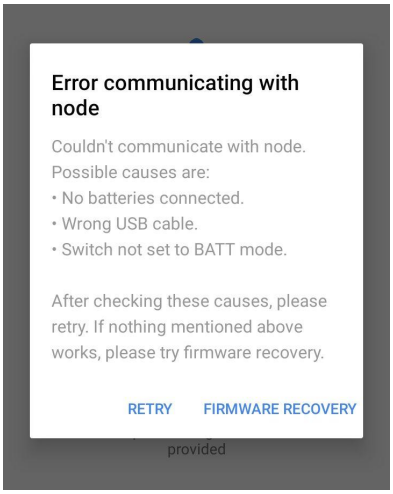
If there is a new version of the node's firmware, you will receive a prompt to update

We recommend keeping the node firmware updated as new versions have new functionalities and bug fixes.



Edge device connection problem

You will get the prompt below if a problem occurs during the update. The error message lists several causes for this error. Follow the instructions and check these points, then click RETRY to try again.
In case it doesn't work click on FIRMWARE RECOVERY.

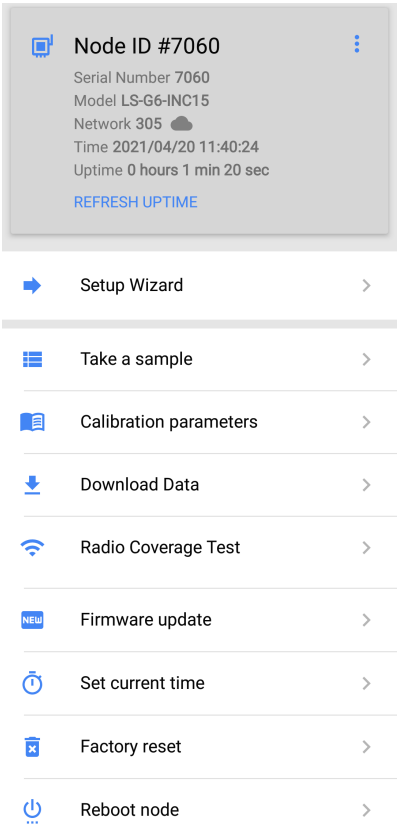


If after the firmware recovery attempt there are still connection problems, please contact our technical support department.

Main page

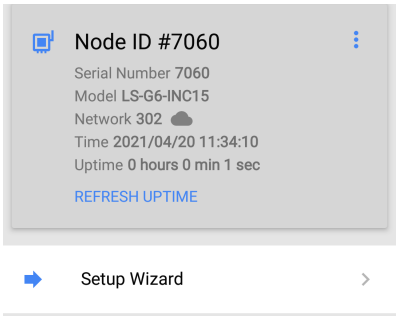
The Worldsensing App home page shows specific information of the node connected to the Android device and the various options to perform the complete configuration of the node, collect data and perform some specific configuration.

Check in the following sections to see all the configuration options (some options are related to the node model, check the Edge device model-specific options section).



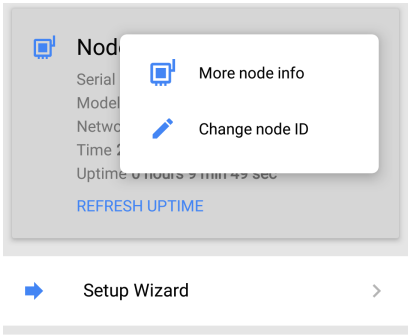
Edge device information

A summary with the main information of the connected node, such as the node ID, the serial number and model, if it's already connected to a network, the node's time and the uptime is displayed in a grey box.



In addition, there is a refresh uptime button to know exactly how long the node has been on without any reboot.

Finally, on the top right, there are three dots to open the node's menu which provides the following:



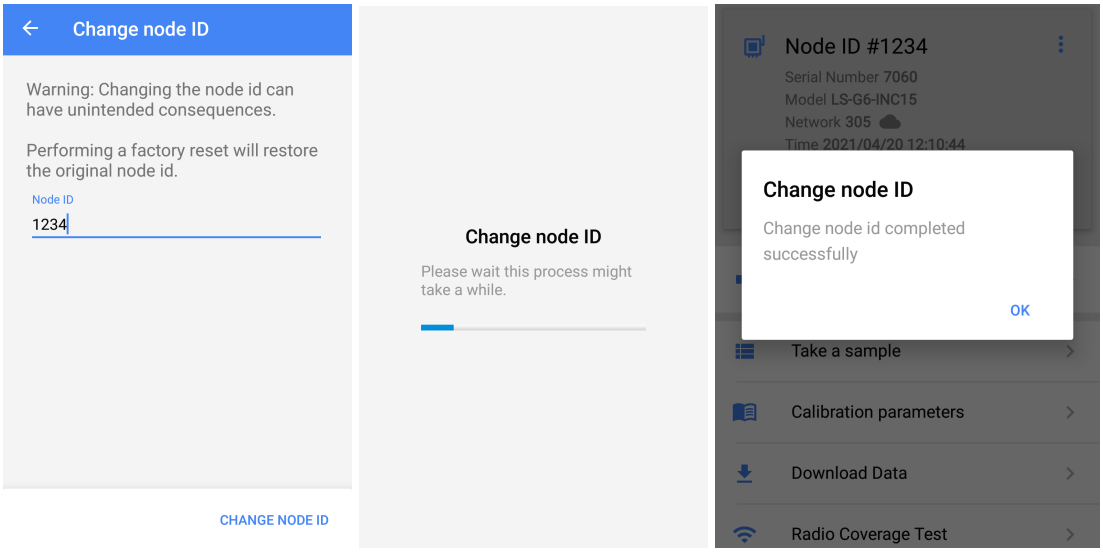
- **More node info:** *displays the complete node information*.

- **Change node ID:** to *change the edge device ID (not the serial number).*

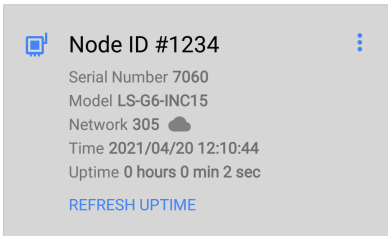
Change the edge device ID

The **Change node ID** section allows changing the node ID (not the serial number). This function is recommended to be used only in case you need to replace a node that for some reason is no longer available.

Important: Don't connect two nodes with the same node ID as this may cause data loss and malfunction.



Enter the preferred ID, click CHANGE NODE ID and wait until you see the notification that the change has been made successfully. The updated node ID will now be displayed in the Node information.



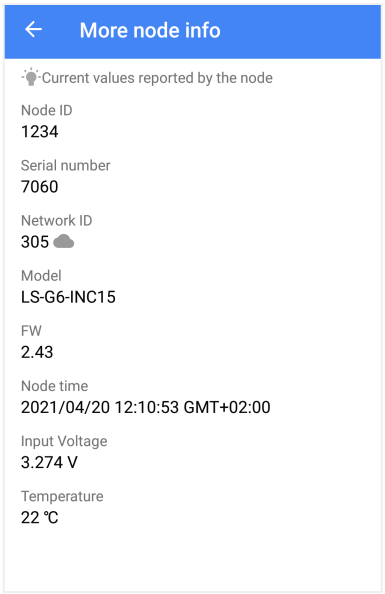
In the example below, a node with the serial number (SN) 18919 had its node ID changed to 7060 another node with SN 7060 has stopped working correctly. This will consolidate all the readings from both nodes, with SN 7060 and SN 18919, in the same node ID in the gateway network.

Id	Name	Status	Model	Serial
7060 1m		Ok	LS-G6-INC15	18919

More edge device info

On the MORE NODE INFO section, all the node information is displayed at the time of access.

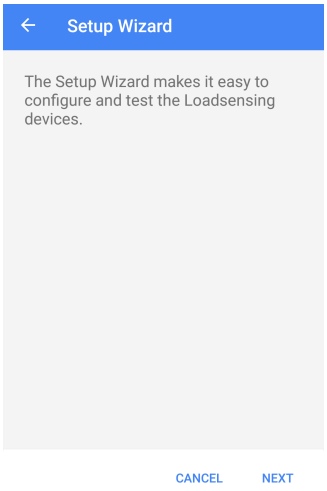
The information includes the ode ID, serial number, network ID (if it is already connected)*, model, firmware version, node time, input voltage and temperature.



*In case the node is already connected to a CMT Cloud server, a cloud icon will be displayed in addition to the ID. Whereas in CMT Edge only the ID will be displayed. This makes it easy to determine whether the node is connected to a CMT Edge or Cloud.

Setup wizard

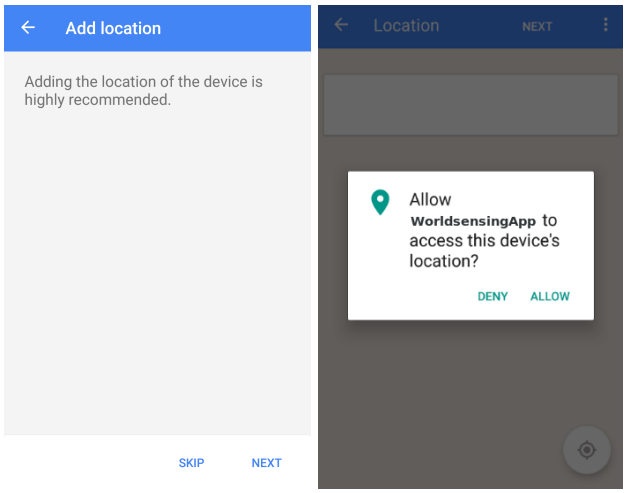
The SETUP WIZARD section enables the complete configuration of the node to connect it to CMT (Edge or Cloud). Click NEXT to start the configuration process which will be described in the succeeding sections.



Add location

The first step of the SETUP WIZARD allows adding the node location so it can also be visible in CMT.

To do this you must allow access to the location of the Android device from the onset. Clicking ALLOW to enable access to the device location. In case the access was denied previously, you must access the device settings and permit the app. If you have any doubts about how to access these permissions, please check the specific information of your device.

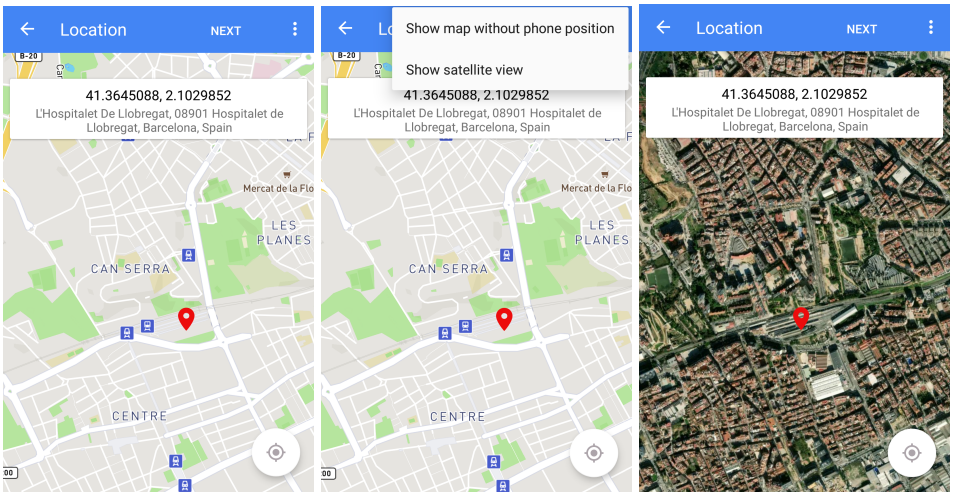


The map will show the position of the Android device as well as the exact coordinates taken with the GPS but it is possible to change this initial location by simply clicking on the screen the place you want to use as the node location.

By clicking on the three dots at the top right of the screen, the following options will be displayed:

- **Show map without phone position** in case you don't want to use the default location of the Android device and instead choose the location on the map.
- **Show street map/satellite view** to change the type of map being displayed, either a street map or a satellite view.

At the bottom right is a grey button that returns the position to the default location of the Android device.

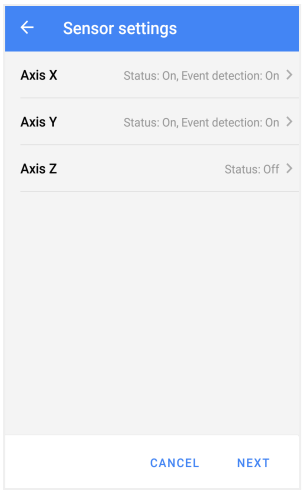


Once the location is correctly located, click NEXT to continue with the node configuration process.

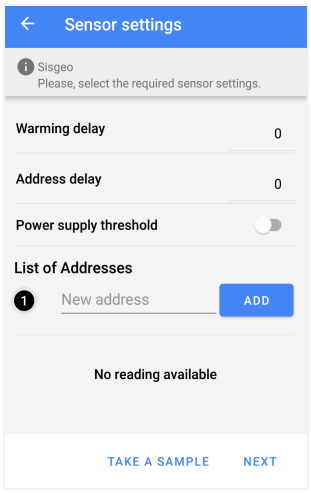
Important: The location will only be available in CMT in case an **online coverage test** is performed during the setup wizard and previously added in this step.

Sensor settings

Different configuration parameters are required for each type of node. For more information regarding the sensor configuration for a specific node, please, refer to the node user guide. Refer to the sensor's datasheet for details on how it should be wired.



TIL90 EDM sensor settings

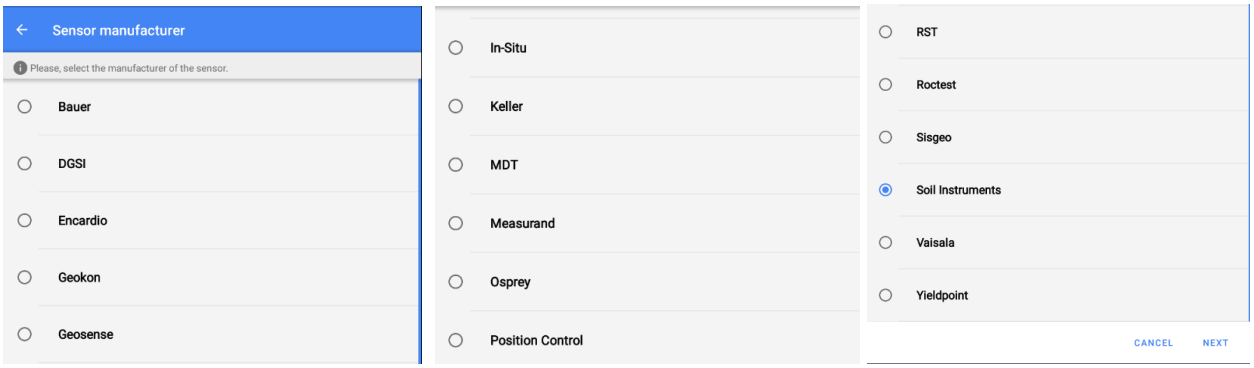


DIG + Sisgeo sensor settings

Sensor manufacturer (Only DIG node)

In case of configuring a digital node, it is necessary to select the sensor manufacturer before configuring the sensor. A list of compatible manufacturers will be displayed to select the sensor connected to the node.

To know the list of compatible sensors please refer to the digital node datasheet on the Worldsensing website.

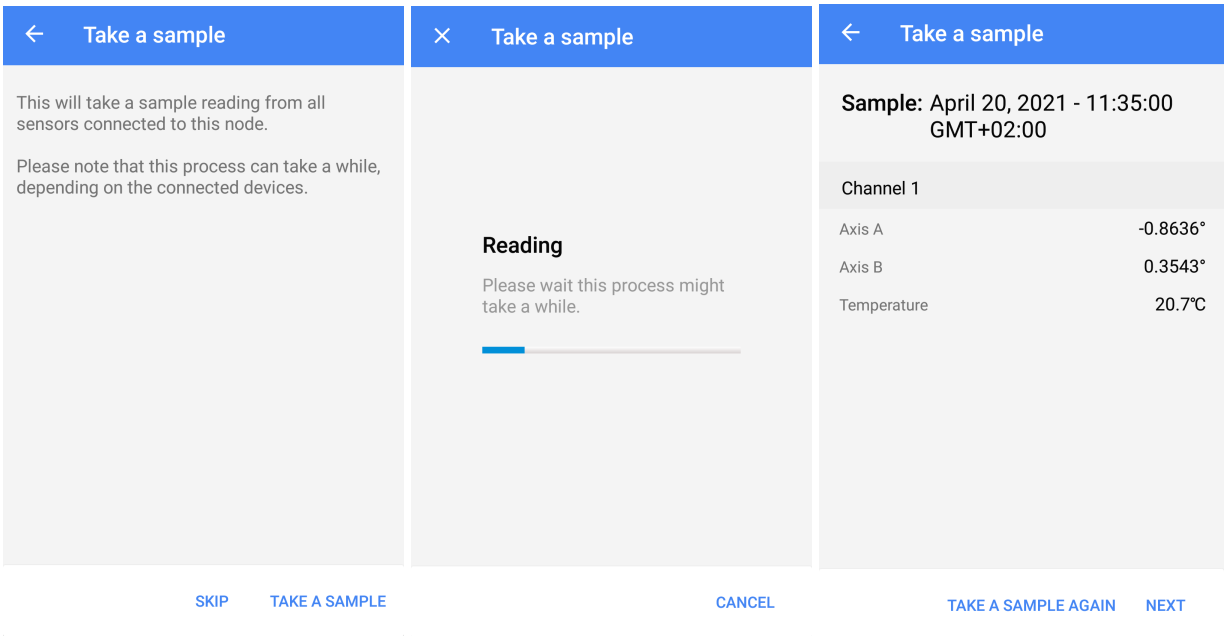


Take a sample

The app allows you to take as many readings as required, and show the data. This step is not mandatory but it can be useful to check if the sensor configuration is correct.

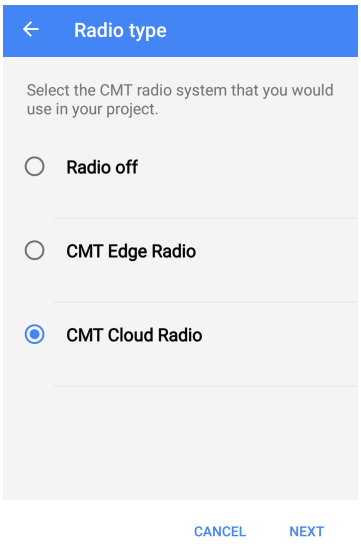
Click on TAKE A SAMPLE AGAIN to take another reading.

If this step has been skipped, a test reading can be taken once the configuration is complete.



Radio type

The node has three different modes depending of the deployment:



Radio off: The node will work in standalone mode, taking the readings and saving them in the node. To download the data, you need to connect the node to a mobile phone with the Mobile App.

CMT Edge Radio: connect the node to a CMT Edge Network.

CMT Cloud Radio: connect the node to a CMT Cloud Network.

Region

As LoRa/LoRaWAN radios are regulated by countries, the appropriate network type (region) must be selected to meet local regulations.

Nodes can be configured with all the regions listed in the app, but it is important to choose the same region on the nodes and the gateway. Otherwise, the gateway won't receive the radio messages from those nodes.

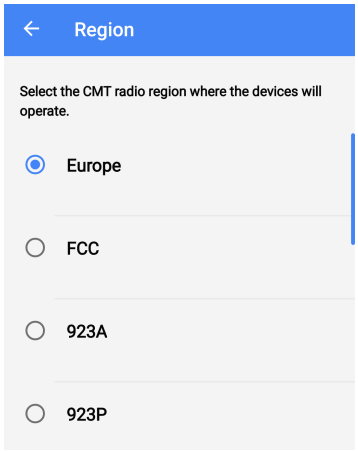
The regions available depend on whether you are using CMT Edge or CMT Cloud. If you have any questions, please contact our technical support team.

Radio types for CMT Edge

The following radio frequencies can be used for CMT Edge network.

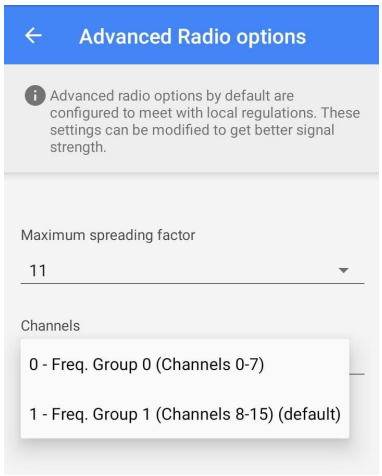
The radio configuration of the Edge devices (nodes) must match the one used on the Gateway, Choose the same region on the nodes and the gateways.

Radios available	
Europe	866I
FCC	923T
923A	922K
923P	916I
922S	922B
923M	Australia 500kHz
926C	Malaysia legacy 868



Note: The 923 A radio for deployments in Oceania has two different groups of channels, the frequencies for Group 0 (channels 0-7), former default group, and the new default Group 1 (channels 8-15).

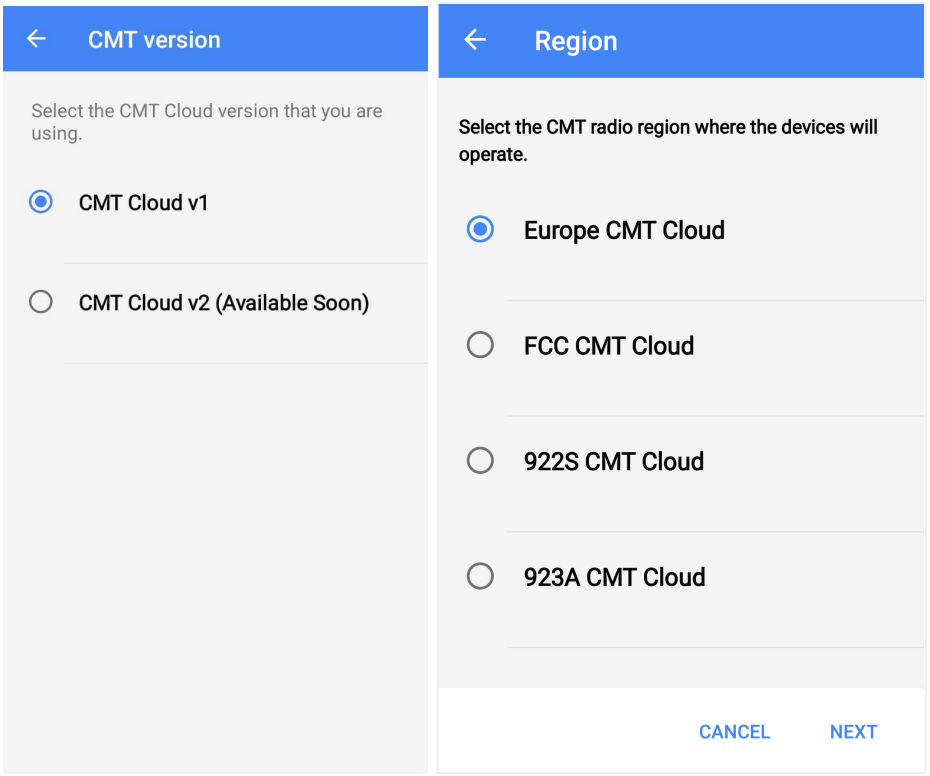
For new deployments the group to be selected on the GW should be the group 1 to match with the sensor/data logger configuration, however for existing deployments using group 0 on both the gateway and the already installed sensors/data loggers, the new loggers to be added should still be in group 0.



Radio types for CMT Cloud

The following radio frequencies can be used for CMT Cloud network.

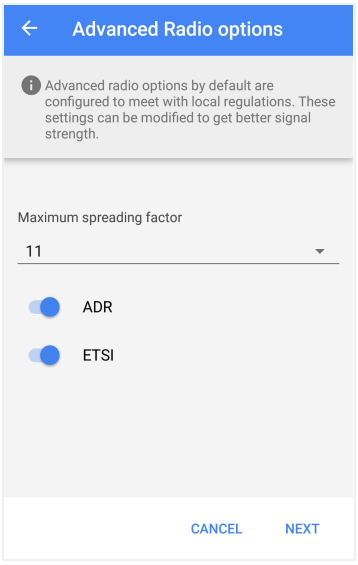
The radio configuration of the Edge devices (nodes) must match the one used on the Gateway, Choose the same region on the nodes and the gateways.



Note: The CMT Cloud V2 option will be available soon, currently only the CMT Cloud V1 option can be configured.

Advanced Radio options

The advanced options are configured to meet the local regulations of each region. Contact Worldsensing technical support before changing these default settings.



Network or server credentials

To register the node on the CMT Edge gateway or the CMT Cloud server, please use the credentials provided by Worldsensing.

To do so, it is necessary to enable the editing of the credentials and to set the correct ones.

Node registration on CMT Cloud

Server credentials screen:

CMT Cloud server ID: the dataserver ID number where the nodes will be registered. Provided by Worldsensing under a data server deployment request.

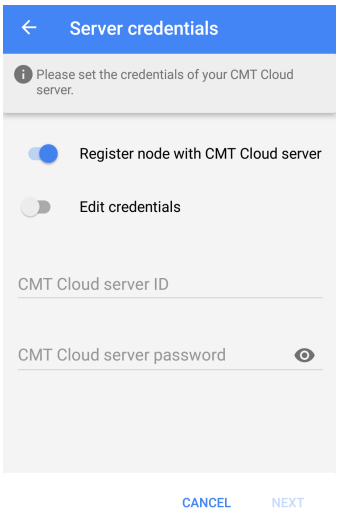
CMT Cloud server password: node registration password. Provided by Worldsensing under a data server deployment request.

There are 2 possible method to register a node on CMT Cloud server:

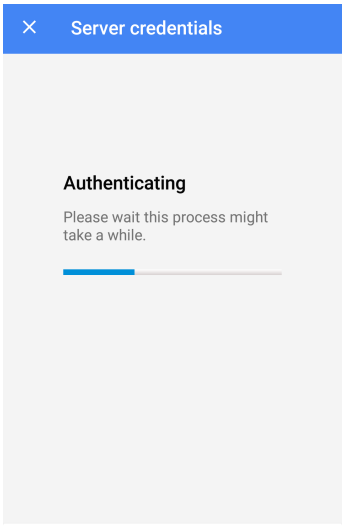
- **Online registration.**
- **Offline registration.**

Online registration

The registration can be performed immediately, and directly from the Worldsensing App as long as the Android device has internet connection. Otherwise, the node needs to be registered in advance on CMT Cloud.



To register online, activate the **“Register node with CMT Cloud server”** button and click NEXT.

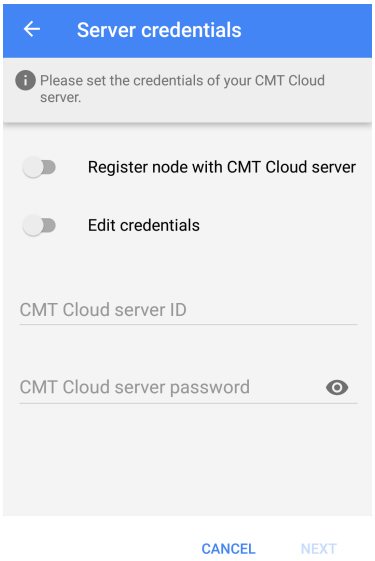


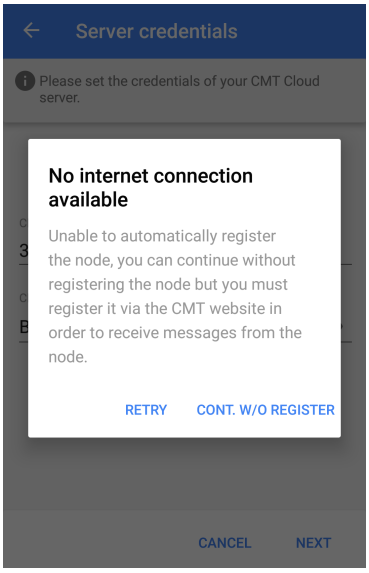
Offline registration

If there is no Internet connection on the mobile device, the node must be registered to CMT Cloud beforehand. If the node has been pre-registered on CMT Cloud, registration through the app is no longer required.

Make sure to disable the **"Register node with CMT Cloud server"** option.

Click on the NEXT followed by the CONNECTION WITHOUT REGISTER button to continue with the configuration.

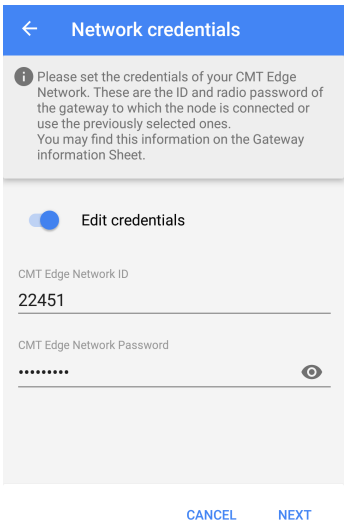




To have more information about the offline registration, please check the CMT Cloud user guide.

Node registration on CMT Edge

Network credentials



CMT Edge Network ID: ID of the gateway where the node will be connected. This can not be changed afterwards.

Password: network password.
This is the Default Network Key on the gateway information sheet provided by Worldsensing. This can be changed later in the CMT Edge in the CONFIGURATION > RADIO section.

Radio coverage test

The last step is to perform a coverage test to check the radio coverage between the node and the gateway.

In the Link check test, the messages sent will depend on the performance because if the communication at a lower Spreading factor is good, the test will be finished with a good signal result. The test may take up to 5 minutes.

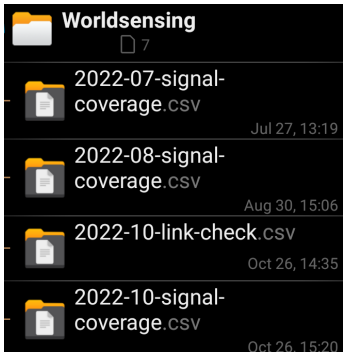
In the online and offline coverage test, the node will send 10 messages at Spreading factors 7, 8 and 9; and 5 more messages at SF 10, 11 and 12. This procedure may take up to 2 minutes.

If the Android device has an Internet connection, all options will be available for an online coverage test. Otherwise, you may perform the coverage test offline, the link check test or skip this last step as it is not a mandatory step, but highly recommended to perform it once the node is installed in the field to check if the radio communication between the node and the gateway is possible.

The application will save the coverage test results in the memory of the Android device in a folder called Worldsensing creating monthly files depending on the type of the test:

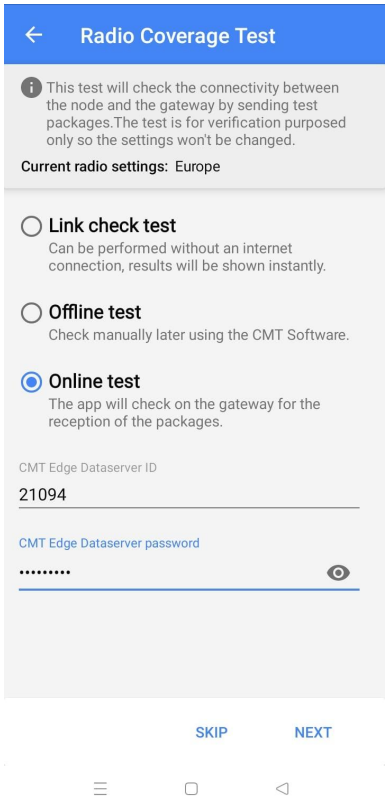
- **Link check test**: "YYYY-MM-link-check.csv".
  Important: this file is not generated in CMT, it's only available on the Android device on which the tests are performed.
- **Coverage test online/offline**: "YYYY-MM-signal-coverage.csv".
  The results of the online test will be the same as those that can be consulted in CMT, while in the case of an offline test, the results will not be visible (the cells will be empty: "") but the token and other information related to this test will be available.

The location of the folder will depend on the device itself.

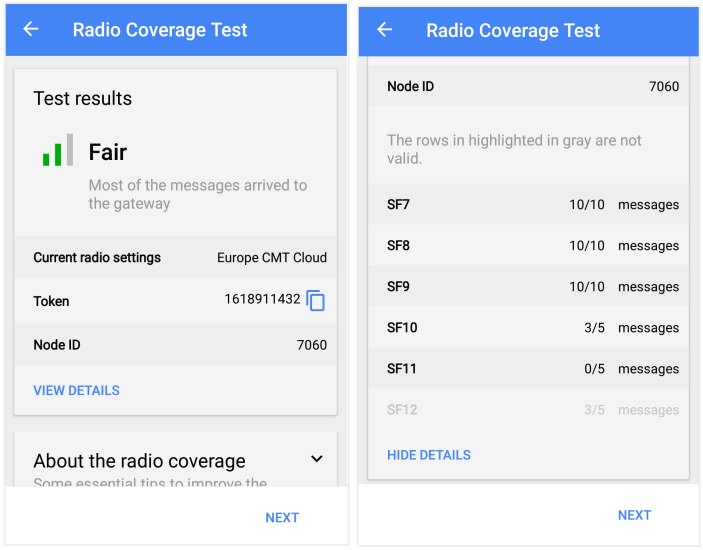


Online coverage test[1]

If the Android device has an Internet connection the online coverage test option will be available. Enter the Gateway ID and server password found on the gateway information sheet. Once the test is completed, you will see the results on the app.

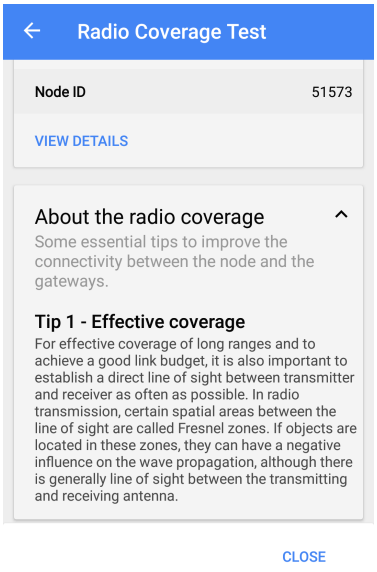


[1] This coverage test is not valid for networks with Edge Repeaters.



You will see an estimation of the signal quality (Good, Fair, Poor, Bad, No Signal) and on the VIEW DETAILS option, more information of the messages received for each spreading factor.
The spreading factors in grey colour are those that are not allowed in a specific region.

The ABOUT THE RADIO COVERAGE TEST button also shows some tips to improve the communication between the node and the gateway.

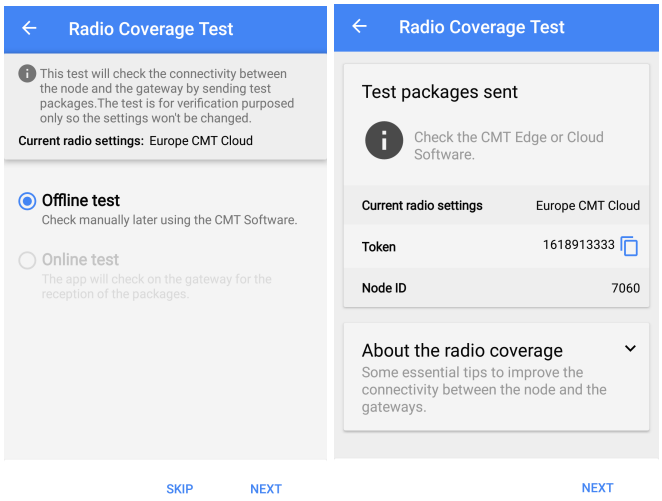


Note: We recommend basing the interpretation of the CMT Cloud coverage test only on SF7 and SF8.

In case of doubt, please contact our support department.

Offline coverage test[2]

The results of an offline coverage test won't be displayed on the app. Instead, you will get a token that you can use to check the results in CMT.



For more information about how to check the coverage test results, please, refer to the CMT Edge/Cloud user guide in our Knowledge base.

Link check test

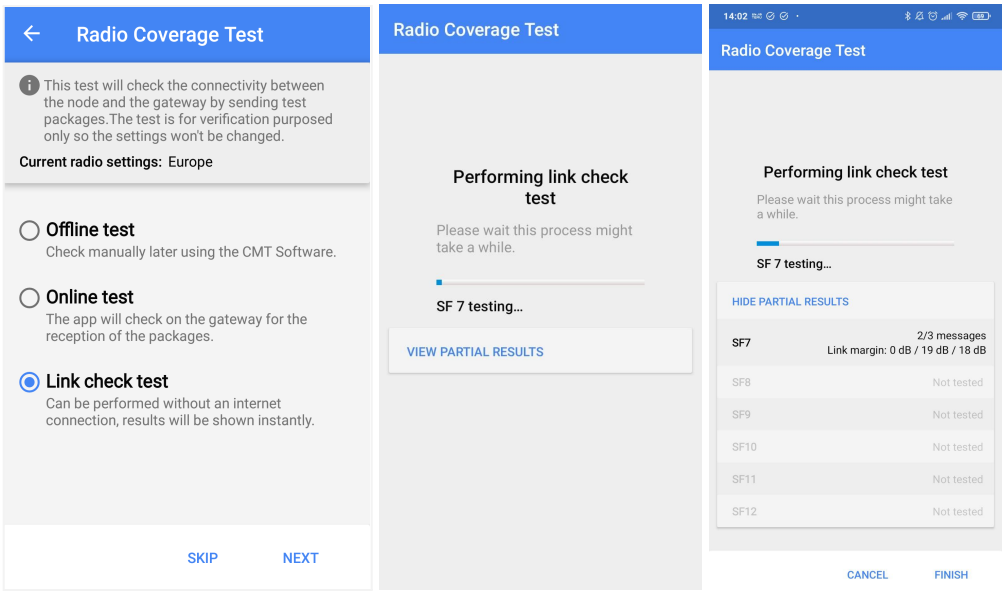
The Link check test will perform a coverage test and receive the results via radio and show the results in the WS Mobile App directly, unlike the online coverage test which will receive them via Internet connection with the gateway. This test is specially valid in case you have a network where one of this conditions is true:

- Using an Edge Repeater in the network, in which case is the only valid coverage test.
- The Android device does not have an internet connection, in which case the offline coverage test can still be used.
- CMT Edge Gateway does not have an internet connection, in which case the offline coverage test can still be used.

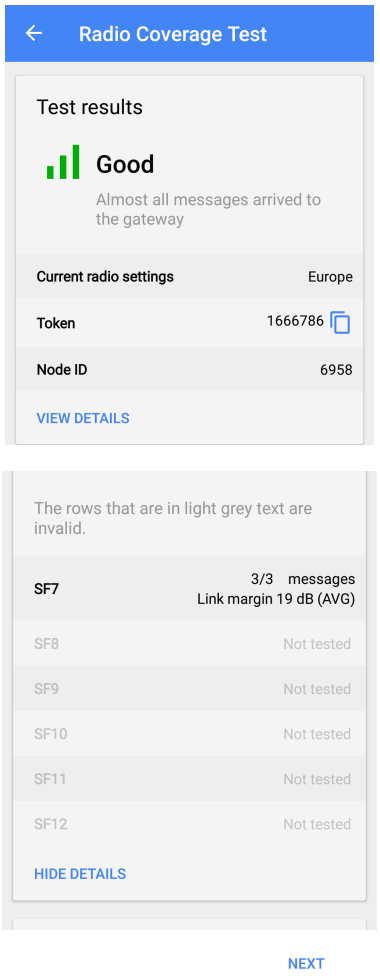
[2] This coverage test is not valid for networks with Edge Repeaters.

The test will take up to 5 minutes as it will require sending packets and receiving results via LoRa radio. But if there is a good connection in the first few Spreading factors, the coverage test will be terminated with a good signal result.

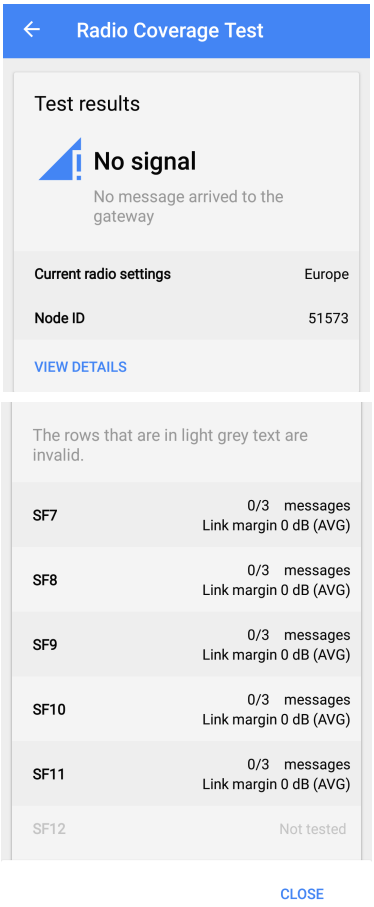
By clicking on the box 'View Partial Results' it is possible to see the outcome of the test for each spreading factor, they can also be hidden by clicking on the box 'Hide Partial Results'. The test can also be cancelled or finished by clicking on the corresponding options displayed at the bottom of the screen as shown in the 3rd image below.



Link check test sequence



Link check test good results

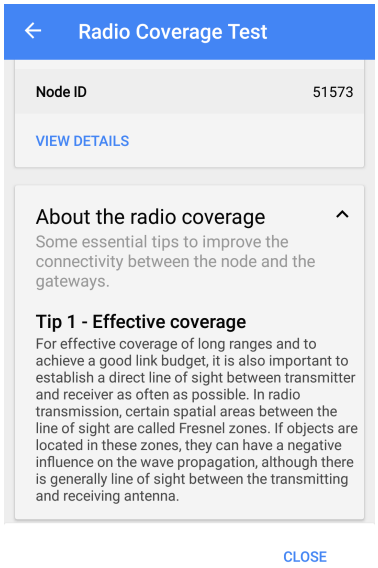


Link check test no signal results

You will see an estimation of the signal quality (Good, Fair, Poor, Bad, No Signal) and on the VIEW DETAILS option, more information on the messages received for each spreading factor.

The spreading factors in grey colour are those that are not allowed in a specific region or those not tested because the test had good results on a lower Spreading Factor.
For example, if there is a result of 3/3 packets received in SF7, the test will not be continued as the result is optimal. On the other hand, if in SF7 the result is not positive, the next one will be done until one with good results is found or until the test finishes according to the regulations of the region.

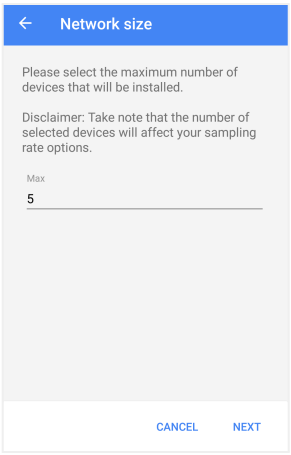
The **“About the radio coverage”** section shows some tips to improve the communication between the node and the gateway.



Network size

The Network size refers to the number of nodes that will be connected to each gateway.

It is important to set the total number of nodes as the available sampling rates will depend on this. The bigger the network (number of nodes), the less frequent sampling rate options will be available to avoid any data loss.



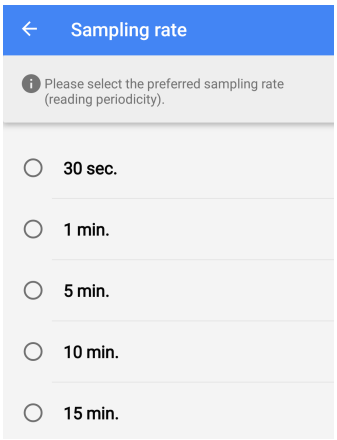
Sampling rate

The sampling rate is the frequency at which the node will take data. This can be from every 30 seconds to every 24 hours.

The same sampling rate will be applied to all channels in the node, it cannot be set independently for each channel in the node.

This is also directly related to network size, as there are some limitations. The bigger the network (number of nodes), the less frequent sampling rate options will be available to prevent message collisions and data loss.

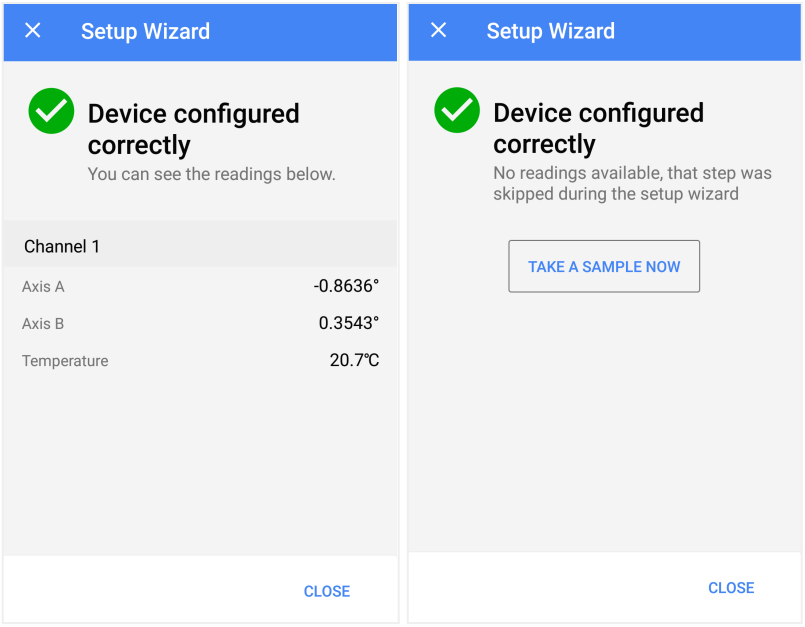
Some nodes may also have sampling rate limitations related to the type of sensor connected, warmups and other affecting variables. Please refer to the node's user guide for more information.



It is highly recommended to reconfigure the sampling rates of the nodes from the CMT after configuring the node via the WS app. This process optimizes the radio performance by minimizing the slot times.

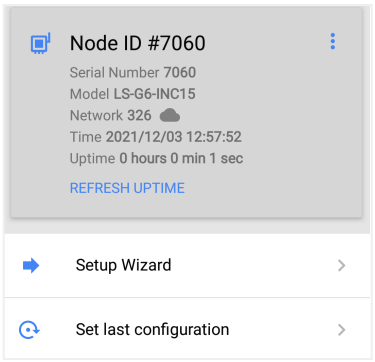
Device configured correctly

After finishing the configuration, you will see a notification that the node has been successfully configured. Also, if a reading has been taken previously, the reading will be displayed, otherwise, the option to take it at that moment will be displayed.

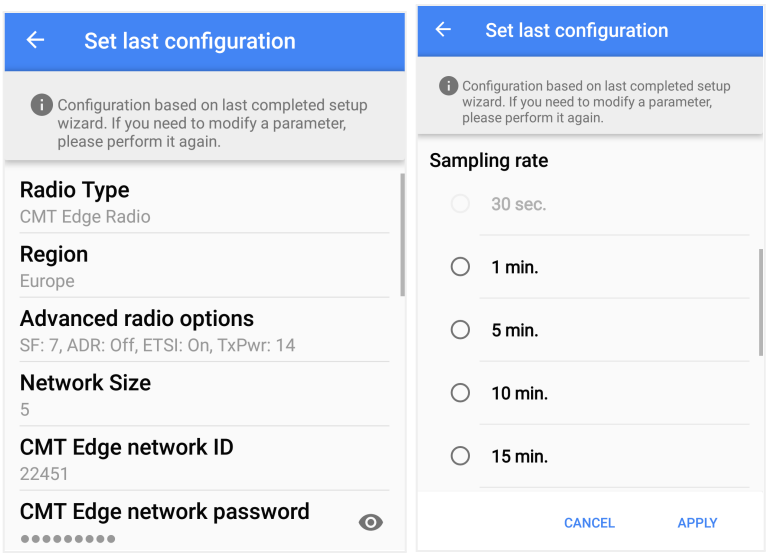


Set last configuration

For nodes that do not have sensors connected or option to configure their own sensors, such as INC15, TILT90, LASTIL90 and LASER, after making the first complete configuration in the SETUP WIZARD section, a new option will be displayed in the main menu to reuse the previous configuration with the option to change the sampling rate. To do so, click on SET LAST CONFIGURATION:



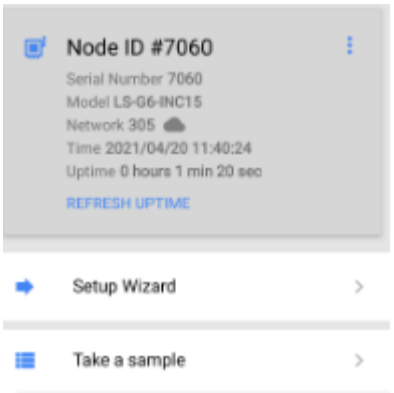
The SET LAST CONFIGURATION section shows all the configurations done in the last setup wizard performed (radio, region, advanced radio options and network. Also it allows checking the radio password by clicking on the eye button) and all sampling rates, those available in black and those unavailable due to network size, in grey. By default, the sampling rate used in the previous setup wizard is selected, but it can be changed by clicking on the new sampling rate.



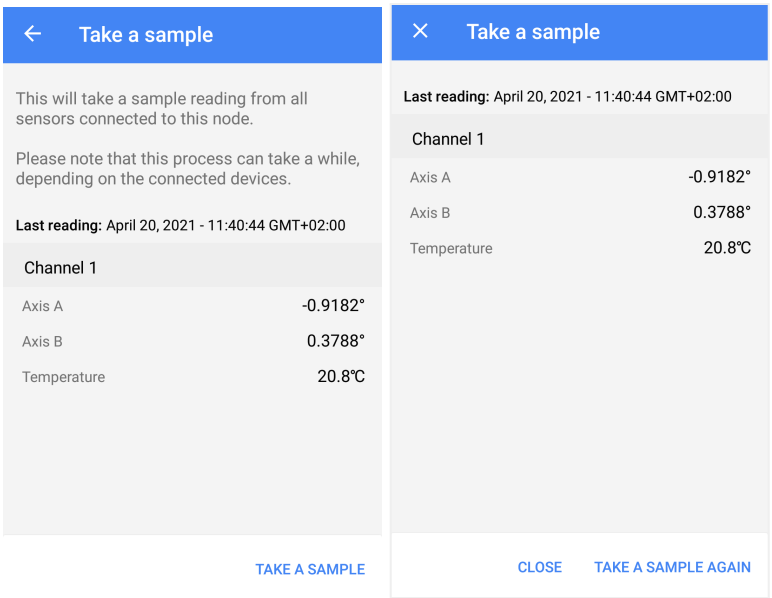
After checking the configuration and choosing the sampling rate if you want to change it, click APPLY to configure the node with these parameters. This process will take a few seconds.

Take a sample

The TAKE A SAMPLE menu allows to take a sample reading from all the sensors connected to the node. Also, if it already took a reading, it will be displayed and the date when it was taken.



By clicking on the TAKE A SAMPLE button it will start taking a reading and will take a few minutes to display it on the screen. Once it is done, it can take another one by clicking on TAKE A SAMPLE AGAIN or go back to the main screen by clicking CLOSE.

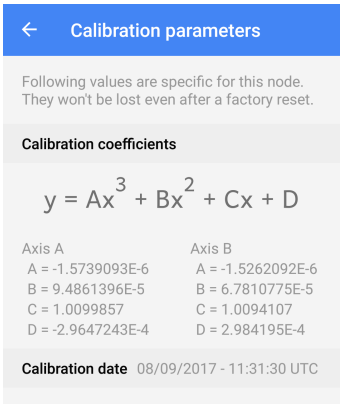


Edge device model-specific options

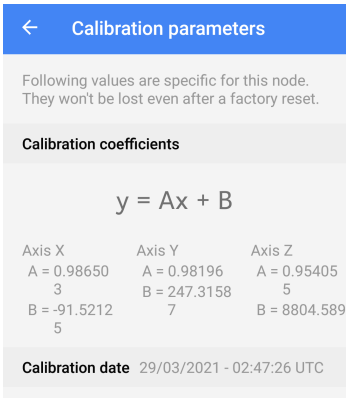
The Worldsensing App adds different configuration options for each model.

Calibration parameters

Calibration parameters will be shown for wireless tiltmeters.



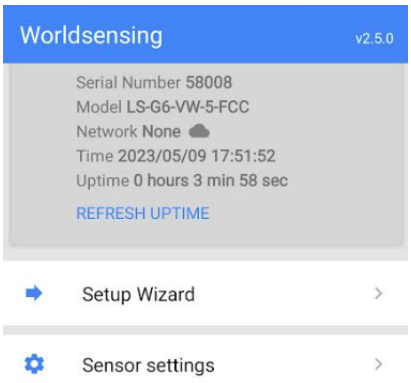
Calibration parameters and calibration date for the INC15 node.



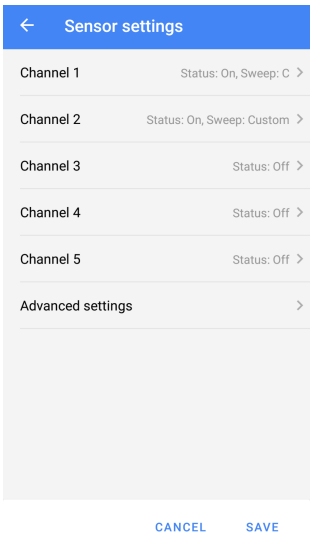
Calibration parameters and calibration date for the LaserTil90 and Til90 devices.

Sensor settings

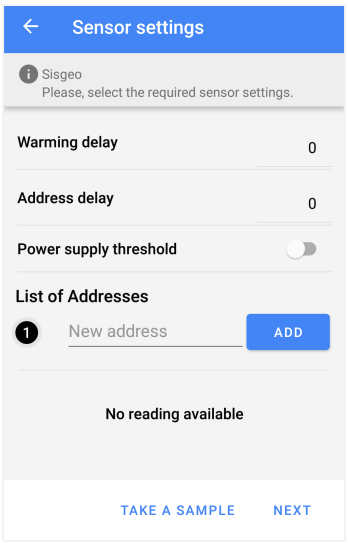
Different configuration parameters are also available for the vibrating wire, Piconode, analog and digital nodes.



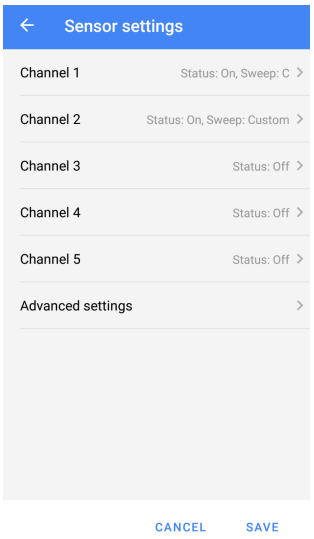
For specific information regarding the sensor configuration for a specific node, please, refer to the node user guide. It is also necessary to refer to the sensor's datasheet for more details on how it should be wired.



Vibrating wire 5-channel data logger sensor settings



DIG + Sisgeo sensor settings

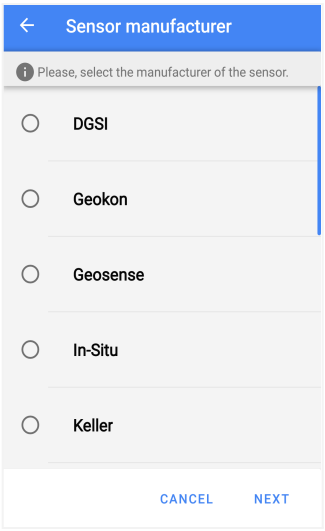


VW5 sensor settings

This option will be available in case the node has sensors to be configured. If not, it will not be displayed as with INC15.

Sensor manufacturer (DIG node)

When configuring a digital node, it is necessary to select the sensor manufacturer before configuring the sensor. A list of compatible manufacturers will be displayed from which the sensor connected to the node must be selected.



Laser pointing mode

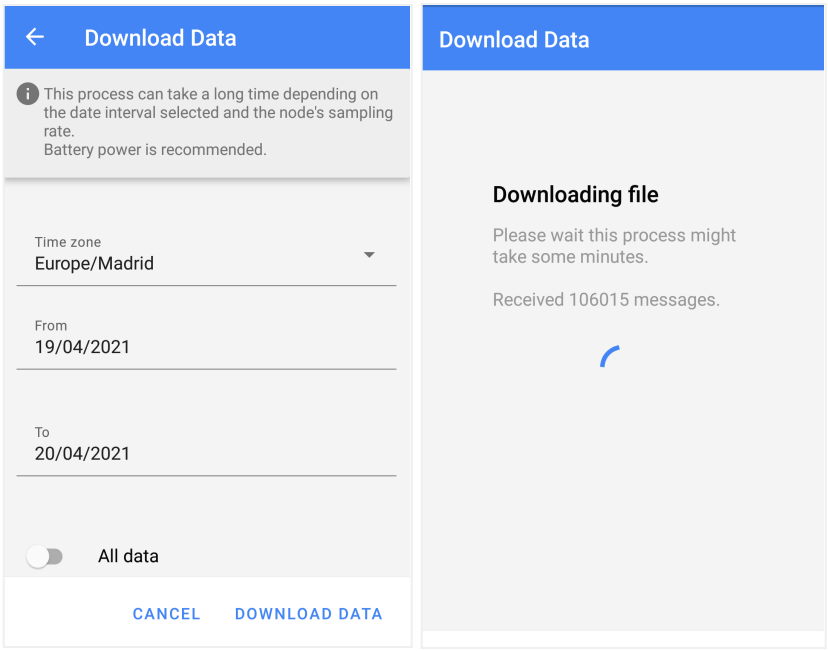
This option is only available for the laser nodes. It allows the laser to be activated for a certain period of time to facilitate the installation.

Download Data

The DOWNLOAD DATA menu allows downloading all the data of the node, both readings and health files, for a specific period. It also enables the selection of the timezone and the start and end date (ALL DATA) of the collection of the readings.

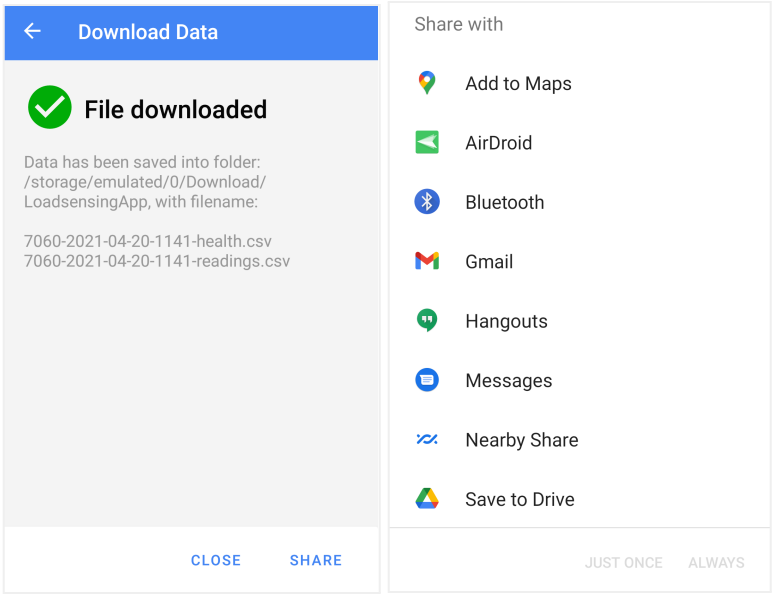
Click ALLOW and then DOWNLOAD DATA to store data on the Android device.

Please note that this process will take some time depending on the total number of messages being downloaded. For example, in the image below more than 100k messages are being downloaded which will cause the download to be slow.

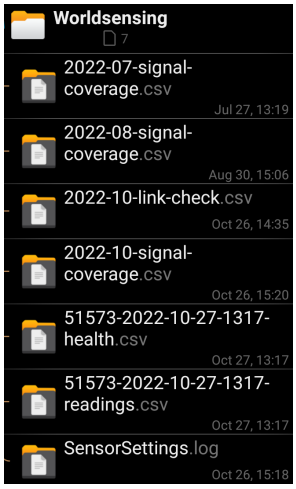


Once the download is finished, you will see a notification that the download was successful and where the data was downloaded.

You can also click on SHARE to see the available sharing options.

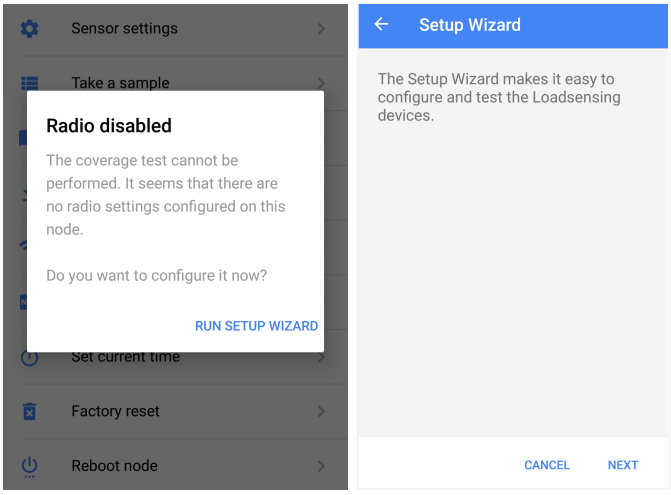


The Worldsensing Mobile App creates a folder called *Worldsensing* in the Android device's memory where the downloaded files as well as the coverage tests will be stored. The location of the folder will depend on the device itself. Go to the Worldsensing App folder section to have more information related to each file.



Radio Coverage Test (stand-alone)

The RADIO COVERAGE TEST menu will only be available if the node has previously done the radio configuration in the complete SETUP WIZARD. In case of no previous configuration, a warning will be displayed. By clicking on the RUN SETUP WIZARD the configuration will start.



Once the node has a radio configuration it will allow doing only a coverage test for checking the radio coverage between the node and the gateway. In the online and offline coverage test, the node will send

10 messages at Spreading factors 7, 8 and 9; and 5 more messages at SF 10, 11 and 12. This procedure may take up to 2 minutes.
In the Link check test, the messages sent will depend on the performance because if the communication at a lower Spreading factor is good, the test will be finished with a good signal result. The test will take up to 5 minutes.

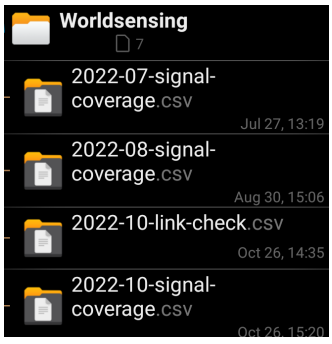
If the Android device has an Internet connection, all options will be available for an online coverage test. Otherwise, you may perform the coverage test offline, the link check test or skip this last step as it isn't a mandatory step but highly recommended to perform it once the node it's installed in the field to check if the communication from the node to the gateway is good enough.

The application will save the coverage test results in the memory of the Android device in a folder called Worldsensing creating monthly files depending on the type of the test:

- **Coverage test online/offline**: "YYYY-MM-signal-coverage.csv".
  The results of the online test will be the same as those that can be consulted in CMT, while in the case of an offline test, the results will not be visible (the cells will be empty: "") but the token and other information related to this test will be available.

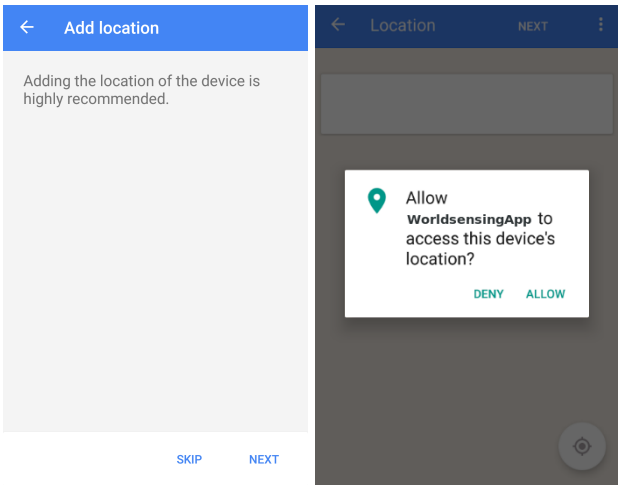
- **Link check test**: "YYYY-MM-link-check.csv".
  Important: this file is not generated in CMT, it's only available on the Android device on which the tests are performed.

The location of the folder will depend on the device itself.



In addition, in this section, the location of the node can be added or changed by clicking on SET LOCATION.

To do this you must allow access to the location of the Android device from the onset. Clicking ALLOW to enable access to the device location. In case the access was denied previously, you must access the device settings and allow the app. If you have any doubts about accessing these permissions, please check the specific information on your device.

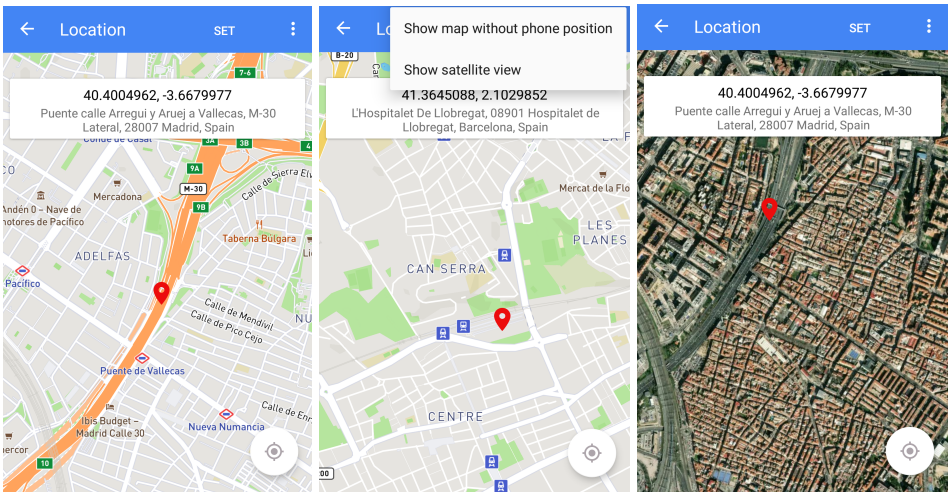


The map will show the position of the Android device as well as the exact coordinates taken with the GPS but it is possible to change this initial location by simply clicking on the screen the place you want to use as the node location.

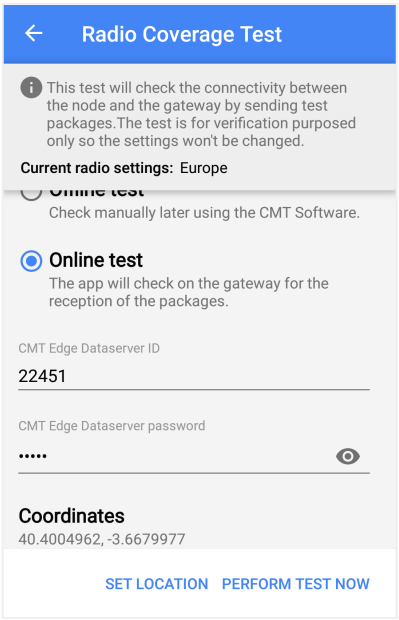
By clicking on the three dots at the top right of the screen, the following options will be displayed:

- **Show map without phone position** in case you don't want to use the default location of the Android device and instead choose the location on the map.
- **Show street map/satellite view** to change the type of map being displayed, either a street map or a satellite view.

At the bottom right is a grey button that returns the position to the default location of the Android device.



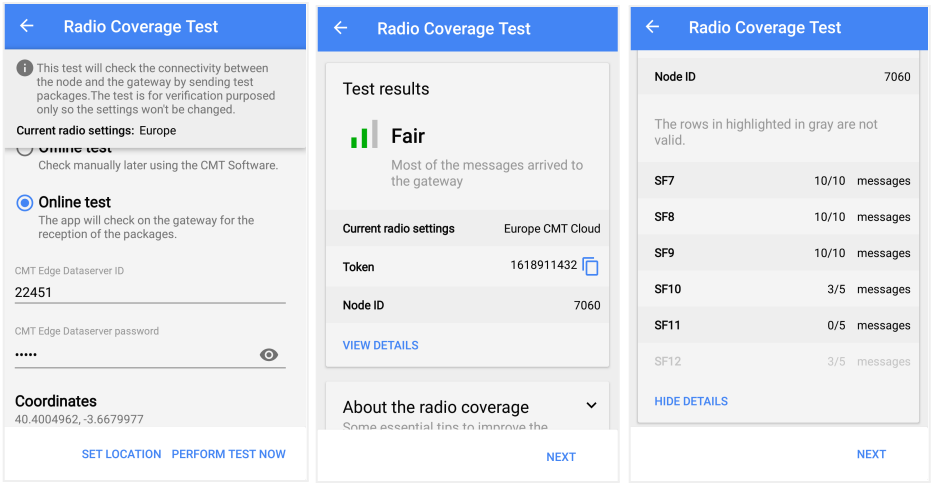
Once the location is correctly located, click SET to go back to the COVERAGE TEST menu where the new coordinates can be checked which will be applied after performing an online coverage test.



Important: the new location will only be sent to the CMT Edge once an ONLINE coverage test is done.

Online

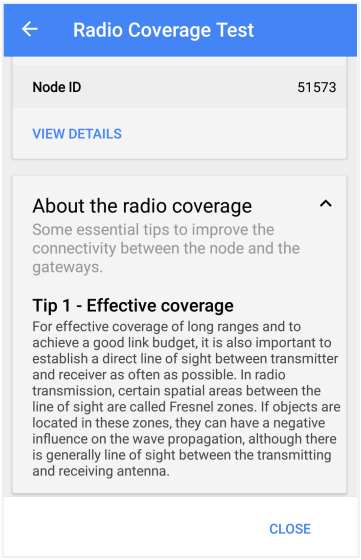
If the Android device has an Internet connection the online coverage test option will be available. It will require the gateway/data server credentials. Then when the online coverage test is done, showing the results in the Worldsensing App.



Once the radio coverage test is done, the final result, with an estimation of the quality can be Good, Fair, Poor, Bad, No Signal. By clicking on the VIEW DETAILS option, information of the messages received for each spreading factor.

The spreading factors not allowed on the chosen radio will be displayed in darker grey colour (i.e. SF12 is discarded for a correct performance).

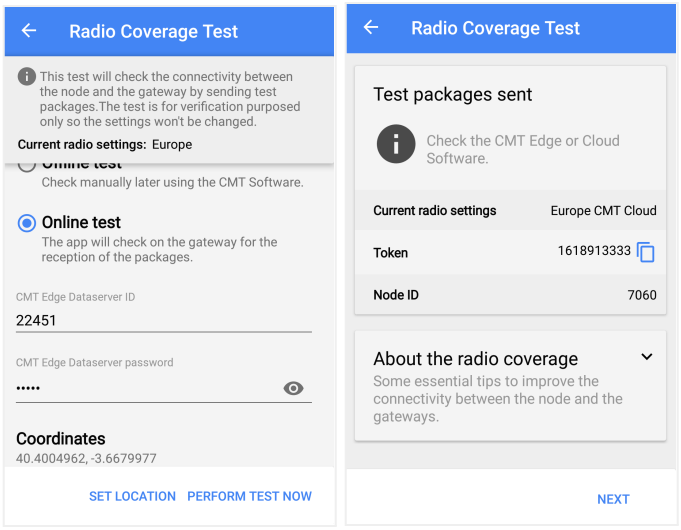
Also, by clicking on the ABOUT THE RADIO COVERAGE TEST some tips to improve the communication node-gateway will be displayed.



Offline

Doing an offline coverage test, it will be done but the results won't be displayed on the app. Instead, the Worldsensing App will show a token ID.

Radio coverage results can be checked in the gateway/data server using this token.

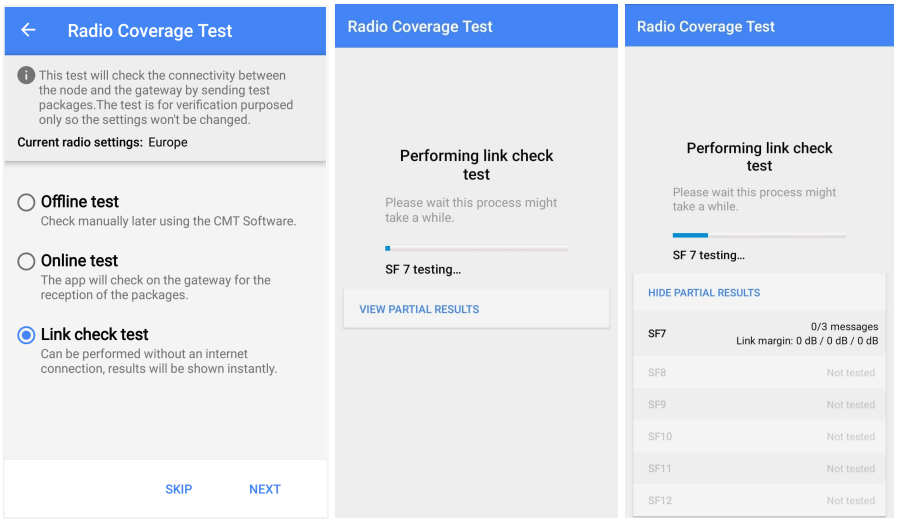


Link check test

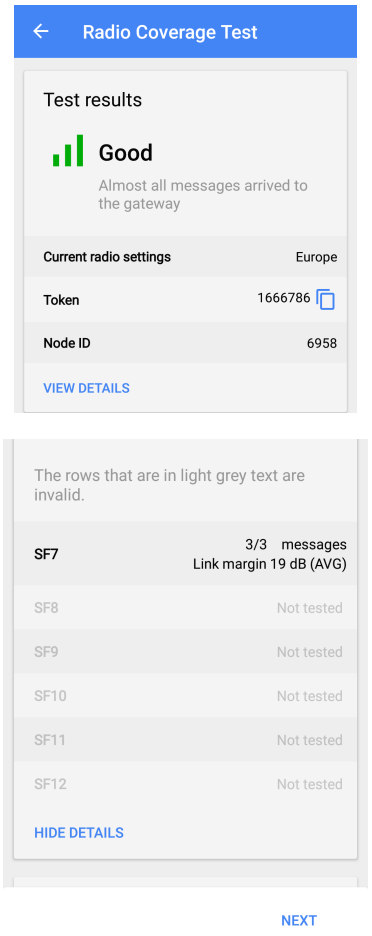
In case the Android device doesn't have an internet connection but you want to receive the coverage test results in the WS Mobile App, the Link check test will perform a coverage test and receive the results via radio, unlike the online coverage test which will receive them via Internet connection with the gateway.

The test will take up to 5 minutes as it will require sending packets and receiving results via LoRa radio. But if there is a good connection in the first few Spreading factors, the coverage test will be terminated with a good signal result.

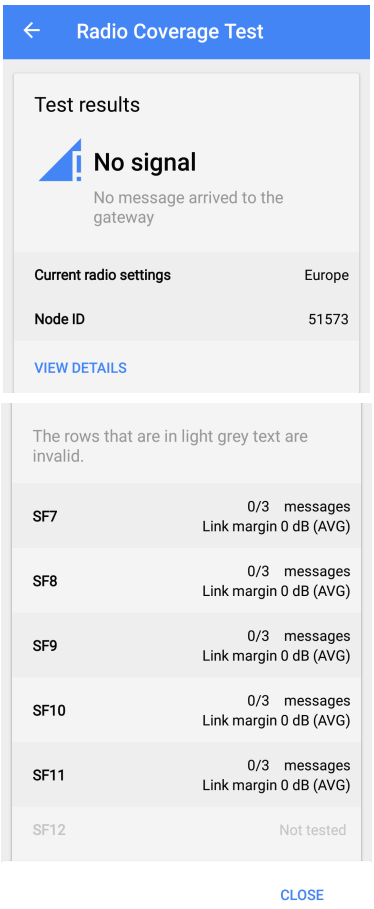
By clicking on the box 'View Partial Results' it is possible to see the outcome of the test for each spreading factor, they can also be hidden by clicking on the box 'Hide Partial Results'. The test can also be cancelled or finished by clicking on the corresponding options displayed at the bottom of the screen as shown in the 3rd image below



Link check test sequence



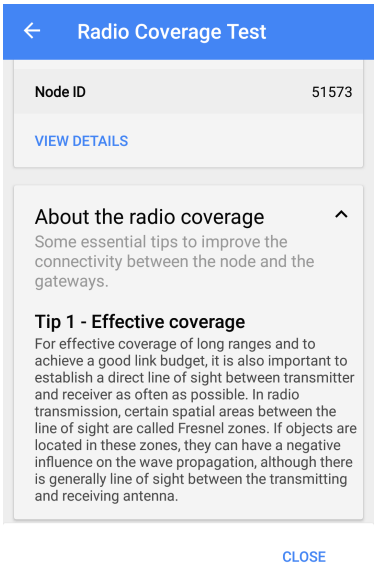
Link check test good results



Link check test no signal results

You will see an estimation of the signal quality (Good, Fair, Poor, Bad, No Signal) and on the VIEW DETAILS option, more information on the messages received for each spreading factor.

The spreading factors in grey are those that are not allowed in a specific region or those not tested because the test had good results on a lower Spreading Factor.
For example, if there is a result of 3/3 packets received in SF7, the test will not be continued as the result is optimal. On the other hand, if in SF7 the result is not positive, the next one will be done until the one with good results is found or until the test finishes according to the regulations of the region.
The ABOUT THE RADIO COVERAGE TEST button also shows some tips to improve the communication between the node to the gateway.

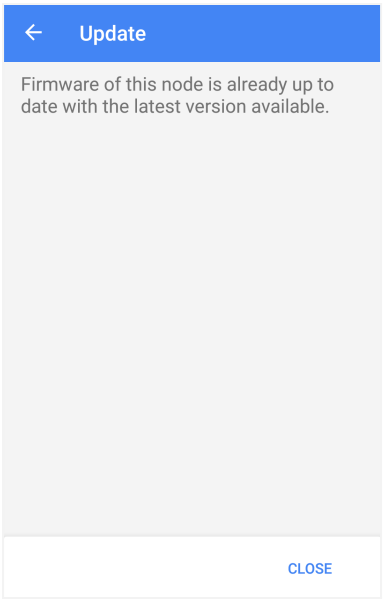


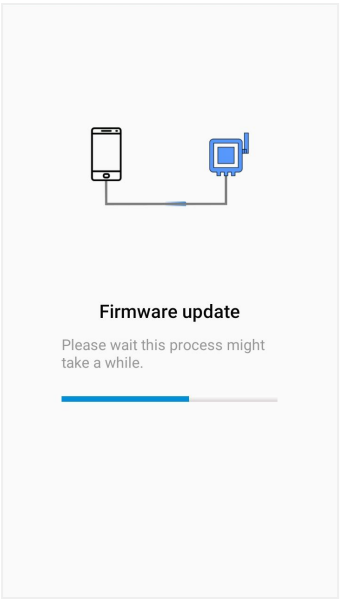
In case of doubt, please contact our support department.

Firmware update (stand-alone)

When starting the connection between the node and the Mobile App, if there is a new firmware version of the node, a warning will be displayed. If it has not been updated at that time, this menu will allow you to do it at the desired time.

We recommend upgrading it whenever it's required because each new version adds new features and can correct previous bugs.





Available firmwares per node

Each version of the application contains the latest firmware version of each node.

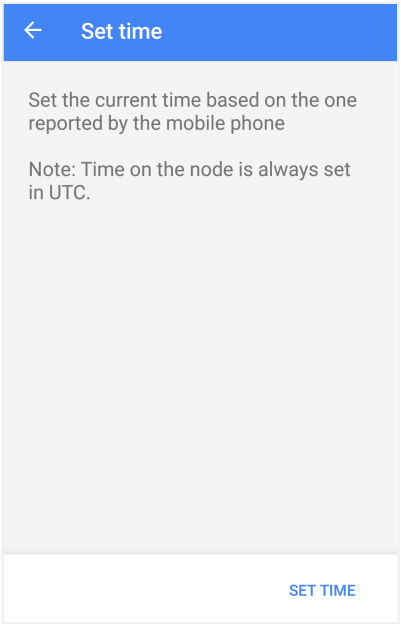
The following are the ones contained in version 2.6.1 of the Worldsensing Mobile App:

Node model	Firmware version
LS-G6-INC15	2.43
LS-G6-INC15-I	2.43
LS-G6-TIL90-X	2.63
LS-G6-TIL90-I	2.63
LS-G6-TIL90-XE	2.67
LS-G6-LASER	2.53
LS-G6-LAS-TIL90	2.77
LS-G6-VW	2.69
LS-G6-VW-1M	2.69
LS-G6-VW-1P	2.69
LS-G6-VW-RCR	2.69
LS-G6-ANALOG-4	2.73
LS-G6-PICO	2.75
LS-G6-DIG-2	2.71

Set the current time

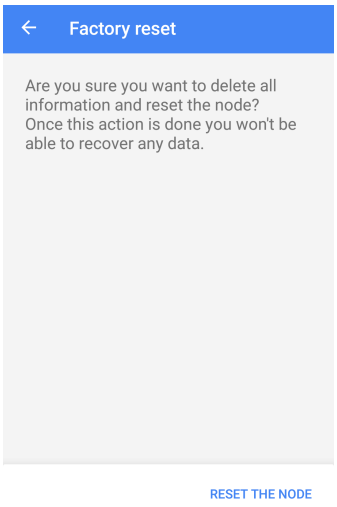
When starting the connection between the node and the Worldsensing App, if the date and/or time is not correct, a prompt to change it will be displayed. In case it has not been done at that first moment, this menu allows the correction.

It is important to do this because if the date is not correct, old data dated 1970 will be sent. This data will be discarded when arriving at the gateway and will not be shown in the CSV.



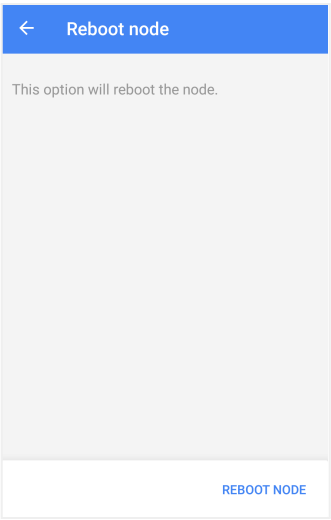
Factory reset

The factory reset menu erases all the data stored in the node and resets the node to the factory configuration, including the node ID.



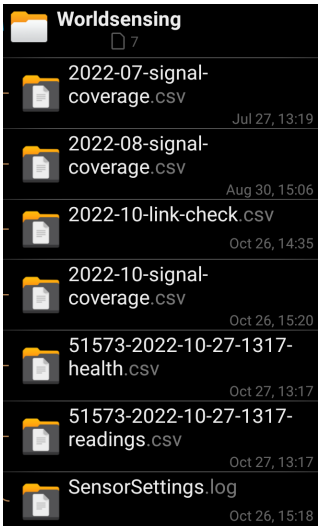
Reboot node

This enables the node to be restarted if needed. It will take some seconds so you don't need to close and reopen the app. The app will reconnect once the node is restarted and you will be able to see in the node uptime when the node was turned on again.



Worldsensing App folder

The Worldsensing Mobile App will create a Worldsensing folder in the memory of the Android device where the following files will be stored:



- **Coverage test online/offline**: "YYYY-MM-signal-coverage.csv".
  Monthly file with the results of the online test will be the same as those that can be consulted in CMT, while in the case of an offline test, the results will not be visible (the cells will be empty: "") but the token and other information related to this test will be available.

- **Link check test**: "YYYY-MM-link-check.csv".
  Monthly file with the results of the link check tests.
  Important: this file is not generated in CMT, it's only available on the Android device on which the tests are performed.

- **Downloaded files**: files manually downloaded from the node using the DOWNLOAD DATA functionality (readings and health files).
  - Readings: "NNNNN-YYYY-MM-DD-HHmm-readings.csv" where NNNNN is the node ID.
  - Health: "NNNNN-YYYY-MM-DD-HHmm-health.csv" where NNNNN is the node ID.

- **Sensor settings**: "SensorSettings.log".

Information about the configuration of connected sensors or nodes with integrated sensors is saved such as activated channels in a Vibrating wire, which sweep frequency has been selected, digital protocol selected and its addresses list with the sensor IDs and its order, etc.
This can be useful for troubleshooting.


```
}{
  "configName": "ConfigVW",
  "date": "2021-11-23T17:45:02.916Z[Europe/London]",
  "nodeId": 30982,
  "sensorConfig": {
    "magnitudeThreshold": 0.02,
    "vwConfig": {
      "enabledChannelsMap": {
        "CHANNEL_1": true,
        "CHANNEL_2": false,
        "CHANNEL_3": false,
        "CHANNEL_4": false,
        "CHANNEL_5": false
      },
      "maxNumChannel": 5,
      "sweepCustomDurationMs": 50,
      "sweepCustomEndFreqHz": 6000,
      "sweepCustomStartFreqHz": 400,
      "sweepMap": {
        "CHANNEL_1": "SWEEP_CUSTOM",
        "CHANNEL_2": "SWEEP_C",
        "CHANNEL_3": "SWEEP_C",
        "CHANNEL_4": "SWEEP_C",
        "CHANNEL_5": "SWEEP_C"
      }
    }
  }
```


Example of sensor settings saved in the 'SensorSettings.log' file for a LS-G6-VW datalogger.


```
}{
  "configName": "ConfigDig",
  "date": "2022-10-27T17:59:39.800+02:00[Europe/Madrid]",
  "nodeId": 34179,
  "sensorConfig": {
    "digSisgeoConfig": {
      "addressDelay": 0,
      "addressesList": [
        1,
        2,
        3,
        4,
        5,
        6,
        7,
        8,
        9,
        10
      ],
      "maxChannels": 0,
      "numberOfChannels": 10,
      "powerSupplyThreshold": 0,
      "typeOfSensor": "SISGEO_V3",
      "warmingDelay": 0
    },
    "typeOfSensor": "SISGEO_V3"
  }
}
```


Example of sensor settings saved in the 'SensorSettings.log' file for a LS-G6-DIG-2 datalogger configured in Sisgeo protocol.

The location of the folder will depend on the device itself.

FAQS

How can I check if my device supports the USB OTG cable provided by Worldsensing?

If you do not know whether your Android device supports a USB OTG connection, we recommend that you check with the device manufacturer.

There are also apps such as the "USB OTG Checker" that can check the device compatibility.

How come the Worldsensing App doesn't work on my device even if it meets minimum requirements?

Android devices, despite sharing common elements, can have different operating systems depending on the brand or model. This is why we can find that a device may meet the minimum requirements to use the Worldsensing App but does not allow its use. Even some devices have worked correctly for a while but after an update, they have stopped working.

In some cases, after downloading the app, you may not be able to use the app when connecting the node and you will see a "USB not found" notification. However, with the same node and cable, the app may work on another device.

Recommended troubleshooting:

- Try with different cables to confirm that it is not a connection problem and with another device to rule out that it is a node problem.
- Uninstall the app, delete the .apk files and reinstall it.

If the node connection works with another mobile phone, we can confirm that it is an Android device compatibility problem.

For questions about compatibility or tested models, please contact our support department.

Is it possible to revert to a previous version of the app

No, our server is always running the latest version of the app and does not allow downgrading to a previous version.

We recommend downloading or upgrade to the latest version available to take advantage of the latest features and bug fixes.

Why did I obtain 10V on input voltage?

When connecting the node to the Worldsensing App, the input voltage supplying the node can be seen on the main screen (*input voltage*). The value can range from 3V to 5V depending on the power mode.

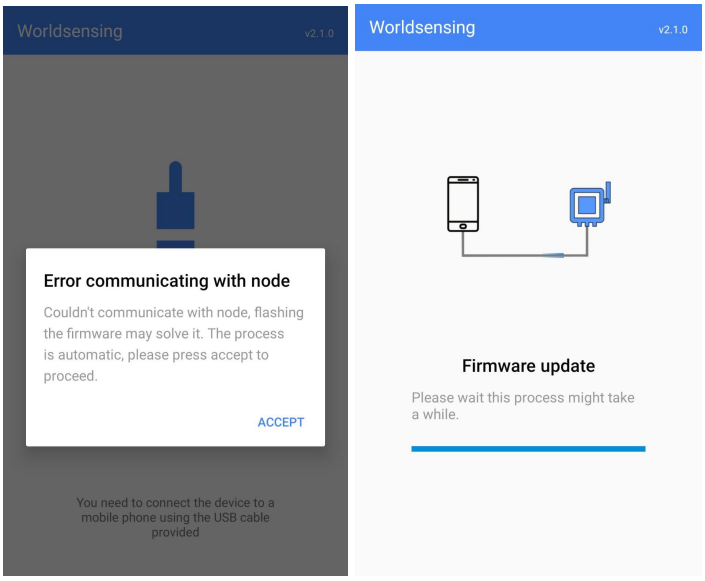
In case the voltage has higher values, usually 10V, it would mean that the node has power supply problems usually related to an overload that may have affected the node's resistance. This can be caused by a discharge higher than it can withstand or by an external overpowering.

By downloading the node's health file, the change of a regular input voltage to out-of-range values can be traced.

If these values are observed, please contact our support department.

How to recover the node if it gets bricked?

In case the node has a firmware problem when connecting to the Application, before displaying the main menu it will show an error message. By clicking ACCEPT it will start the *unbrick* process which will force the reinstallation of the latest firmware version available for that node to recover the regular node functionality.



CONTACT WORLDSENSING

Need more support? Get in touch with our Customer Success team:

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Phone: +34 93 418 05 85 (08.30h - 16.30h UTC)

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