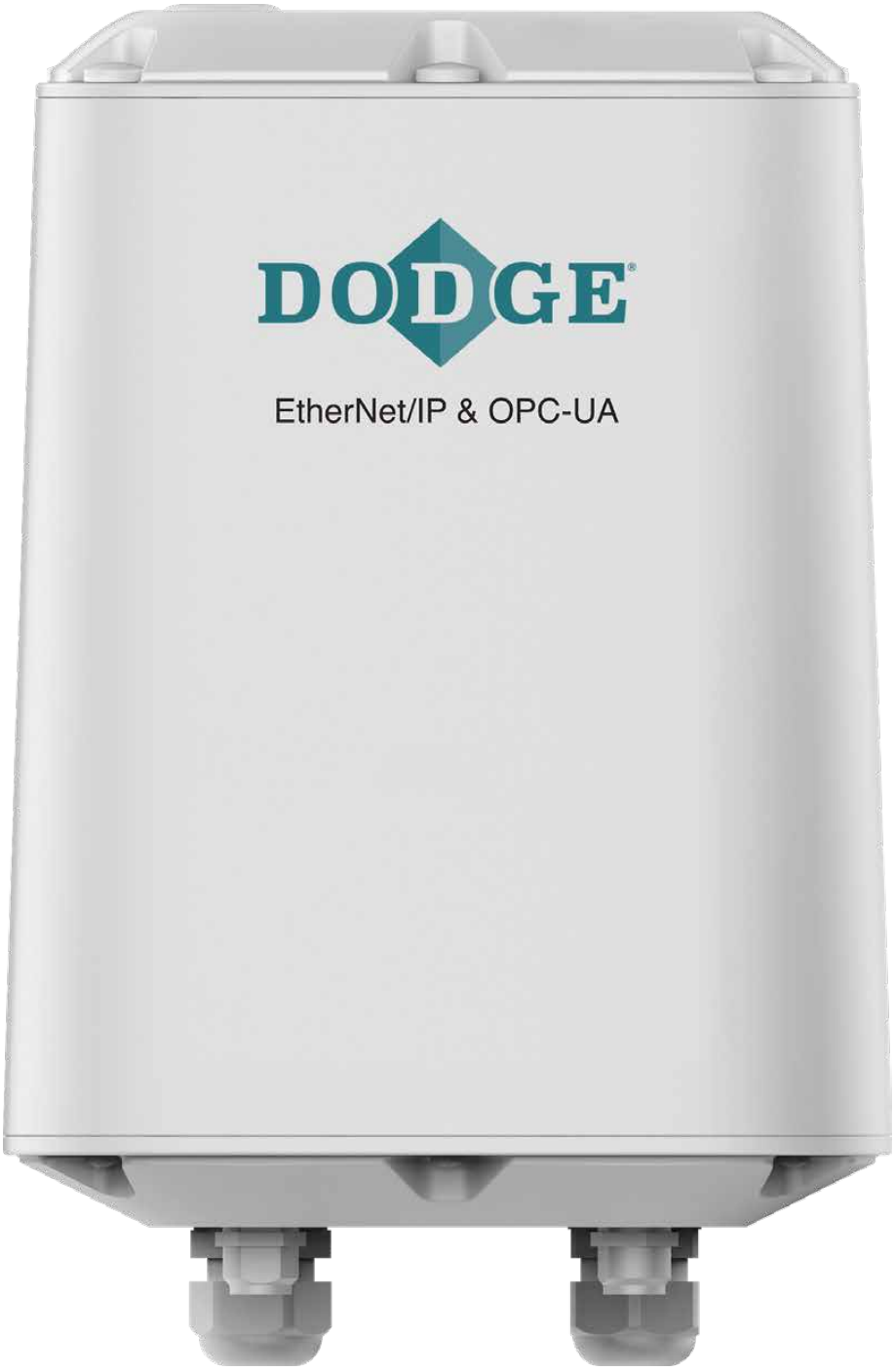
X2000 Gateway – On-Premise
User Guide



These instructions must be read thoroughly before installation or operation. This instruction manual was accurate at the time of printing. Please see **dodgeindustrial.com** for updated instruction manuals.

TABLE OF CONTENTS

1 INTRODUCTION

This guide describes how to use the X2000 Gateway – On-Premise that supports EtherNet/IP in an Ethernet network industrial protocol and OPC Unified Architecture (UA) to collect data from OPTIFY™ sensors. This document guides you through setup configurations and mapping sensors to OPC-UA or EtherNet/IP subsystems.

The key performance indicator (KPI) values are:

- Surface temperature
- Acceleration RMS
- Velocity RMS
- Peak acceleration

The gateway application offers an interface for OPC-UA server and EtherNet/IP that can support:

- Up to 20 OPTIFY sensors
- Up to 10 OPC-UA clients
- Up to five EtherNet/IP-based devices

The typical gateway software functionality includes:

- Measurement interval and accelerometer range setup
- Sensor firmware update
- Sensor clock synchronization
- Back up and restore configuration data
- Export historical data: last 24 hours and last seven days
- Export sensor raw data
- Change unit values between metric and imperial

1.1 Acronyms

- EtherNet/IP – Ethernet Network for Industrial Protocol
- OPC-UA – Open Platform Communications Unified Architecture
- CIP – Common Industrial Protocol

1.2 System requirements

The gateway software requires the following application components:

- X2000 Gateway with firmware version: 2.1.1 or newer
- Container version: 1.2.0 or newer
- Application version: 1.2 or newer

All the components are preinstalled on the gateway. In case of manual installation or updating the software please refer to section six of this user guide.

1.3 Tested OPC-UA client software

- Prosys OPC: downloads.prosysopc.com/opc-ua-client-downloads.php#download
- UaExpert: unified-automation.com/downloads/opc-ua-clients.html

1.4 Supported PLC controllers

- Allen-Bradley – CompactLogix EtherNet/IP
  - Tested PLCs
    - 1769-L33ER Compact Logix 2 MB Memory
    - 1769-L16ER-BB1B

  NOTE: To connect directly to a PLC, the PLC must be EtherNet/IP compatible. Check with your local IT department to confirm this before continuing. Not all PLCs that connect with an Ethernet cable are Ethernet/IP compatible.

1.5 References

- Open Source OPC UA licensed under the MPL v2.0 open62541.org/
- Open-source Rockwell Automation EtherNet/IP library https://www.odva.org

2 PRELIMINARY STEPS

2.1 Log into dashboard

Open your web browser (Google Chrome is recommended). Enter the assigned IP Address and press enter. Enter your username and password. For more information, please refer to the X2000 Gateway – On-Premise installation manual.

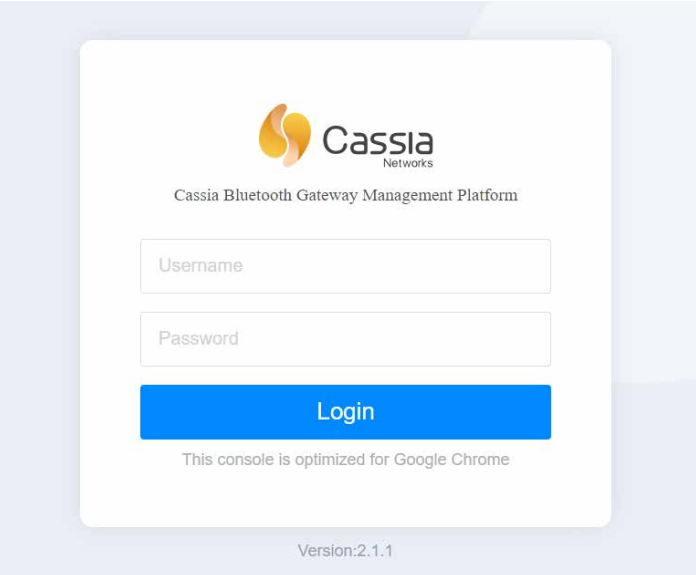


Figure 1 - Login page

2.2 Dashboard view

Upon logging into the gateway, the Status tab is displayed by default. From the top banner, you can select the OPC-UA or EtherNet/IP tab.

- Select the OPC-UA tab to set up an OPC-UA server
- Select the EtherNet/IP tab to set up an EtherNet/IP interface

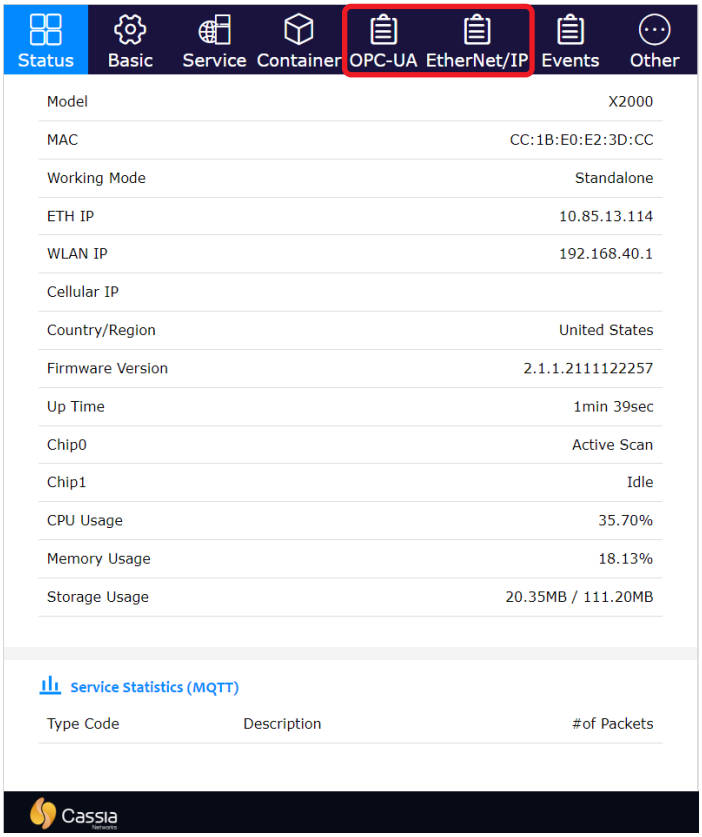


Figure 2 - Dashboard view

3 SENSOR MONITORING MANAGEMENT

This gateway scans and captures Bluetooth® Low Energy (BLE) advertising packets transmitted by OPTIFY sensors. The same sensor management is available on both the OPC-UA and EtherNet/IP tabs and allows users to execute the following actions:

- Scan – show a list of active sensors within range of the gateway
- Replace – replace an existing sensor with a new sensor
- Delete – remove selected sensor from the list
- Refresh – refresh the list of sensors in range of the gateway every defined period or never
- Options – show more settings
  - Export/Configuration – export current list of sensors and settings
  - Export/Last 1 day history
  - Export/Last 7 days history
  - Export/Debug logs
  - Change units: imperial or metric
  - Change EtherNet/IP operating mode between CIP and EtherNet/IP tag writer
- Details – show more information
  - Read sensor details and last performed measurement
  - Read/update measurement interval and accelerometer range
  - Read firmware version
  - Enable tri-axis measurements
  - Download raw sensor data
  - Synchronize clock
  - Update firmware

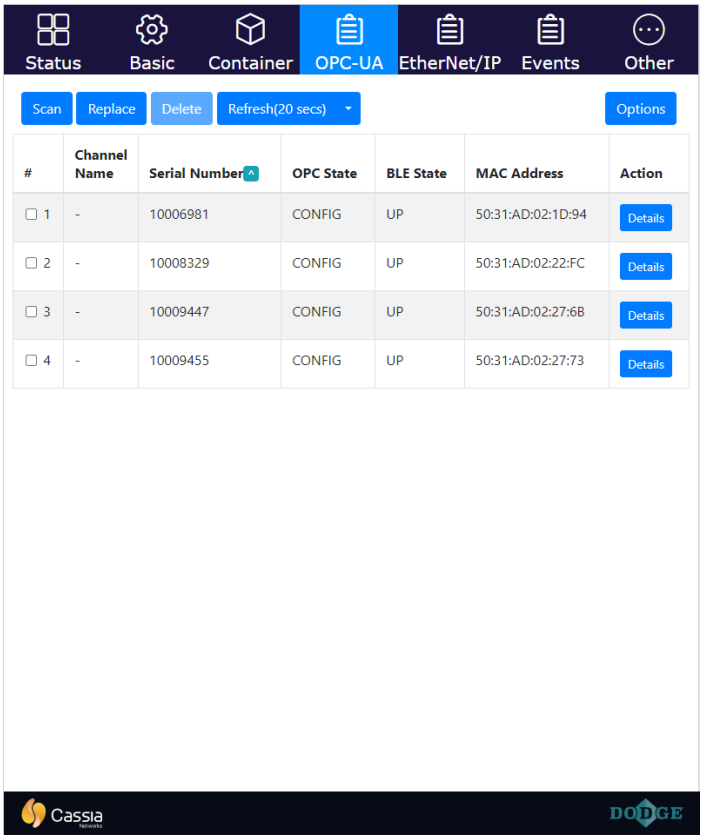


Figure 3 - OPC-UA page

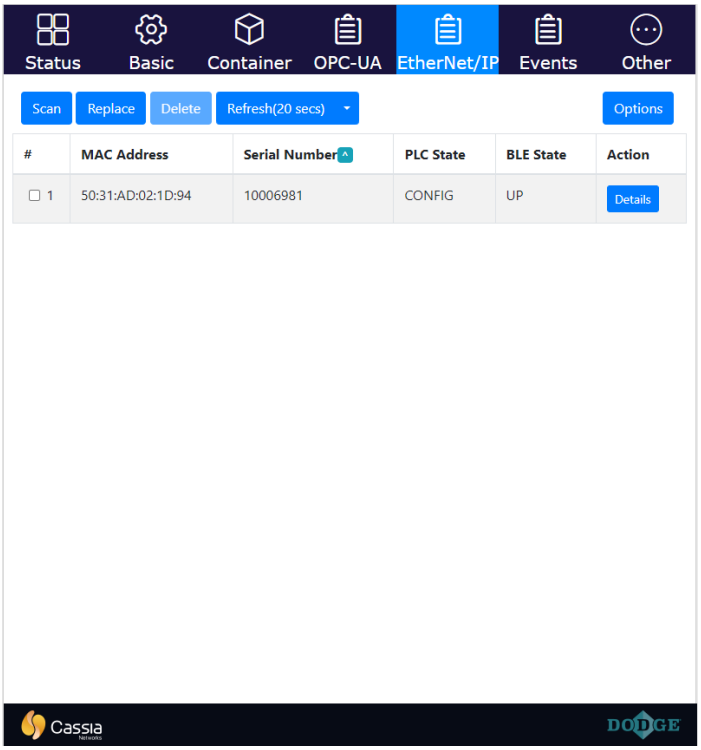


Figure 4 - EtherNet/IP page

3.1 Adding sensors to monitoring list

From the OPC-UA or EtherNet/IP page:

1. Click scan.
2. Click add on the chosen sensor.

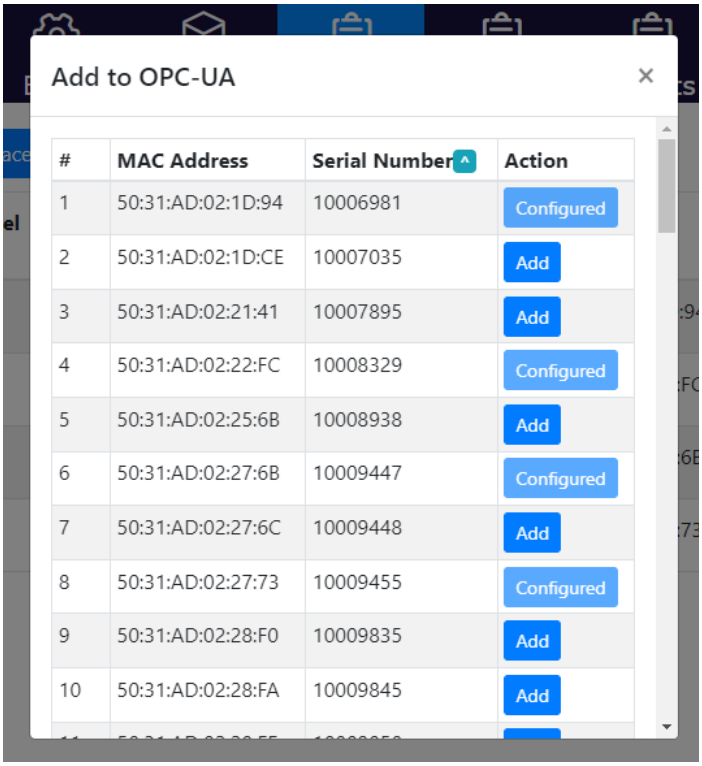


Figure 5 - Add sensor to OPC-UA

NOTE: To add a sensor on the EtherNet/IP page, you will also need to input the IP address of the PLC controller.

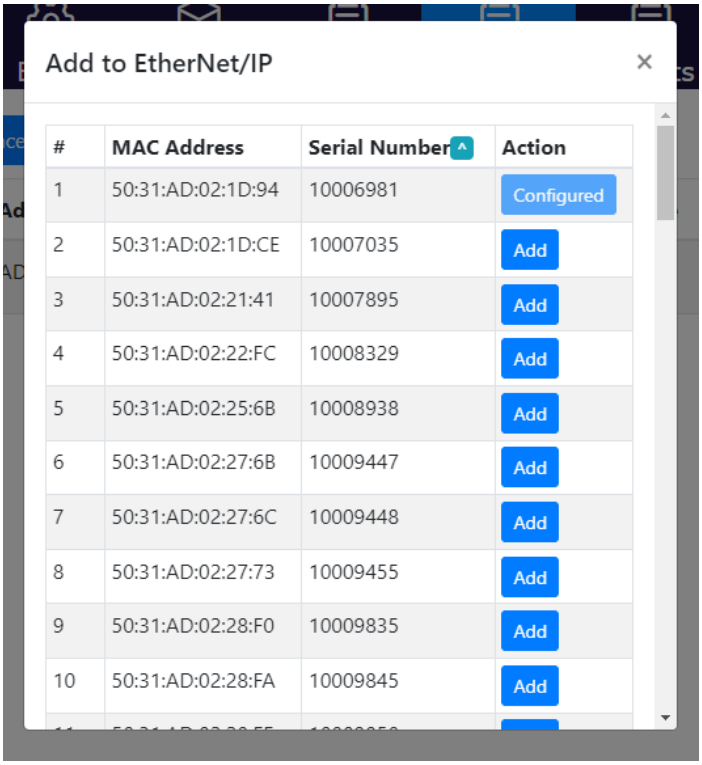


Figure 6 - Add sensor to EtherNet/IP

After adding the sensors, the gateway will start to synchronize the sensors' clocks. Wait for the synchronization process to complete on all sensors and press OK.

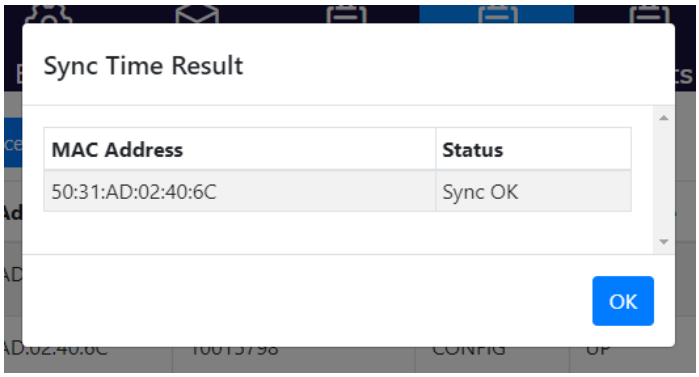


Figure 7 - Sensor clock synchronization

3.2 Deleting sensors from monitoring list

To delete sensors from the monitoring list:

1. Select sensors in the monitoring list.
2. Click delete.

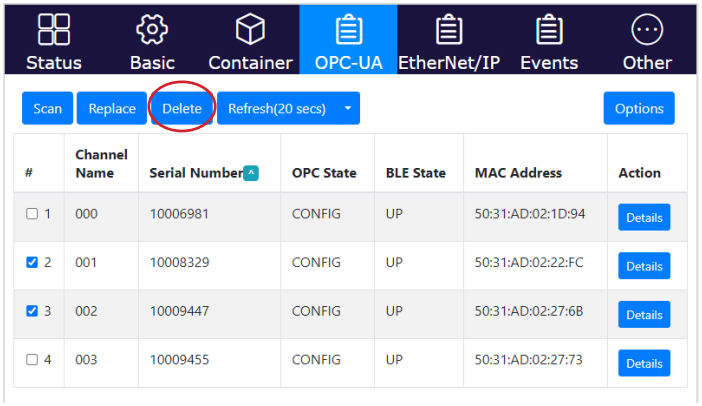


Figure 8 - Delete sensors

3. Click yes.

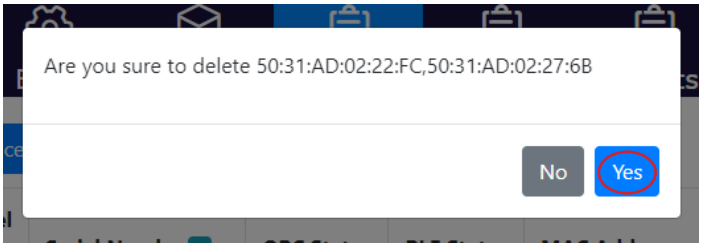


Figure 9 - Delete sensors confirmation

3.3 Refreshing monitoring list

To change refresh rate in the monitoring list:

1. Click on the drop-down list.
2. Choose desired option from list.

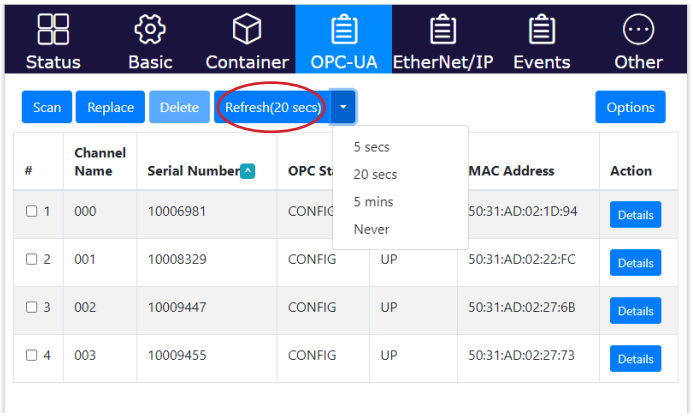


Figure 10 - Refresh rate

3.4 Options menu

This menu will allow you to change units, swap EtherNet/IP operating modes between CIP and EtherNet/IP tag writing, restore old monitoring configurations, and export historical and configuration data.

To access options:

1. Click options.

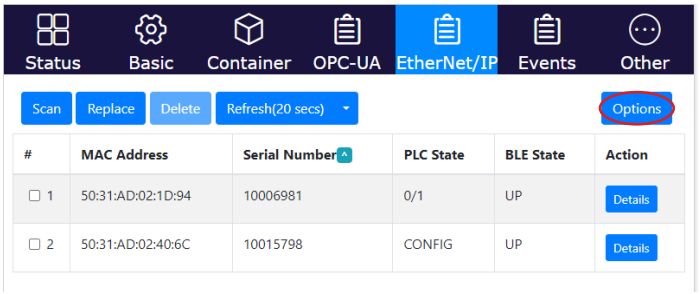


Figure 11 - Options selection

To change units:

1. Select imperial or metric from the drop-down list.
2. Click save.

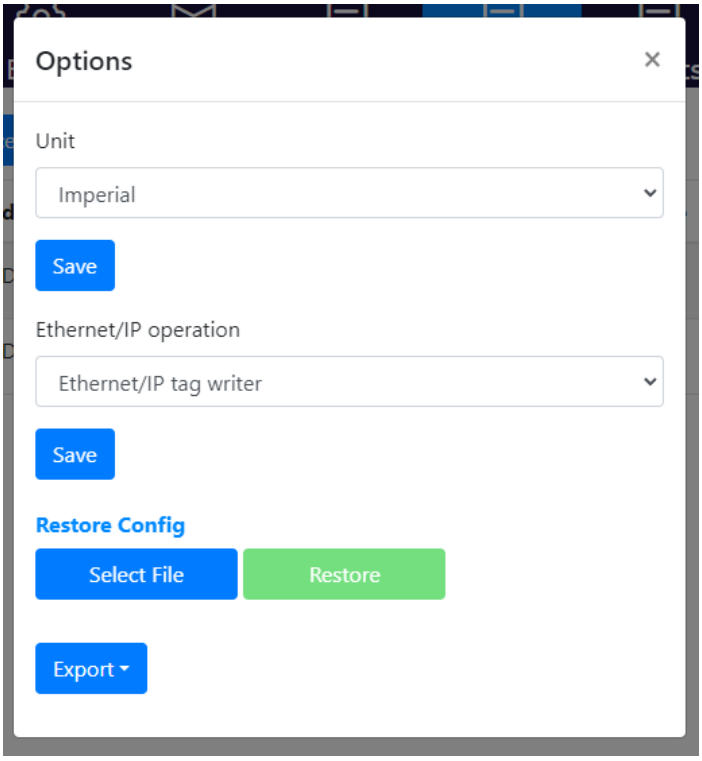


Figure 12 - Unit selection

To export files:

1. Click export.
2. Select configuration, last 24 hours history, last 7 days history, or debug logs.

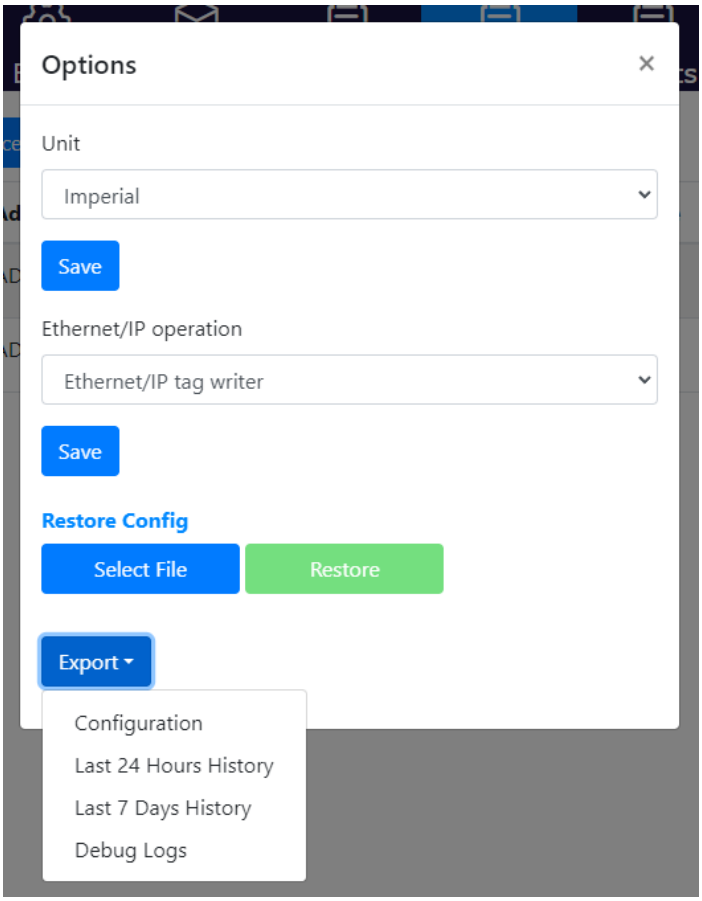


Figure 13 - Export files

To restore configuration:

1. Click select file.

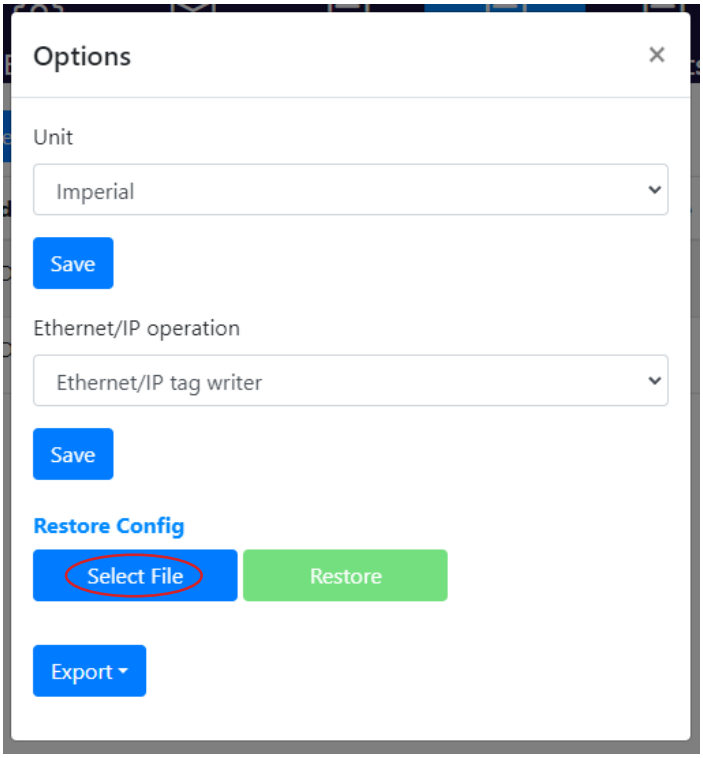


Figure 14 - Select configuration file

2. Locate the exported configuration file on your device and click open.

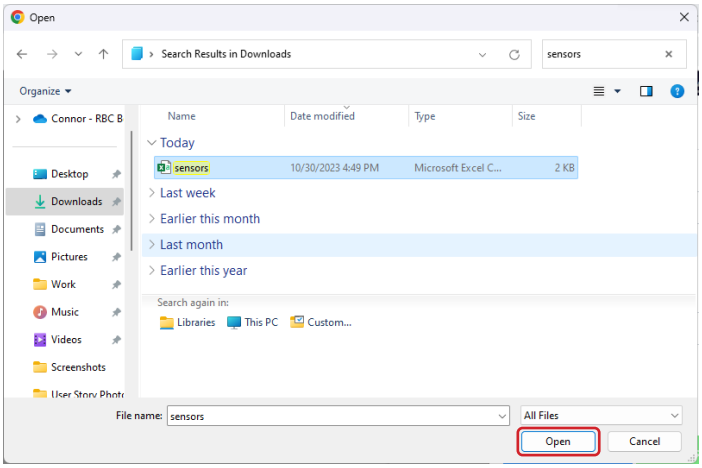


Figure 15 - Open configuration file

3. Click restore.

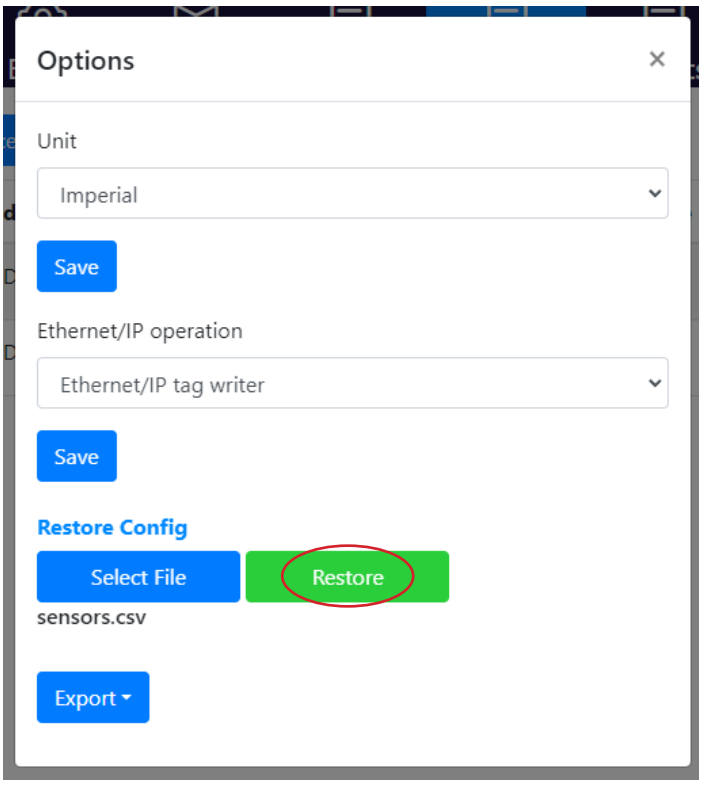


Figure 16 - Restore configuration

3.5 Viewing sensor details

Once all sensors have been added, to view the sensor data within the OPC-UA or EtherNet/IP page:

- Click on details for the desired sensor.

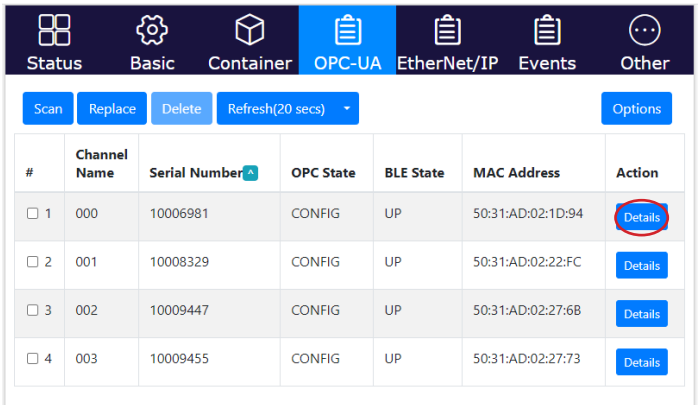


Figure 17 - Sensor details selection

Sensor details on the OPC-UA pages contains two tabs while the EtherNet/IP page contains one additional tab (three in total).

3.5.1 Measurement tab

The measurement tab inside the OPC-UA page contains information specific to the sensor, such as the MAC address, the serial number, and the sensor parameters data from the last measurement performed.

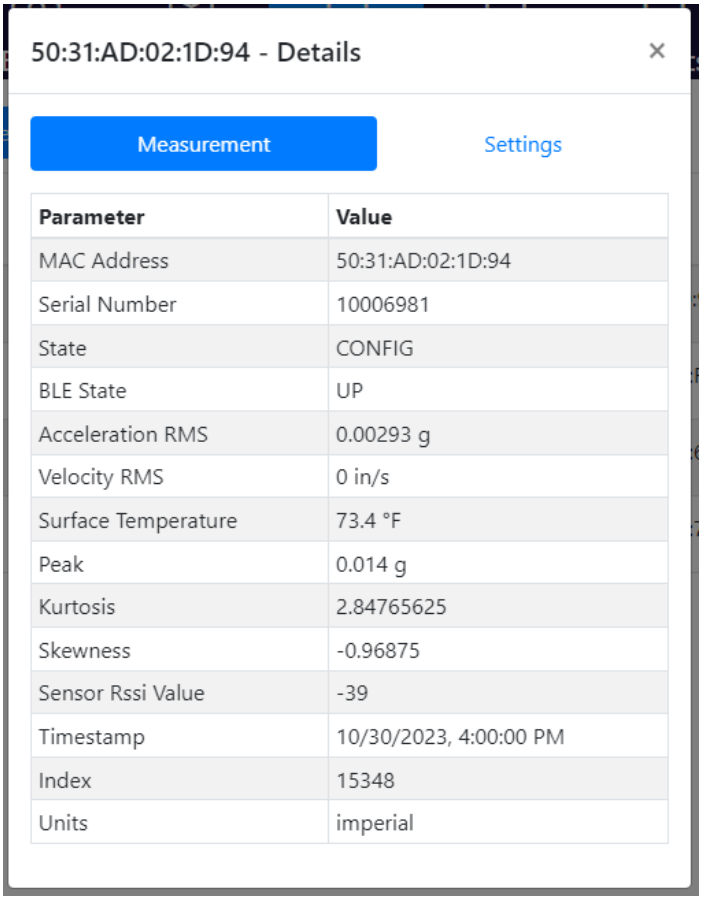


Figure 18 - Measurement tab

The measurement tab inside EtherNet/IP contains the same information as the OPC-UA page, as well as an additional column based on the selected EtherNet/IP operation.

For selected CIP server operation, there is an input array parameter.

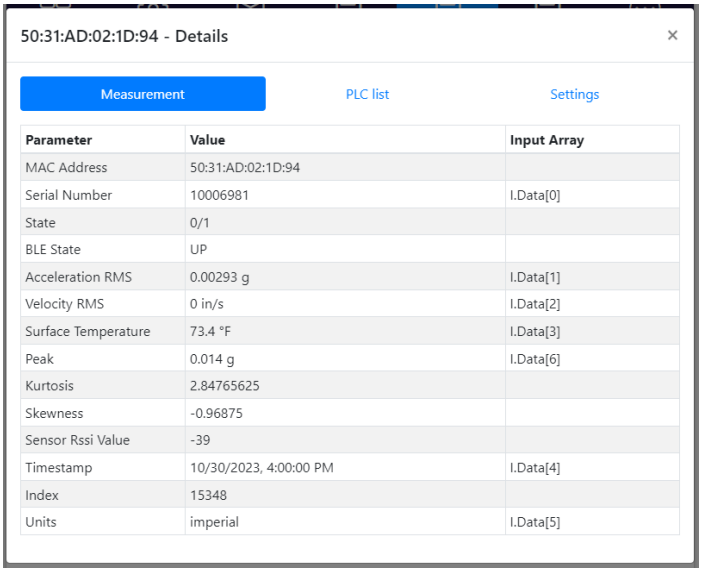


Figure 19 - Input array parameter

For selected EtherNet/IP tag writer operation, there is a PLC tag parameter.

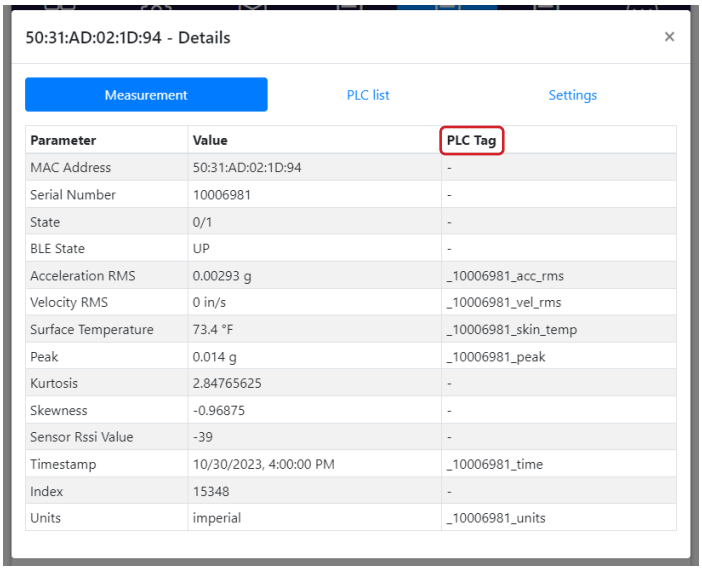


Figure 20 - PLC tag parameter

For more information on how to change EtherNet/IP operation, please refer to section five of this guide.

NOTE: To learn more about what each sensor parameter means, please refer to the OPTIFY Sensor user guide at:
iiot-dodgeindustrial.swipeguide.com/guide/optify-sensor-user-guide

3.5.2 PLC list tab (only EtherNet/IP page)

The PLC list tab appears only on the EtherNet/IP page and contains the configured IP address of the PLC controller which is set when adding a sensor.

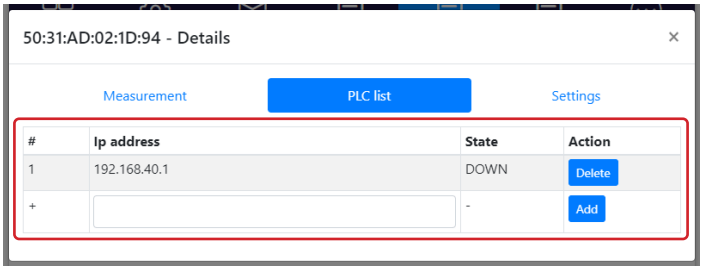


Figure 21 - PLC list tab

3.5.3 Settings tab

3.5.3.1 Measurement interval and accelerometer range

The settings tab displays the sensor's current measurement interval and accelerometer range, which can be modified here if needed.

By default, the sensor measurement interval is one hour and the accelerometer range is auto. However, if the measurement interval and accelerometer range need to be changed, complete the following steps:

1. Click on the settings tab.
2. Click read.

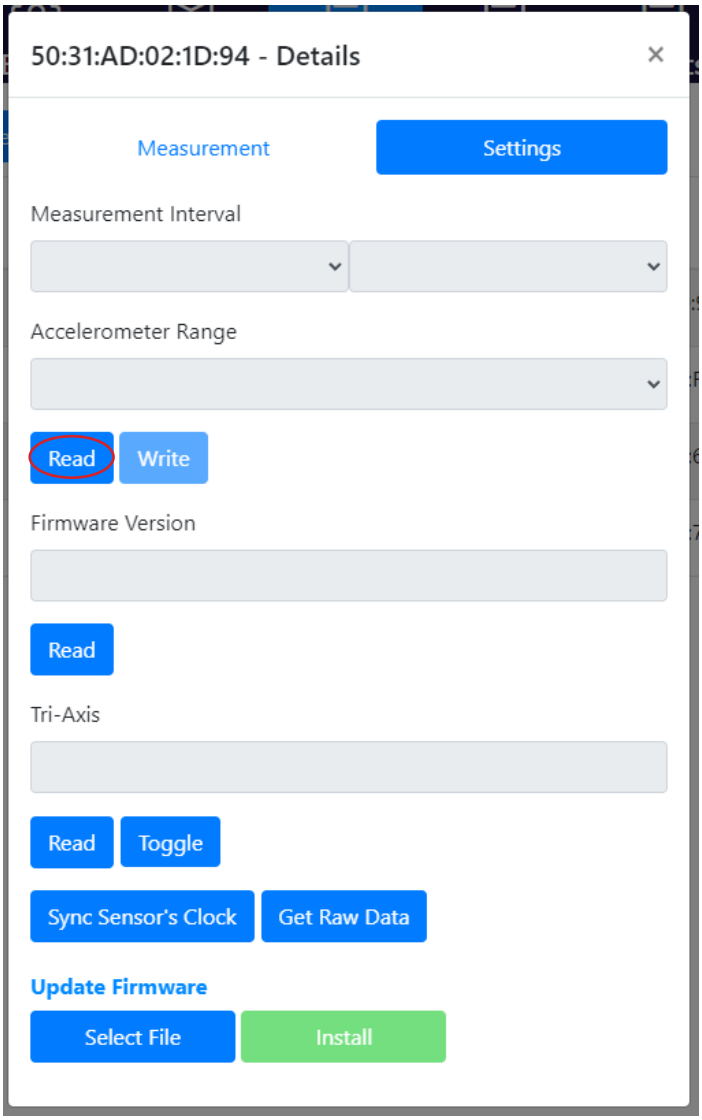


Figure 22 - Read sensor settings

3. Select desired measurement interval (from 15 minutes to 12 hours).
4. Select desired accelerometer range (up to 16 g).
5. Click write.

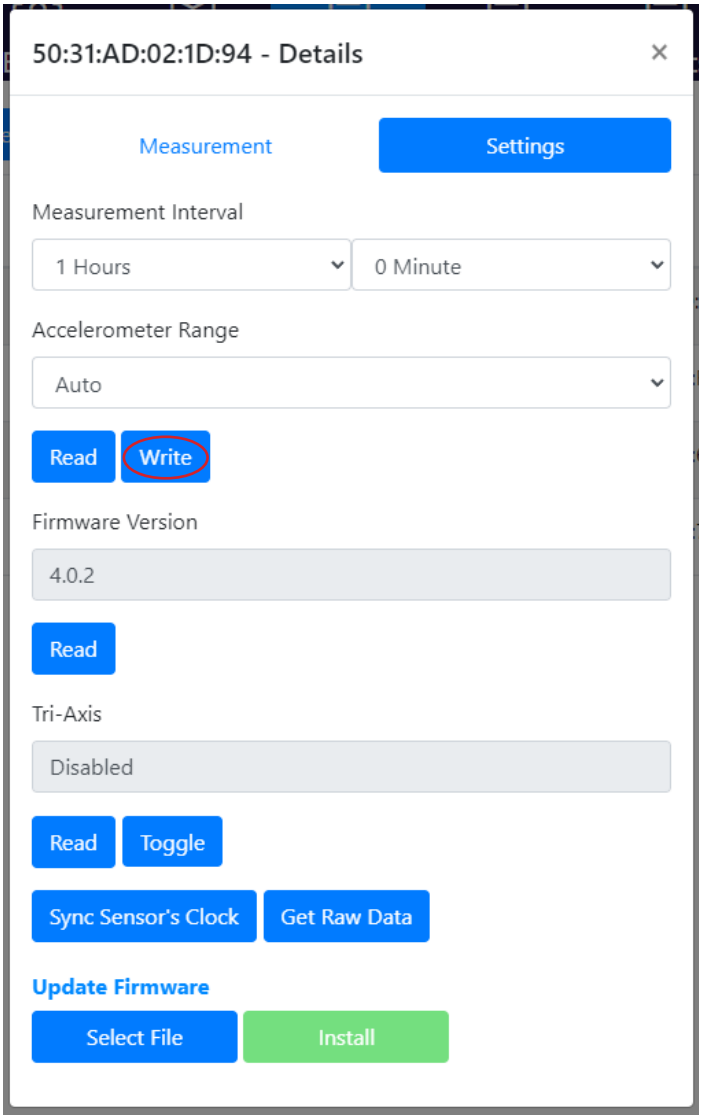


Figure 23 - Write sensor settings

3.5.3.2 Firmware version

In order to read the firmware version on the sensor:

1. Click read.

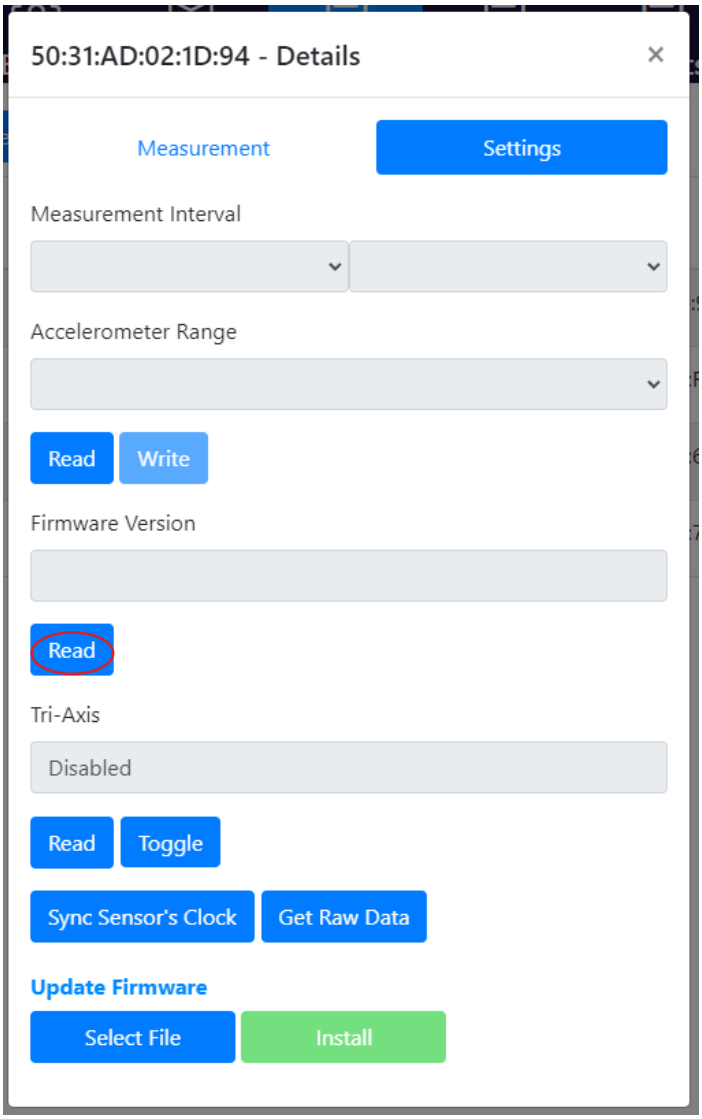


Figure 24 - Read firmware version

3.5.3.3 Enable/disable tri-axis data

In order to collect tri-axis raw data from the sensor:

1. Click read to check the current sensor setting.

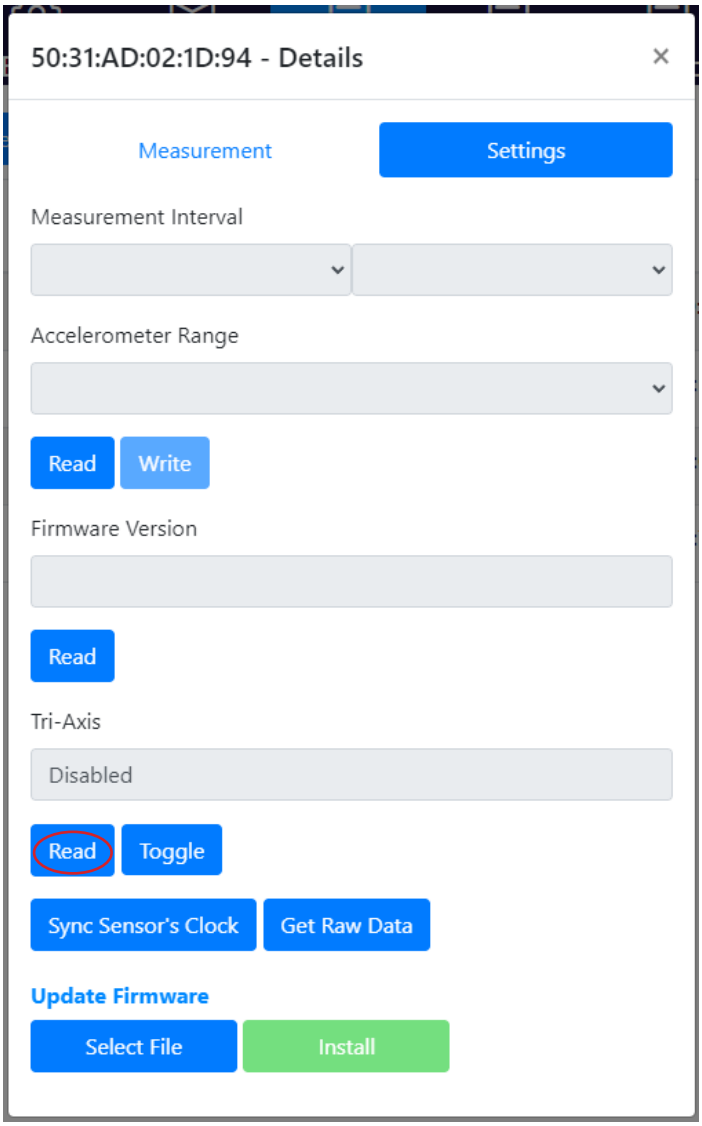


Figure 25 - Read sensor tri-axis status

2. Click toggle and wait for confirmation.

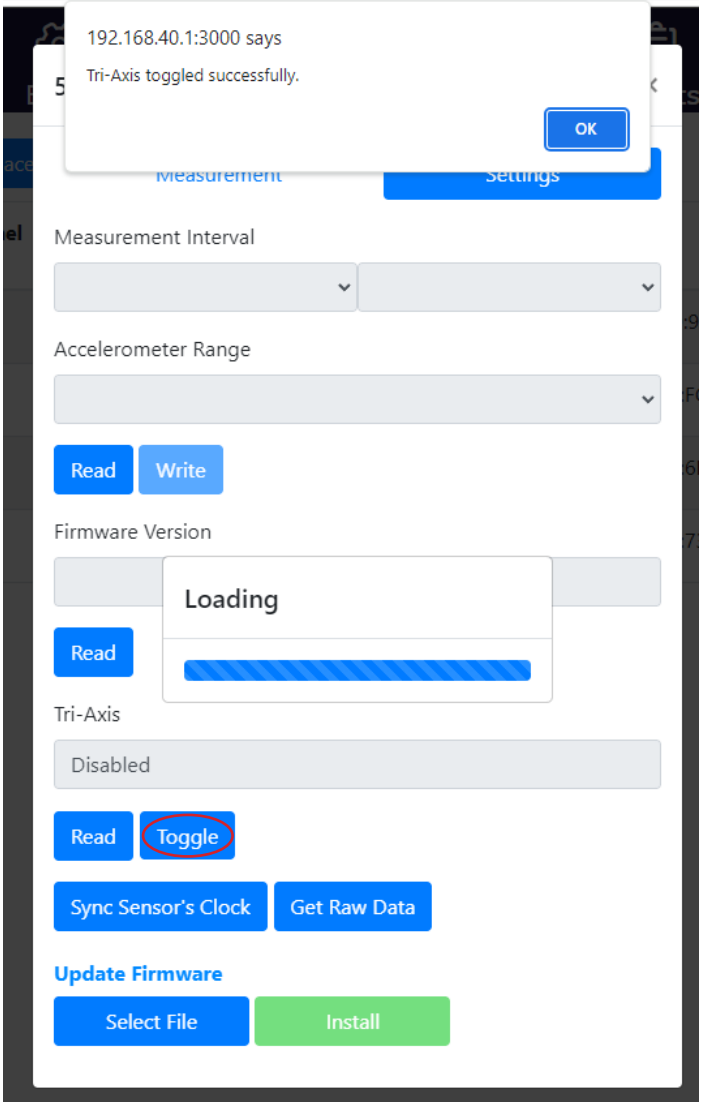


Figure 26 - Change sensor tri-axis status

3.5.3.4 Synchronize sensor clock

Synchronizing the sensors clock is critical for accurate measurement data. The gateway will sync a sensor clock when first adding the sensor, but if this fails or if measurements are showing the wrong time, please resynchronize the clock.

1. Click sync sensor's clock.

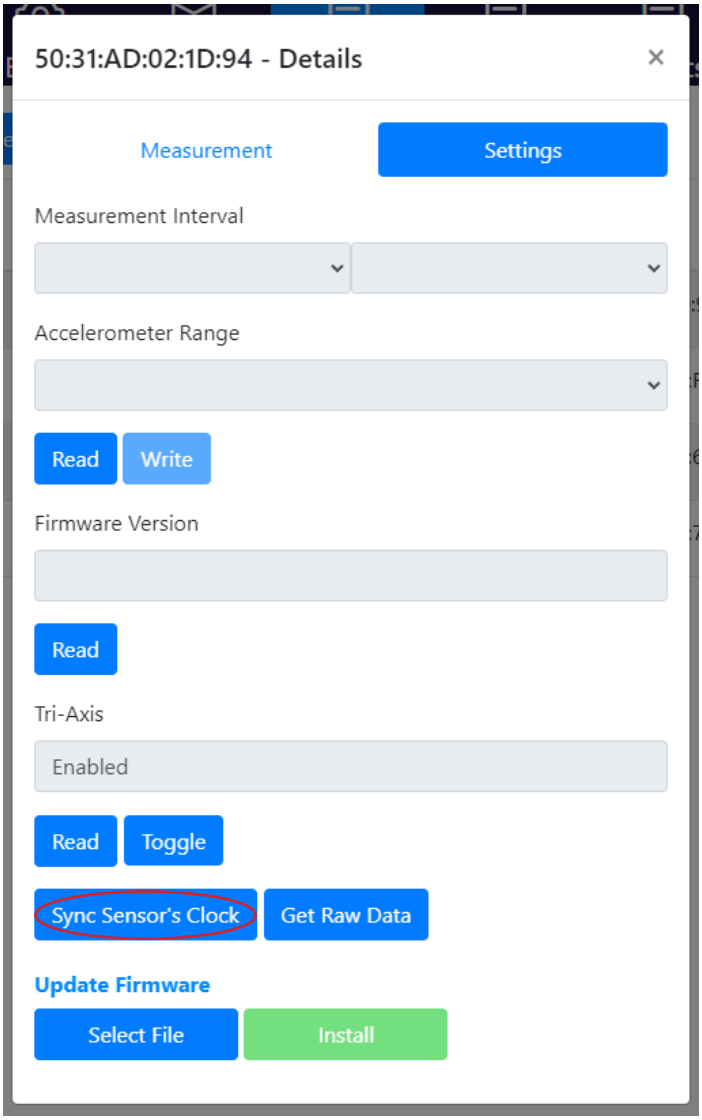


Figure 27 - Synchronize sensor's clock

3.5.3.5 Update sensor firmware

In order to update sensor firmware:

1. Click select file.

   NOTE: Contact Dodge IIoT technical support by phone at +1 864 284 5700 ext. 6 or email at engineering@support.dodgeindustrial.com to obtain the sensor firmware file.

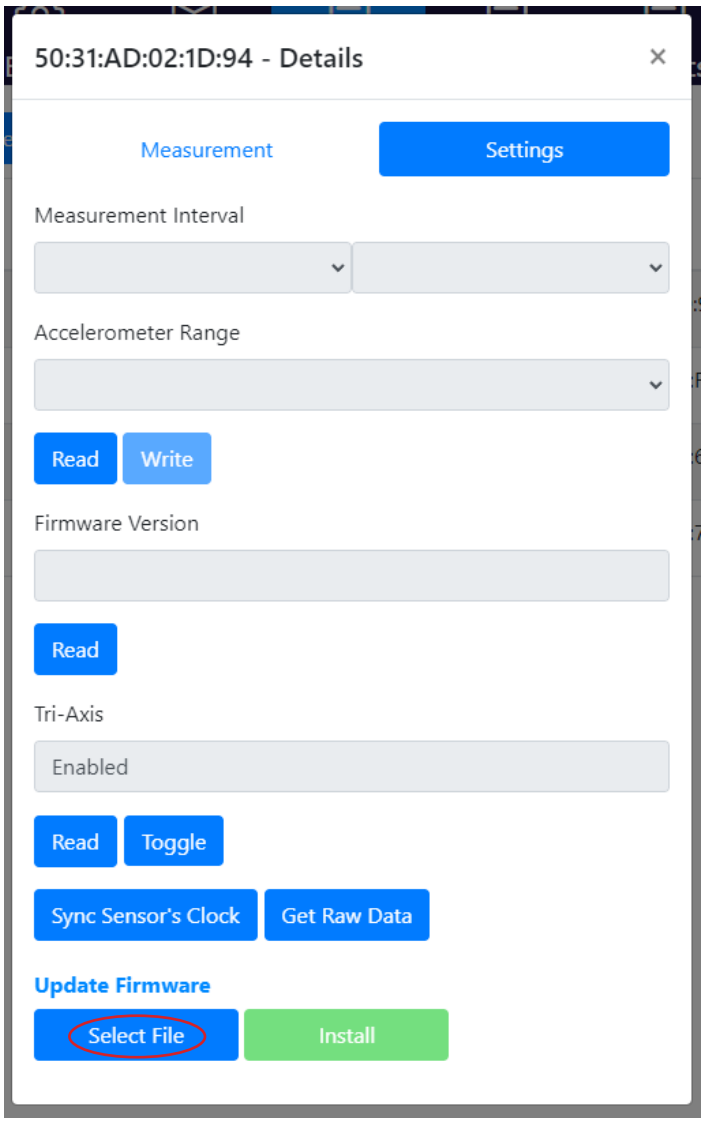


Figure 28 - Select file

2. Locate the sensor firmware file on your device and click open.

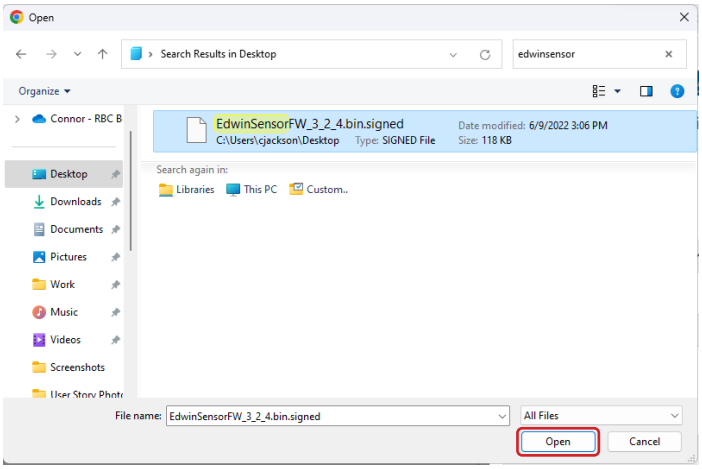


Figure 29 - Select sensor firmware

3. Click install.

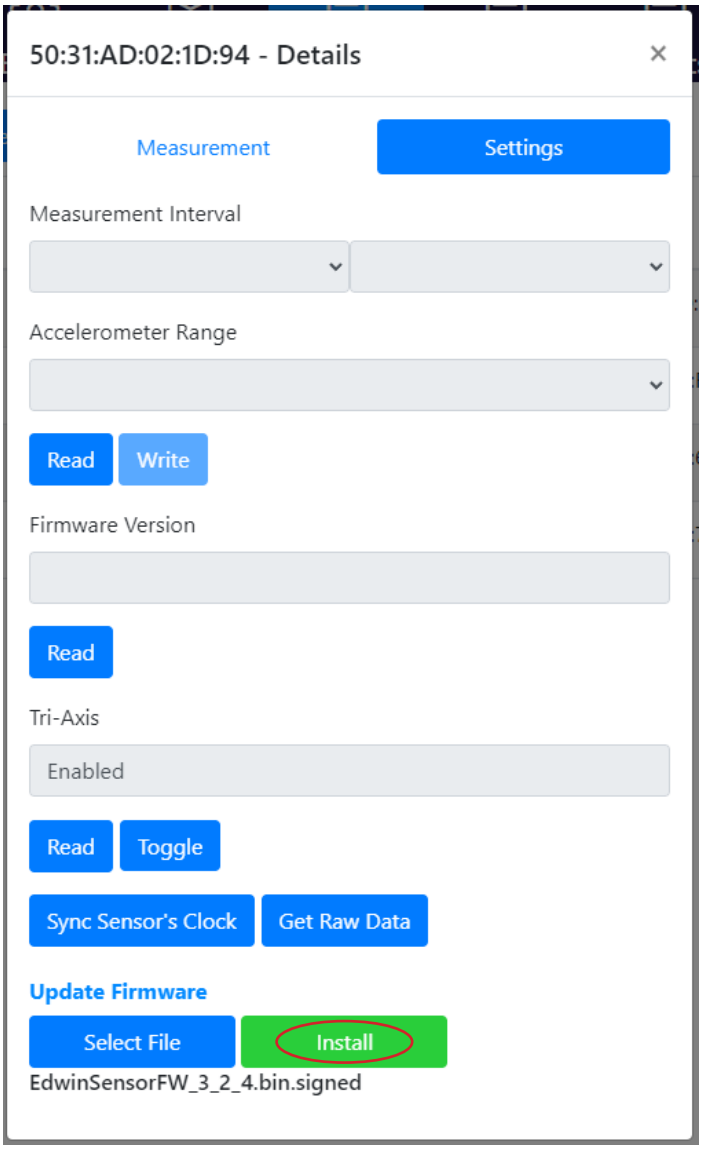


Figure 30 - Install sensor firmware

4. Wait for the new firmware installation to complete.

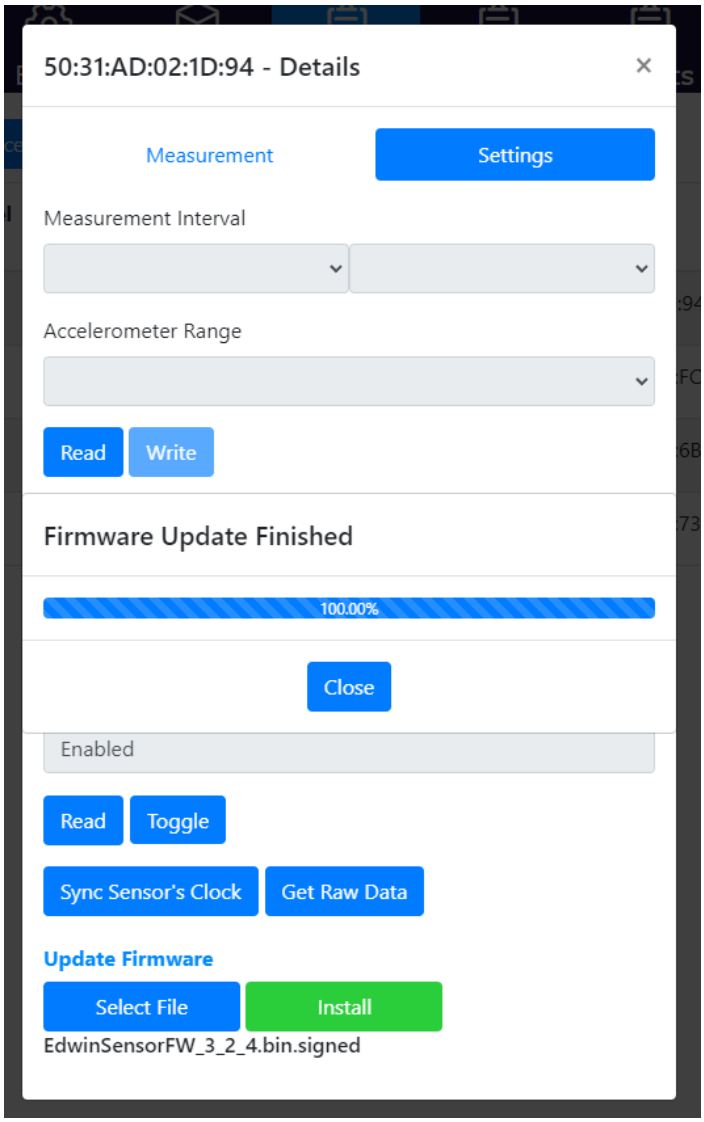


Figure 31 - Finish installing firmware

3.5.3.6 Exporting raw sensor data

Raw sensor data can be exported to a .xlsx file for post-processing. To export:

1. Select the get raw data button under sensor settings.

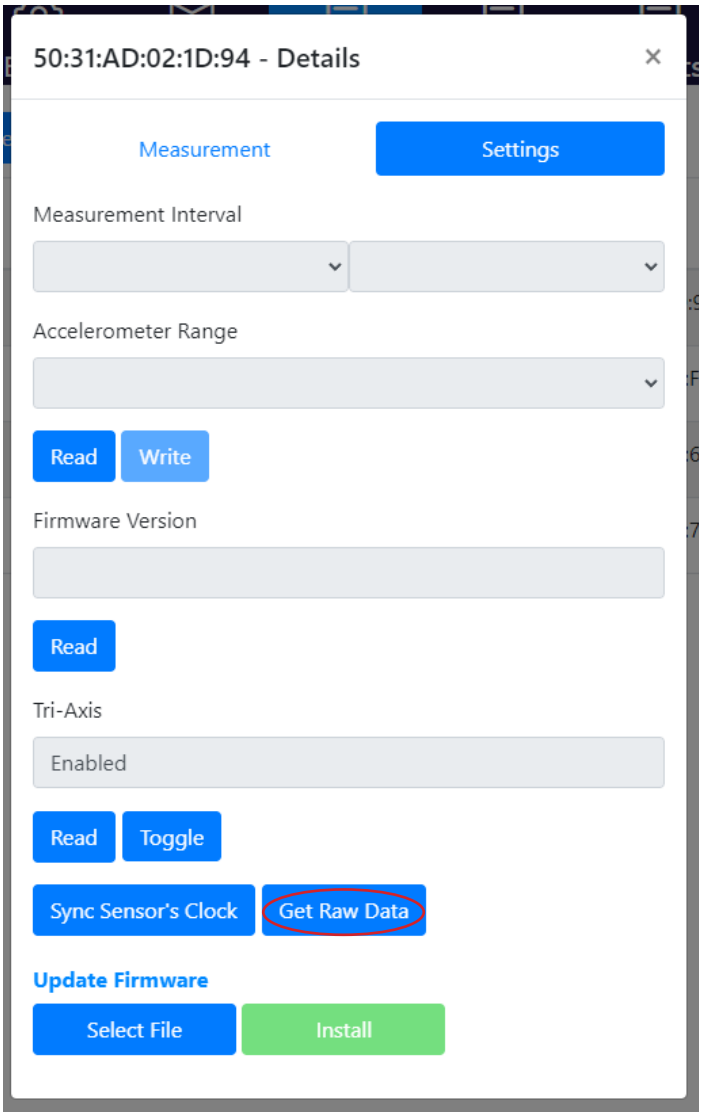


Figure 32 - Select get raw data

2. An Excel file will download. Depending on whether the sensor is set to one axis or tri-axis, this sheet will include different columns.

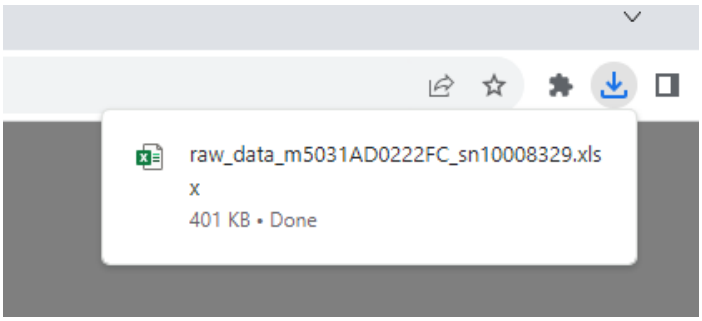


Figure 33 - Raw data download

3.6 Replacing a sensor with a new one

In case of a dead battery or faulty sensor, purchase a new sensor. To replace the existing sensor with a new sensor, complete the following steps after commissioning the replacements following the instructions in the installation manual.

1. Select replace in either OPC-UA or EtherNet/IP.

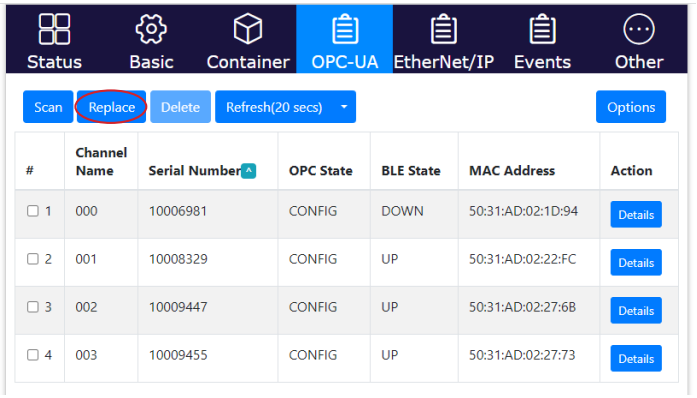


Figure 34 - Replace sensor

2. In the menu that appears, multiple sensors can be selected for replacement. One at a time, select an existing sensor and its corresponding replacement sensor. The number of the existing sensor will appear next to the sensor that will replace it.

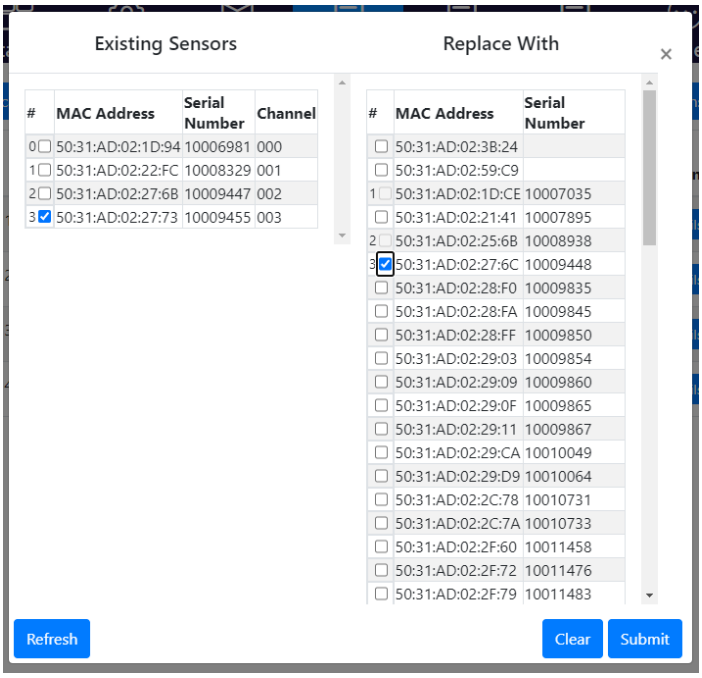


Figure 35 - Replace sensor selection

3. Select submit and confirm the changes made. Click yes.

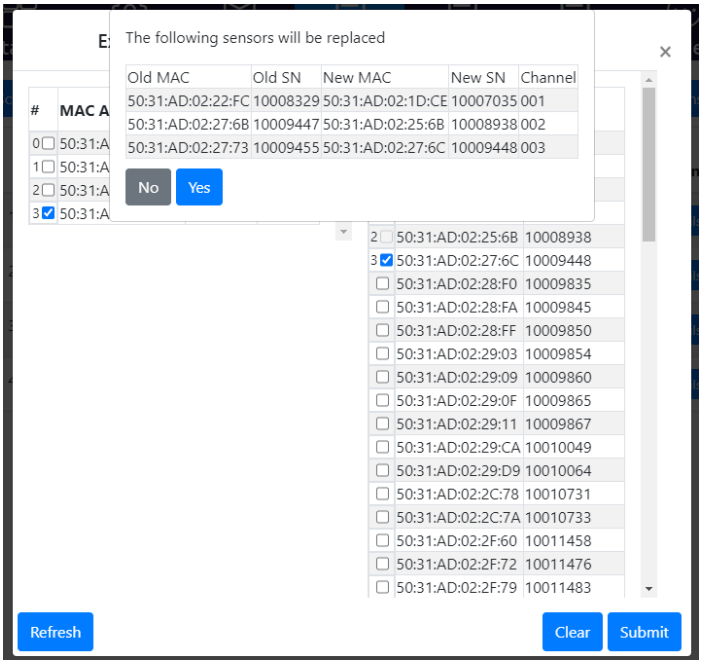


Figure 36 - Replacement validation

Once the sensors have been successfully replaced, a confirmation window will appear.

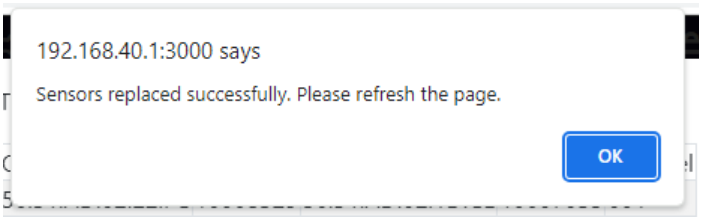


Figure 37 - Replacement confirmation window

4 OPC-UA SERVER CONFIGURATION

4.1 Before you begin

Ensure that the OPC-UA clients can ping the gateway.

4.2 Connecting to OPC-UA clients

There are many OPC-UA client software options available in the industry. For this user guide, Prosys OPC UA client is used.

1. Launch Prosys OPC UA client application.
2. Write: opc.tcp:///(IP address assigned to gateway by the local area network):61210
   (e.g., opc.tcp://192.168.0.192:61210)

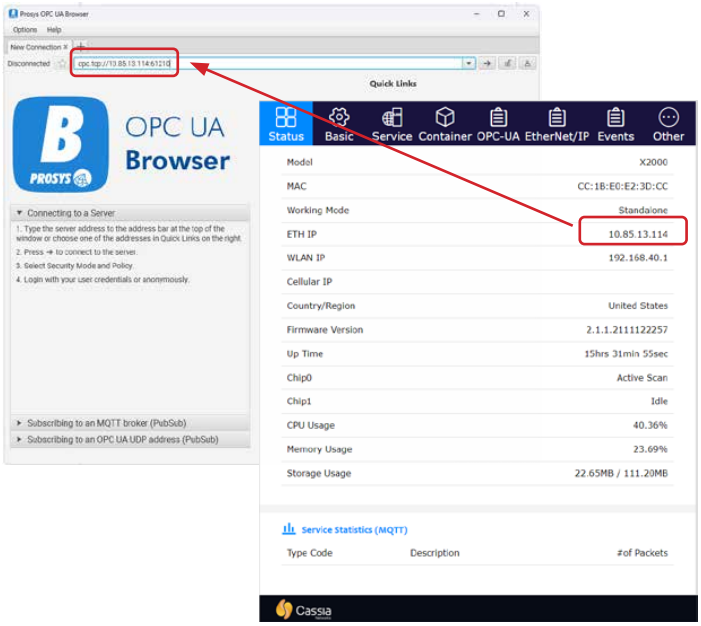


Figure 38 - Gateway network IP

3. Press enter key to connect to server.
4. Select none below security mode and security policy.
5. Click OK.

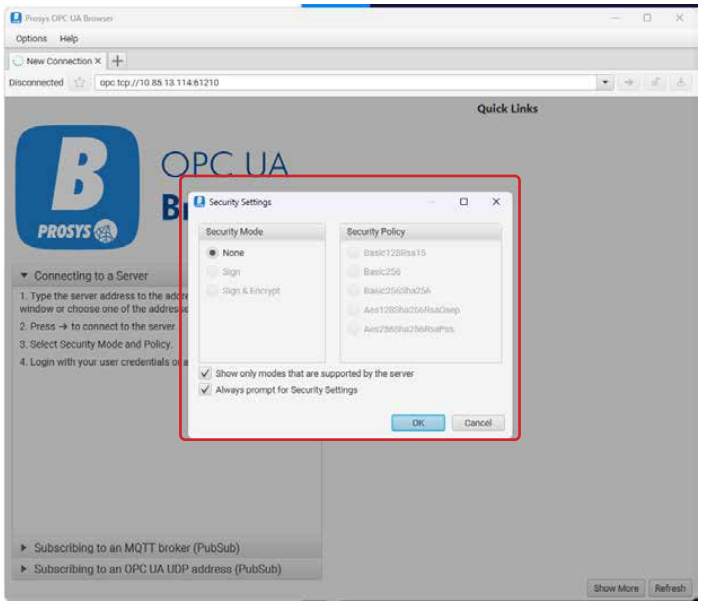


Figure 39 - Security settings

4.2.1 Checking sensor parameters

1. Click on the triangle symbol to expand objects folder.

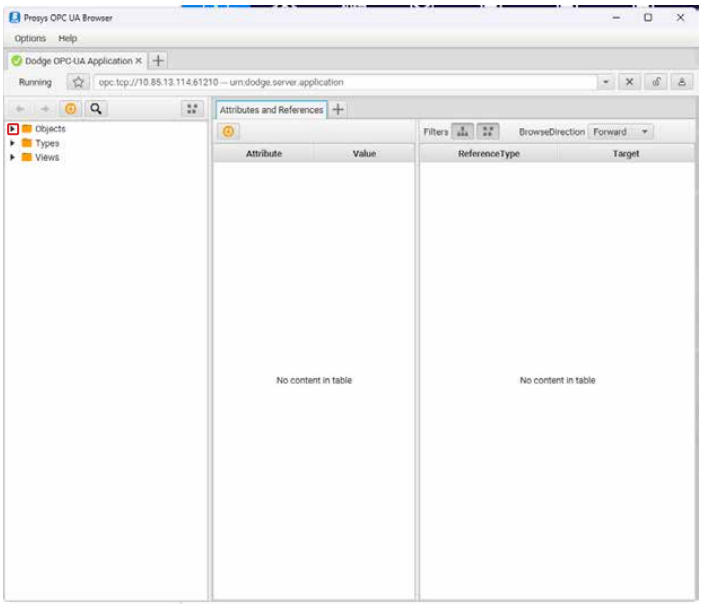


Figure 40 - Objects folder

2. Click on the triangle symbol next to the sensor number.

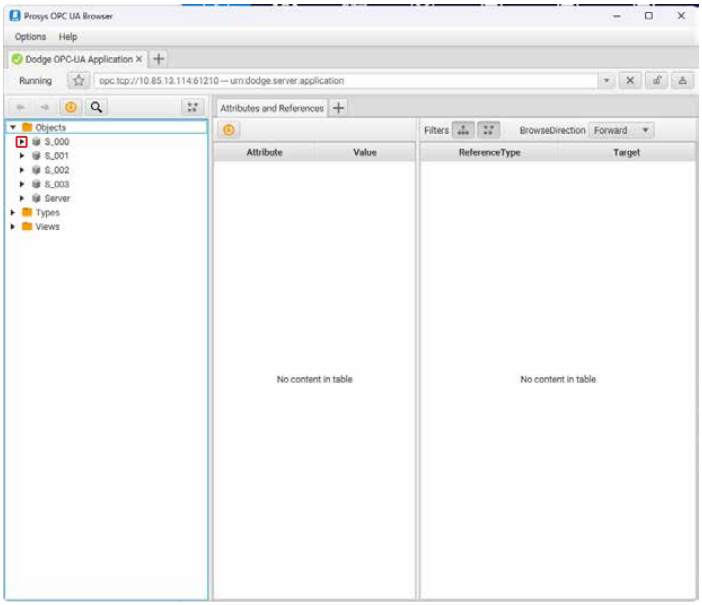


Figure 41 - Sensor number

3. Click on the name of the variable (e.g., rms).

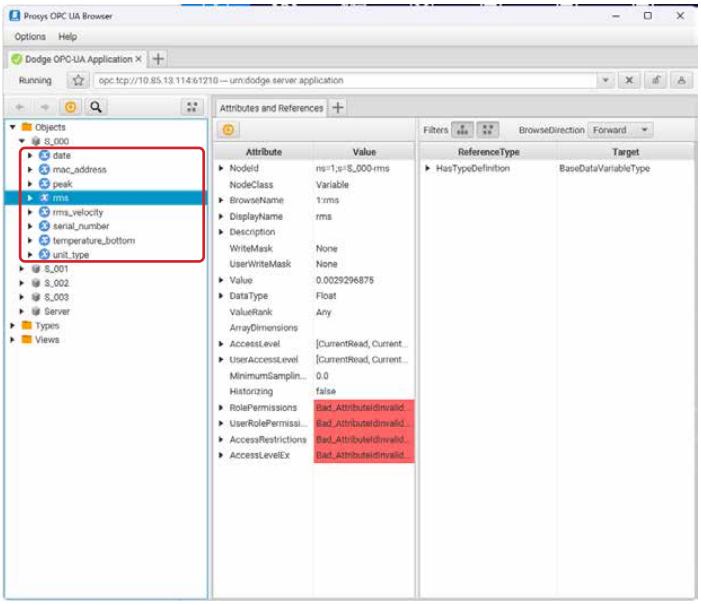


Figure 42 - Variables

4.2.2 Monitor sensor parameter

1. Right-click on the chosen variable.
2. Click monitor.

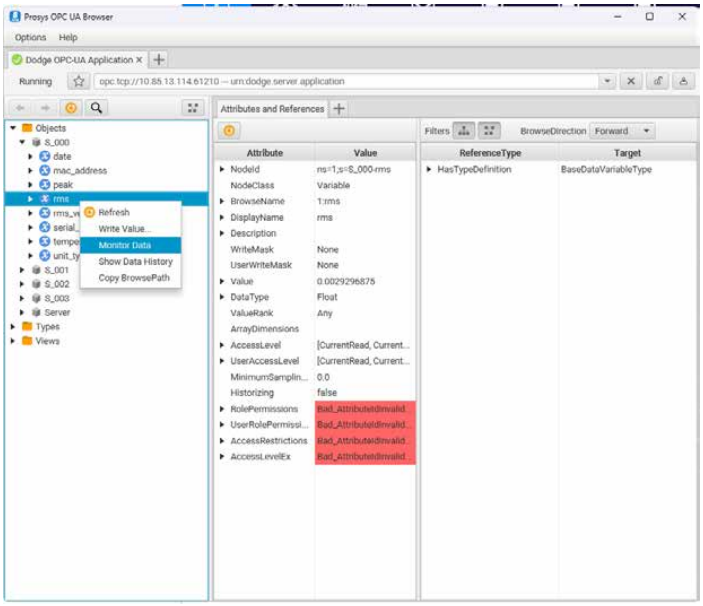


Figure 43 - Monitor sensor parameter

4.2.3 Observing new data of a sensor parameter

To observe new data of a certain variable:

1. Set publishing interval to 50.
2. Click on checkbox on the graph column.
3. Set show data for seconds to 3600.
4. Observe new data in the rms tab.

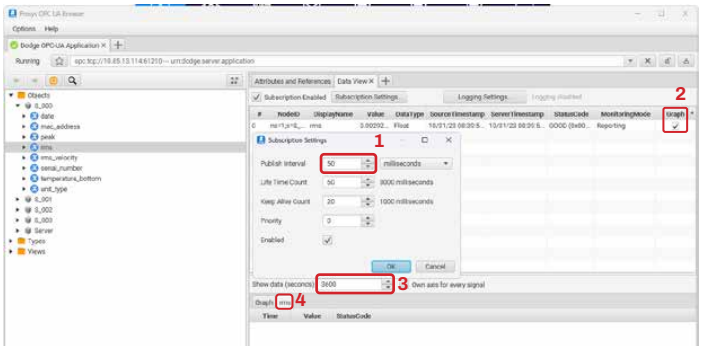


Figure 44 - Observing new data

5 ETHERNET/IP CONFIGURATIONS

5.1 Changing EtherNet/IP operation

EtherNet/IP setup supports two modes of operation. Select the appropriate mode for the PLC prior to viewing sensor data.

From the gateway EtherNet/IP page:

1. Select options.

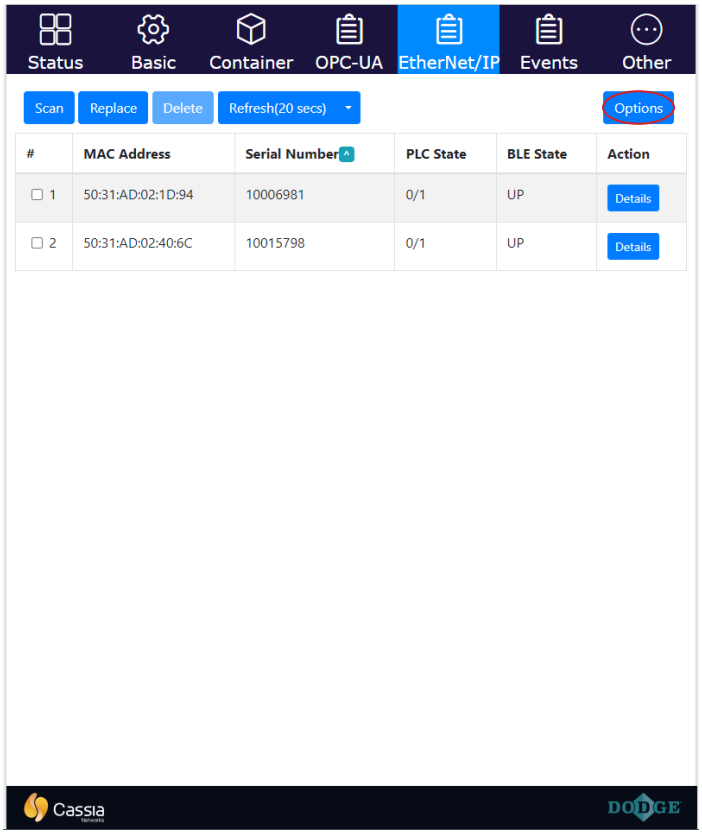


Figure 45 - EtherNet/IP options

2. Select EtherNet/IP tag writer or CIP server, then click save.

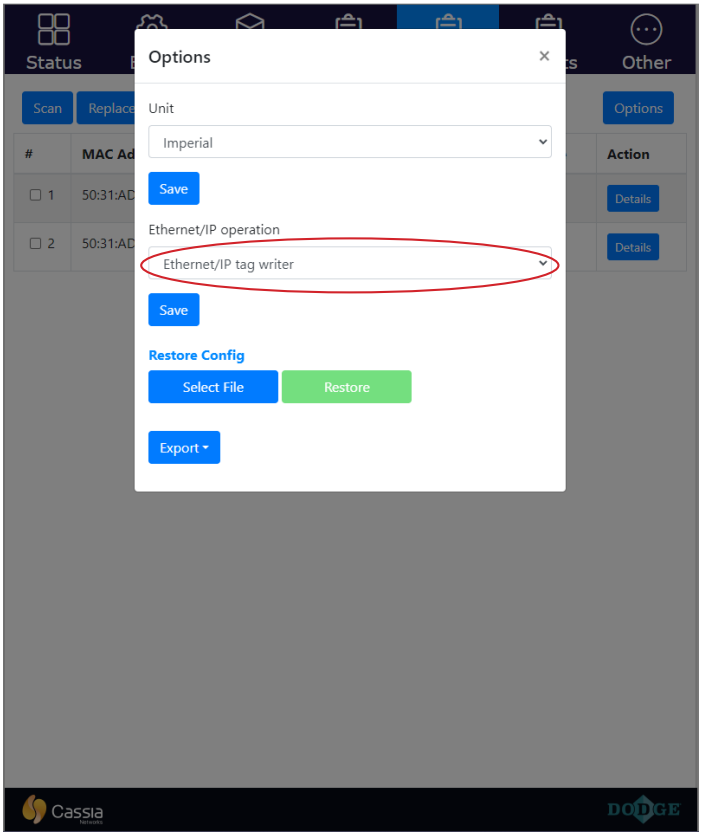


Figure 46 - Selecting EtherNet/IP writer

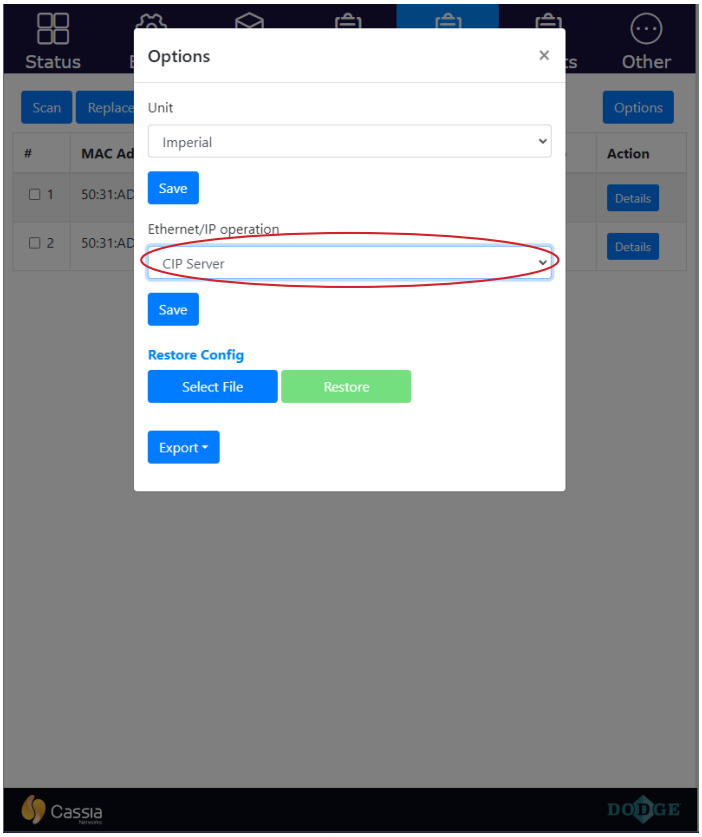


Figure 47 - Selecting CIP server

5.2 EtherNet/IP tag writer operation

Ensure EtherNet/IP tag writer operation is selected. Refer to section 5.1 of this user guide.

5.2.1 Viewing sensor details

To view selected sensor details:

1. Click details for selected sensor.

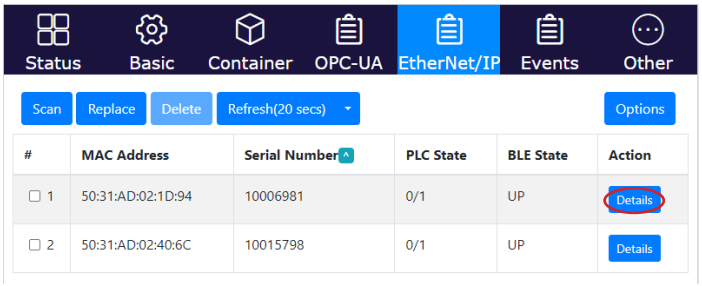


Figure 48 - Viewing sensor details

The measurement tab contains information specific to the sensor such as the MAC address, the serial number, and the sensor parameters data from the last measurement performed.

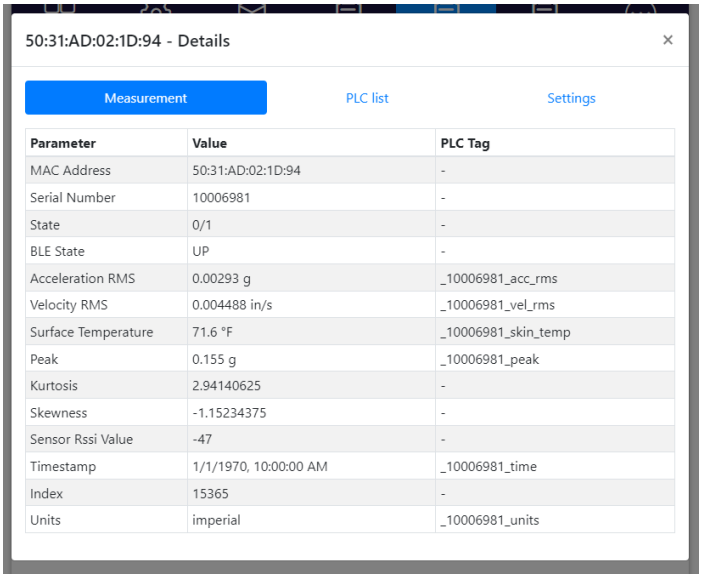


Figure 49 - EtherNet/IP measurement tab

See table below with PLC tags and their types.

Parameter	PLC Tag	Type
Acceleration RMS	_10015901_acc_rms	DINT
Velocity RMS	_10015901_vel_rms	DINT
Surface Temperature	_10015901_skin_temp	DINT
Timestamp	_10015901_time	DINT
Units	_10015901_units	DINT
Peak Acceleration	_10015901_peak	DINT

NOTE: [SN] = Serial Number of specific sensor (example: _10021078_acc_rms).

PLC list tab contains information about configured IP addresses for PLC controller.

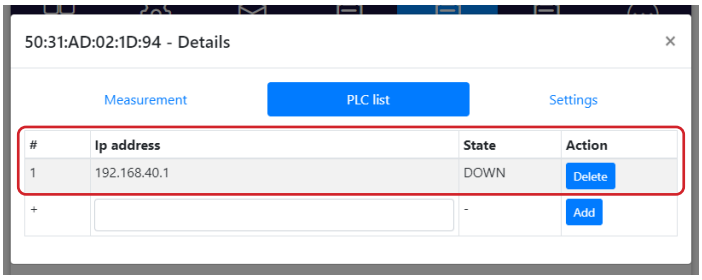


Figure 50 - PLC list tab

To add a new PLC controller to a specific sensor:

1. Write IP address of PLC controller.
2. Click add.

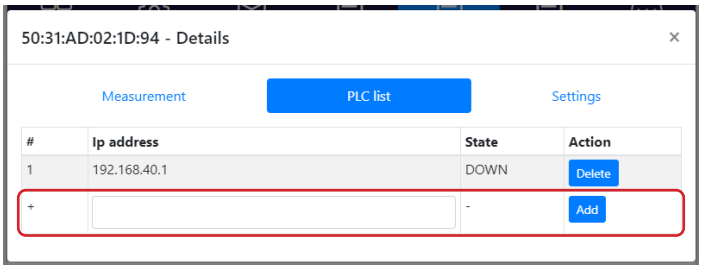


Figure 51 - Adding new PLC controller to sensor

5.2.2 Configuring EtherNet/IP tag writer inside Studio 5000

1. Launch Studio 5000 and open existing project.

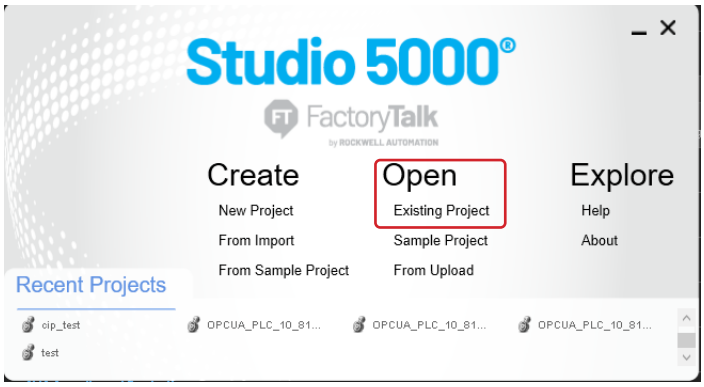


Figure 52 - Open existing project

2. Navigate to controller tags, then navigate to edit tags.

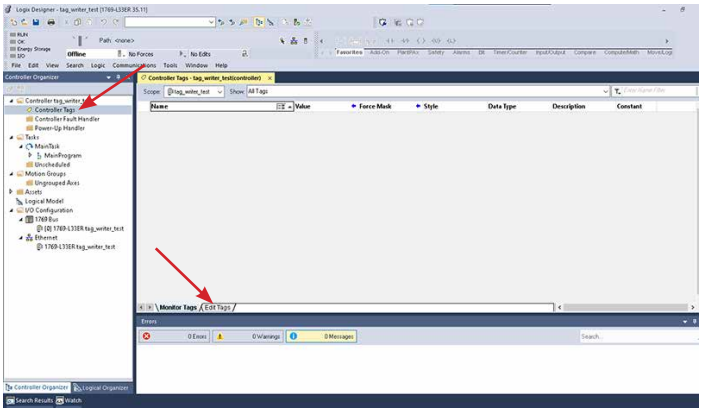


Figure 53 - Edit tags

3. Copy PLC tags of specific sensor and create them.

Name	Data Type
_xxxxxxxx_acc_rms	DINT
_xxxxxxxx_vel_rms	DINT
_xxxxxxxx_skin_temp	DINT
_xxxxxxxx_time	DINT
_xxxxxxxx_units	DINT
_xxxxxxxx_peak	DINT

NOTE: xxxxxxxx is the serial number of the selected sensor (example: _10015901_acc_rms).

4. See example below with one sensor.

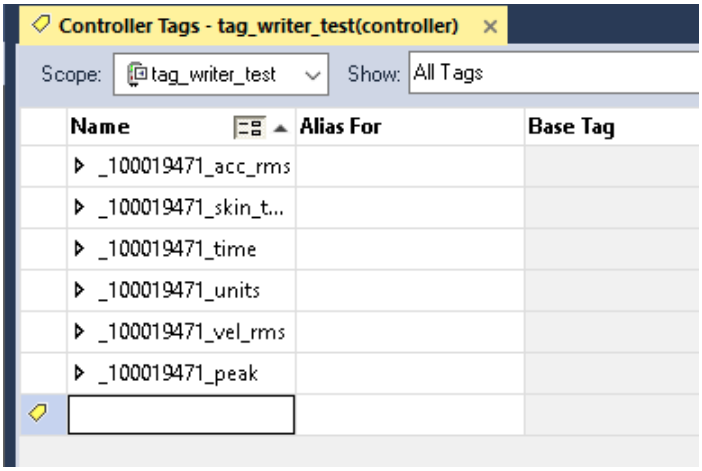


Figure 54 - Choosing tags

5. Save the project. Upload tags when prompted.

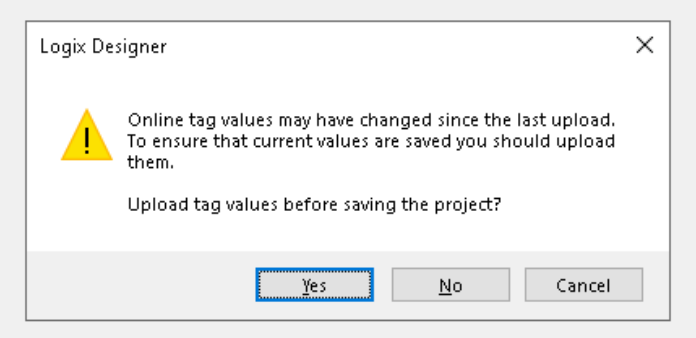


Figure 55 - Upload tags prompt

6. Navigate to monitor tags.

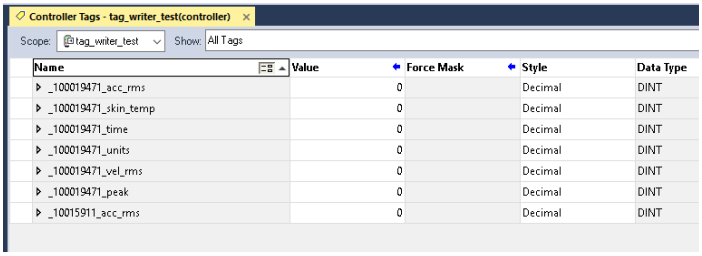


Figure 56 - Monitor tags

5.3 CIP server operation

5.3.1 Viewing sensor details

Ensure CIP operation is selected. Refer to section 5.1 of this user guide.

To view selected sensor details:

1. Click details for selected sensor.

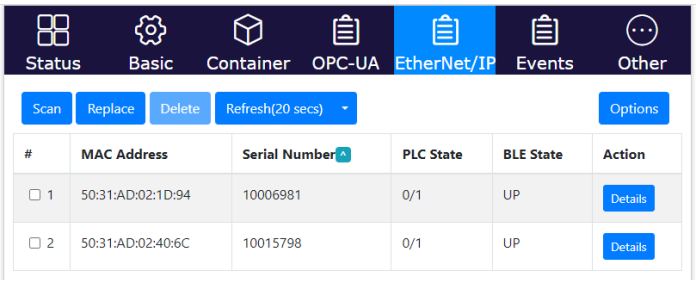
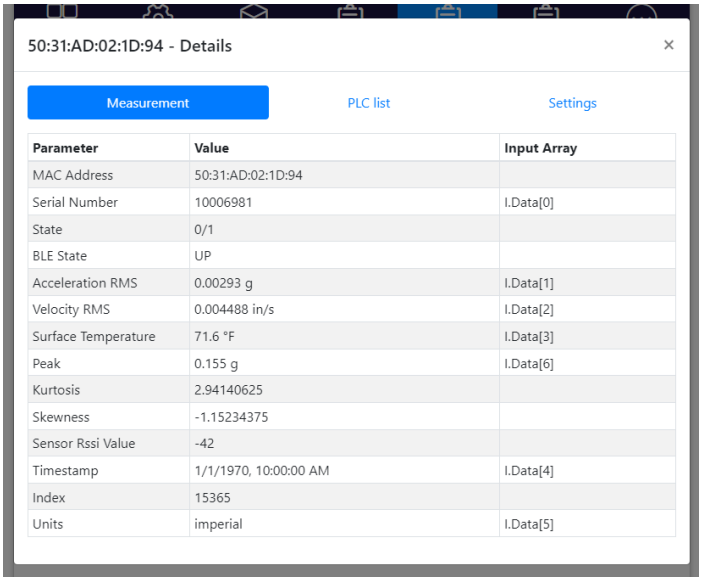


Figure 57 - Viewing sensor details

The measurement tab contains information specific to the sensor such as the MAC address, the serial number, the list of input arrays, and the sensor parameters data from the last measurement performed.



Parameter	Value	Input Array
MAC Address	50:31:AD:02:1D:94	
Serial Number	10006981	I.Data[0]
State	0/1	
BLE State	UP	
Acceleration RMS	0.00293 g	I.Data[1]
Velocity RMS	0.004488 in/s	I.Data[2]
Surface Temperature	71.6 °F	I.Data[3]
Peak	0.155 g	I.Data[6]
Kurtosis	2.94140625	
Skewness	-1.15234375	
Sensor Rssi Value	-42	
Timestamp	1/1/1970, 10:00:00 AM	I.Data[4]
Index	15365	
Units	imperial	I.Data[5]

Figure 58 - CIP measurement tab

See table below with input array and their types.

Parameter	Input Array	Type
Serial Number	I.Data[0]	DINT
Acceleration RMS	I.Data[1]	DINT
Velocity RMS	I.Data[2]	DINT
Surface Temperature	I.Data[3]	DINT
Peak Acceleration	I.Data[4]	DINT
Timestamp	I.Data[5]	DINT
Units	I.Data[6]	DINT

NOTE: Numbers inside square brackets stand for an index number in input array in CIP server and will change depending on the number of sensors in the server.

5.3.2 Configuring CIP server inside Studio 5000

1. Launch Studio 5000 and create new project.

Figure 59 - Create new project

2. Click on Logix tab.
3. Select a PLC type, and type a name for the project in the name field.
4. Click next.

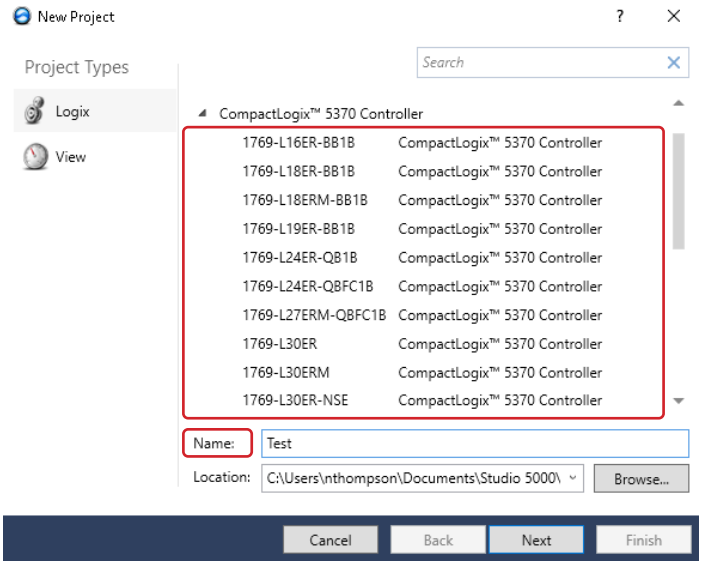


Figure 60 - Select PLC type and name new project

5. Click finish. New instance of Logix designer will be opened.

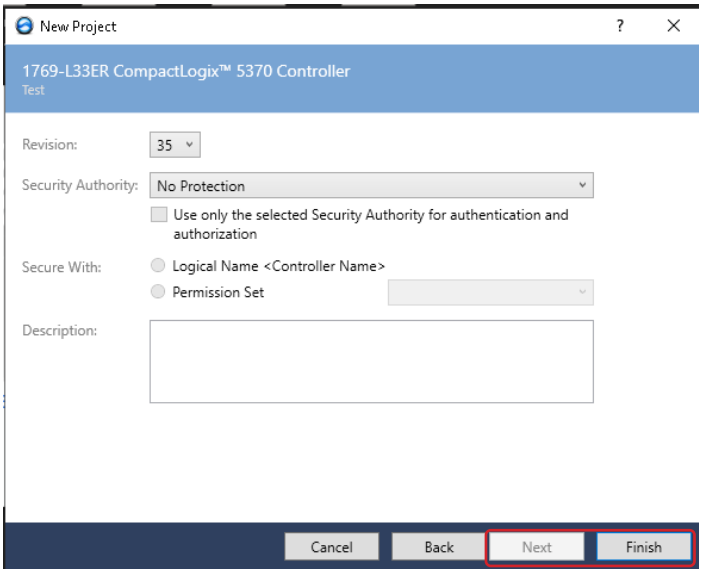


Figure 61 - New project configuration

6. Choose select path button.

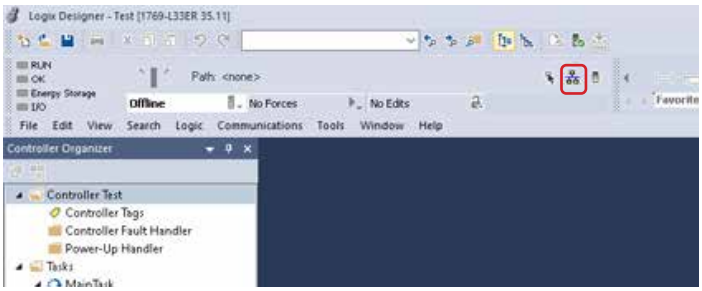


Figure 62 - Select path

7. Select your controller.

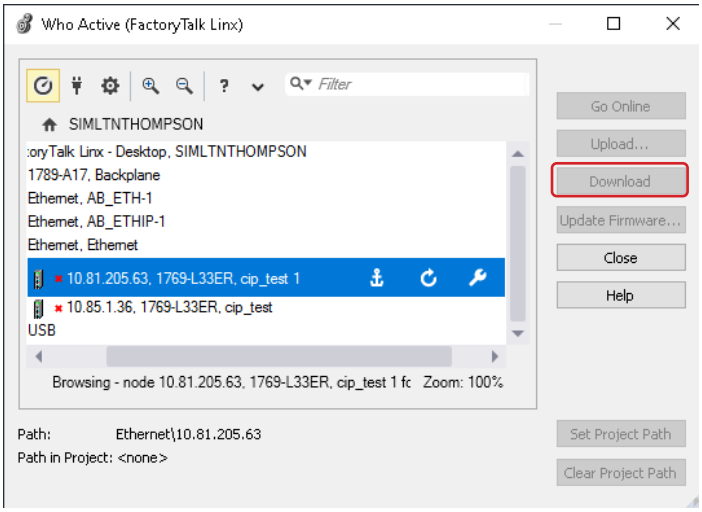


Figure 63 - Select controller

8. Click download.

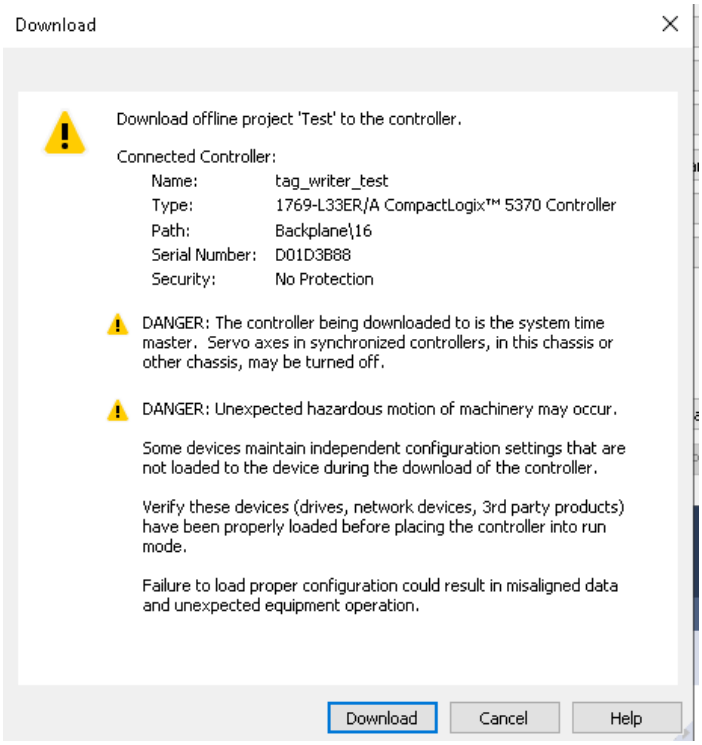


Figure 64 - Download controller

9. After download is complete, the controller mode can be changed back to remote run. Click yes.

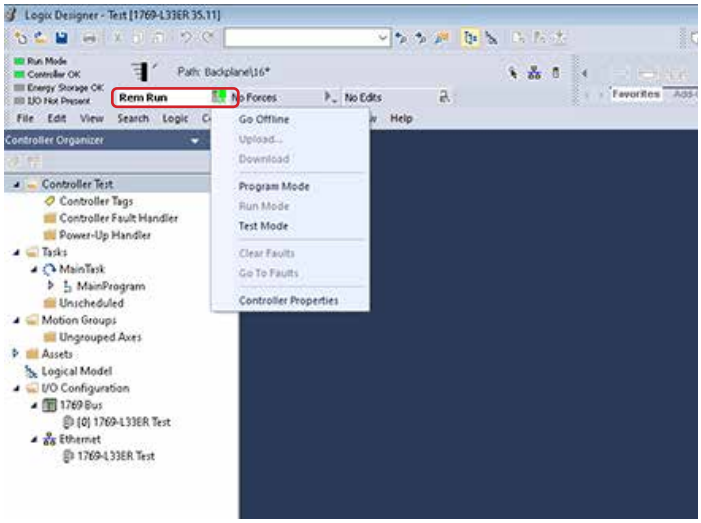


Figure 65 - Setting remote run

10. When everything is ready, Logix designer shows "rem run" in the marked box.

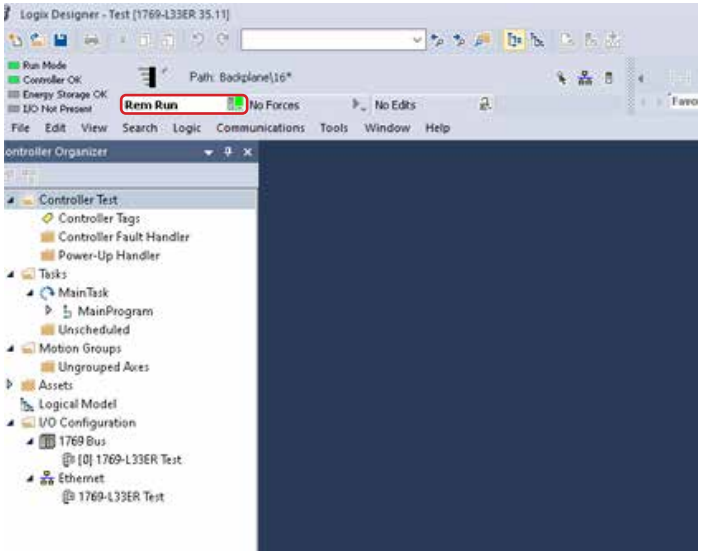


Figure 66 - Remote run confirmation

5.3.3 Create new module

1. Click go offline.

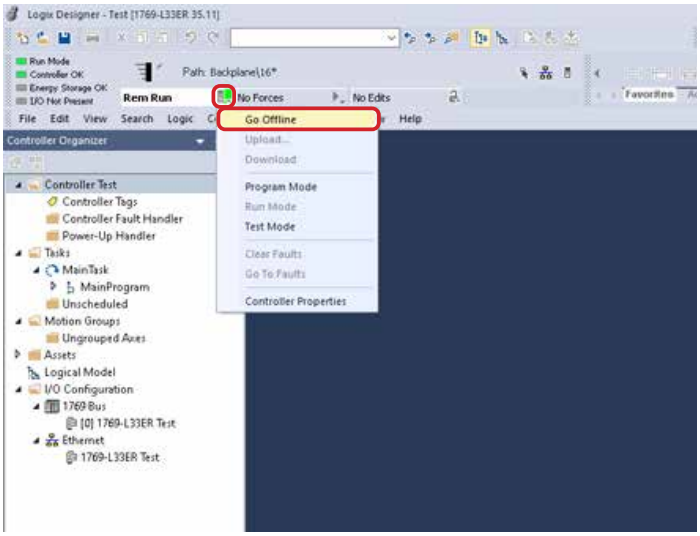


Figure 67 - Go offline

2. Right-click on Ethernet and choose new module.

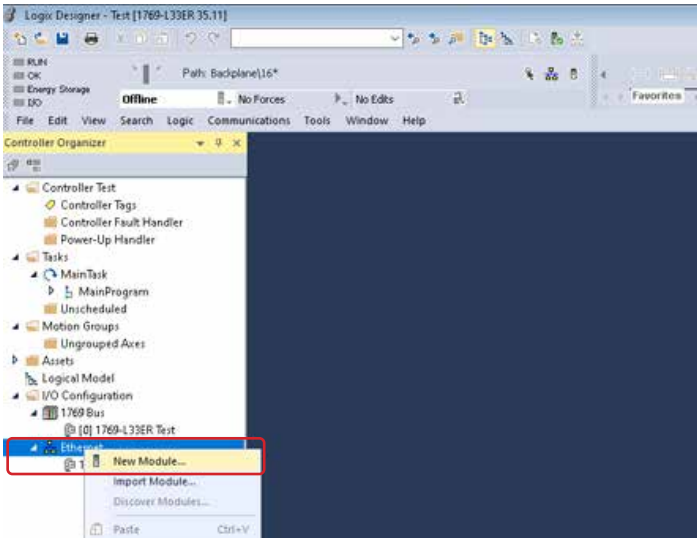


Figure 68 - New module

3. Find generic Ethernet module on the list.
4. Select generic Ethernet module and click create.

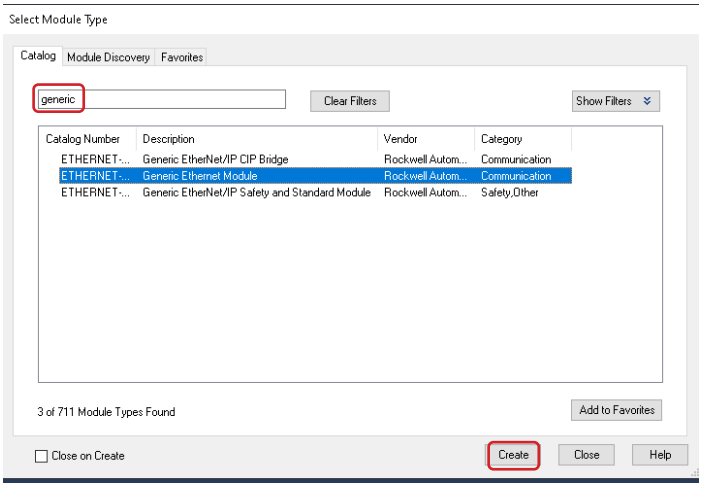


Figure 69 - Select generic Ethernet module

5. Input the following data.

Parameter Name	Value
Name	Cassia
IP Address	192.162.0.40 [1]
Comm	Data - DINT
Input (Assembly Instance)	100
Input (Size)	120 [2]
Output (Assembly Instance)	150
Output (Size)	1
Configuration (Assembly Instance)	151
Configuration (Size)	4

[1] - Assigned IP address during local network configuration
[2] - Reserved locations for six parameters for 20 sensors

6. Click OK.

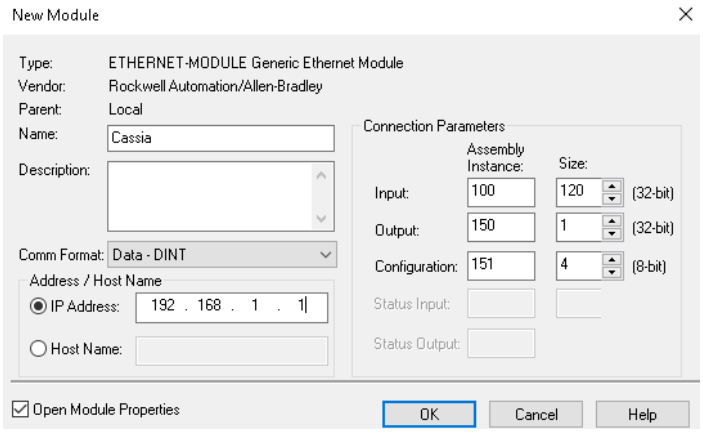


Figure 70 - General module settings

7. Change requested packet interval to 200 ms and click OK.

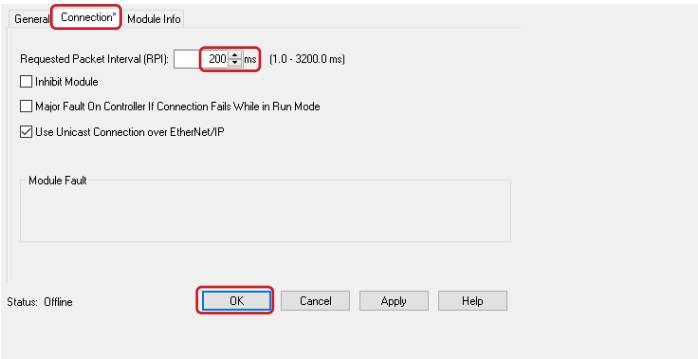


Figure 71 - Requested packet interval

5.3.4 Inputs and outputs data

1. Double-click on the controller tags in the controller organizer.

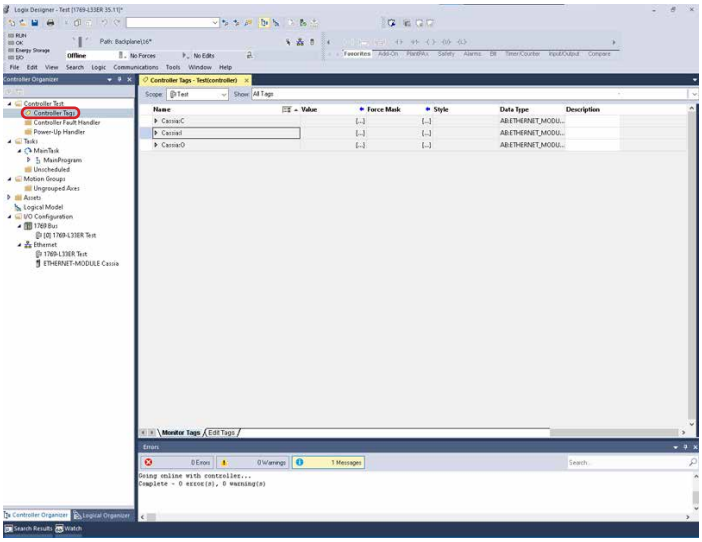


Figure 72 - CIP tags

2. Expand Cassia:I.Data.

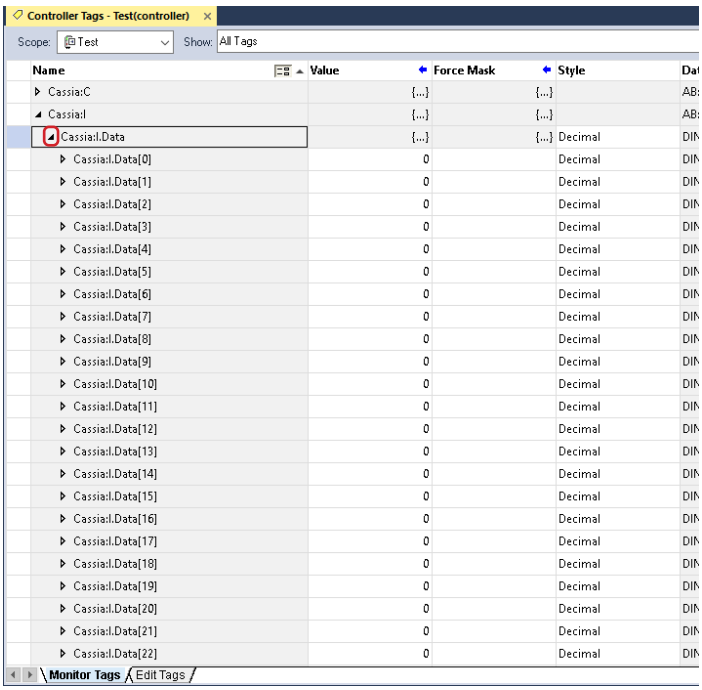


Figure 73 - Expanded CIP tags

3. Click go online.

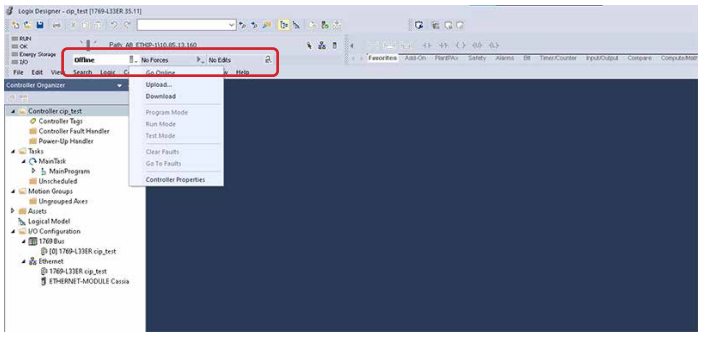


Figure 74 - Go online

4. Download the project into the controller.

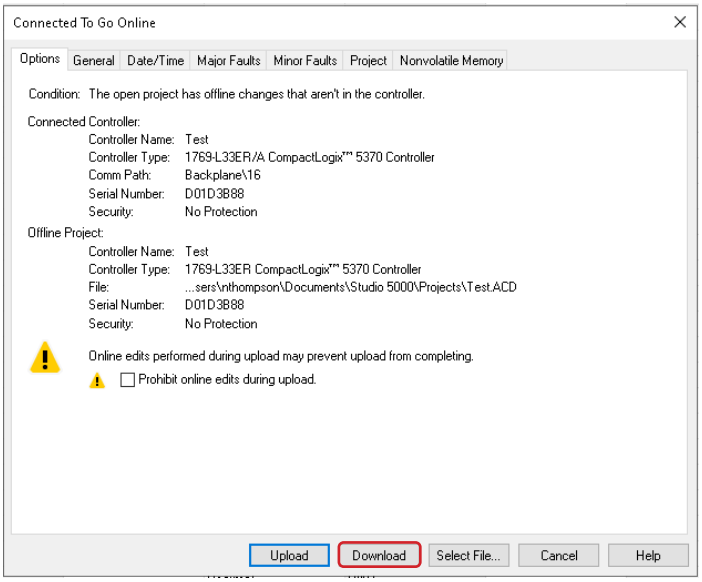


Figure 75 - Download project

5. Each tag value corresponds to each parameter position shown in sensor details, measurement tab of the EtherNet/IP page.

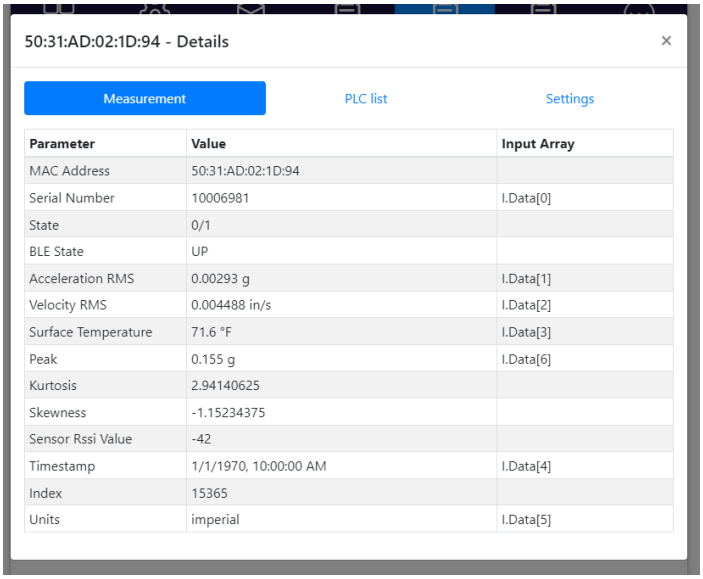


Figure 76 - Measurement tab

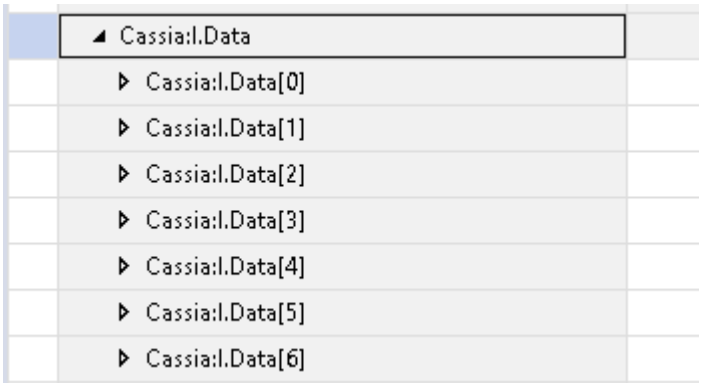


Figure 77 - Tag list

5.3.5 Converting data

1. Right-click on tasks/mainprogram and choose add new routine.

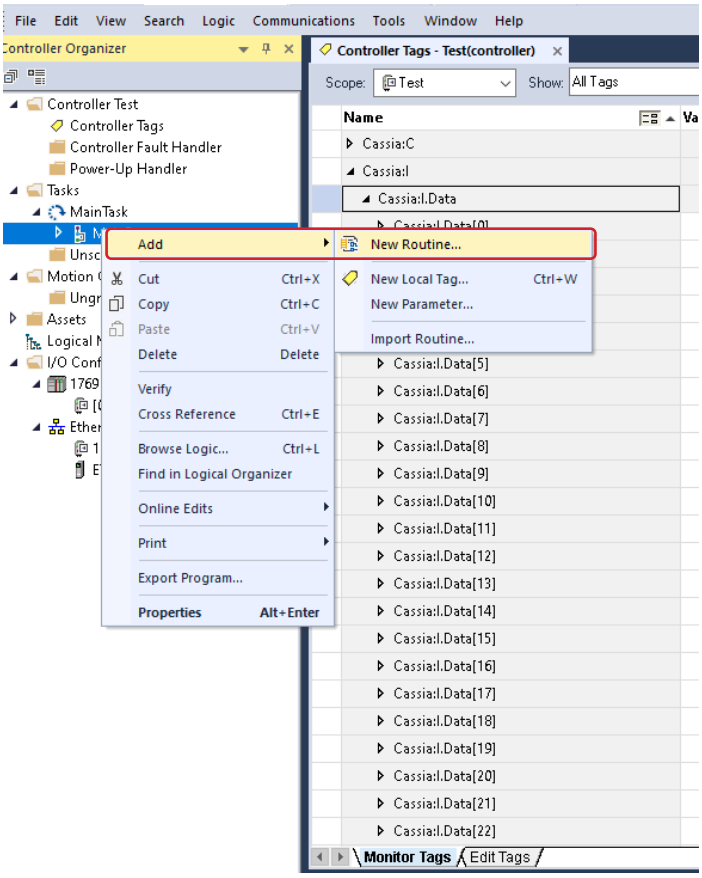


Figure 78 - Add new routine

2. Type "Conversion" in the name field. Select structured text from the type field drop-down menu.

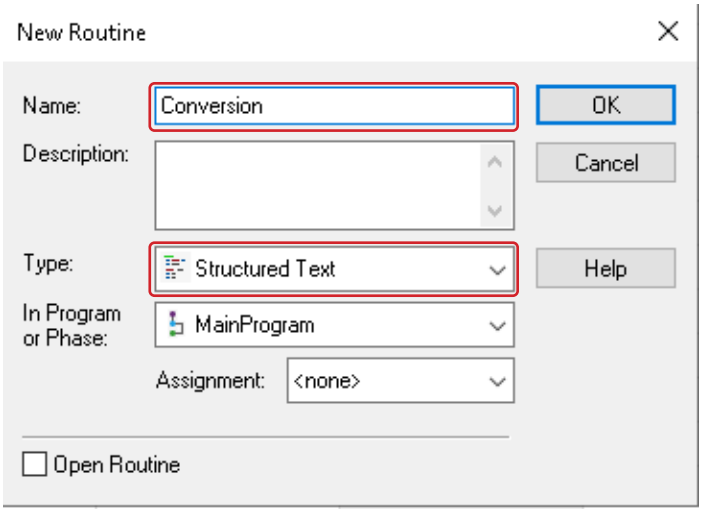


Figure 79 - New routine settings

3. Navigate back to controller tags. Go offline to create the following tags:

Name	Data Type
vel_rms_divider	DINT
acc_rms_divider	DINT
skin_temp_divider	DINT
sensor1_serial_number	DINT
sensor1_acc_rms	REAL
sensor1_vel_rms	REAL
sensor1_acc_peak	REAL
sensor1_skin_temp	REAL
sensor1_units	BOOL
sensor1_time	DINT

4. Go offline to change data type.

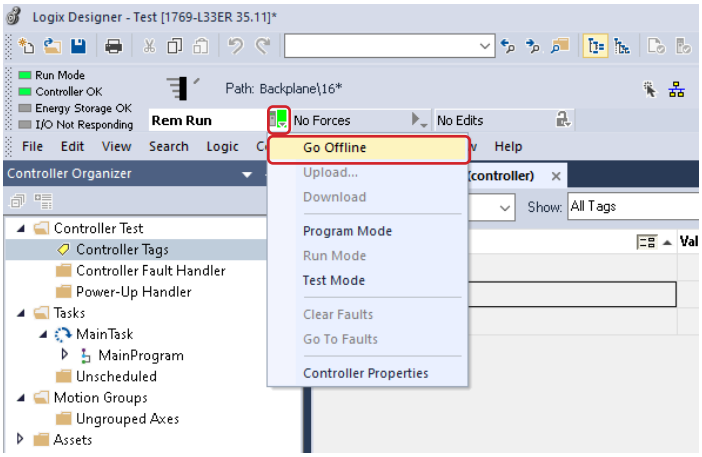


Figure 80 - Go offline

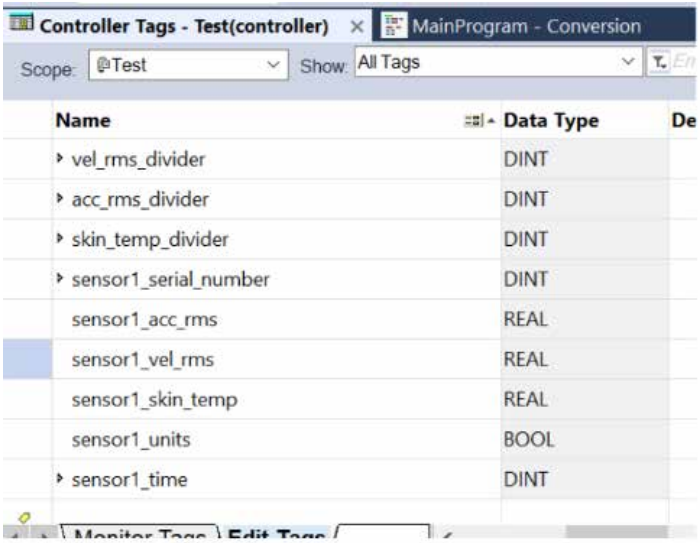


Figure 81 - Controller tags

5. Double-click main program.
6. Go to the configuration tab and select conversion for main and <none> for fault from the corresponding drop-down menus.

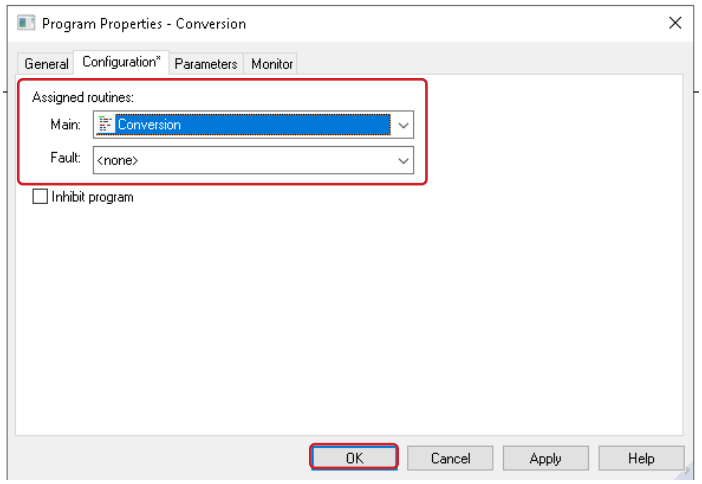


Figure 82 - Main program configuration

7. Click OK.
8. Go to conversion and paste the following text into the conversion routine:

```
vel_rms_divider := 1000;
acc_peak_divider := 1000;
acc_rms_divider := 2048;
skin_temp_divider := 10; sensor1_serial_number := cassia:I.Data[0];
sensor1_acc_rms := cassia:I.Data[1]/acc_rms_divider;
sensor1_vel_rms := cassia:I.Data[2]/vel_rms_divider;
sensor1_skin_temp := cassia:I.Data[3]/skin_temp_ divider;
sensor1_time := Cassia:I.Data[4];
sensor1_units := cassia:I.Data[5].0;
```

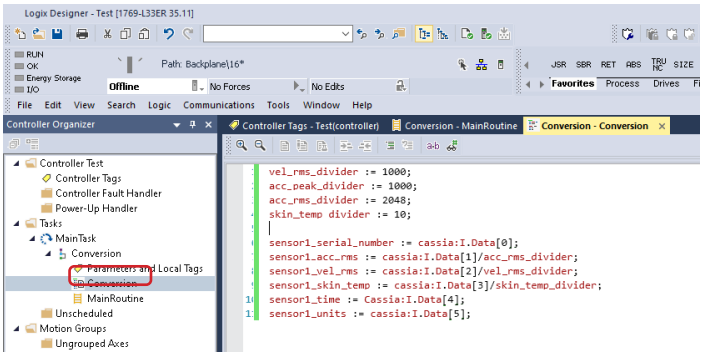


Figure 83 - Structured text conversion

9. Click save.

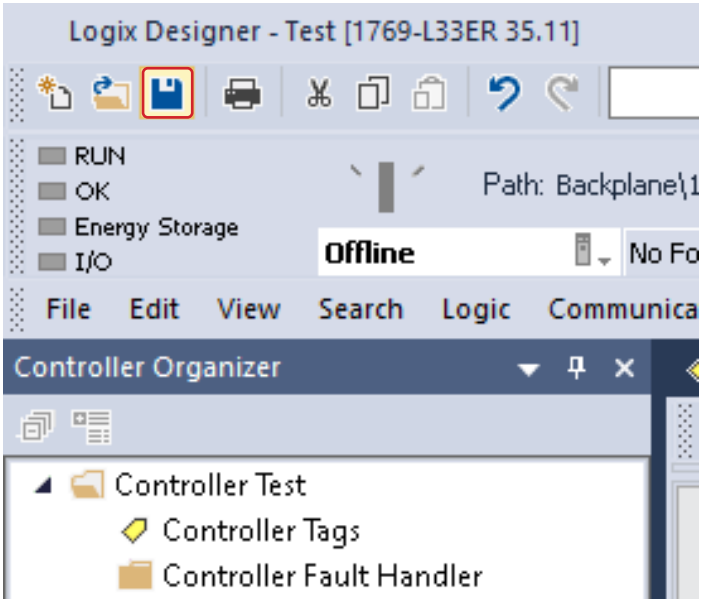


Figure 84 - Save

10. Go online and download program to PLC.

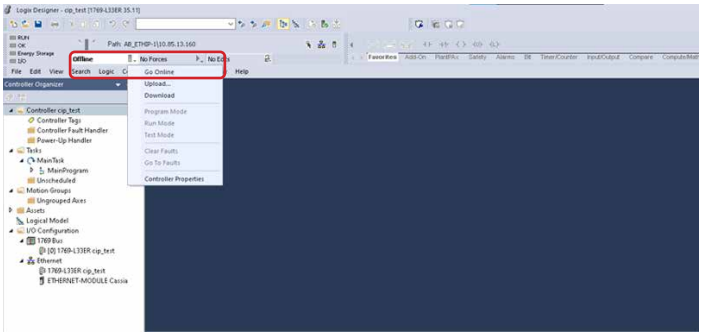


Figure 85 - Go online

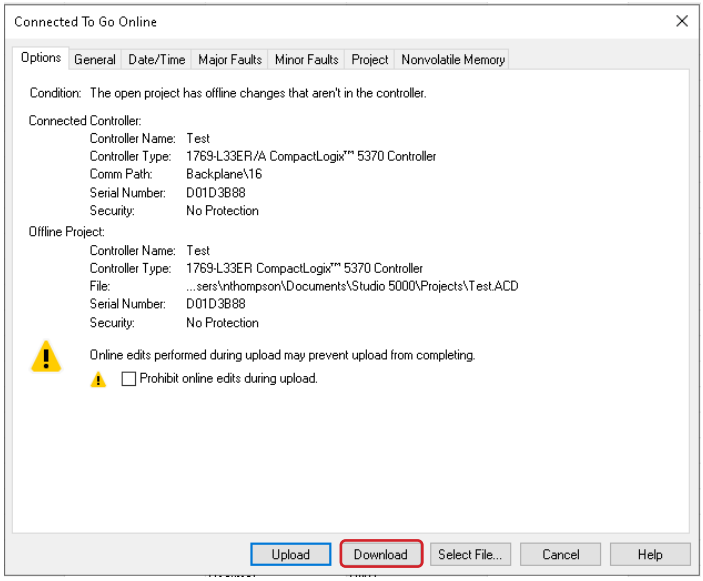


Figure 86 - Download program

11. Go to monitor tags tab and observe the converted values.
    - Acc_rms is in [g] rms unit
    - Vel_rms is in in [/s] or[mm/s]
    - Skin_temp is in [°F] or [°C]
    - If units is 0 the system is [metric], if 1 the system is [imperial]
    - Time is the unix timestamp – number of seconds since January 1, 1970

vel_rms_divider	1000
acc_rms_divider	2048
acc_peak_divider	1000
skin_temp_divider	10
sensor1_serial_number	10019793
sensor1_acc_rms	0.001951
sensor1_vel_rms	0.0
sensor1_acc_peak	0.0012
sensor1_skin_temp	71.5
sensor1_units	0
sensor1_time	0

Figure 87 - Converted values

6 UPDATING GATEWAY FIRMWARE/APPLICATION

6.1 Update gateway firmware

From the top banner, click other tab.

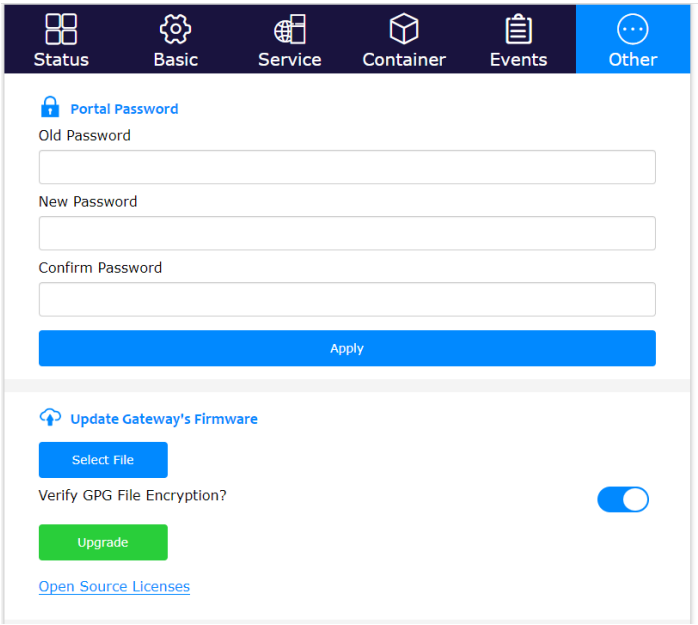


Figure 88 - Other tab

Scroll down to update gateway's firmware and click on select file.

NOTE: Contact Dodge technical support by phone at +1 864 284 5700 ext. 6 or by email at engineering@support.dodgeindustrial.com to obtain the latest firmware file.

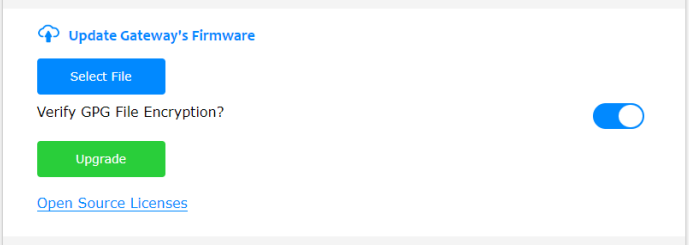


Figure 89 - Select file for upgrade

Locate the provided file on your PC to update the router's firmware and click open.

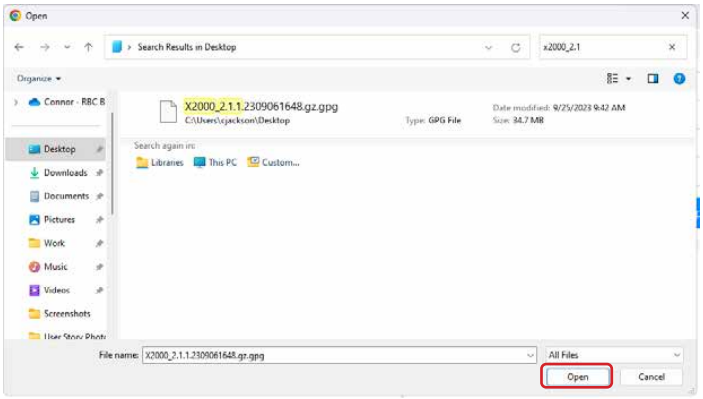


Figure 90 - Open firmware file

Click upgrade to start updating the router's firmware and wait until the process has completed.

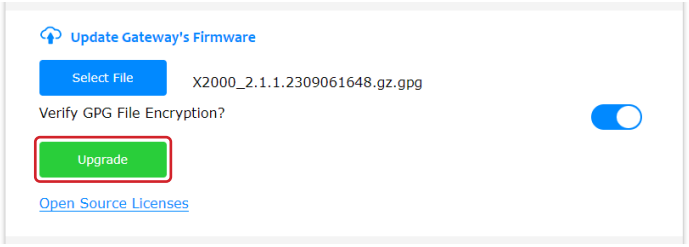


Figure 91 - Upgrade gateway firmware

6.2 Check port forwarding

Under the container tab, scroll down to the port forwarding configuration tab. Click on protocol, select TCP. In port dialogue, enter "61210" then apply. This is used to forward OPC-UA data to a different OPC-UA client.

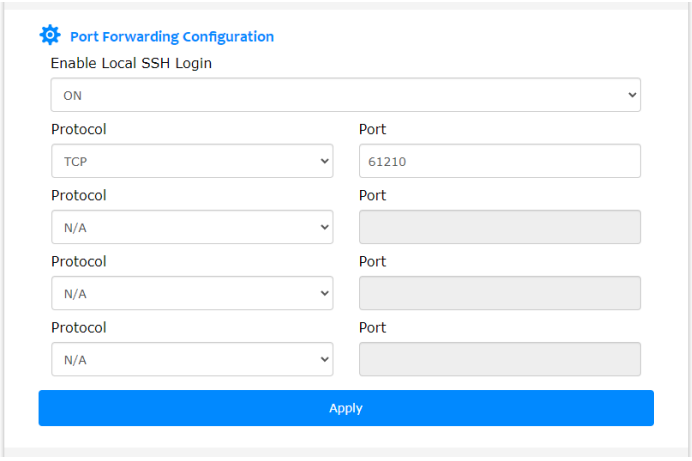


Figure 92 - Port forwarding configuration

6.3 Update gateway application

NOTE: To download the newest X2000 – On-Premise Gateway application file, visit the link below. The application file will be under software in the literature tab.

https://dodge.ptplace.com/productDetail/_pn=749923

From the top banner, select either the OPC-UA or EtherNet/IP tab.

Click on options and export the configuration file (named "sensors.csv"). Save this file in an easily accessible location, as it will be used to reconfigure the gateway once the new application is installed.

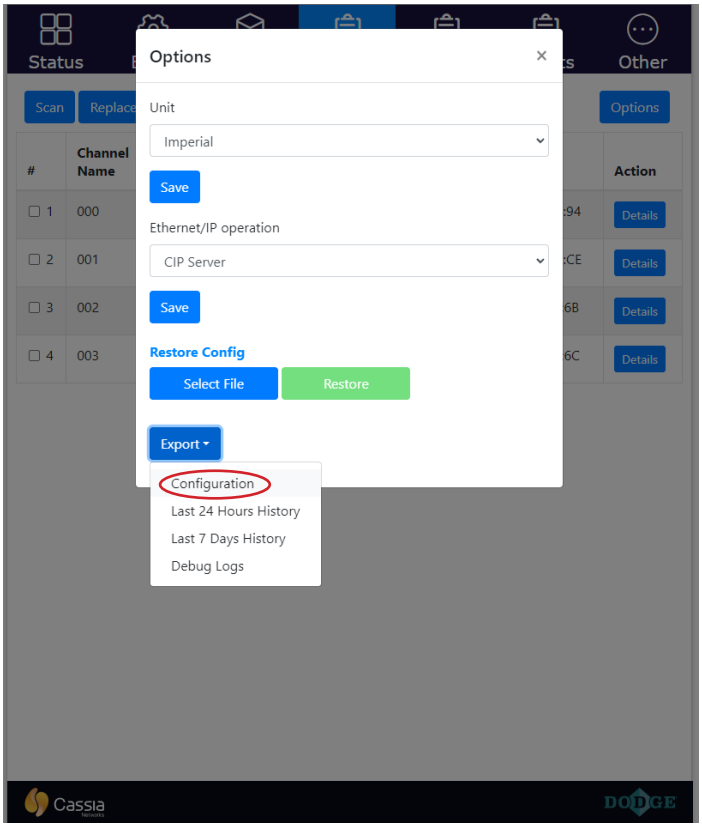


Figure 93 - Export sensor configuration

Navigate to the gateway container section and scroll to the bottom of the page. Click reset and provide confirmation in order to reset the gateway container.

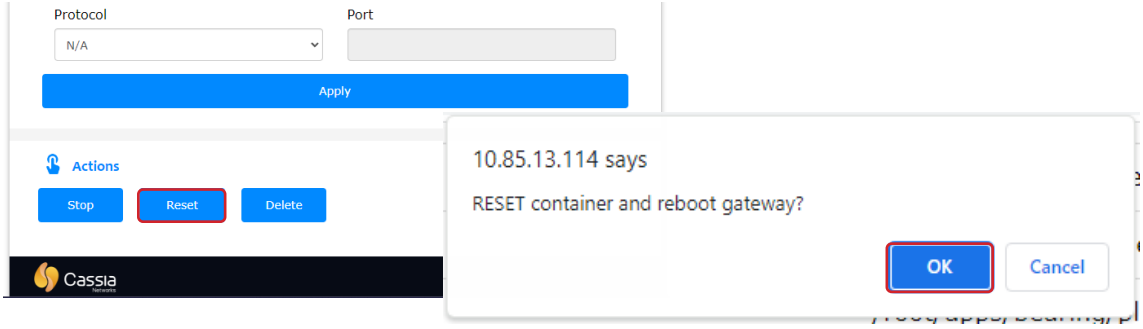


Figure 94 - Reset gateway container

Reconnect to the gateway and navigate back to the container page. There should no longer be any apps installed on the gateway. If there are any apps present, reset the container again. Wait for the container status to be running and not installing before continuing to the next step.

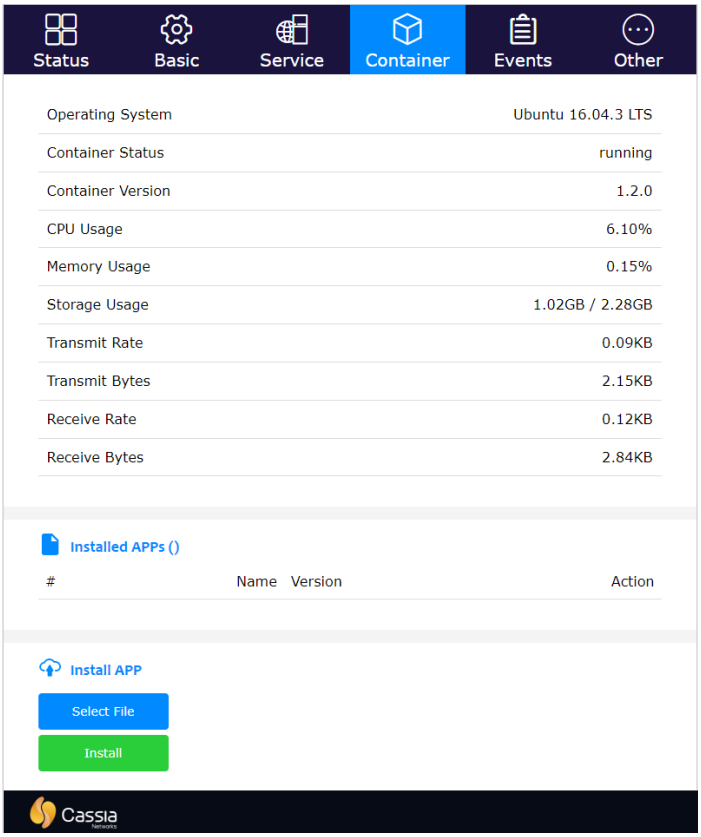


Figure 95 - Empty container

On the container page, find the "Install APP" section. Click on the select file button.

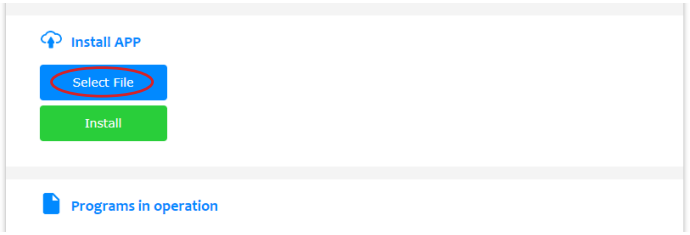


Figure 96 - Install APP

Locate the application file that was previously downloaded and select open.

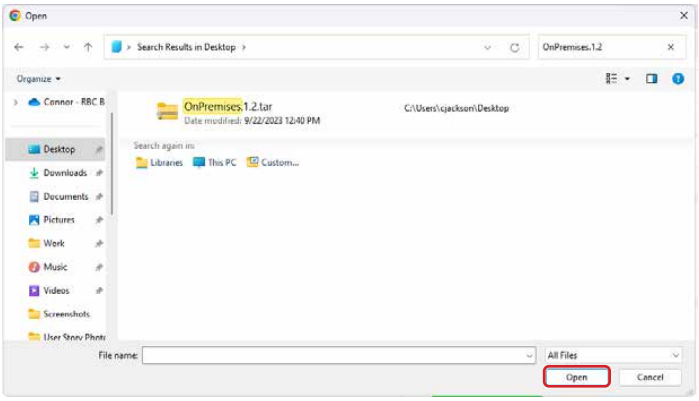


Figure 97 - Open application file

Click install to start installing the application. Wait until the process is complete.

Figure 98 - Install application

Once the installation is complete, navigate to the gateway other page and scroll to the actions section. Reboot the gateway.

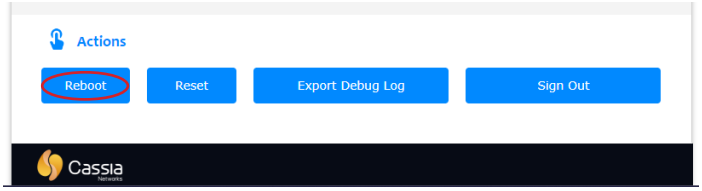


Figure 99 - Reboot the gateway

When the gateway has finished rebooting, reconnect and navigate to the container section. The new application with an updated version number should display in the installed APPs section, as shown below.

Figure 100 - New application version

After installing the new application, it is necessary to reconfigure the sensor settings. Go to the options section of either the OPC-UA or EtherNet/IP section.

1. Click select file.

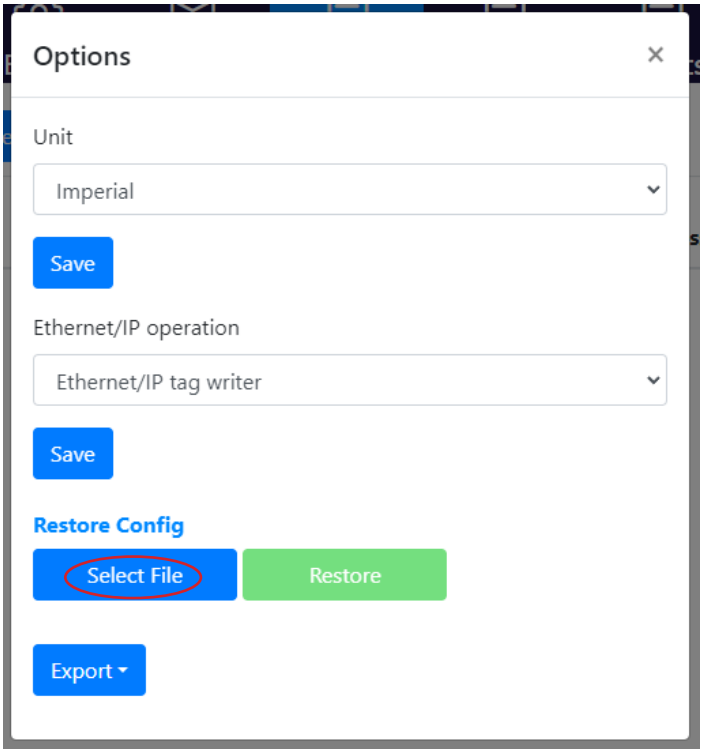


Figure 101 - Select sensor configuration to restore

2. Locate the exported configuration file (sensors.csv) and click open.

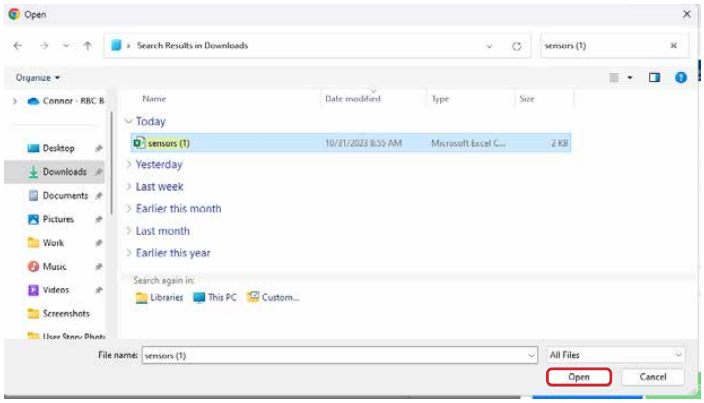


Figure 102 - Open sensor configuration

3. Click restore.

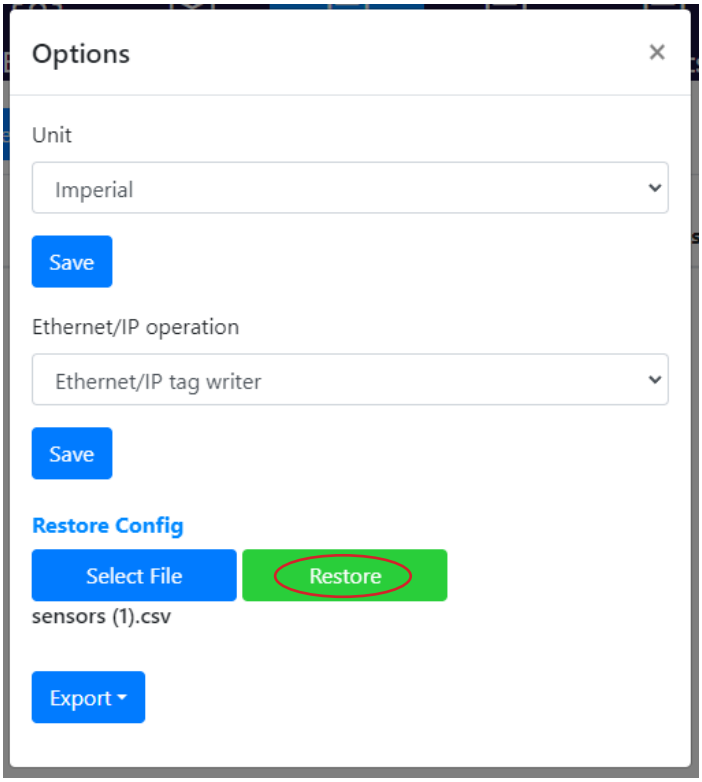


Figure 103 - Restore file

7 KNOWLEDGE BASE

- **How many EtherNet/IP devices and OPC-UA sessions can connect to a X2000 Gateway – On-Premise?**
  Each gateway functions as a server and can accept up to five EtherNet/IP devices and 10 OPC-UA sessions.
- **How many OPTIFY sensors can be processed by a X2000 Gateway – On-Premise?**
  Each X2000 Gateway On-Premise can support up to 20 sensors.
- **What protocol and service port does a X2000 Gateway – On-Premise support?**
  The gateway supports CIP protocol, using the industry standard UDP/TCP port: 44818.
- **What KPIs from the sensor does the gateway transmit to connecting devices?**
  Surface temperature, velocity and acceleration (RMS).
- **What does it mean when BLE state is UP or DOWN and what actions should be taken?**
  UP:
  Indicates that the sensor is within range of the gateway and it is working correctly.

  DOWN:
  - Several instances may cause the BLE state to change to “DOWN” and it is generally attributed to the following conditions:
    - Sensor is out of range.
    - Sensor battery is depleted.
    - Sensor stopped working unexpectedly.
  - Actions:
    - Make sure the sensor is in range of the gateway. Use the refresh button on the OPC-UA or EtherNet/IP page.
    - If the status has not changed, press the button on the sensor to reset it. Remember, when the button is pressed, all settings on the sensor are set to default (measurement interval to 3600 seconds, accelerometer range to 2g and clock to 0 (1970 year)). Then use the refresh button on the OPC-UA or EtherNet/IP page.
    - If the status has not changed, replace the defective sensor with a new one. Refer to section 3.6 of this user guide.
- **What does it mean when OPC state is UP, DOWN, or CONFIG and what actions should be taken?**
  UP means that the sensor is currently connected with at least one OPC-UA Client.
  DOWN means that the sensor is not currently connected to any OPC-UA Clients.
  CONFIG indicates initial configuration and that the sensor has not yet been connected to any OPC-UA Client. For instructions on how to connect to OPC-UA Client, please refer to section 4.2 of this user guide.
- **What does it mean when PLC state is 0/0, 0/1, 1/1, DOWN or UP and what actions should be taken?**
  0/0, 0/1, and 1/1 refer only to EtherNet/IP tag writer operation.
  - 0/0 indicates initial configuration. For more information on how to assign PLC Controller to a sensor, please refer to section 3.5 of this user guide.
  - 0/1 indicates that the sensor has been configured with one PLC controller and it is not connected to any PLC controller.
  - 1/1 indicates that the sensor has been configured with one PLC controller and it is connected to one PLC controller.

  DOWN and UP refer only to CIP Server operation.
  - DOWN indicates that the sensor is not connected to the PLC controller. For more information on how to assign PLC Controller to a sensor, please refer to section 3.5 of this user guide.
  - UP indicates that the sensor is connected to the PLC controller.

8 GLOSSARY

- **EtherNet/IP** (IP = Industrial Protocol) uses the Ethernet infrastructure to manage the connection between various automation devices such as robots, PLCs, sensors, CNCs, and other industrial machines. It is managed by the Open DeviceNet Vendors Association (ODVA).
- **OPC-UA** stands for Open Platform Communications Unified Architecture and is a data exchange standard for industrial communication (machine-to-machine or PC-to-machine communication). This open interface standard is independent of the manufacturer or system supplier of the application, of the programming language in which the respective software was programmed, and of the operating system on which the application is running.
- **PLC** stands for Programmable Logic Controller and is a ruggedized computer used for industrial automation. These controllers can automate a specific process, machine function, or an entire production line.
- **BLE** stands for Bluetooth Low Energy, which is a variation of Bluetooth wireless standard designed for low power consumption.

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Dodge Industrial, Inc.
1061 Holland Road
Simpsonville, SC 29681
+1 864 297 4800

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