NIFTI™ Configuration App Reference Guide

Version 1.4. Last Updated 1st April 2026

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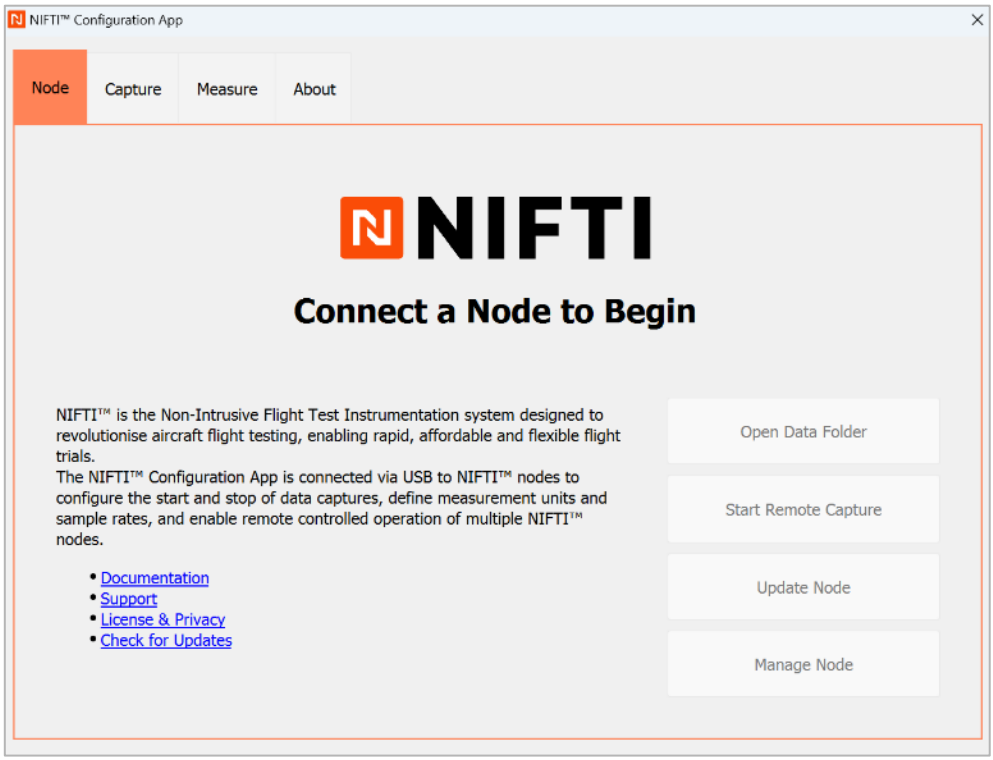
1 The NIFTI Configuration App Overview

The NIFTI™ Configuration App is an easy-to-use utility to configure and manage both NIFTI Accelerometer and Strain Gauge Sensor Nodes (i.e. Sensor Nodes). It provides the following key features split across four tabs:

- The **Node Tab** – System level information of the operation and management of the Sensor Node.
- The **Capture Tab** – Different capture modes to configure the Sensor Node to operate on.
- The **Measure Tab** – Configure the Sensor Node's measurement settings that is recorded during capture.
- The **About Tab** – Provide support and legal information of the Sensor Node.

A NIFTI Sensor Node must be connected to the NIFTI Configuration app to operate and manage the Sensor Nodes. When no Sensor Node is connected to the NIFTI Configuration App, the app will display as follows.



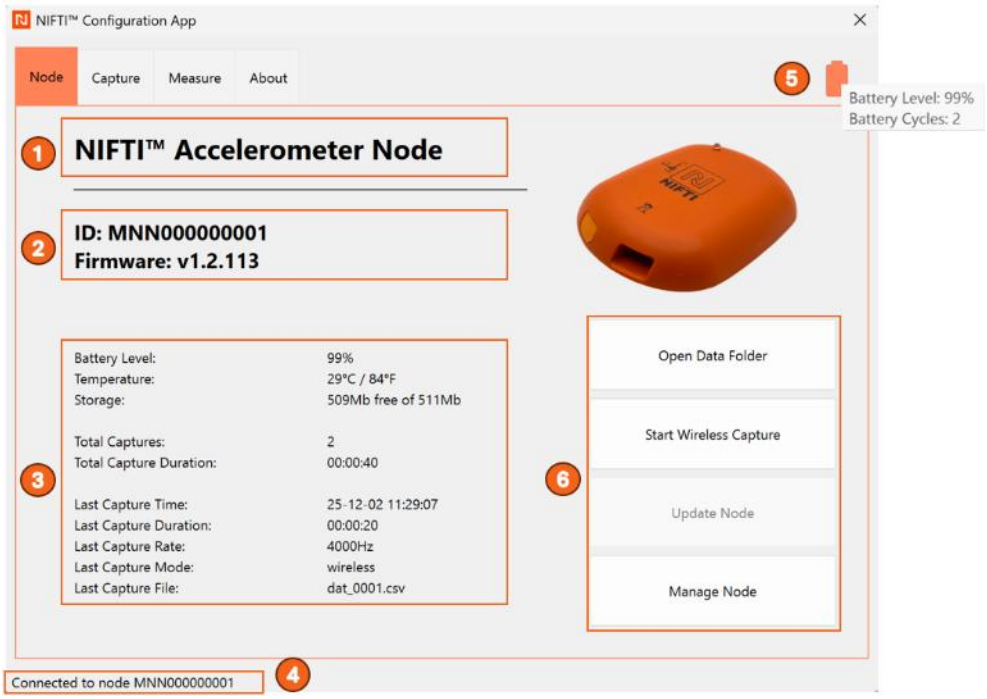
NB: Only one Sensor Node is to be connected to the PC at any time

⚠ *Application is only compatible with Windows operating system*

2 The Node Tab

The **Node Tab** provides convenient access to system information about the NIFTI Sensor Node and access to Sensor Node management functions.

The key features are highlighted below:



The key features of the **Node Tab** include:

1. NIFTI Sensor Node type identifier (NIFTI Accelerometer or Strain Gauge).
2. Sensor Node ID and Firmware version.
3. Sensor Node information including:
    - Available data storage capacity.
    - Internal temperature in degrees Celsius and Fahrenheit.
    - Usage information about the Node (total number of data captures, total data capture duration, last data capture information).
4. Status bar to notify the user when the Configuration App is communicating with the connected Sensor Node.
5. Battery state of charge (in %) and cycle count when the mouse cursor hovers over the battery icon.
6. Sensor Node management commands:
    - Open Data Folder – to open the contents of the Sensor Node's disk.
    - Start Wireless Capture – to trigger a wireless capture event using the connected Sensor Node as the controller.
    - Update Node – to update the Sensor Node with the latest firmware (greyed out when firmware is up-to-date).
    - Manage Node – to shutdown, erase, restart or reset the Sensor Node.

2.1 Sensor Node Management

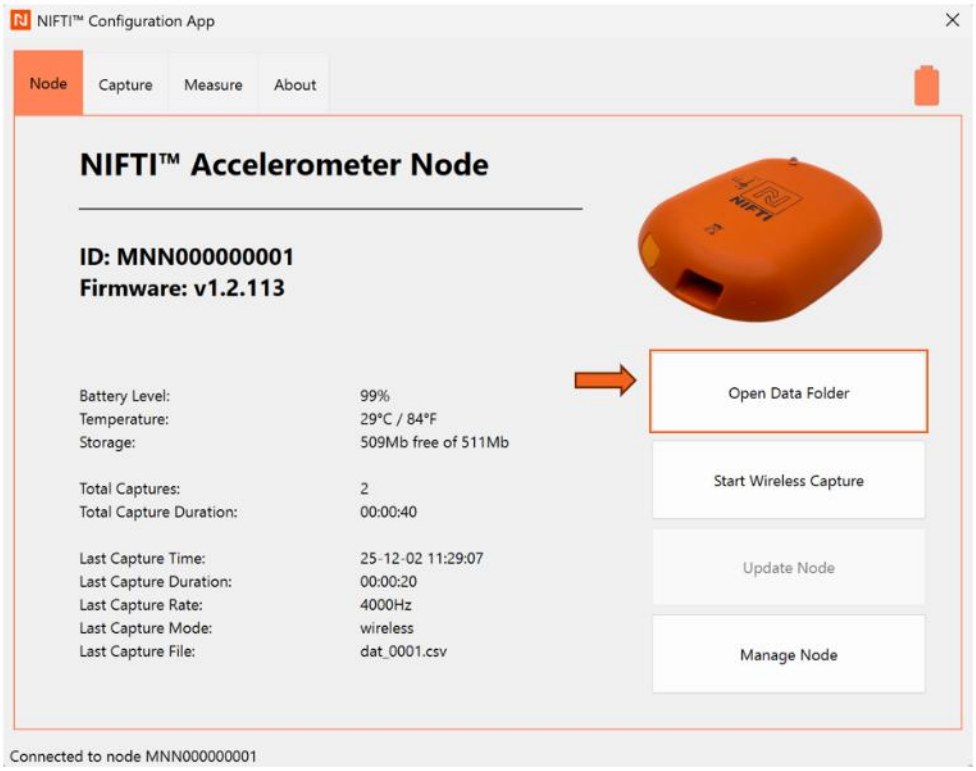
This section highlights the Sensor Node management functions.

2.1.1 Open Data Folder

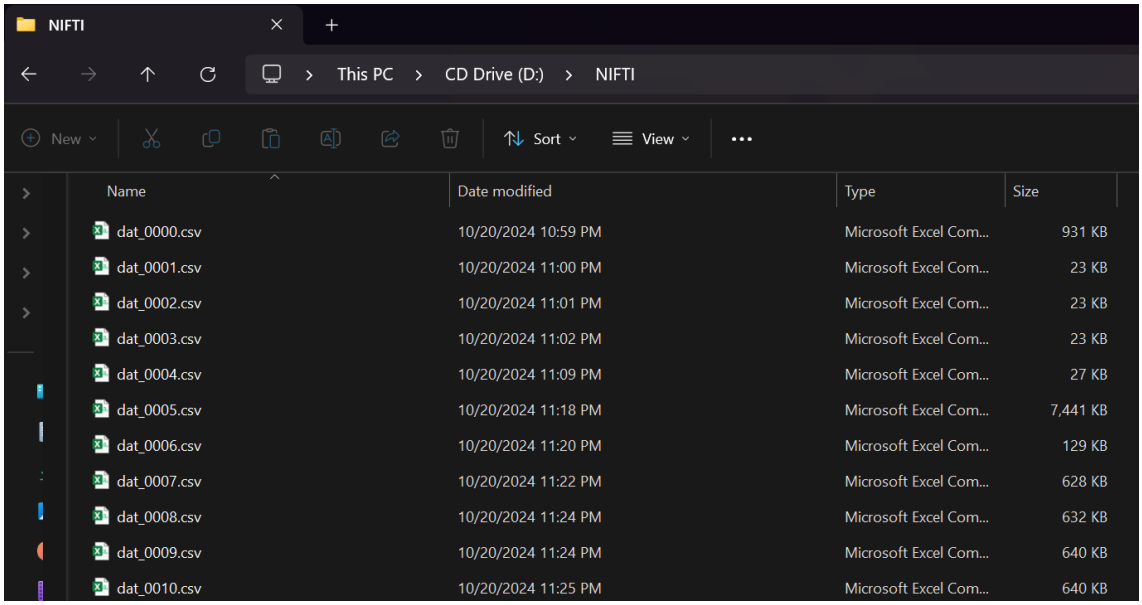
Once the user has successfully connected the NIFTI Sensor Node to the PC, the Sensor Node's disk will be available to copy the Comma Separated Values (.csv) files that each contain recorded data.

To access the Sensor Node's disk:

1. Use the **Node Tab** in the NIFTI Configuration App to access the files containing captured data by clicking on the **Open Data Folder**.



2. A new window showing the contents of the Sensor Node's disk will appear.



⚠ *If the NIFTI Sensor Node's disk does not appear in the PC's list of available disks, please visit https://nifti.aero/support for assistance.*

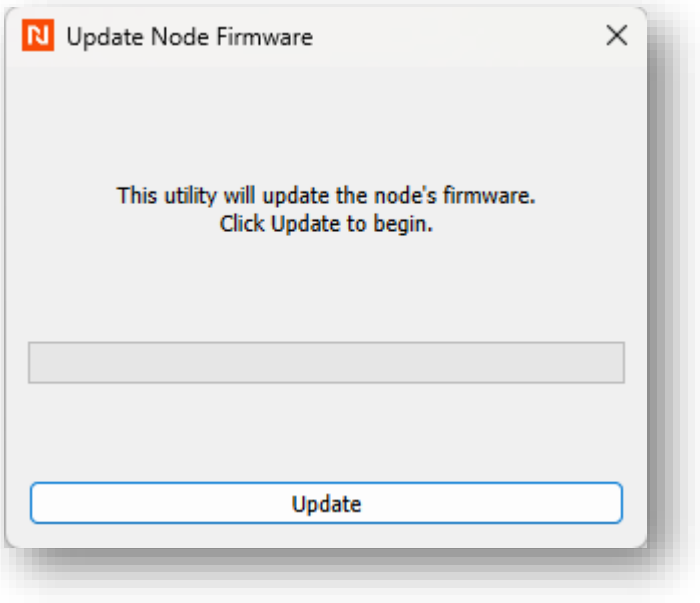
2.1.2 Start Wireless Capture

This command starts a Wireless Capture using the connected NIFTI Sensor Node as the Controller that sends start and stop signals to Receiver Sensor Nodes – configured for Wireless Capture – to synchronously start and stop capturing.

2.1.3 Update Node

If a firmware update is available for the connected Sensor Node, the Update Node button will become available for selection.

1. Click the **Update Node** button to display the Update Node Firmware window.

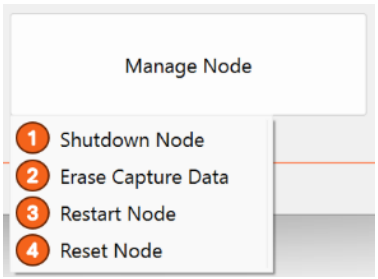


2. Click the **Update** button to update the connected Sensor Node's firmware. The Sensor Node will automatically restart to complete the firmware update process.

2.1.4 Manage Node

The **Manage Node** button performs management functions on Sensor Node including:

1. Shutdown Node – to shut down the Sensor Node, preserving battery charge whilst in storage. Sensor Node will wake up when micro-USB is connected.
2. Erase Capture Data – to delete all previous capture data stored from the NIFTI Sensor Node's disk.
3. Restart Node – to reboot the Sensor Node, preserving all capture and configuration data.
4. Reset Node – to erase the capture and configuration data from the Sensor Node.

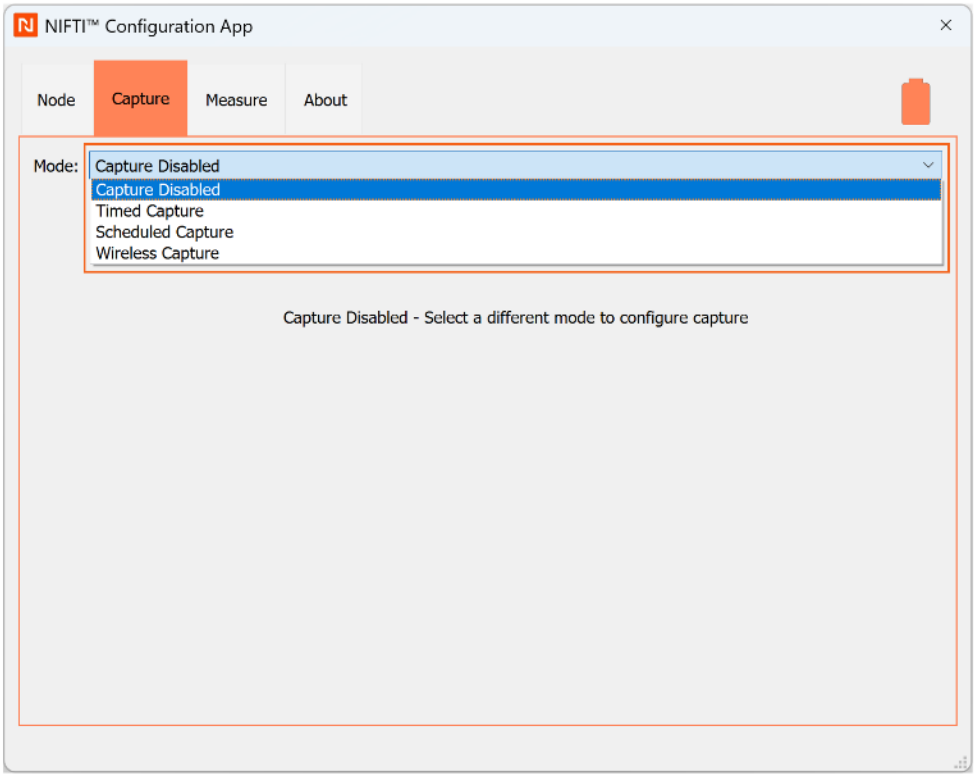


Copy any desired .csv files before performing any Sensor Node management functions or data captures.

3 The Capture Tab

The **Capture Tab** provides configuration options for the following modes:

- **Capture Disabled** – The Sensor Node will not perform a capture.
- **Timed Capture** – This is a time-based capture that can work with one Sensor Node and is based off a start delay and capture duration.
- **Scheduled Capture** – This is a time-based capture that can work with one Sensor Node and is set to capture based off a start date/time and a finish date/time.
- **Wireless Capture** – This is a wireless capture, that works with a minimum of two Sensor Nodes; one Sensor Node as a Controller to send signals to the Sensor Nodes; and one or more Sensor Nodes to wirelessly receive signals and capture data.

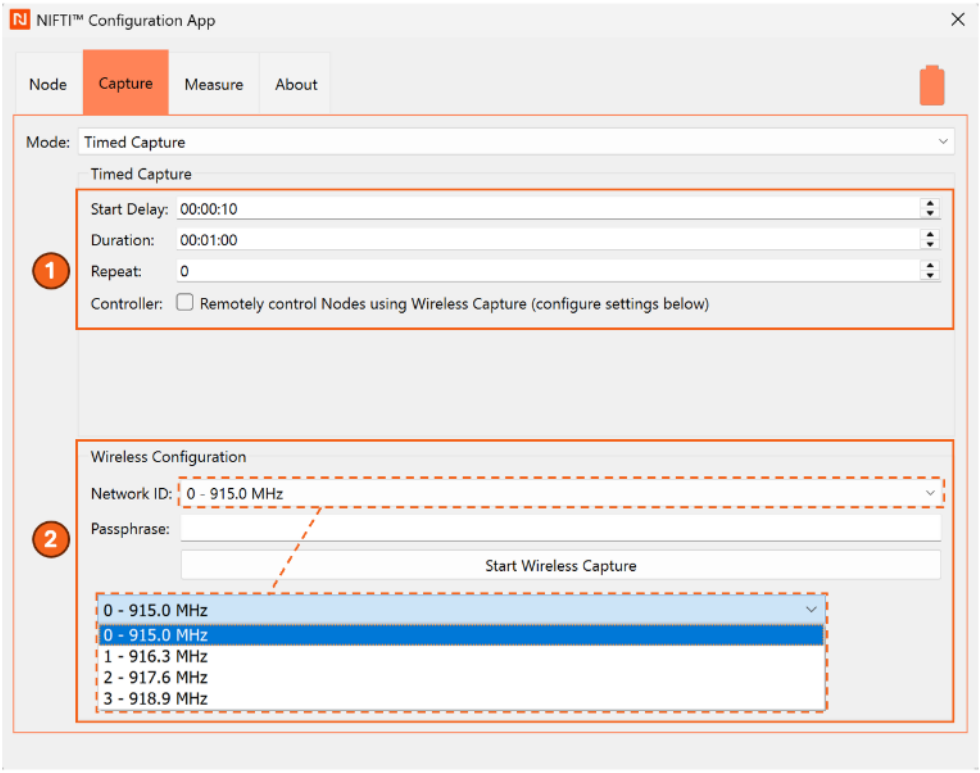


When finished with the Sensor Nodes, it is recommended to shut down the Sensor Node. This ensures that no unwanted captures occur and preserves the battery life whilst in storage.

3.1 Timed Capture Mode

This capture mode will initiate a data capture on the Sensor Node after a predefined Start Delay, and for the specified Duration of time. The Sensor Node can also be configured to repeat the timed capture as required.

1. Timed Capture - The user can set the following options:
   a. **Start Delay** – the Sensor Node will commence capturing data after this delay, from disconnecting the Sensor Node from a PC or charge.
   b. **Duration** – the Sensor Node will capture for the specified length of time.
   c. **Repeat** – If the timed capture is to be repeated, it will repeat the start delay and duration based on the set repeats.
   d. **Controller** – When selected, the Sensor Node will be assigned as the Wireless Controller.



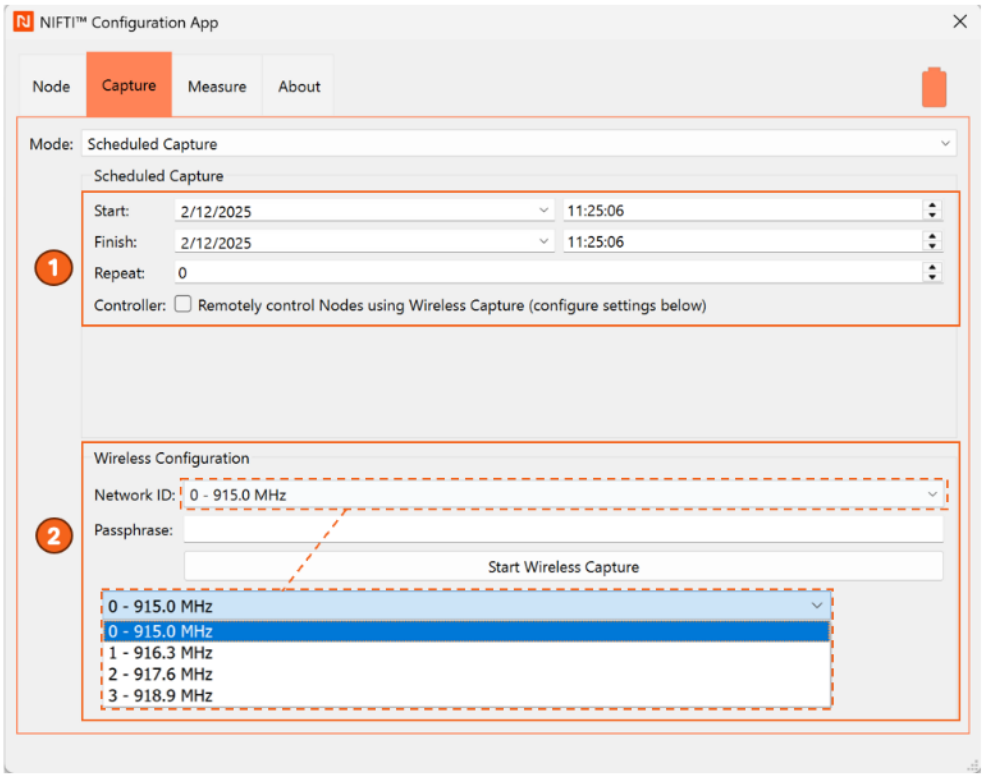
2. Wireless Configuration – Used to configure Sensor Nodes to be on the same network to run a Wireless Capture.
   a. **Network ID** – Specifies the radio channel for communication between Controller and Receivers.
   b. **Passphrase** – Specifies the user-defined network passphrase to enable encrypted wireless communication between Sensor Nodes.
   c. **Start Wireless Capture** – A button for users to access to perform a Wireless Capture.

3.2 Scheduled Capture Mode

This capture mode will initiate a data capture on the Sensor Node starting and ending at specified date and time. The Sensor Node can also be configured to repeat the scheduled capture at 24-hour intervals.

1. Scheduled Capture – The user can set the following options:
   a. **Start** – The date and time for the capture to begin.
   b. **Finish –** The date and time for the capture to end.
   c. **Repeat –** A repeat will occur every 24hrs based on the start and finish date/times.
   d. **Controller –** When selected, the Sensor Node will be assigned as the Wireless Controller.
   e. **Wireless Configuration –** Used to configure Sensor Nodes to be on the same network to run a Wireless Capture.

NB: The date/time displayed will be based off the PC's clock.



2. Wireless Configuration – Used to configure Sensor Nodes to be on the same network to run a Wireless Capture.
   a. **Network ID** – Specifies the radio channel for communication between Controller and Receivers.
   b. **Passphrase** – Specifies the user-defined network passphrase to enable encrypted wireless communication between Sensor Nodes.

c. **Start Wireless Capture** – A button for users to access to perform a Wireless Capture.

3.3 Wireless Capture Mode

This capture mode will initiate a data capture on the Receiver Nodes when wirelessly signalled to start and stop capture by a Controller Node. Receiver Nodes configured to capture data in this mode will be time-synchronised with the Controller Node and attain synchronised clocks.

At least two Sensor Nodes are required for this mode: one acting as a Controller, and up to 15 as Receivers.

The Controller Node wirelessly sends the following commands to the Receivers:

a. Time Sync
b. Start Capture
c. Stop Capture

Receiver Nodes respond to these commands by executing the corresponding actions. Receiver Nodes will automatically wake from Sleep state upon receiving any wireless command.

A wireless capture can be initiated by a Controller Node in two ways:

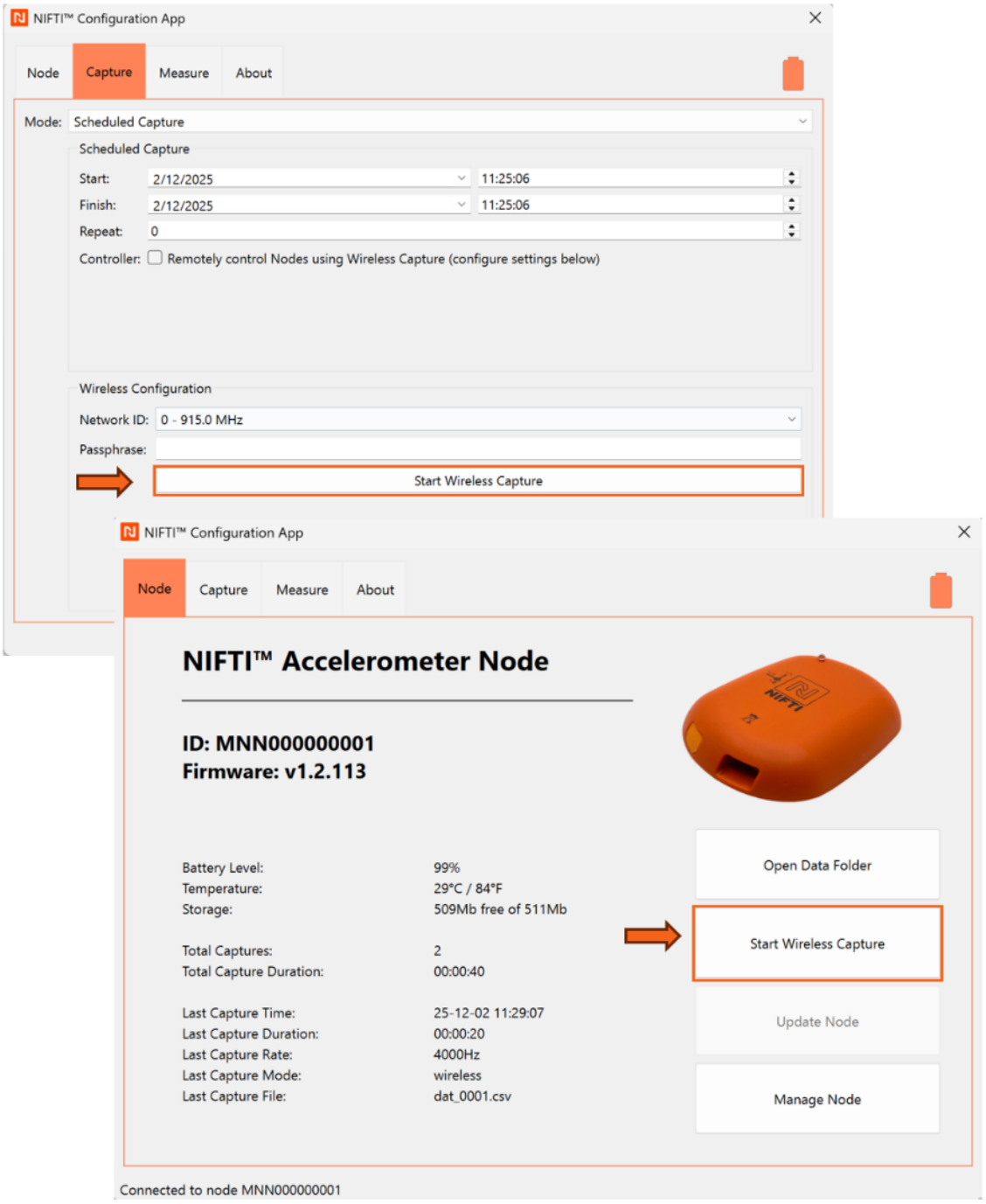
1. Via tether – Where the Controller Node remains connected to a PC to initiate a Wireless Capture to Receiver Nodes; or
2. Via Time-Based Capture – A Sensor Node configured as a Controller Node via Timed or Scheduled capture to wirelessly control Receiver Nodes.

3.3.1 Wireless Capture (Via tether)

A Controller remains tethered to PC. A user initiates and ends the wireless capture using the NIFTI Configuration App.

As Controller is tethered, it does not perform capture or record data.

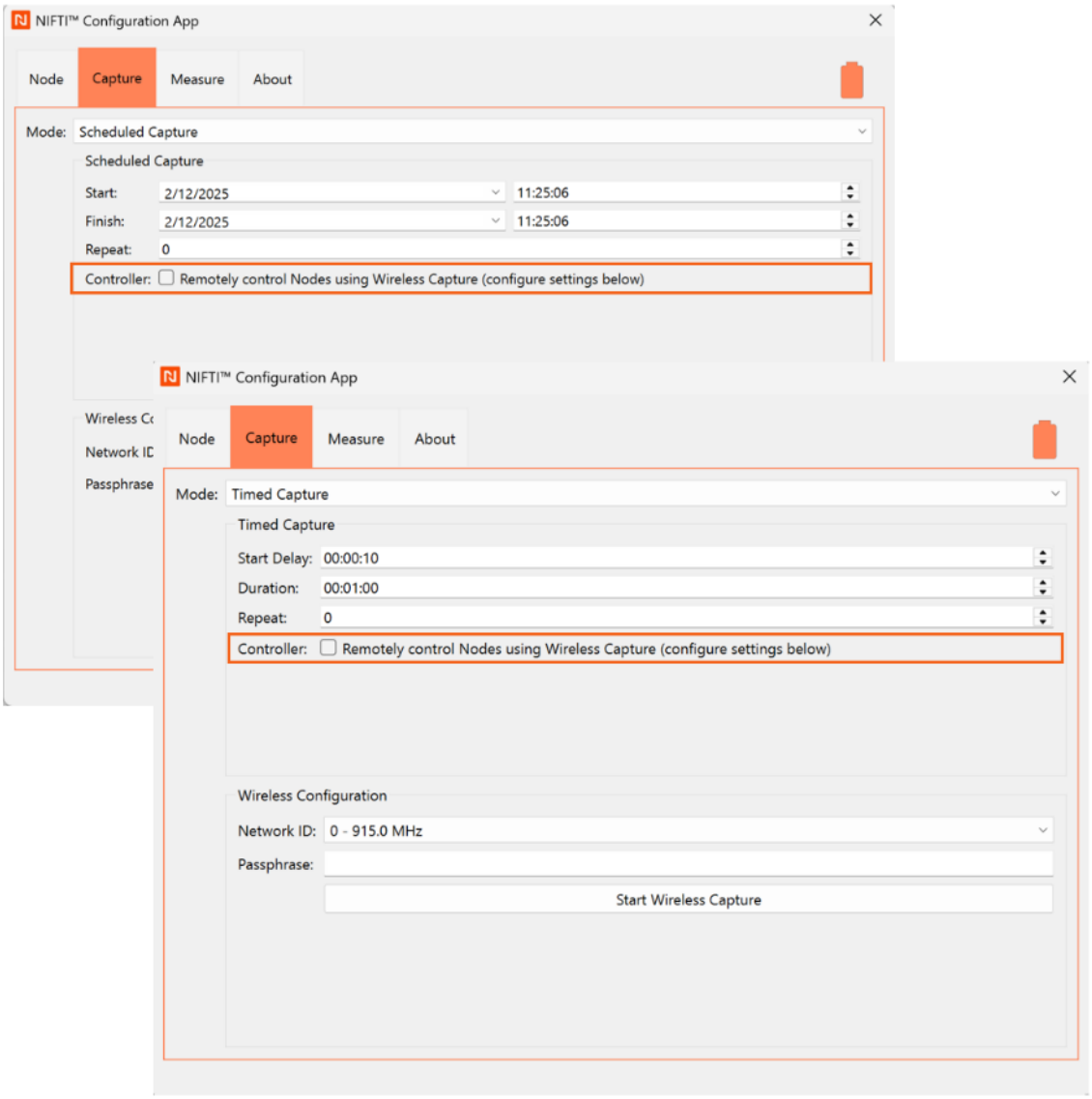
Receiver Nodes start and stop capture based on the Controller's wireless commands.



3.3.2 Wireless Capture (Via Time-Based Capture)

This advanced mode allows the Controller Node to be configured in Timed or Scheduled Capture mode, operating independently from a PC.

The Controller Node captures data while also issuing wireless start/stop commands to Receiver Nodes, which enables consistent capture timing across multiple Sensor Nodes without configuring each individually.

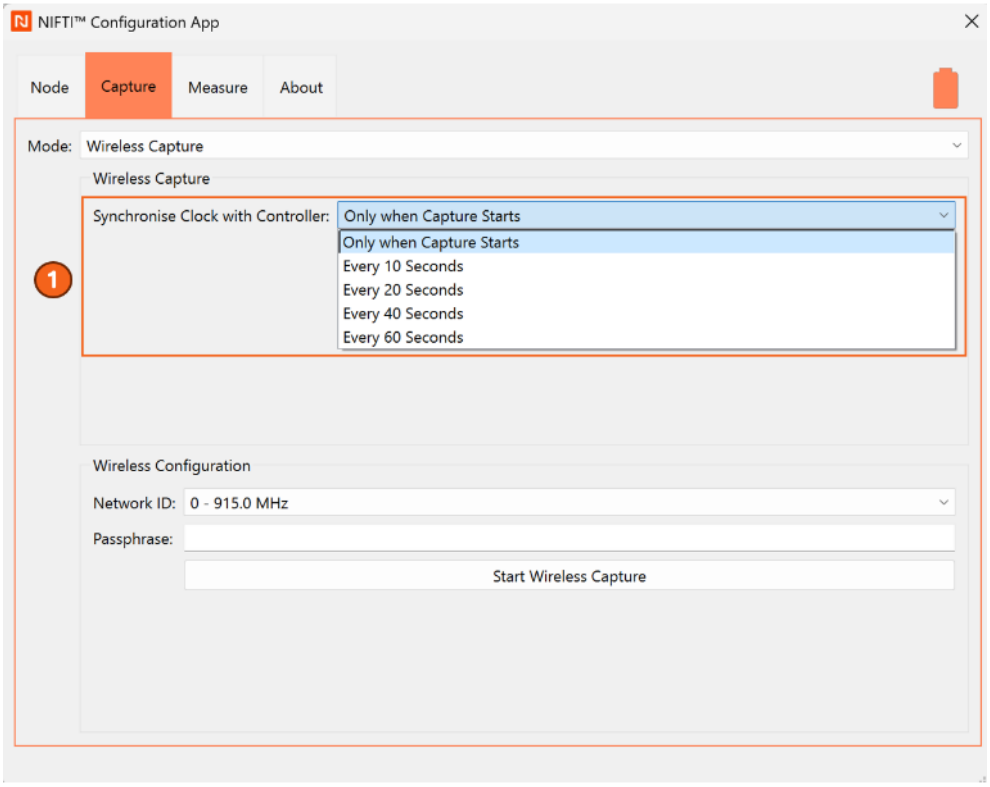


3.3.3 Synchronise Clock with Controller

This setting determines how frequently a Receiver Node must receive a Time Sync signal from the Controller to continue capturing. If a Receiver does not receive a sync signal within the configured interval, it will automatically stop capturing.

Available options:

- Only when Capture Starts (Receiver will continue capturing indefinitely unless a stop command is received)
- Every 10 Seconds
- Every 20 Seconds
- Every 40 Seconds
- Every 60 Seconds

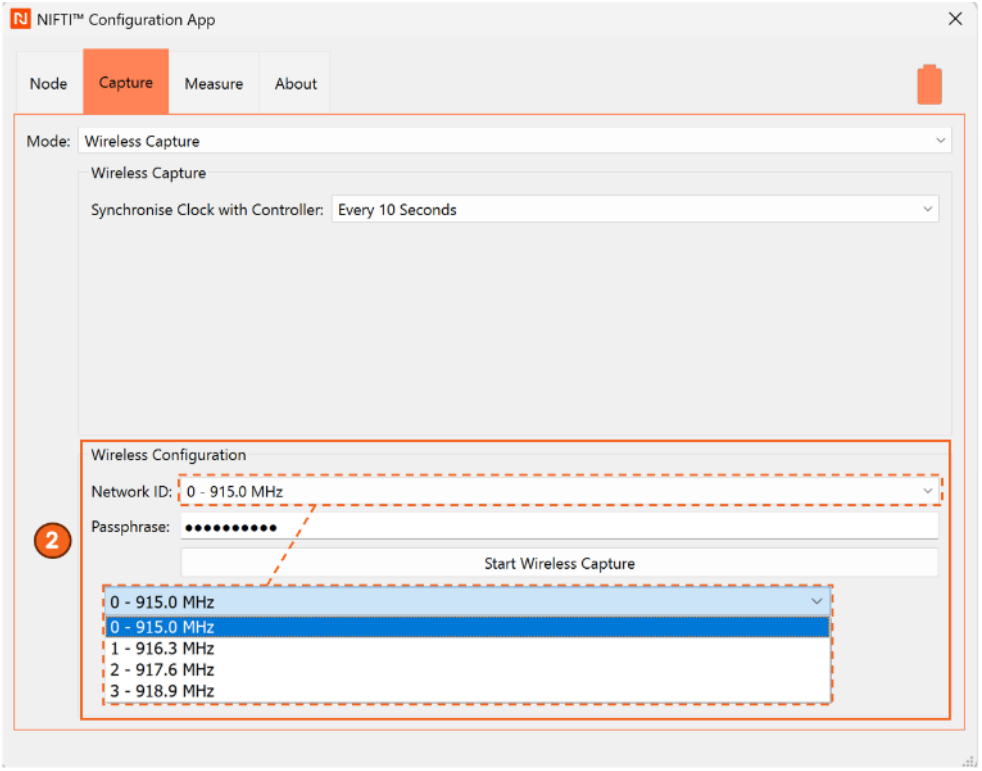


3.3.4 Network ID

The Network ID defines the wireless communication channel used by a group of Sensor Nodes during Wireless Capture. It ensures that the Controller and Receiver Nodes operate on the same frequency. By assigning unique Network IDs to different groups, multiple independent sensor clusters can operate simultaneously without interference. Each Network ID corresponds to a dedicated radio frequency, allowing for clear separation between networks.

Considerations for Network configuration:

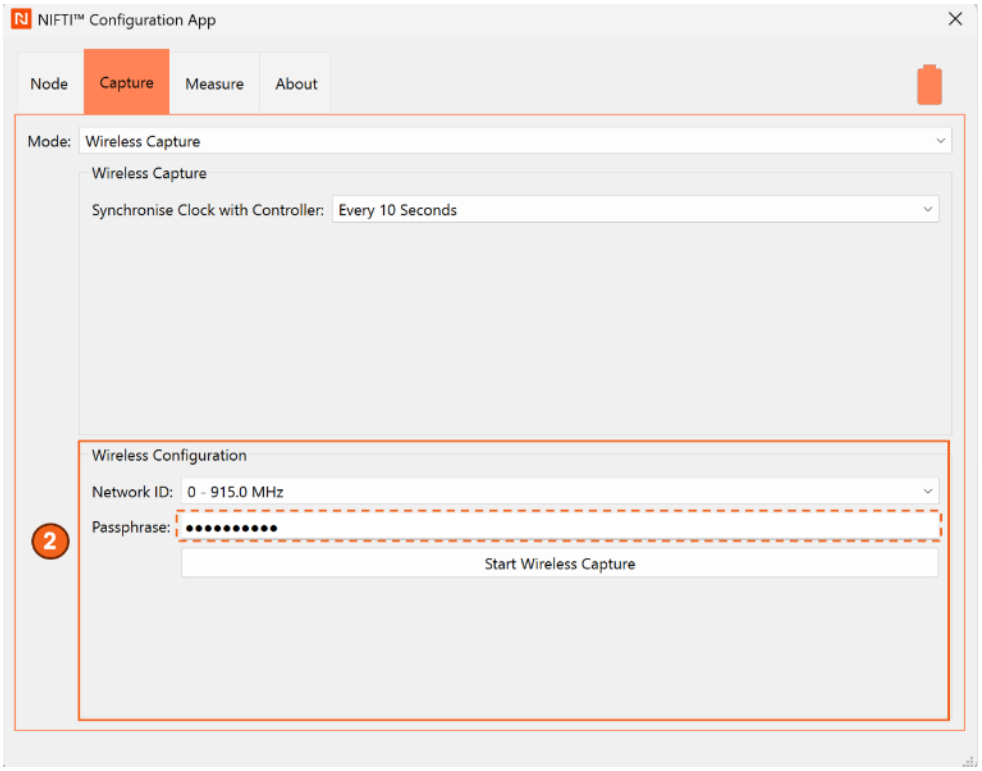
- All Sensor Nodes within the same network must use the same Network ID.
- Valid Network IDs: 0, 1, 2, 3 – each network maps to a distinct frequency channel:
  - 0 – Frequency 915.0 MHz
  - 1 – Frequency 916.3 MHz
  - 2 – Frequency 917.6 MHz
  - 3 – Frequency 918.9 MHz
- A single network can support up to 16 Sensor Nodes.



3.3.5 Passphrase

The passphrase specifies the user-defined network passphrase used by a network of Sensor Nodes to communicate securely using SHA-256 encryption during Wireless Capture.

- All Sensor Nodes within the same network must use the same Passphrase.
- The Passphrase can only be made up of the following:
    - Uppercase letters (A – Z)
    - Lowercase letters (a – z)
    - Numbers (0 – 9)
    - Hyphens (-), Underscores (_) and Full Stops (.)



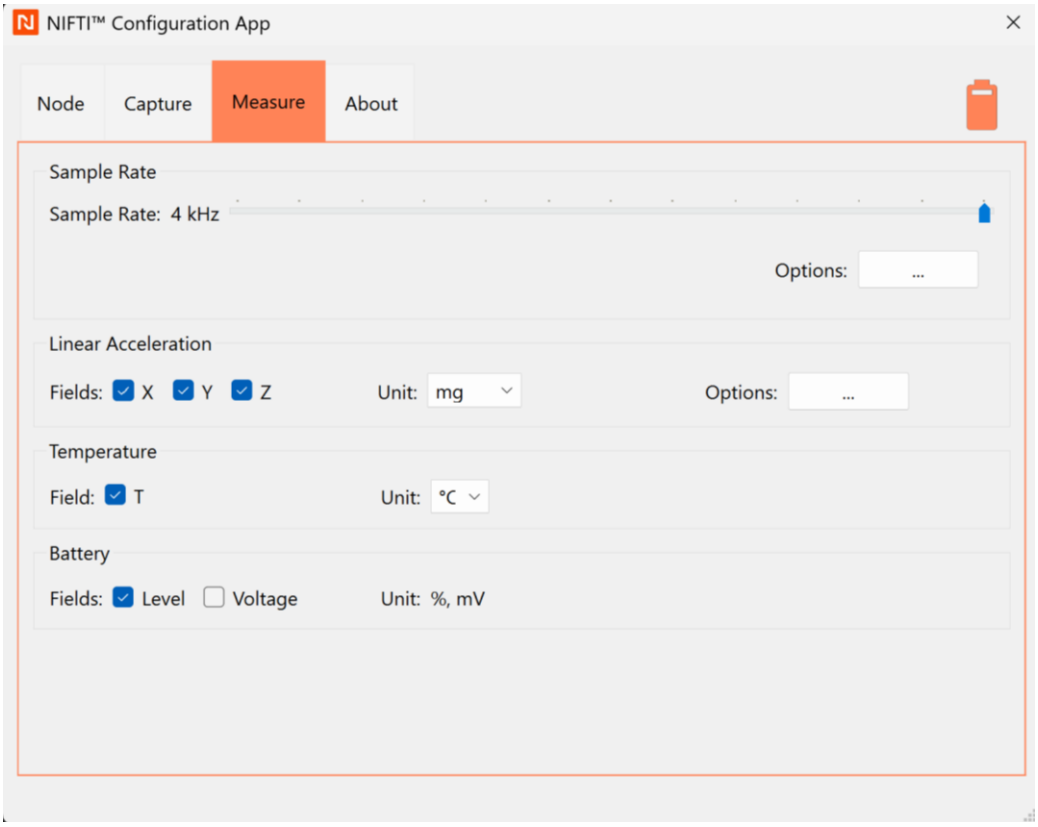
4 The Measure Tab

The **Measure tab** provides configuration options for the measurement data that is recorded by a NIFTI Sensor Node during a capture. The Measure tab provides various options based on the connected Sensor Node.

1. Measure Tab – NIFTI Accelerometer Sensor Node

For an Accelerometer Node, the measures available are:

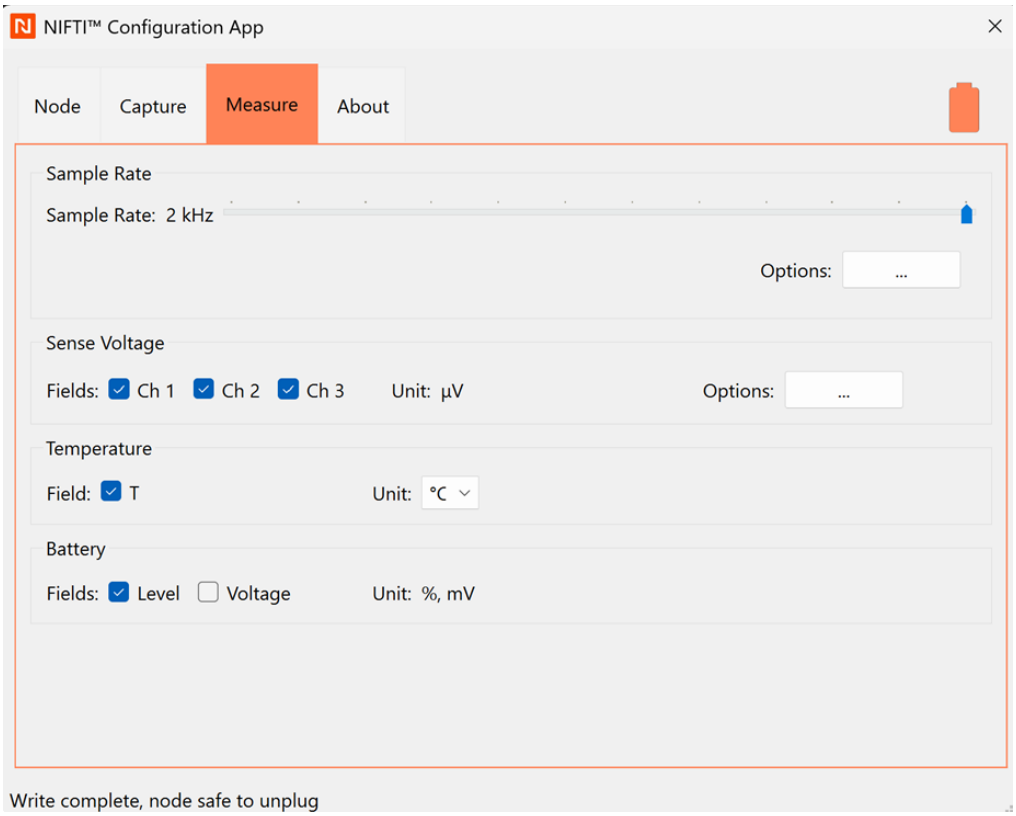
- **Sample Rate –** The frequency to be used for recording data in a capture.
- **Linear Acceleration:**
  - **Fields –** Which data fields are to be recorded for the data output.
  - **Unit –** Which unit the data fields will be recorded in.
  - **Options –** Adjust the built-in sensor's measurement range.
- **Temperature:**
  - **Field –** If the data field is to be recorded for the data output.
  - **Unit –** Which unit the data field will be recorded in.
- **Battery Level:**
  - **Field –** Which data fields are to be recorded for the data output.



2. Measure Tab – NIFTI Strain Gauge Sensor Node

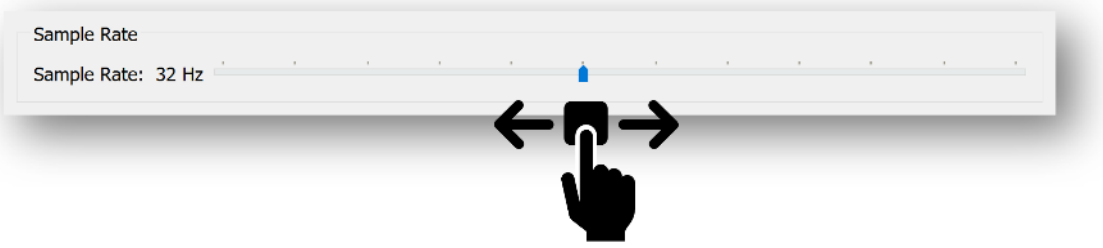
For a Strain Gauge Node, the measures available are:

- **Sample rate –** The frequency to be used for recording data in a capture.
- **Sense Voltage:**
  - **Fields –** Which channels are to be recorded for the data output.
  - **Options –** Channel gain and other options.
- **Temperature:**
  - **Field –** If the data field to be recorded for the data output.
  - **Unit –** Which unit the data field will be recorded in.
- **Battery:**
  - **Field –** Which data fields to be recorded for the data output.



4.1 Sample Rate

The Sample Rate specifies the number of data samples captured by the NIFTI Sensor Node in one second. If a higher or lower sampling rate is required, the user can drag the cursor across the bar to the desired sampling frequency.



For the Accelerometer Sensor Node, the sample rate range is from 1 Hz – 4 kHz, and for the Strain Gauge Sensor Node, the sample rate range is from 1 Hz – 2 kHz.

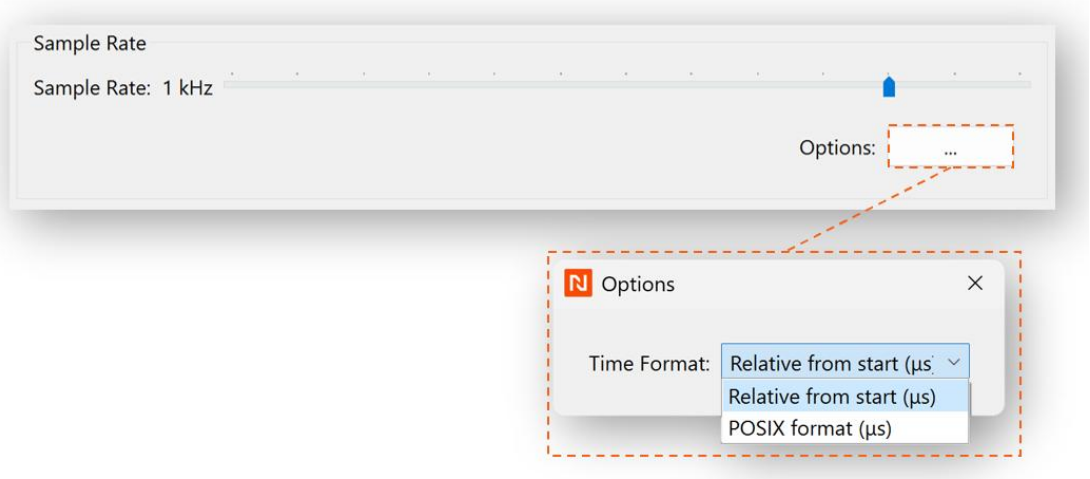
The list of sample rate options are as follows:

• 1 Hz	• 125 Hz
• 2 Hz	• 250 Hz
• 4 Hz	• 500 Hz
• 8 Hz	• 1 kHz
• 16 Hz	• 2 kHz
• 32 Hz	• 4 kHz (Accelerometer Only)
• 64 Hz	

4.2 Time Format

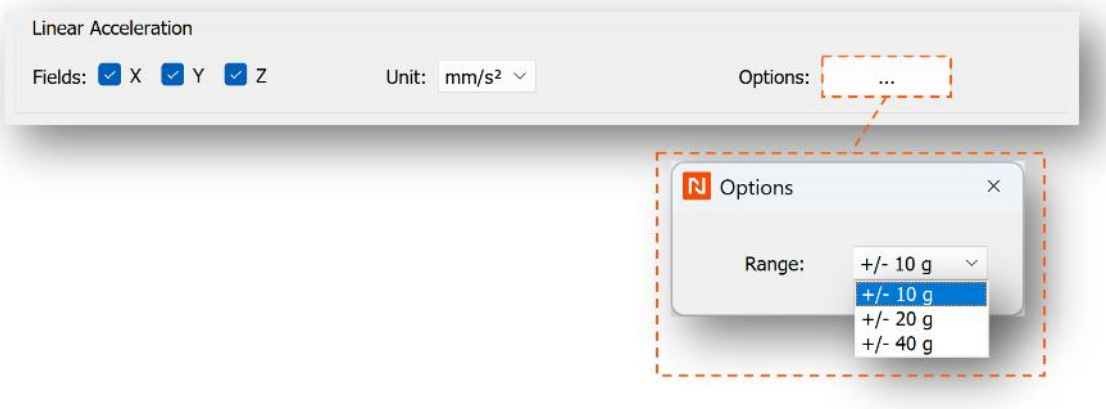
The Time Format allows the user to select how the timestamp is recorded for captured data samples in microseconds. There are two available formats:

- Relative from start (µs) – The sample's elapsed time since capture start.
- POSIX format (µs) – The sample's absolute time in POSIX-compliant format.



4.3 Linear Acceleration (Accelerometer Node Only)

The NIFTI Accelerometer Node features a 3-axis linear accelerator sensor that measures acceleration in the X, Y, and Z directions.



The NIFTI Accelerometer Node captures acceleration data in either of the following units of measure:

- mg
- mm/s^2
- mft/s^2

The Linear Acceleration Option allows the user to select either of the following accelerometer ranges as required:

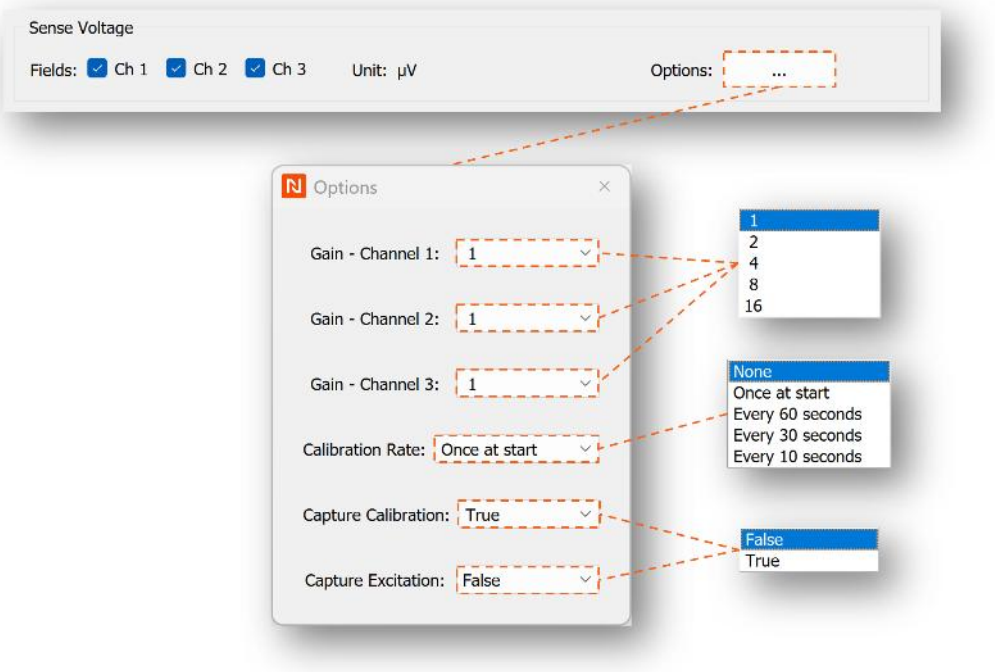
- ±10g
- ±20g
- ±40g

Increasing the accelerometer range decreases the resolution at which the acceleration data is recorded.

4.4 Sense Voltage (Strain Gauge Node Only)

The NIFTI Strain Gauge Node features a highly sensitive, 3-channel, 24-bit Analogue to Digital Converter (ADC) that can measure voltages from sensors connected to the Sensor Node via the External Sensor Interface.

Sense Voltage is a measurement of voltage detected by a differential pair of inputs for each channel. Sense Voltage is measured in microvolts.



The Sense Voltage Option allows the user to configure additional Sense Voltage parameters supported by the Strain Gauge Node, including:

- **Gain – Channel 1**: The gain of the channel can be set to 1,2,4,8 or 16.
- **Gain – Channel 2**: The gain of the channel can be set to 1,2,4,8 or 16.
- **Gain – Channel 3**: The gain of the channel can be set to 1,2,4,8 or 16.

- **Calibration Rate**: To specify when to periodically perform sensor calibration, including:
  - Once at the very start.
  - Every 60 seconds.
  - Every 30 seconds.
  - Every 10 seconds.

- **Capture Calibration**: Records the calibration state if TRUE.

- **Capture Excitation**: Records the supplied Excitation Voltage for selected channels if TRUE.

4.5 Temperature

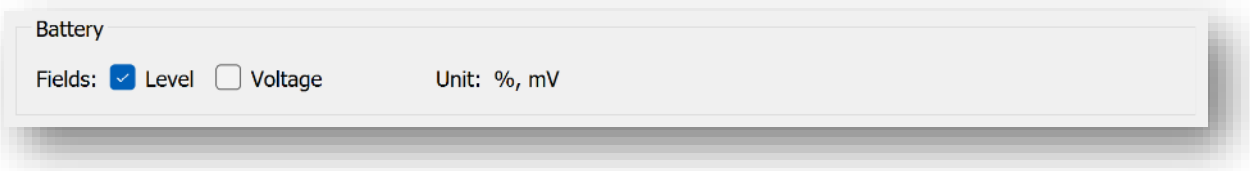
The measurement of the internal temperature of the NIFTI Sensor Node is recorded during a capture event, based on the internal temperature of the Sensor Node during an active capturing process.

The NIFTI Sensor Node captures temperature data in either of the following units of measure:

- Degree Celsius
- Degree Fahrenheit

4.6 Battery

Measurement of the condition of the NIFTI Sensor Node's internal battery is recorded during a capture event. The battery's state of charge is recorded as a percentage, and the battery's voltage level is recorded in millivolts.



5 The About Tab

The **About Tab** provides convenient access to references and useful product information including:

- NIFTI Documentation, such as User and Reference Guides.
- Support information including troubleshooting and frequently asked questions.
- Legal information including license agreements and statements.
- Links to downloads and product updates.

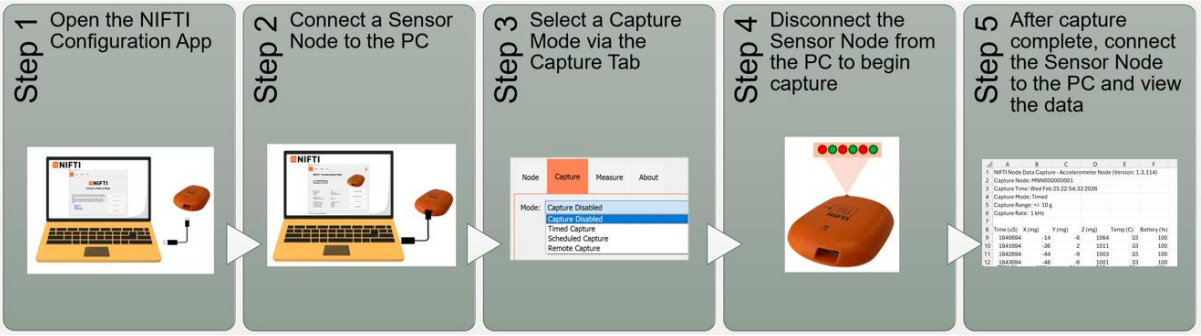
6 Configuring a Time-Based Capture

A Timed-based Capture can work with one Sensor Node, and it includes:

- **Timed Capture** – based on start delay, capture duration and number of repeats set by the users.
- **Scheduled Capture** – based on start date and time, finish date and time and number of repeats set by the users.

6.1 Operational Overview

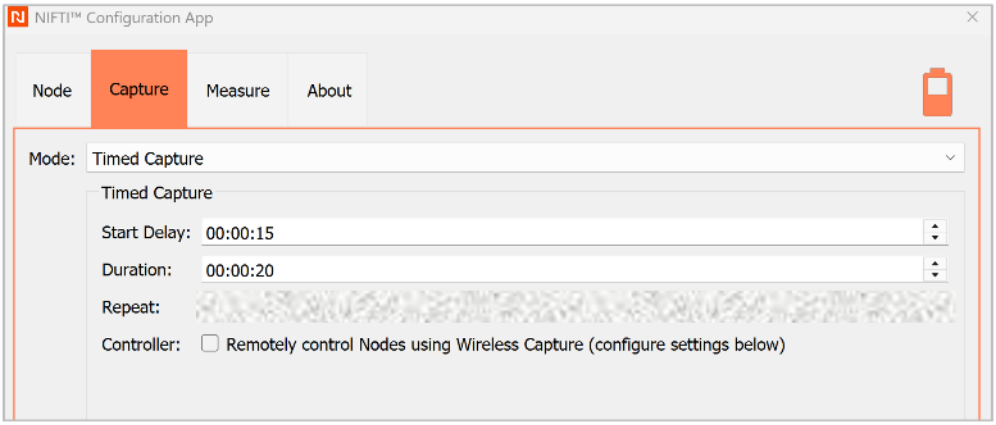
The steps below highlight the high-level overview of how to configure NIFTI Sensor Nodes to perform a Timed-based Capture.



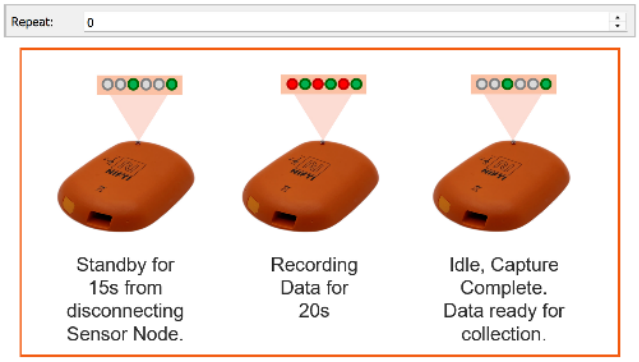
6.2 Timed Capture

Timed Capture can be configured when Timed Capture Mode is selected in the Capture Tab. The below examples show how the Sensor Node can be configured to:

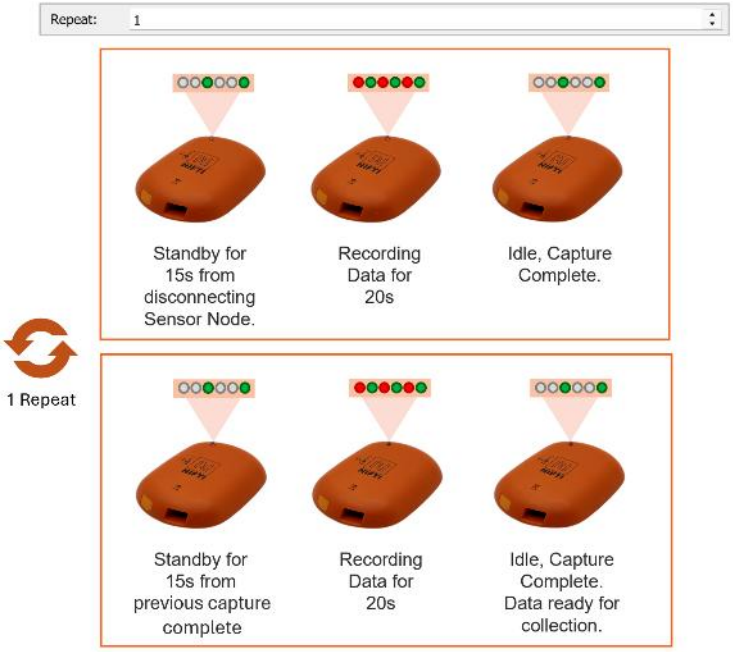
1. Start Delay – Start capturing the data after 15 seconds has elapsed since disconnecting the Sensor Node from a PC.
2. Duration – Capture the data for 20 seconds.



3. Repeat – Capture the data with:
    a. No repeats



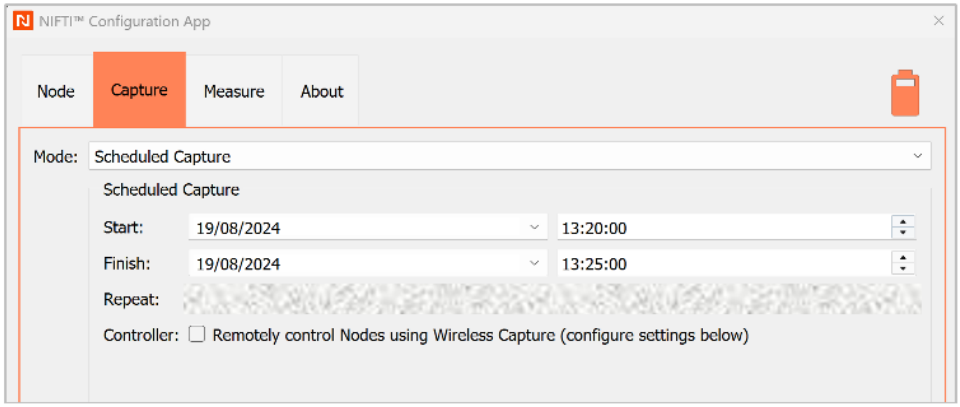
b. One repeat



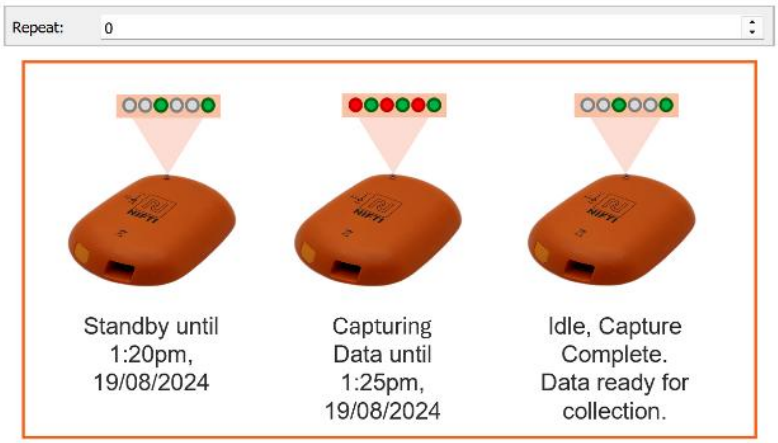
6.3 Scheduled Capture

Scheduled Capture can be configured when Scheduled Capture Mode is selected in the Capture Tab. The below examples show how the Sensor Node can be configured to:

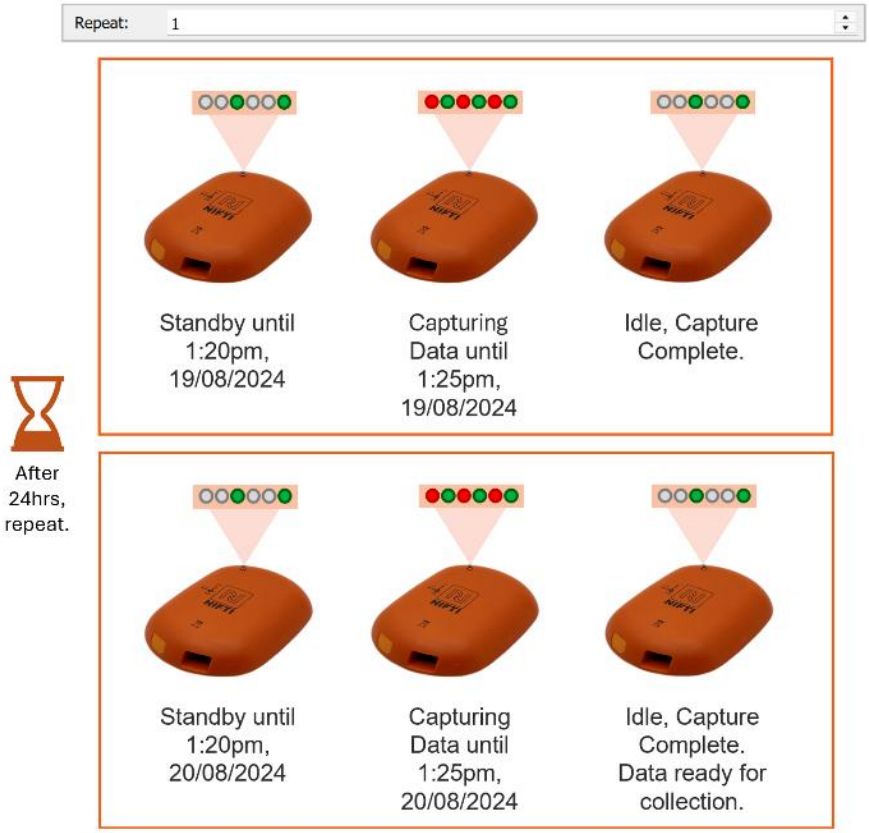
1. Start – Start capturing the data at 1.20 pm on 19/08/2024.
2. Finish – Complete data capture at 1.25 pm on 19/08/2024.



3. Repeat – Capture the data with:
    a. No repeats



    b. One repeat



7 Configuring a Wireless Capture

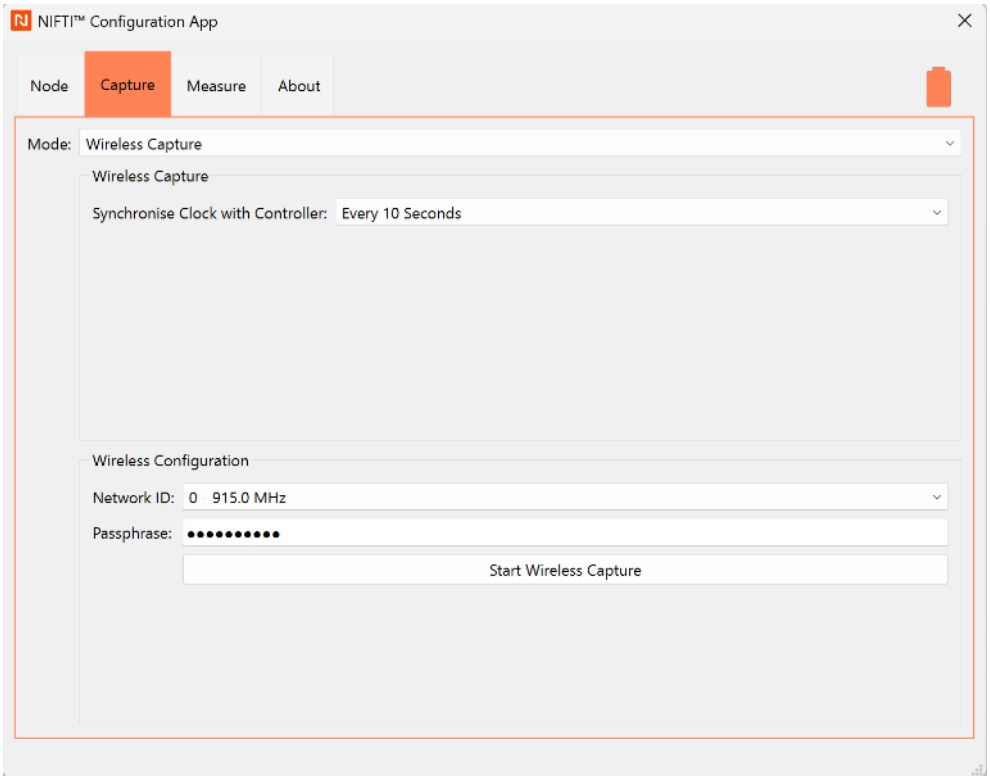
A Wireless Capture can work with a cluster of a Controller Sensor Node and up to 15 Receiver Sensor Nodes (i.e. a cluster can have up to 16 Sensor Nodes). There are two methods to conduct a Wireless Capture.

- **Configuring a Wireless Capture (via Tether)** – A Controller Sensor Node is tethered to PC, and it does not perform data capture. The users define when the Controller Sensor Node sends start and stop signal to Receiver Sensor Nodes via the NIFTI Configuration App.
- **Configuring a Wireless Capture (via a Time-based Capture)** – A Controller Sensor Node is configured to be in either Timed Capture or Scheduled Capture. It is not tethered to PC, and it does perform data capture. This allows multiple Receiver Sensor Nodes to follow one timing configuration without having to configure each separately.

7.1 Configuring a Wireless Capture (via Tether)

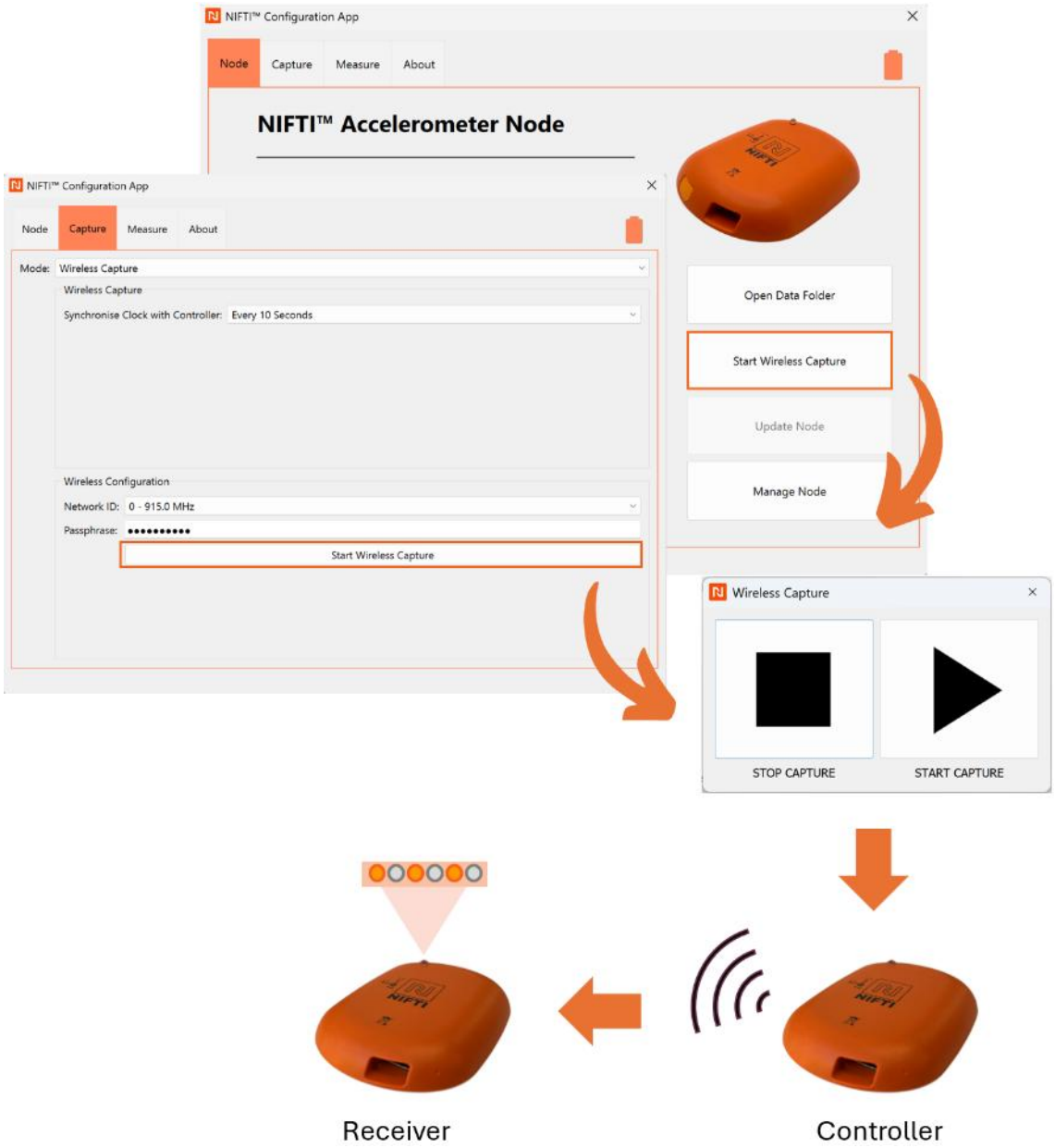
The Receiver Sensor Nodes are to firstly be configured, followed by the Controller Sensor Node. They should be configured to use the same Network ID (i.e. frequency channel) and same Passphrase (if specified). The below examples show how the both the Receiver and Controller Sensor Nodes can be configured.

1. Configure Receiver Sensor Nodes with the below settings. Unplug each Sensor Node once configured.
    a. Mode – Wireless Capture
    b. Synchronise Clock with Controller – Every 10 Seconds
    c. Network ID – 0 - 915.0 MHz
    d. Passphrase – hellonifti

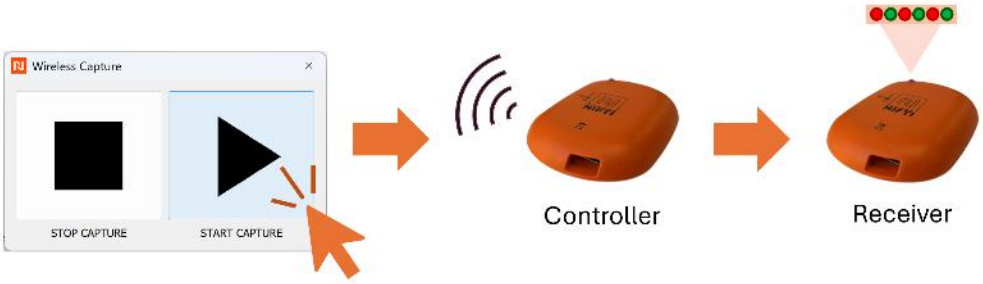


2. Configure Controller Sensor Node with the below settings. Leave the Sensor Node connected to PC once configured.
    a. Mode – Wireless Capture
    b. Synchronise Clock with Controller – Not relevant for a tethered capture.
    c. Network ID – 0 - 915.0 MHz (This must be the same as the Receiver Sensor Nodes)
    d. Passphrase – hellonifti (This must be the same as the Receiver Sensor Nodes)

3. Conduct the Wireless Capture using the below steps.
    a. Click Start Wireless Capture button from either the Node or the Capture tab.
    b. The Wireless Capture Window opens, and do not yet click the Start Capture or Stop Capture buttons. The Controller Sensor Node sends a time sync signal to the Receiver Sensor Nodes. This causes the Receivers to synchronise their clocks with the Controller and standby for capture.

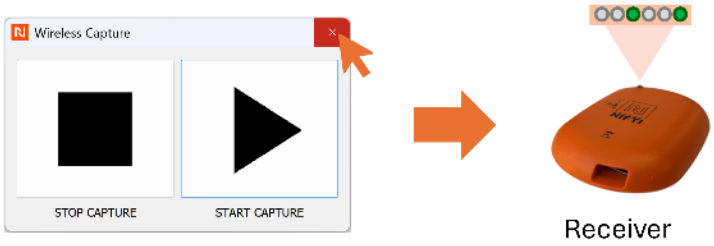


c. Click the Start Capture button in the Wireless Capture Window for the Controller Sensor Node to send a start capture signal to the Receiver Sensor Nodes. This causes the Receiver Sensor Nodes to start capturing.



d. Click the Stop Capture button in the Wireless Capture Window for the Controller Sensor Node to send a stop capture signal to the Receiver Sensor Nodes. This causes the Receiver Sensor Nodes to stop capturing.

e. Close the Wireless Capture Window to return the Receiver Sensor Nodes to Idle.

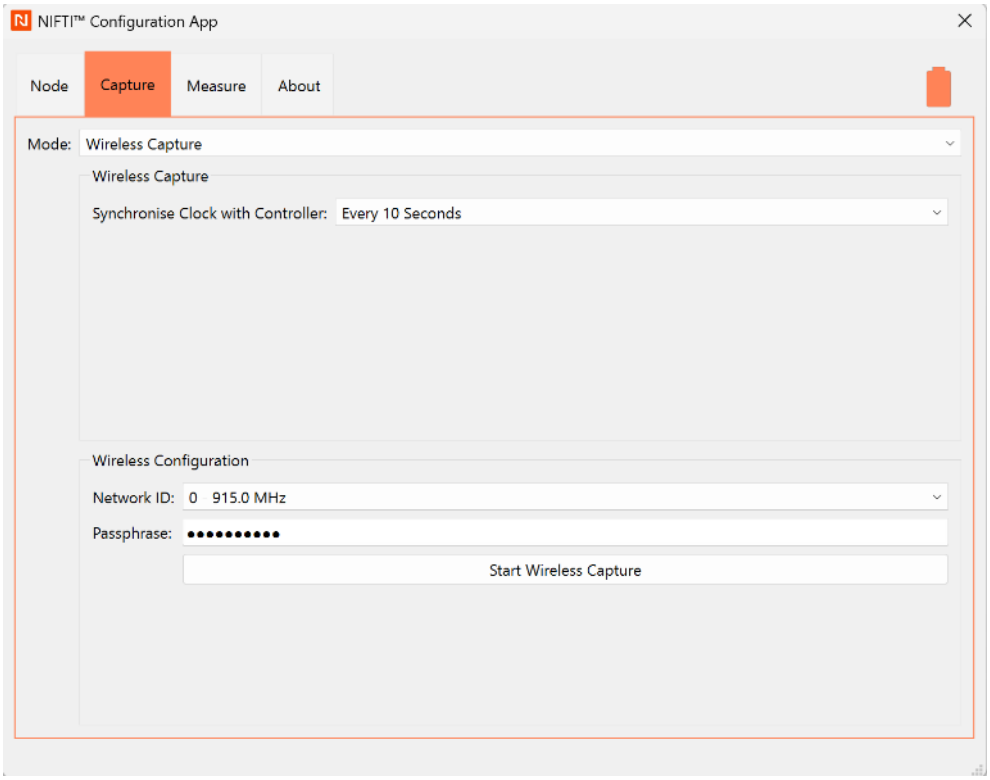


7.2 Configuring a Wireless Capture (via a Time-Based Capture)

A Controller Node can be configured to wirelessly activate other Receiver Nodes on the same Network ID and for a defined number of repeats. This remote-control configuration can be activated by selecting the “Timed Capture” or “Scheduled Capture” modes and then selecting the “Remotely control Nodes using Wireless Capture” option. Note that the Network ID and Passphrase on both the Controller and the Receivers must be the same for this functionality to work.

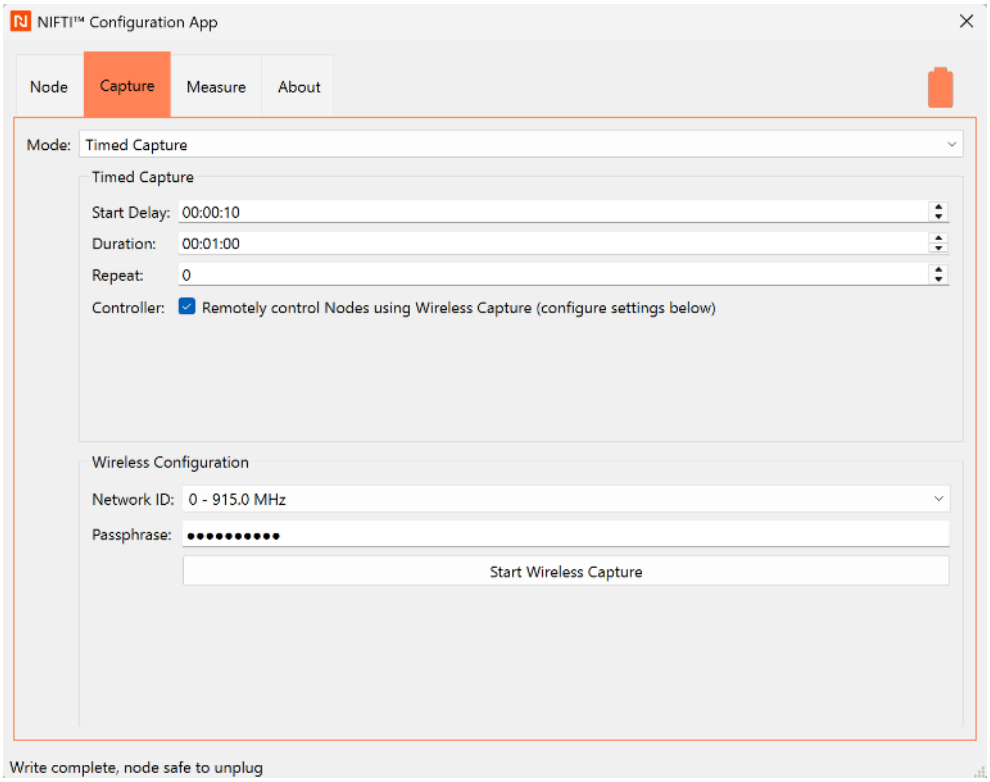
1. Configuring Receivers.

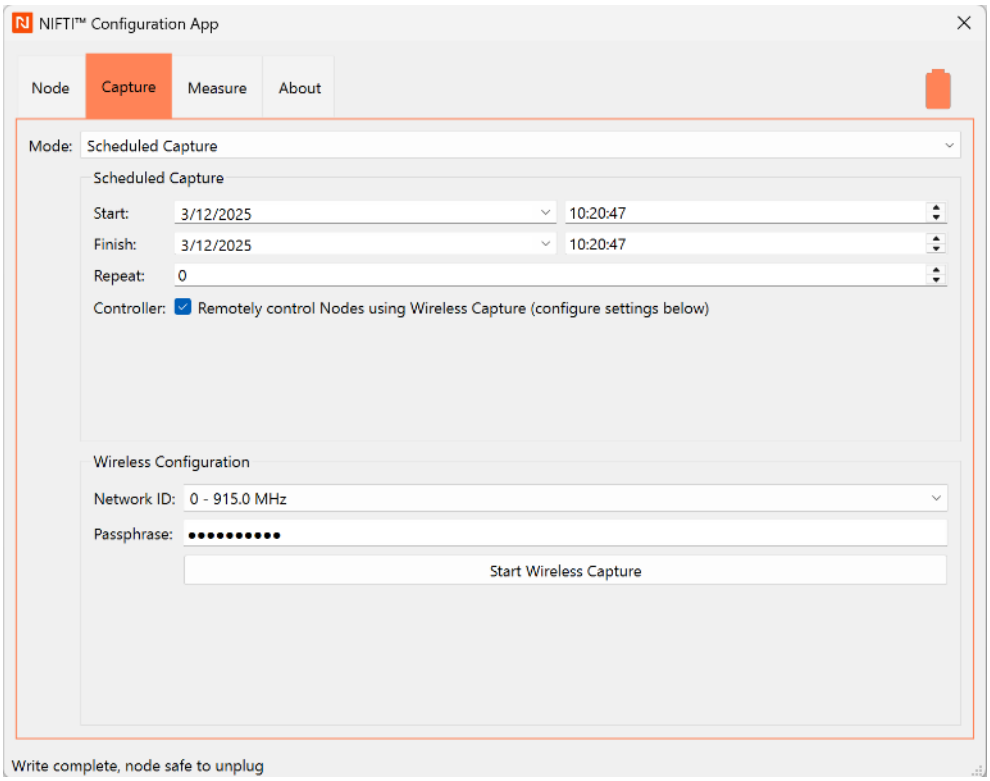
The Receiver(s) must be set to Wireless Capture mode and the appropriate Network ID must be set to perform a wireless capture. A Passphrase can also be configured. Once set, the Receiver Node(s) can be disconnected from the computer. The example image below shows a NIFTI Sensor Node configured with the Wireless Capture Mode set with a Network ID of 0 and the Passphrase “hellonifti”.



2. Configuring the Controller.

The Controller can then either be set to activate via Scheduled or Timed Capture Modes. For the Sensor Node to act as a controller, the Controller checkbox must be selected and the same Network ID and Passphrase as the Receiver Node(s) must be configured. Once the mode, controller option, Network ID and Passphrase are set, the Controller Node can be disconnected from the computer. The images below are an example of a Node set as a Controller with a Network ID of 0 and the Passphrase “hellonifti”.

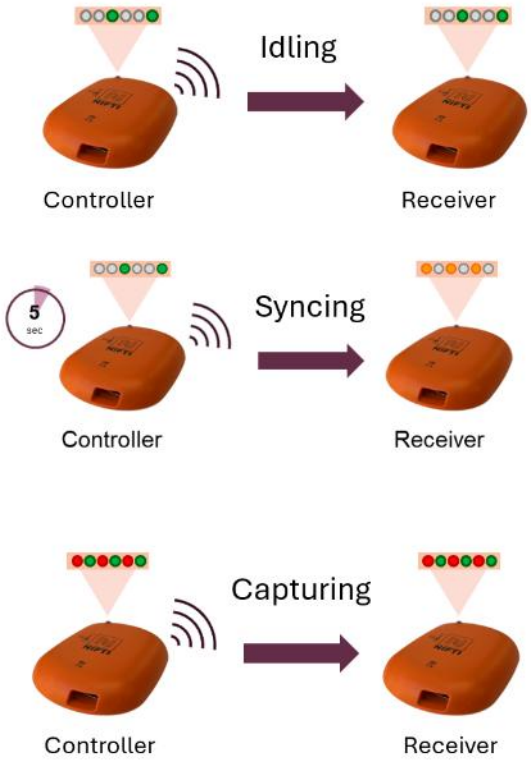




3. Conducting the Capture.

Once disconnected, the Controller and Receiver will go into an Idle state until five seconds before the start delay or scheduled time is reached. Five seconds before the

capture begins, the Controller will send a time sync signal to the Receiver(s) which causes the Receiver(s) to synchronise their clock(s) with the Controller. Once synced, the Controller and Receiver(s) both begin capturing.



When the Controller ends the capture, it will send a stop capture signal to the Receiver(s) causing them to stop capturing. If the Controller Node has been configured to repeat, the same procedure will reoccur.

8 Default Measure Configurations

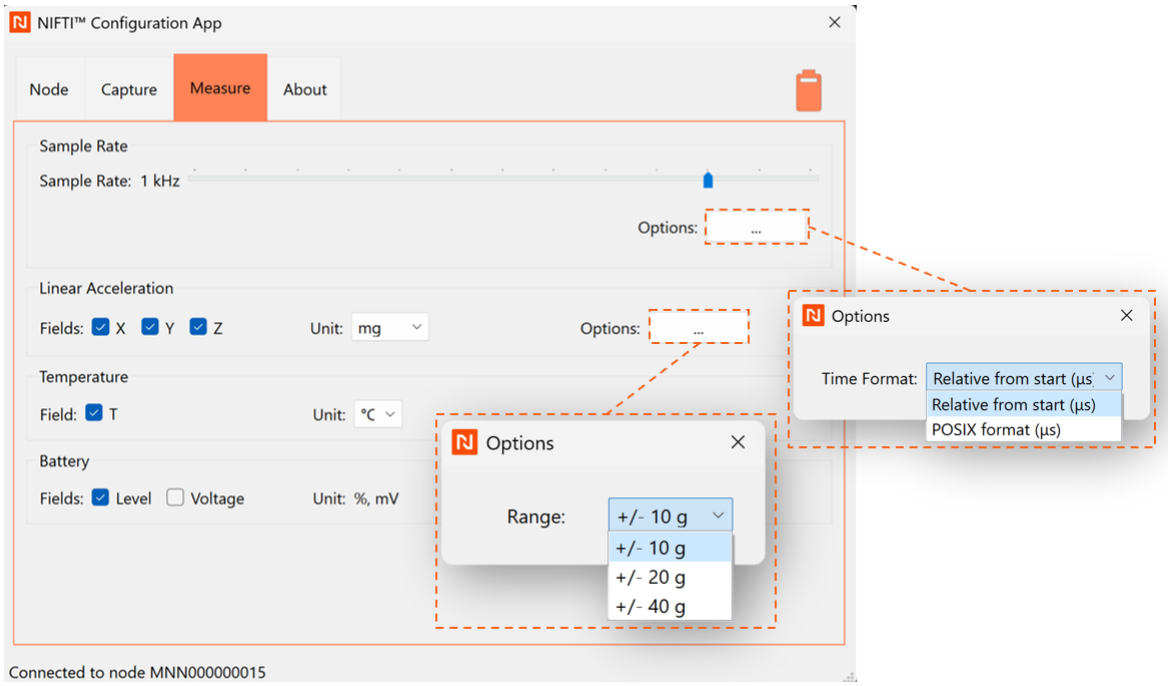
Each Sensor Node has predefined measure configurations defined on the Sensor Nodes.

8.1 Default Measures – Accelerometer Node

The Accelerometer Node has predefined default measure configuration. The default measures are outlined in the table below.

Measure Field	Selected Options	Unit	Range
Sample Rate	1	kHz	N/A
Time Format	Relative from start	µs	N/A
Linear Acceleration	X, Y, Z	mg	$\pm 10g$
Temperature	T	$°C$	N/A
Battery	Level	%	N/A

The image below shows the Measure Tab with the default configuration.



With the default measures selected on an Accelerometer Node, the .csv file would contain the following data:

- Sensor Node variant and firmware version
- Sensor Node serial number
- Capture time (t = 0s) in whole seconds (UTC)
- Capture mode, range and rate selected

- The elapsed capture time (since t = 0s) in microseconds.
- Linear acceleration in the X, Y, and Z direction.
- Internal temperature during the capture.
- The battery levels during the capture

Below is an example image of the data within the recorded .csv file if the default measure configuration was used.

NIFTI Node Data Capture - Accelerometer Node (Version: 1.3.114)					
Capture Node: MNN000000001					
Capture Time: Wed Feb 25 22:54:33 2026					
Capture Mode: Timed					
Capture Range: +/- 10 g					
Capture Rate: 1 kHz					
Time (uS)	X (mg)	Y (mg)	Z (mg)	Temp (C)	Battery (%)
1840694	-14	-6	1064	33	100
1841694	-36	2	1011	33	100
1842694	-44	-9	1003	33	100
1843694	-48	-6	1001	33	100
1844694	-49	-6	997	33	100

8.2 Default Measures – Strain Gauge Node

The Strain Gauge Node has a predefined default measures configuration. The default measures are outlined in the table below.

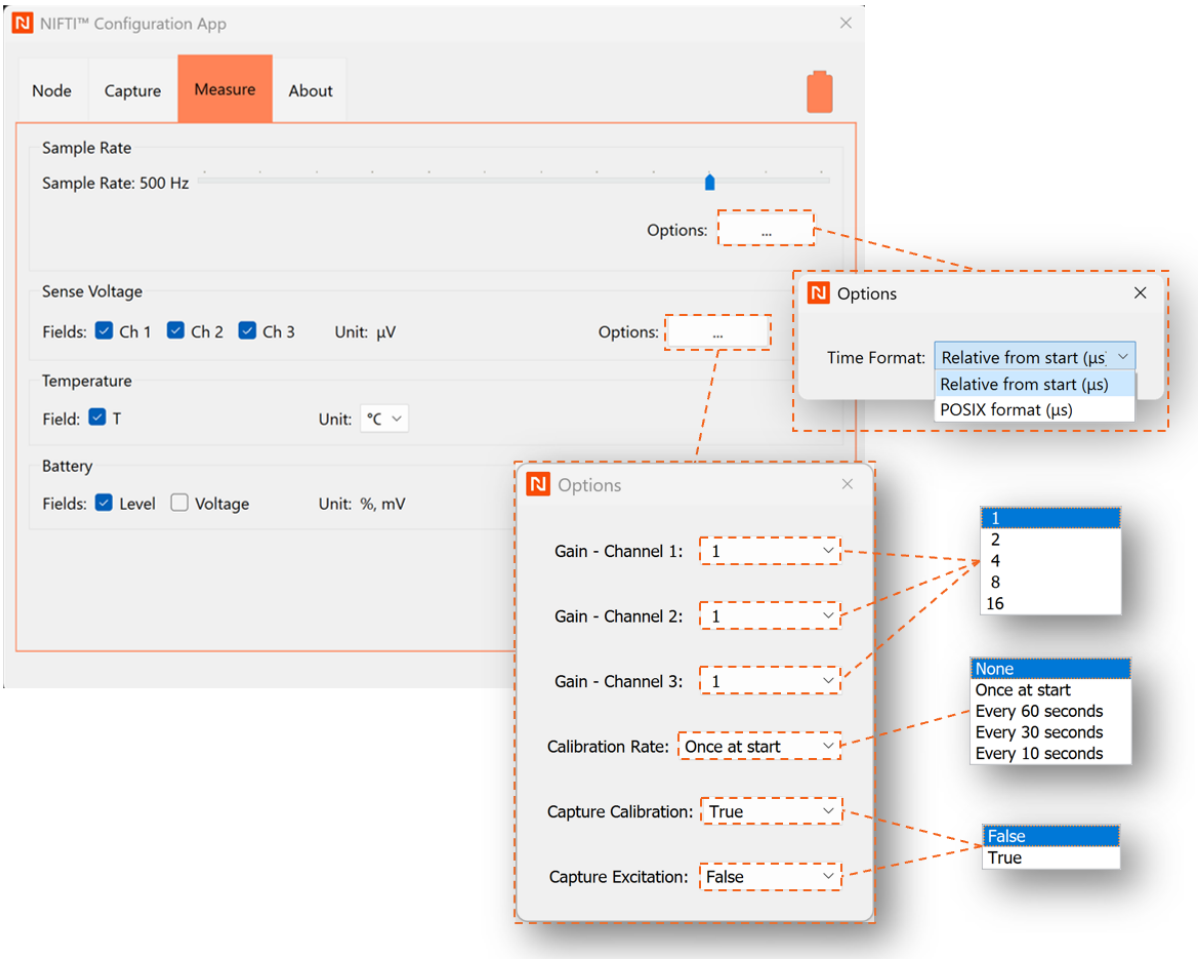
Measure Field	Selected Options	Unit
Sample Rate	500	Hz
Time Format	Relative from start	µs
Sense Voltage	Ch1, Ch2, Ch3	μV
Temperature	T	$°C$
Battery	Level	%

The default selected options within the Sense Voltage field are:

- Gain – Channel 1: 1
- Gain – Channel 2: 1
- Gain – Channel 3: 1

- Calibration Rate: Once at start
- Capture Calibration: True
- Capture Excitation: False

The images below show the default configuration of the Strain Gauge Node.



With the default measures selected on a Strain Gauge Node, the .csv file would contain the following data:

- Sensor Node variant and firmware version
- Sensor Node serial number
- Capture time (t = 0s) in whole seconds (UTC)
- Capture mode, gain and rate selected
- The elapsed capture time (since t = 0s) in microseconds.
- The sense voltage, in microvolts, for each of the three input channels.

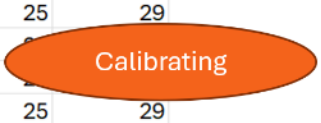
- The user-defined periodic calibration of the Sensor Node. When the value is 1 then the Sensor Node is being calibrated.
- Internal temperature during the capturing process.
- The battery levels during the capturing process.

Below is an example image of the data within the recorded .csv file if the default measure configuration was used.

NIFTI Node Data Capture - Strain Gauge Node (Version: 1.3.114)						
Capture Node: MNN000000029						
Capture Time: Wed Feb 25 02:25:50 2026						
Capture Mode: Timed						
Ch 1 Gain: 1						
Ch 2 Gain: 1						
Ch 3 Gain: 1						
Capture Rate: 1 kHz						
Time (uS)	Ch 1 VSense (uV)	Ch 2 VSense (uV)	Ch 3 VSense (uV)	Calibrating	Temp (C)	Battery (%)
1847508	3758	4005	3591	1	0	99
1848508	3771	4002	3588	1	0	99
1849508	3752	4002	3589	1	0	99
1850508	3756	4005	3589	1	25	99
1851508	3760	3999	3581	1	25	99

The calibration state in the .csv file will be represented by a number 1 within the “Calibrating” column. From the figure below it can be seen that for the first 4 data points, the NIFTI is calibrating. For the next 4 data points the Sensor Node is not calibrating.

Time (uS)	Ch 1 VSense (uV)	Ch 2 VSense (uV)	Ch 3 VSense (uV)	Calibrating	Temp (C)	Battery (%)
1996572	4137	4312	3856	1	25	29
1997572	4136	4306	3848	1		
1998572	4145	4296	3856	1		
1999572	4134	4298	3847	1	25	29
2000572	9685	9331	9308		25	29
2001572	17244	16231	16803		25	29
2002572	17198	16178	16763		25	29
2003572	17162	16142	16741		25	29

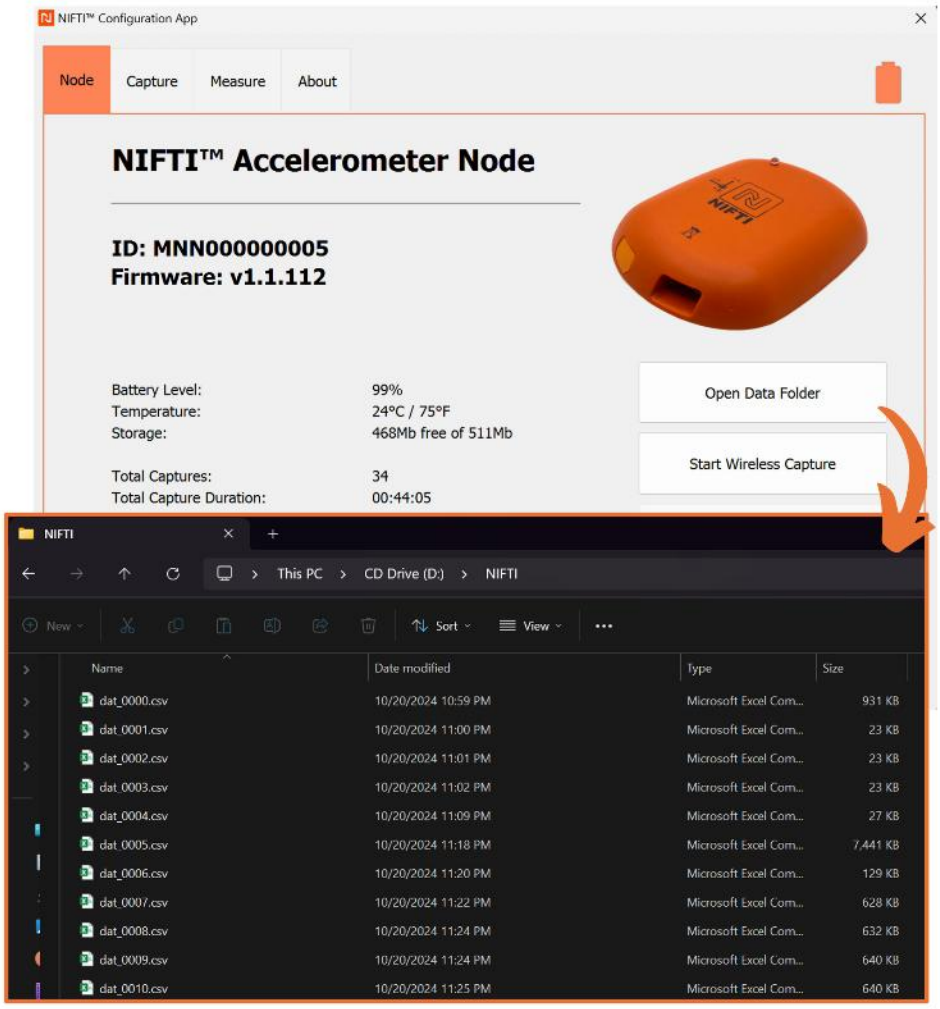


9 Effects of Changing the Measure Options

Changing the measure options will have various effects on NIFTI Sensor Nodes.

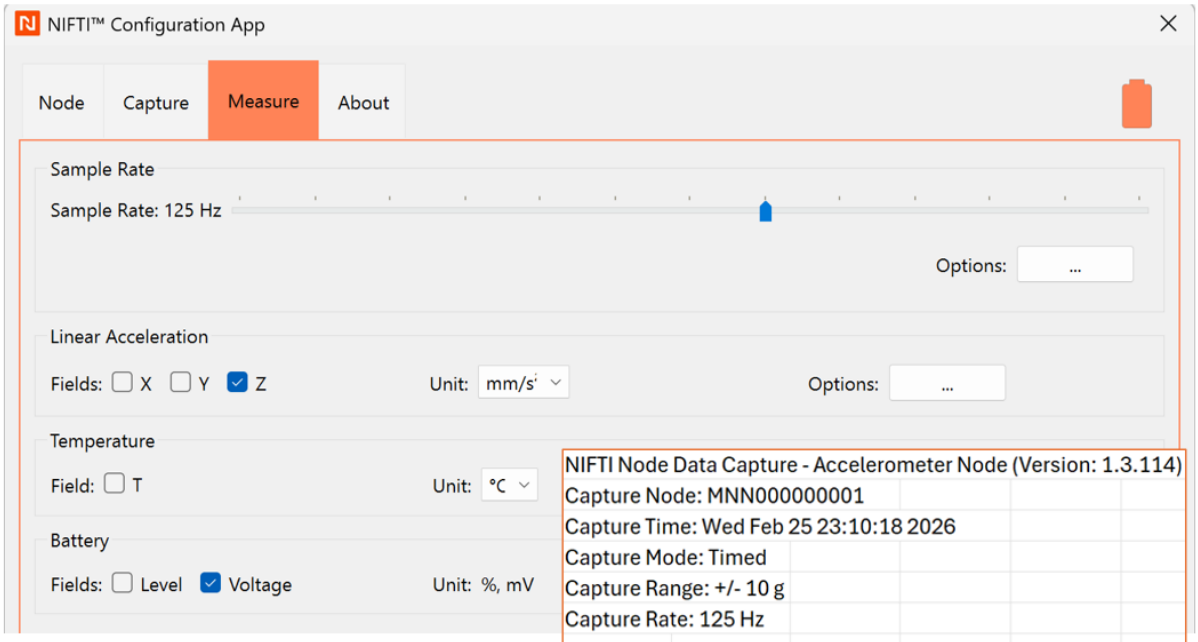
9.1 Data Output

The recorded data from captures is saved in .csv files and can be accessed through the “Open Data Folder” button within the NIFTI Configuration App. Below is an example image showing the “Open Data Folder” button within the NIFTI Configuration App and an example of the folder contents. Each .csv file is recorded sequentially following the format “dat_xxxx” where “xxxx” is the data file number. If a capture was configured to repeat, each repeat will have its own .csv file.



9.1.1 Accelerometer Node

In the provided example, only the Z-axis Linear Acceleration and Battery Voltage were selected. All other fields were left unticked. As a result, the output file contains only the chosen measurements.



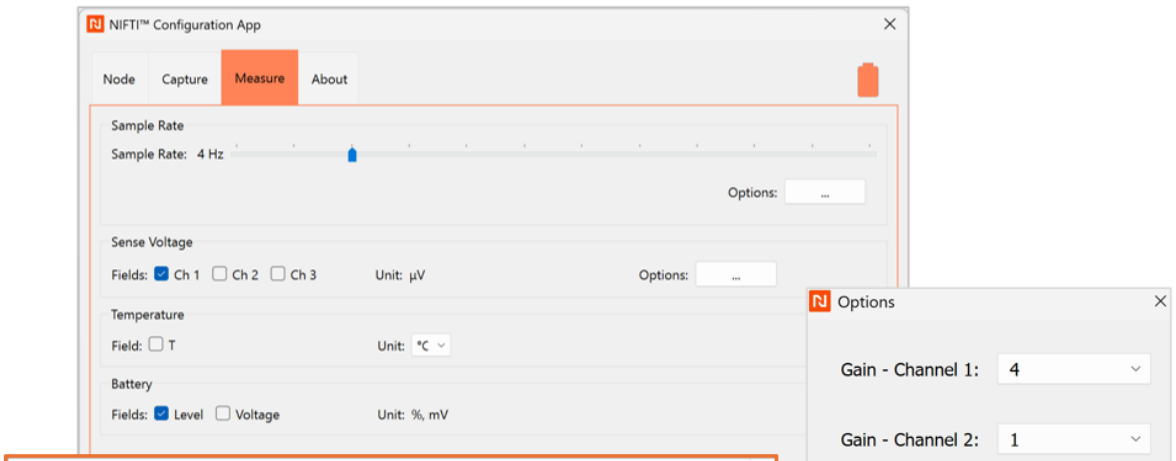
NIFTI Node Data Capture - Accelerometer Node (Version: 1.3.114)
Capture Node: MNN000000001
Capture Time: Wed Feb 25 23:10:18 2026
Capture Mode: Timed
Capture Range: +/- 10 g
Capture Rate: 125 Hz

Time (uS)	Z (mm/s^2)	VBatt (mV)
1053359	10336	4198
1061359	9904	4198
1069359	10591	4198
1077359	9973	4198
1085359	9894	4198
1093359	9953	4198
1101359	10757	4198
1109359	9571	4198

9.1.2 Strain Gauge Node

In the provided example, the following fields were enabled for capture at a sample rate of 4 Hz:

- Channel 1 (Ch1)
- Excitation Voltage
- Calibration
- Battery Level

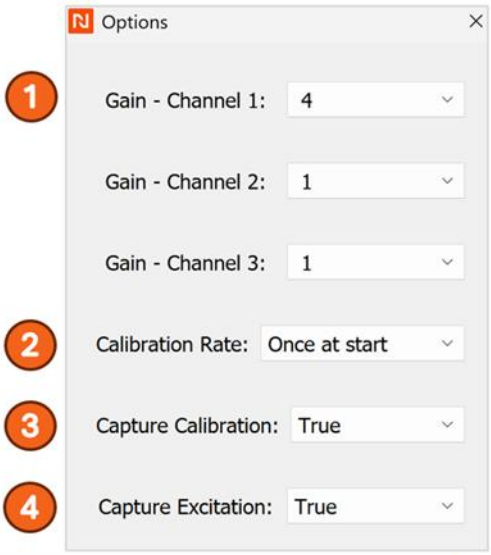


NIFTI Node Data Capture - Strain Gauge Node (Version: 1.3.114)
Capture Node: MNN000000029
Capture Time: Wed Feb 25 23:15:22 2026
Capture Mode: Timed
Ch 1 Gain: 4
Capture Rate: 4 Hz

Time (uS)	Ch 1 VSense (uV)	Calibrating	Ch 1 VExcite (uV)	Battery (%)
1738028	3789	1	0	99
1988028	3852	1	8545	99
2238028	3839	1	8545	99
2488028	3845	1	8545	99
2738028	62034		8545	99
2988028	54902		8545	99
3238028	41181		8545	99
3488028	27721		8545	99
3738028	14555		8545	99

The impact of gain and calibration configurations on the recorded data is as follows:

1. **Gain –** The Sense Voltage on Ch1 is scaled by the configured gain value. The value of 4 multiplies the raw voltage by 4.
2. **Calibration rate –** As "Once at Start" is selected, calibration occurs once at the beginning of the measurement. This is marked in the dataset by a value of 1 in the calibration field. No value indicates no calibration.
3. **Capture Calibration –** With this setting set to "True", data collected during calibration is included in the recording.
4. **Capture Excitation –** With this setting set to "True", the excitation voltage for Ch1 is included in the recorded dataset.



NIFTI Node Data Capture - Strain Gauge Node (Version: 1.3.114)
Capture Node: MNN000000029
Capture Time: Wed Feb 25 23:15:22 2026
Capture Mode: Timed
Ch 1 Gain: 4 (1)
Capture Rate: 4 Hz (4)

Time (uS)	Ch 1 VSense (uV)	Calibrating	Ch 1 VExcite (uV)	Battery (%)
1738028	3789	1	0	99
1988028	3852	1	8545	99
2238028	3829	1	8545	99
2488028	3[illegible]	1	8545	99
2738028	62[illegible]		8545	99
2988028	54902		8545	99
3238028	41181		8545	99
3488028	27721		8545	99
3738028	14555		8545	99

(2) (3)

9.2 Sensor Node Performance

1. Hardware Limitations
    - Storage Capacity – 512 MB onboard flash
    - Battery Capacity – 440 mAh lithium polymer battery

2. Factors Affecting Performance
    - Sample Rate – Higher sample rates reduce total available capture time.
    - Capture stop conditions:
        - charge drops below 5%
        - Onboard storage becomes full

3. Estimated Operation Times (Per Full Charge)
    - Accelerometer Node

Sample Rate	Capture Time	Sleep Time
4000 Hz	2 hrs	33 hrs
1000 Hz	8 hrs	22 hrs
500 Hz	16 hrs	7 hrs

- Strain Gauge Node

Sample Rate	Capture Time	Sleep Time
2000 Hz	2 hrs	27 hrs
1000 Hz	4 hrs	18 hrs
500 Hz	6 hrs	9 hrs

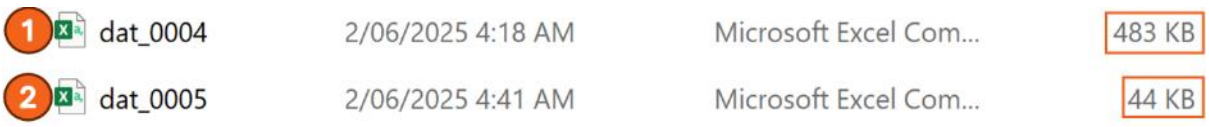
9.3 Data Storage

File size is affected by:

- Duration of capture
- Sample rate
- Number of measurement fields selected

Accelerometer example:

1. dat_0004.csv – 20 s capture at 1000 Hz; fields: X, Y, Z, Temperature, Battery Level
2. dat_0005.csv – 20 s capture at 125 Hz; fields: Z, Battery Voltage



Strain Gauge example:

1. dat_0007.csv – 20 s capture at 1 kHz; six fields recorded
2. dat_0008.csv – 20 s capture at 1 kHz; four fields recorded