Surface Box with Touch Display

DataCan User Manual – V1.1

www.datacan.ca

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1 About This Guide

This document is intended as a supplement to formal training. DataCan is constantly working to improve its products. We must therefore reserve the right to change designs, materials, specifications and prices without notice. DataCan declines any liability that may arise out of the potential inaccuracies in this guide.

This guide assumes that you have some computing and tool knowledge. For more information, contact your local service representative.

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We thank you for any feedback or comments that will help us to continue to improve our products and service.

2 Introduction

DataCan Services Corp. provides technology driven downhole measurement solutions that deliver productivity, quality and safety. We design, manufacture and service 200°C plus hybrid platform instruments, patent pending multi-cycle instant close shut-in tools, reservoir management systems and a suite of quartz and piezo-resistive pressure measurement instruments. We offer specialized solutions that will help you improve productivity in your applications.

We are the leader in ultra-high temperature circuit design, manufacturing and packaging.

- Our part selection process ensures the best long term reliability is provided.
- Our fully automated surface mount assembly procedures ensure the highest quality circuit is constructed every time with minimal heat impact.
- Our Hybrid design and construction techniques will enable DataCan and its customers to reliably enter the 177ºC to 225ºC market.
- Our metal to metal seal and fully welded designs prevent potential leaks.

This manual is supplemented by a number of other manuals depending on the elements of your system:

- DataCan Download Software User Manual – for all features of the software and graphing.
- Surface Transmitter Manual
- Multi-Gauge Telemetry Card Manual
- Cablehead Installation Manual
- Permanent Gauge Installation Manual
- Multi-Gauge Surface Box Troubleshooting Guide

To answer questions not covered in the manual about a specific component of your system, please refer to the manual for that specific component.

3 Surface Box with Touch Display

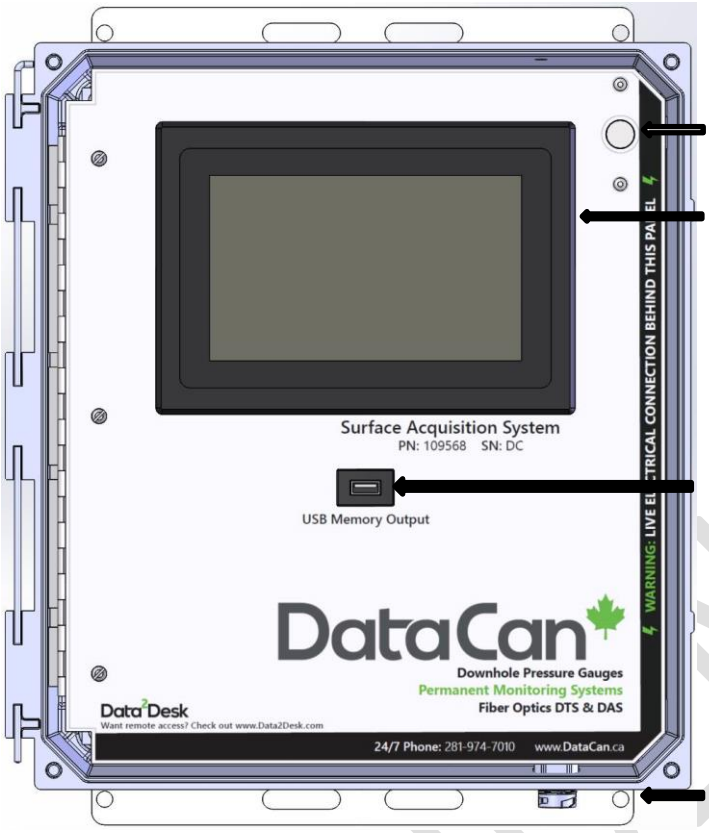
3.1 Product Description

A real time reservoir monitoring system for; progressive cavity pump, rod lift, gas lift, observation and injection wells. DataCan's Surface Box with Color Touchscreen is designed to display, record, and output the real-time data of multiple gauges. The gauges can be in a single well on a single wire (multi-gauge), or from multiple wells on a single pad (multi-well), or a combination of both. DataCan Piezo and Quartz sensors, Surface transmitters, RTD's, and Thermocouples can be connected. The box can output an RS-485, or ethernet. Additionally, DataCan can install a Data2Desk system with a remote Cellular or Satellite connection.

Benefits

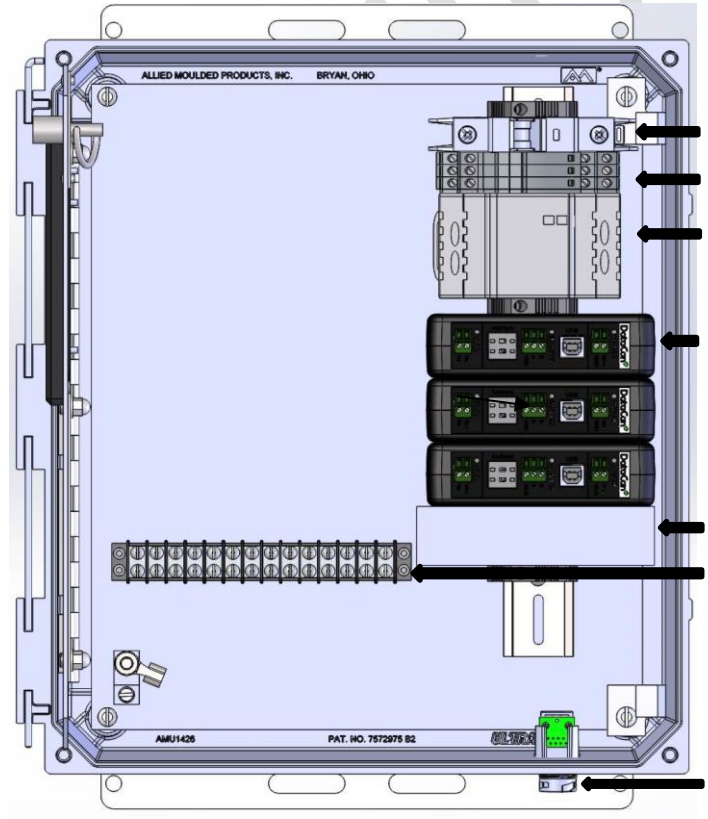
Having the touchscreen means you don't need to have a laptop to configure, program, set-up, download, or view your data. The design has low power requirements, and enough memory capacity to store one-second data from a single gauge for over 10 years.

Components



Front Panel (Closed)

1) Front Panel Knob
2) Touch Screen Display
3) USB Drive Socket
4) Mounting Plate



Box Internals (Open)

5) Circuit Breaker
6) Surge Protection Device (SPD)
7) Isolated Power Supply
8) Telemetry Card
9) Ethernet SPD
10) Screw Terminal Connections
11) IP67 Ethernet Connection

3.2 Product Specifications

Surface Box with Touch Display

Part No.	109568
Display	7" LCD, 840p x 480p
Memory Capacity	20 Million Samples
Output	RS-485 Modbus, Ethernet
Enclosure Rating	Nema 4X
Temperature Range	-20°C to 70°C
Enclosure Dimensions	11.6" x 13.9" x 7.3"
Power Input	12 – 24 VDC
Power Consumption	150 mA (Single Multi-Gauge Well) + 40 mA (Each Additional Well)
Transient Protection	25 kA 8/20 us on Tool Line
	50 kA 8/20 us on Power Line
	UL 1449 600 V, UL 96A compliant

Part No.	107976
VFD Interface	RS-485 2 Wire (Modbus RTU Protocol)

4 Commissioning

Proper installation of DataCan products ensures high quality performance and long-lasting results. The following section highlights the steps required to properly configure devices to the Surface Box.

4.1 Tools Required

Description	Part No.
USB Download Cable	100682
#2 Phillips Head Screwdriver or Flat Head Screwdriver	N/A
Wire stripper	N/A
Adjustable wrench (for installing cable glands on box)	N/A
Windows laptop with DataCan Download Software Installed	N/A

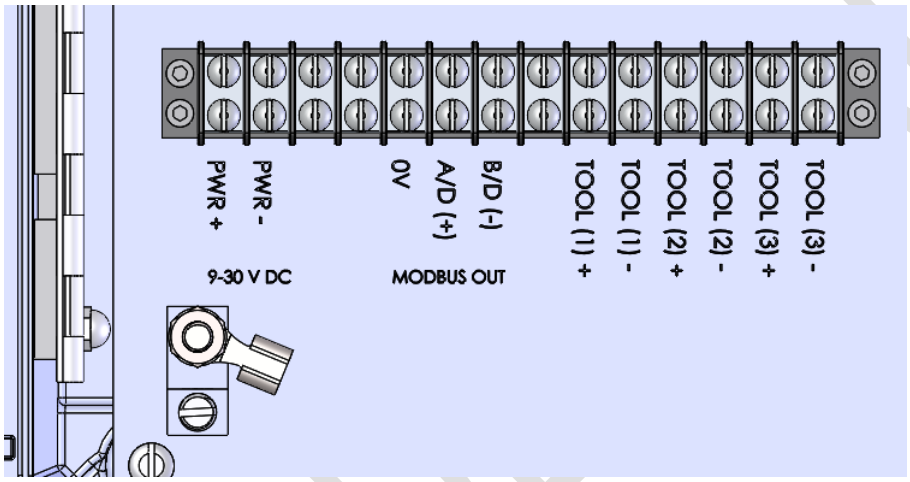
4.2 Instructions

4.2.1 Wiring

WARNING: Power should be disconnected or the circuit breaker in the OFF position before any electrical connections are made or broken.

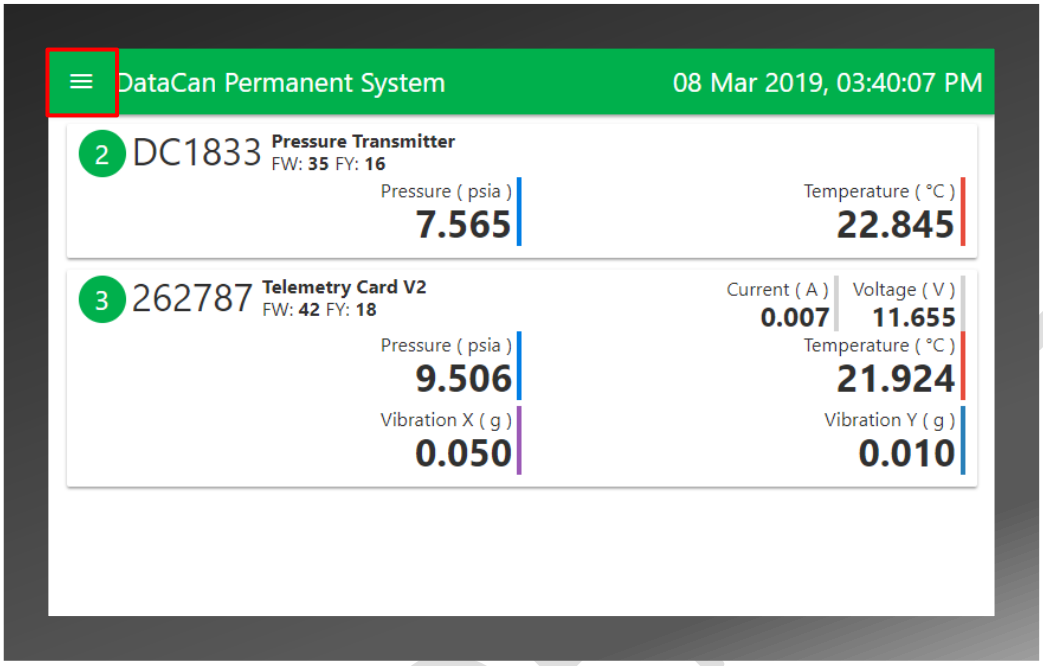
1. If using cable glands to enter the box, prep wires with up to 30 cm of wire past the cable gland. If your system is logging on multiple telemetry cards, be sure to keep track of the serial number of the downhole tools connected to each line.
2. Open the clear faceplate of the surface box and then use the front panel knob to expose the internal of the box.
3. Switch the circuit breaker to the OFF position

4. Connect wires to the screw terminals as per the markings. An example is shown below. If a tool channel is marked with a serial number, then it is set up to log the downhole gauge with that serial number. **TOOL +** is to be connected to the line that connects to **TOOL LINE IN** on the wellhead junction box or the center pin of the tool. **TOOL –** is connected to **GND** of the junction box or the housing of the tool.

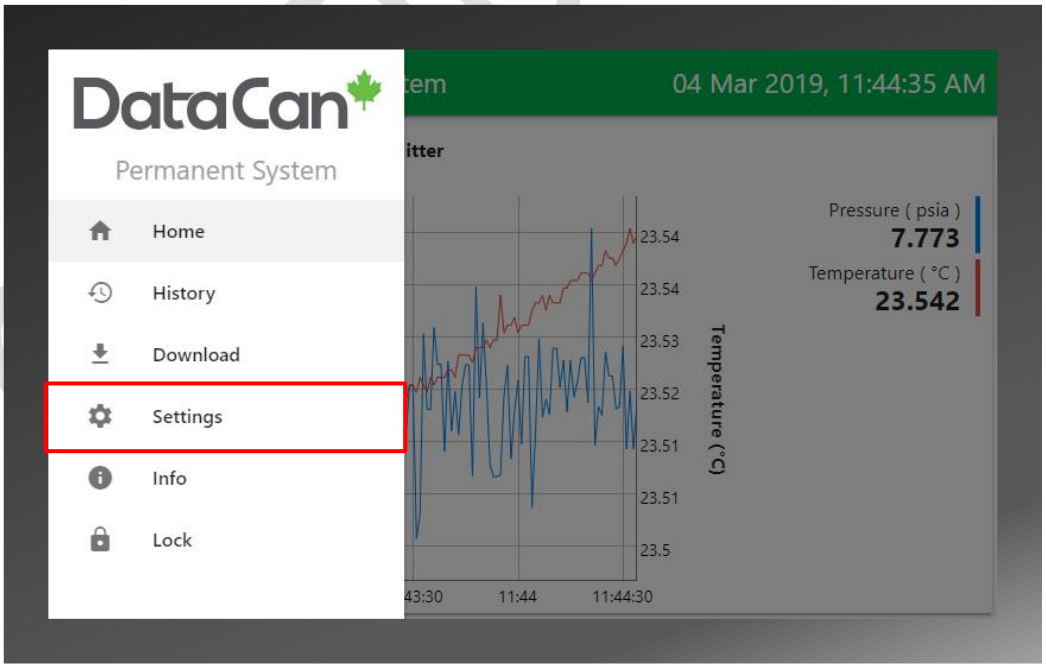


4.2.2 Adding a Device

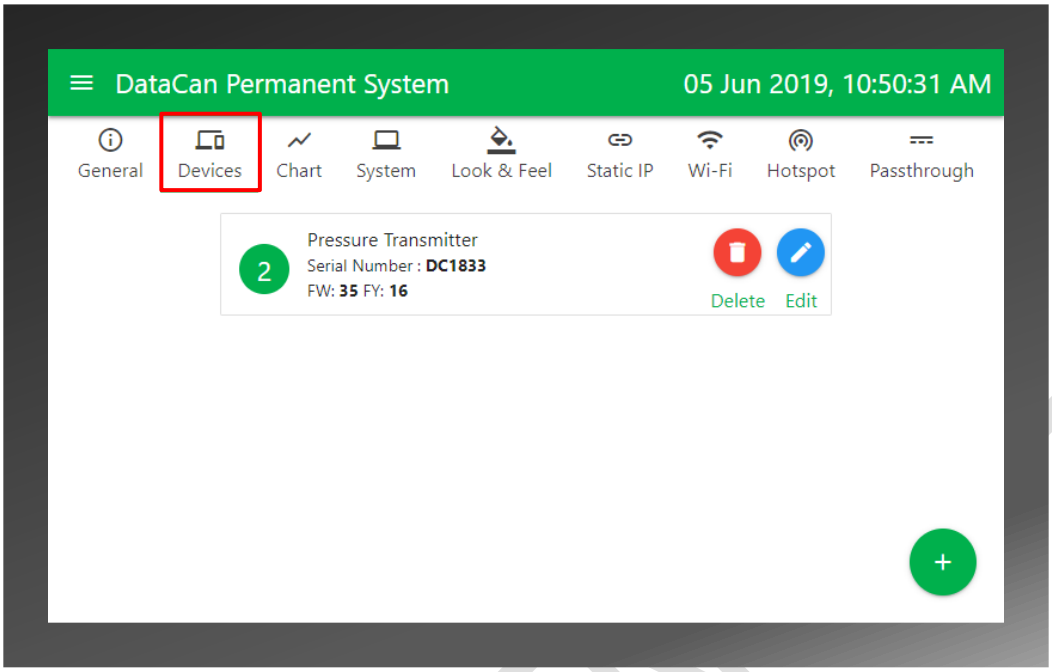
1. From the Home Page screen, click on the Menu bar.



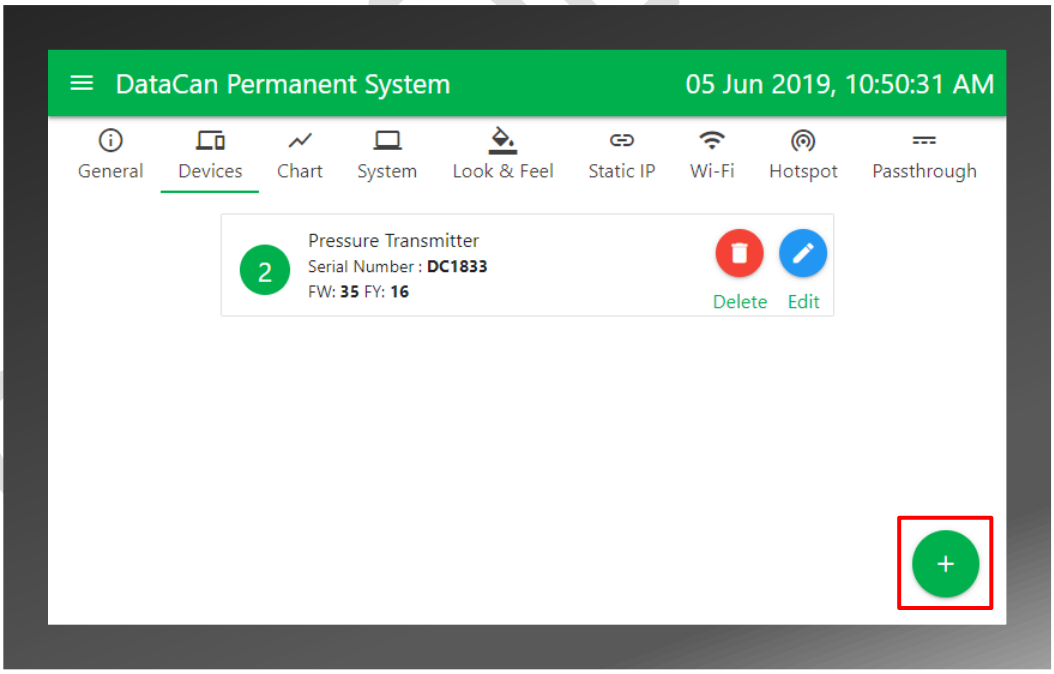
2. Click on the **Settings** menu item.



3. From the Settings main page, click on the **Devices** tab.

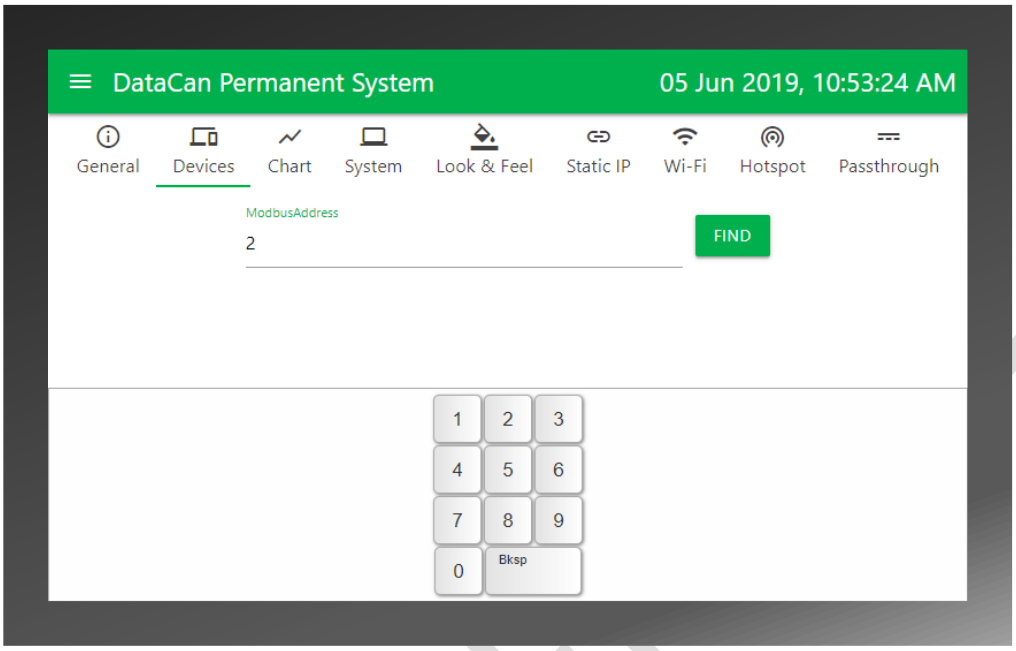


4. On the bottom right corner, tap on the **+** button.

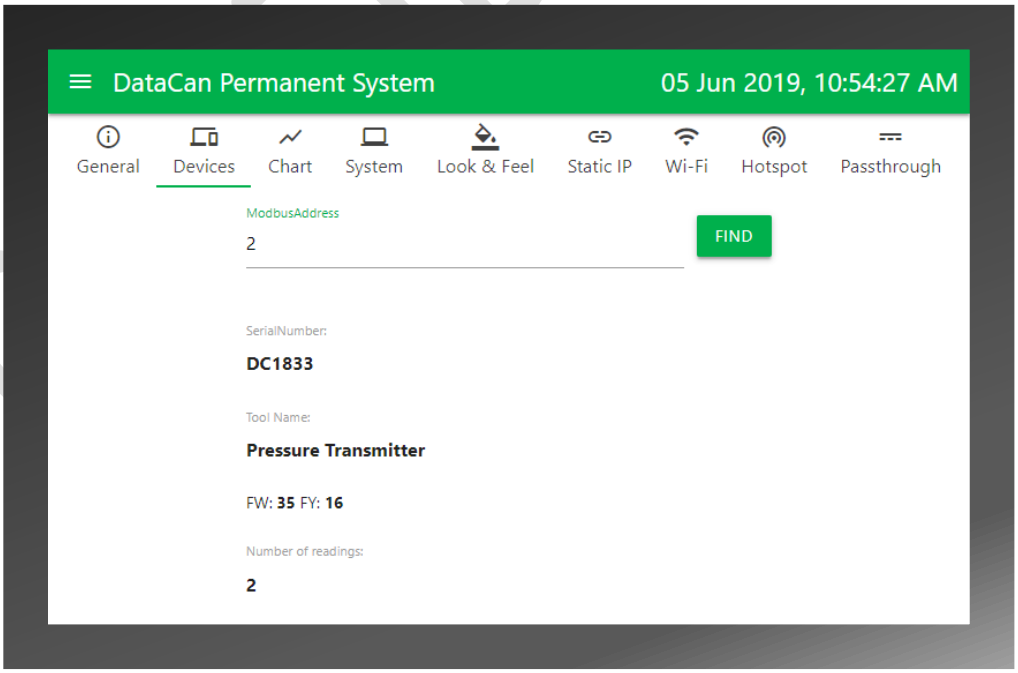


5. Specify the Modbus Address using the touch pad and then press the **FIND** button.

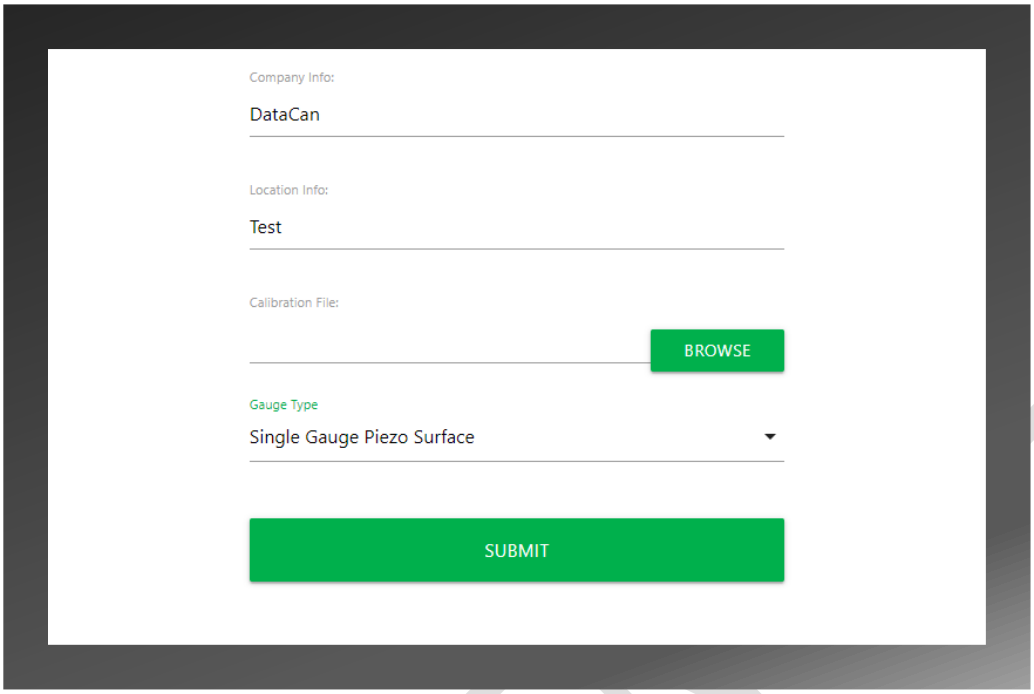
   Note: This action pauses the logging and finds the device on the Modbus network.



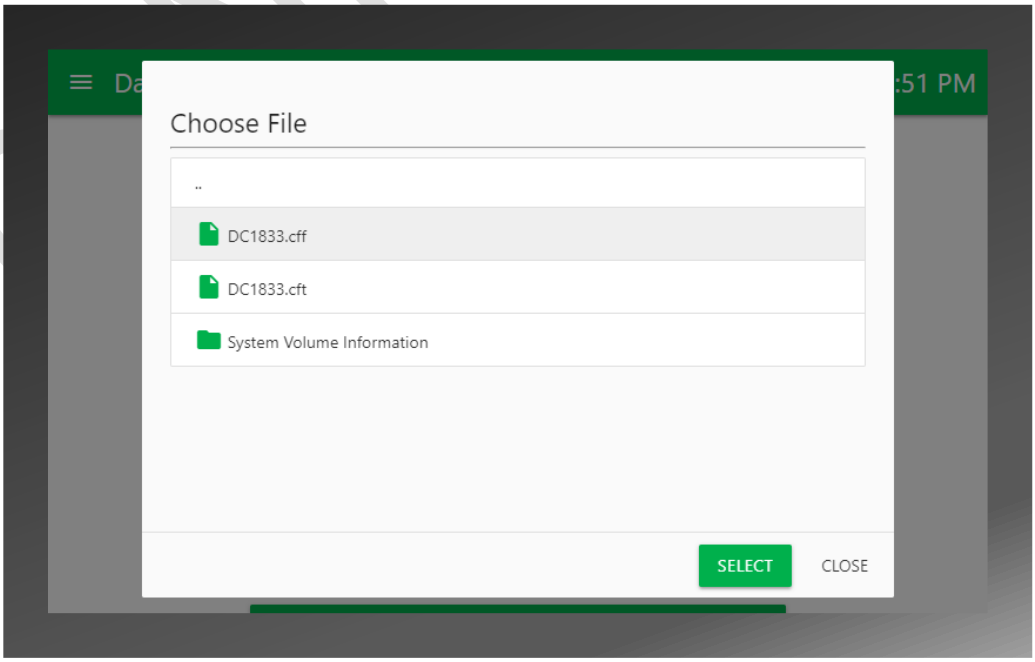
If there is a physical device connected on that address, the page will show the device information as shown below.



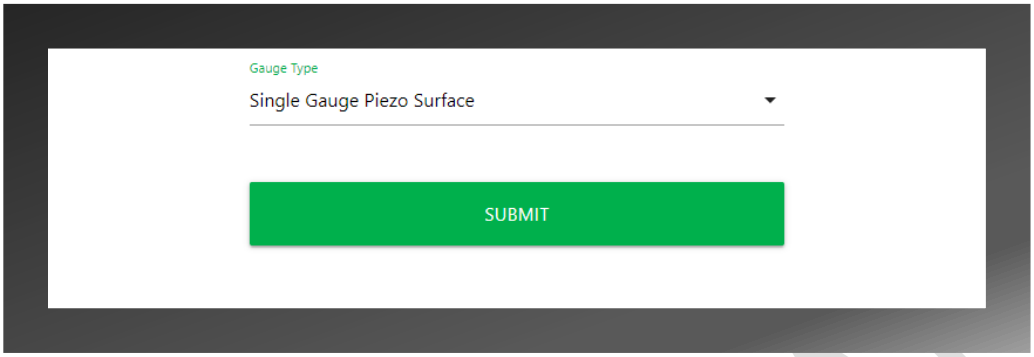
6. Set up company name and location information for the device found if needed.



7. Optional: Change Calibration if the tool needs a firmware upgrade.
    a. Plug in a USB drive with calibration files in it.
    b. Under the "Calibration File" field, press the **BROWSE** button to view the calibration files from the USB drive.
    c. Choose the [Serial Number of Device].cff (Example: DC1833.cff)
    d. Press **SELECT** button to select the file.



8. Select appropriate Gauge Type under the Gauge Type field.

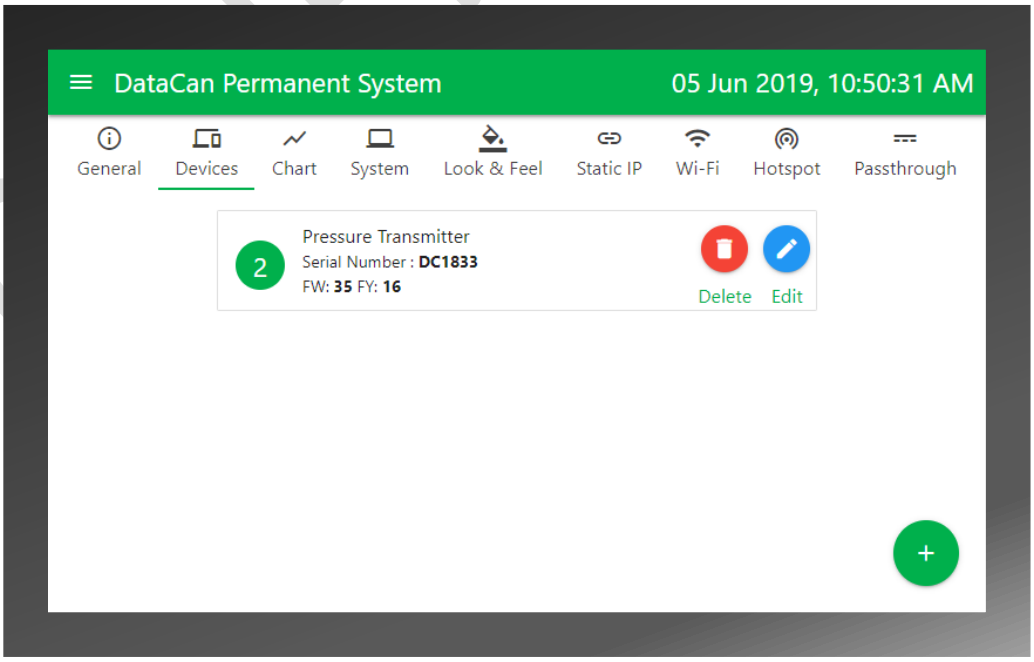


9. Press the **SUBMIT** button to add the device.

   Note: This action stops logging, adds the tool to the system, and restarts logging.

General Notes:

- For Multi-Gauge Telemetry Cards, the calibration and gauge type fields appear, but will not be applied to the device. Multi-Gauge cards must be configured by connecting them to a PC with the Datacan Download Software installed.
- Once added to the system, the devices list will update to display the new tool as shown below.



4.2.3 Confirming Connections

Once all the connections have been made, the circuit breaker can be switched to the ON position. Once powered up, the following indicators on the internal telemetry card can be viewed to confirm correct operation. The correct behaviour is highlighted in green.

Indicator	Behaviour	Meaning
Power Supply	Solid Blue	Power is on and adequate to power the system
	Off or Flickering	Connection to power source may not be secure or power source may not be able to source 36 Watts
Telemetry Card POWER (Orange)	Solid	Power is on and adequate to power telemetry card
	Fast or Erratic Blinking	Connection to power supply may not be secure.
Telemetry Card MODBUS (Green)	Flashing	The Telemetry card is responding to data requests from logger.
	Solid	The card has had an error; please power the card off and on.
Telemetry Cart Tool	Flashing (Blue)	Samples are being collected from a downhole gauge
	Flashing (Red)	Confirm that the correct tools are connected.
	Solid (Blue)	No tool connection fault—there is no current draw on the tool line. Check tool connection. (Note: this is only updated when the card attempts to talk with a gauge. If the sampling rate is set for a long interval, it can be a long time before this indicator responds.)
	Solid (Red)	Tool Power fault—this is most likely caused by a short circuit in the tool line. Check tool connections.
Surge Protection Devices	Blank	Surge protection devices are protecting the system
	Red	Surge protection device has been burnt-out and is no longer protecting the system

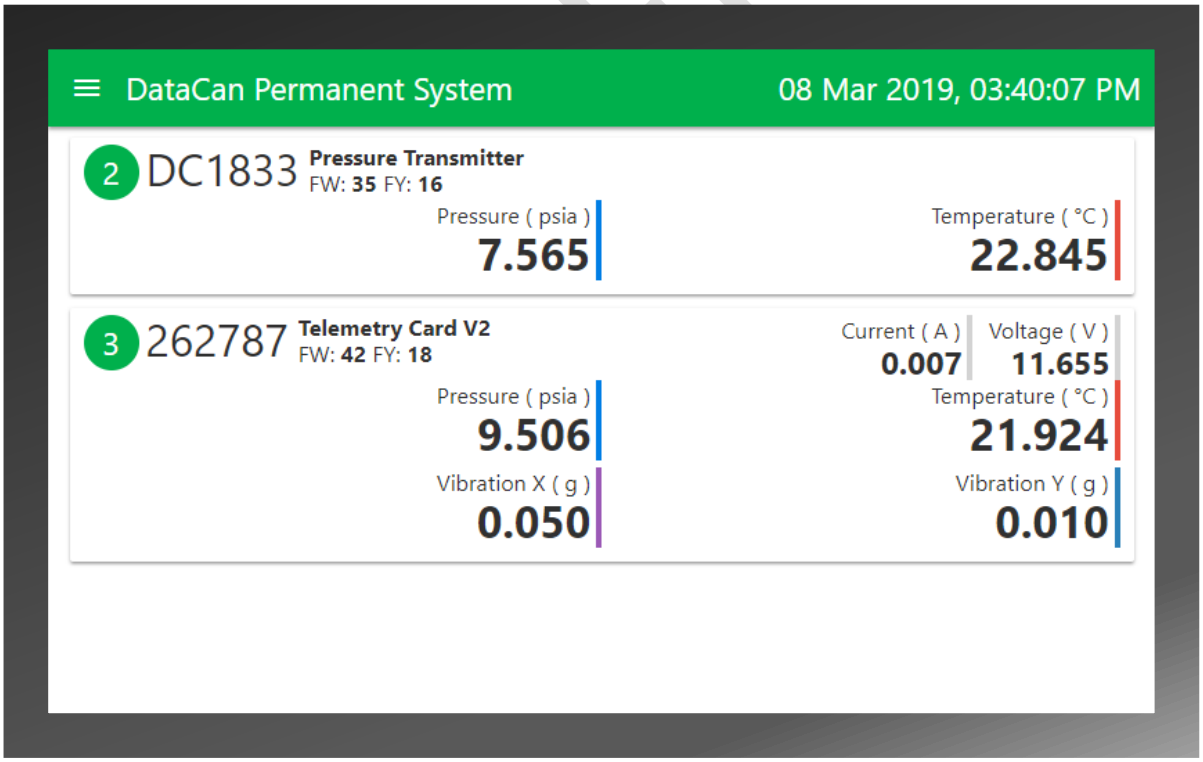
If all the indicators are correct, the front panel can be closed and data should be displayed on the front screen.

5 Software Operation

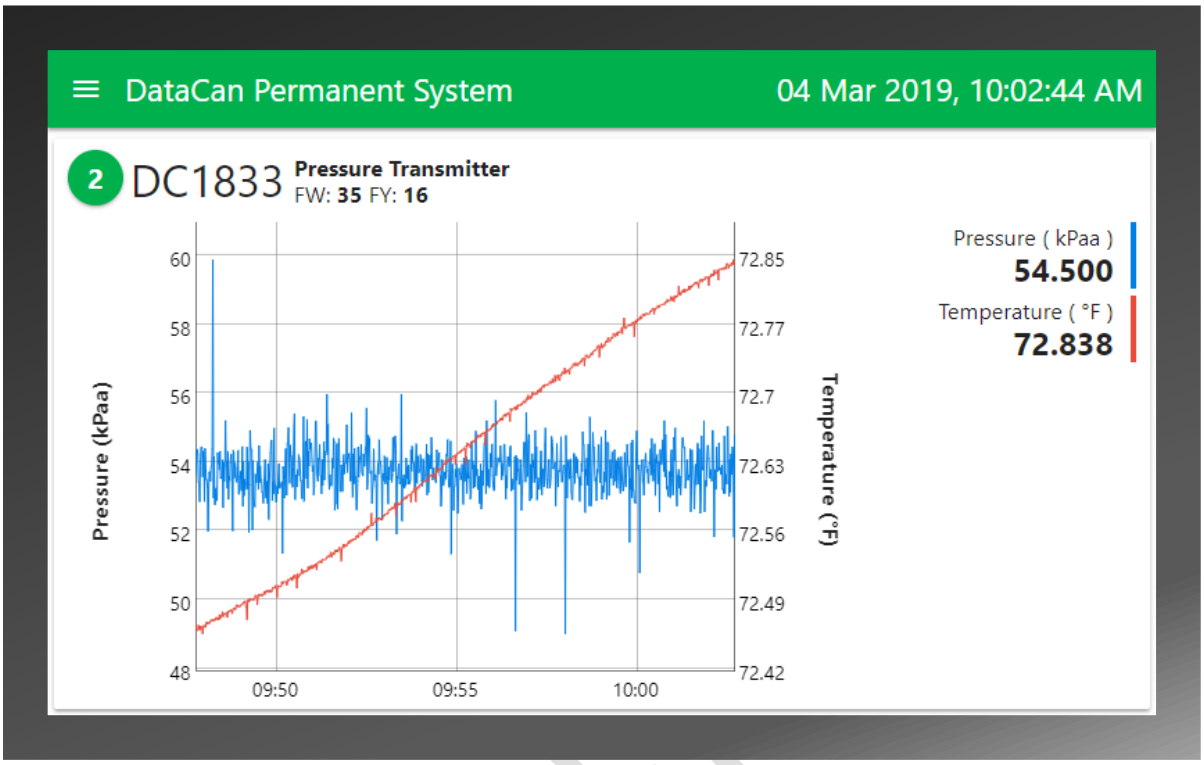
5.1 Startup

During startup, the Surface Box will start logging and displaying live information on the main page. If more than one device is connected to the system, the main page displays brief information about all the devices and their readings. Otherwise, it displays a live graph with readings.

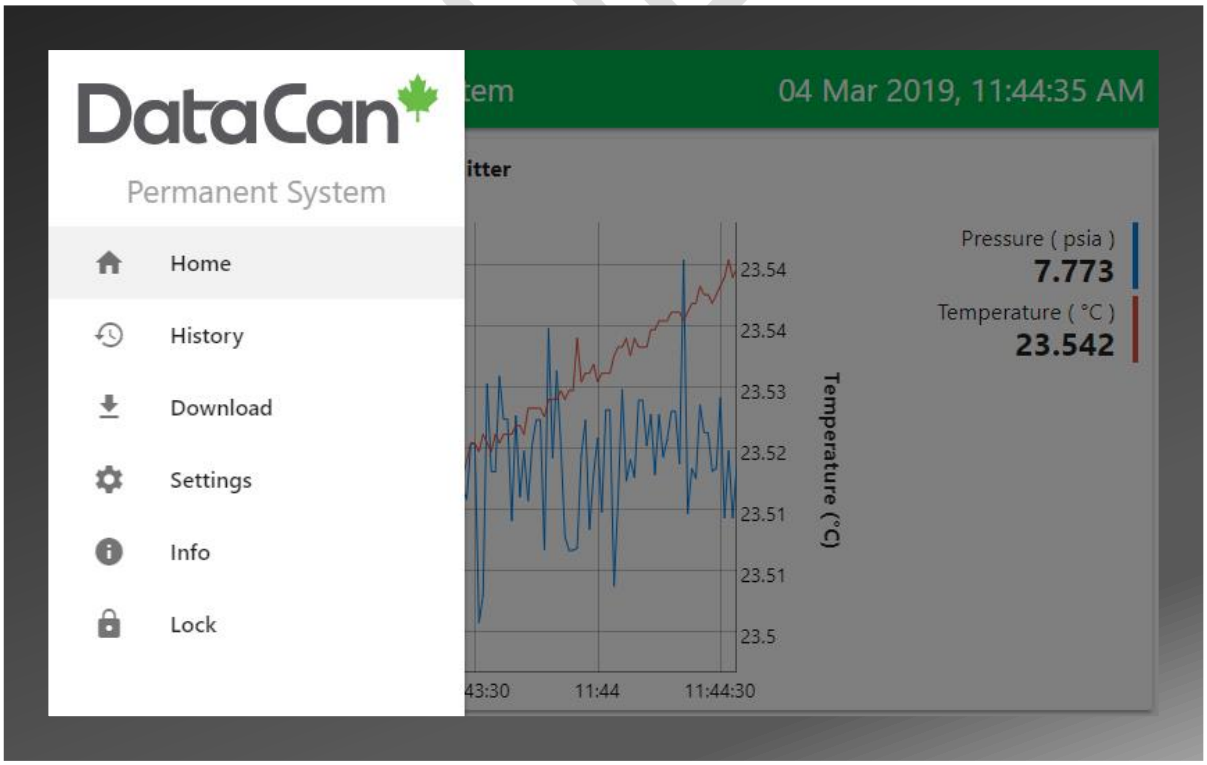
Note: To view the graph of each device connected to the system, tap on the device information to view the graph page. You may also bring up a menu bar by pressing the button on the top left corner.



Home Page Displaying Live Data



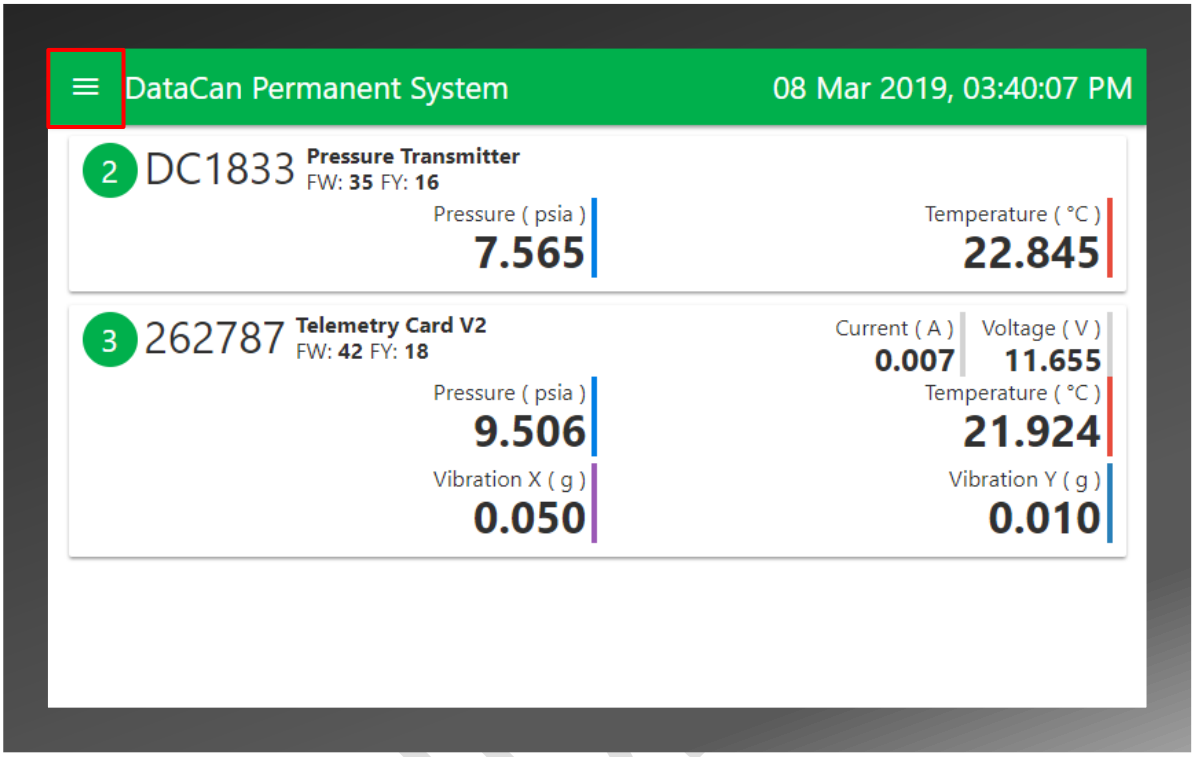
Home Page Displaying Graph



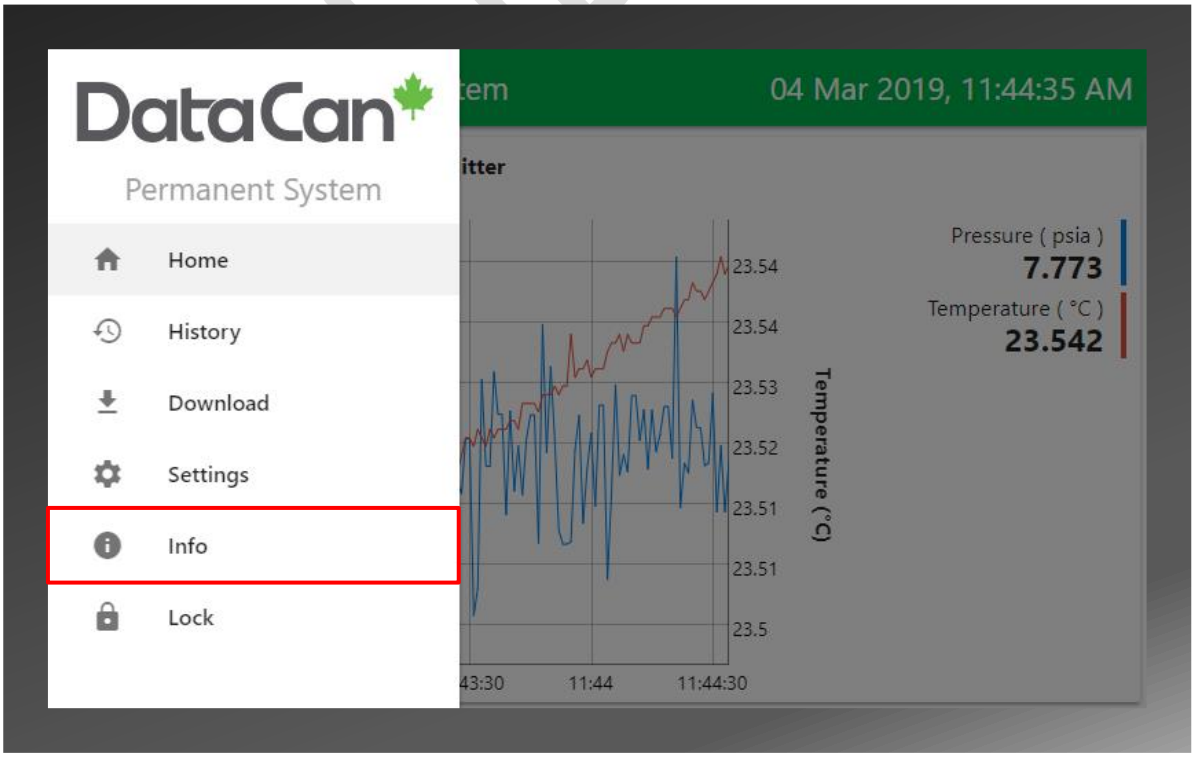
Screen Menu Bar

5.2 System Information

1. Click on the Menu bar.



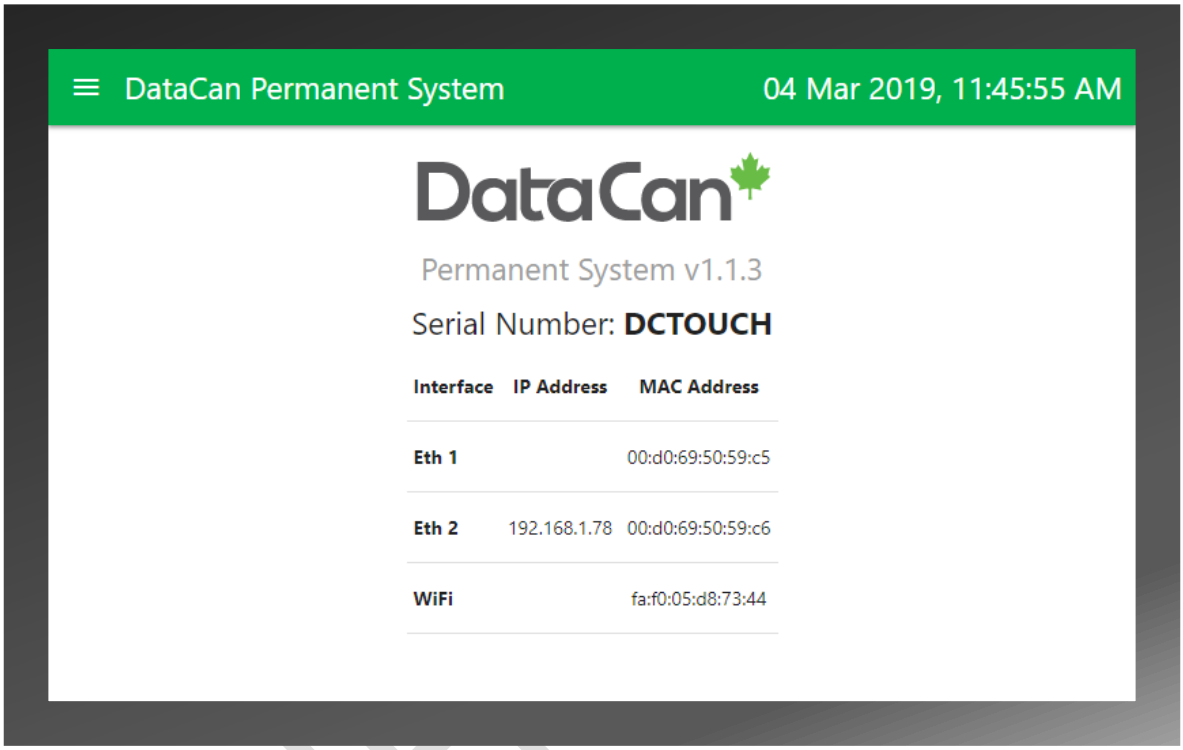
2. Click on the **Info** menu item.



The page should display the following information:

- Software Version
- Serial Number of the System
- All the interfaces and their IP and MAC Address

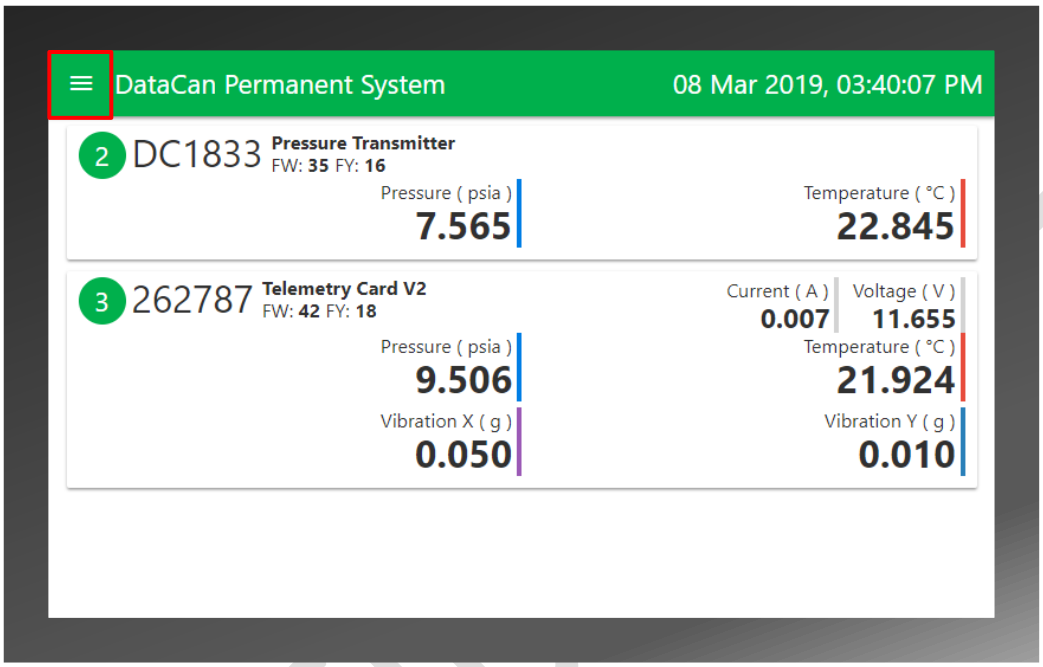
Note: The Wi-Fi interface info is only visible if the module is on.



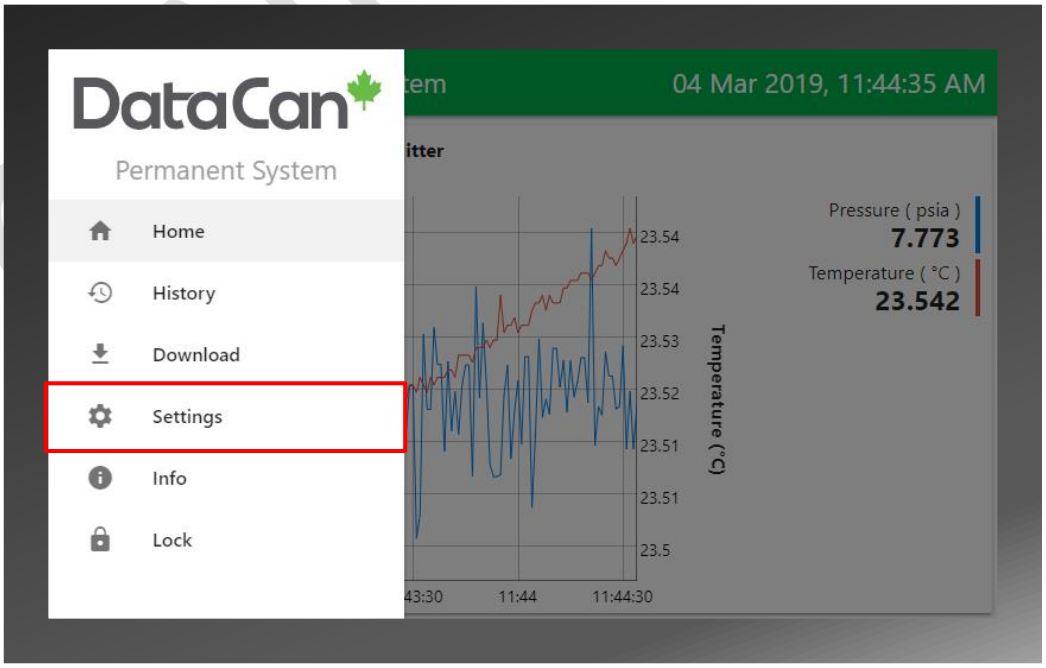
5.3 Devices

5.3.1 Viewing Devices

1. From the Home Page screen, click on the Menu bar.



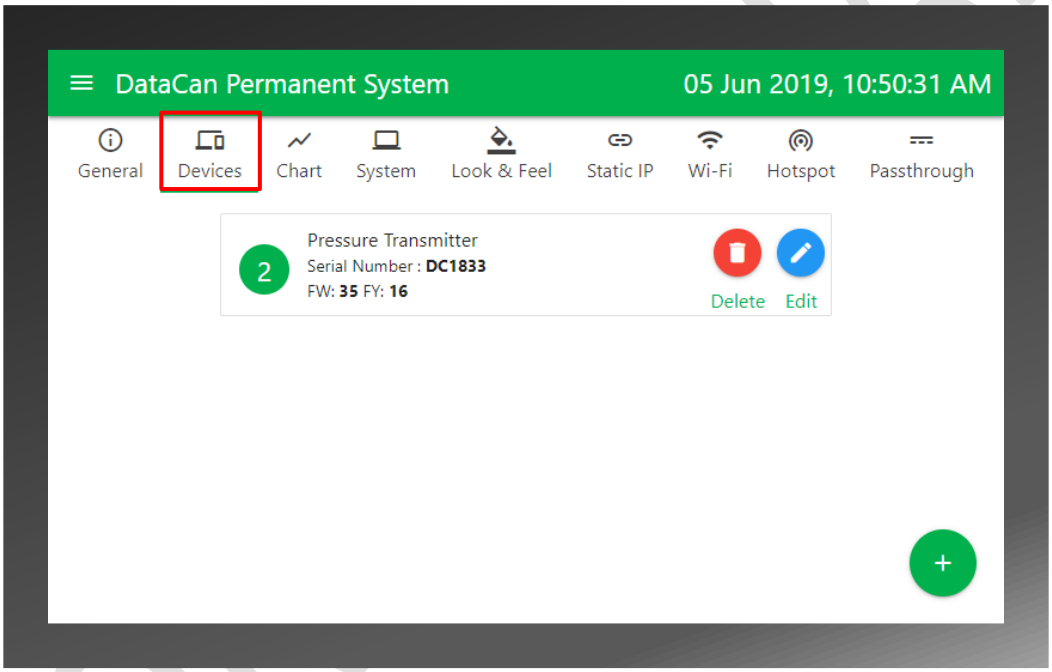
2. Click on the **Settings** menu item.



3. From the Settings main page, click on the **Devices** tab. The page shows the list of devices connected to the system.

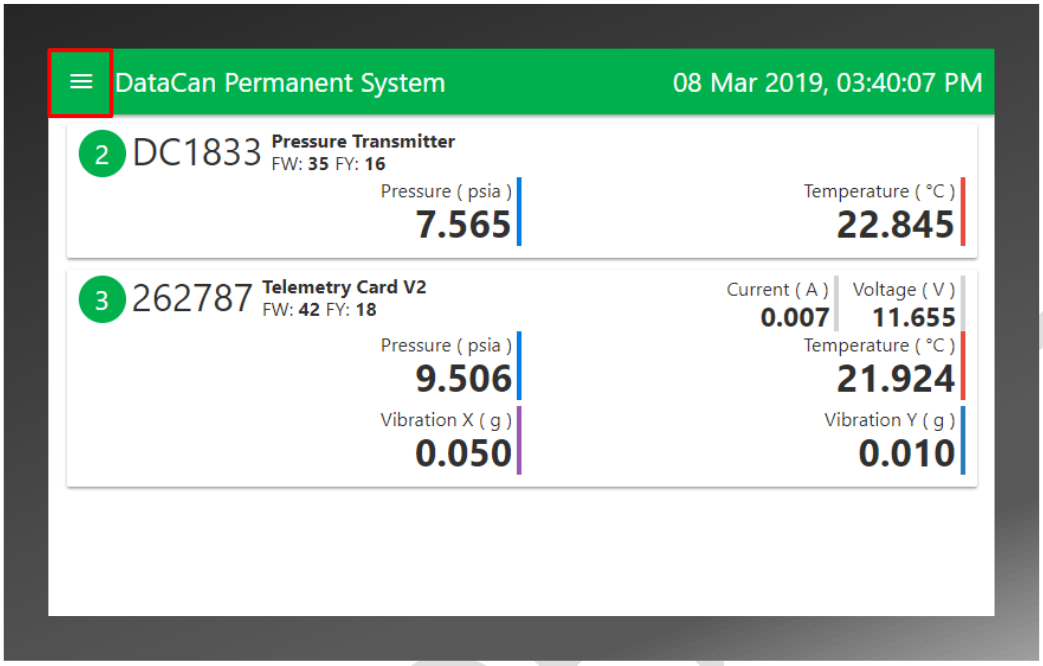
   Note: Each device has information and actions associated with them. Such information may include:

   - Name of the tool
   - Modbus Address
   - Serial Number
   - Firmware Year
   - Firmware Week

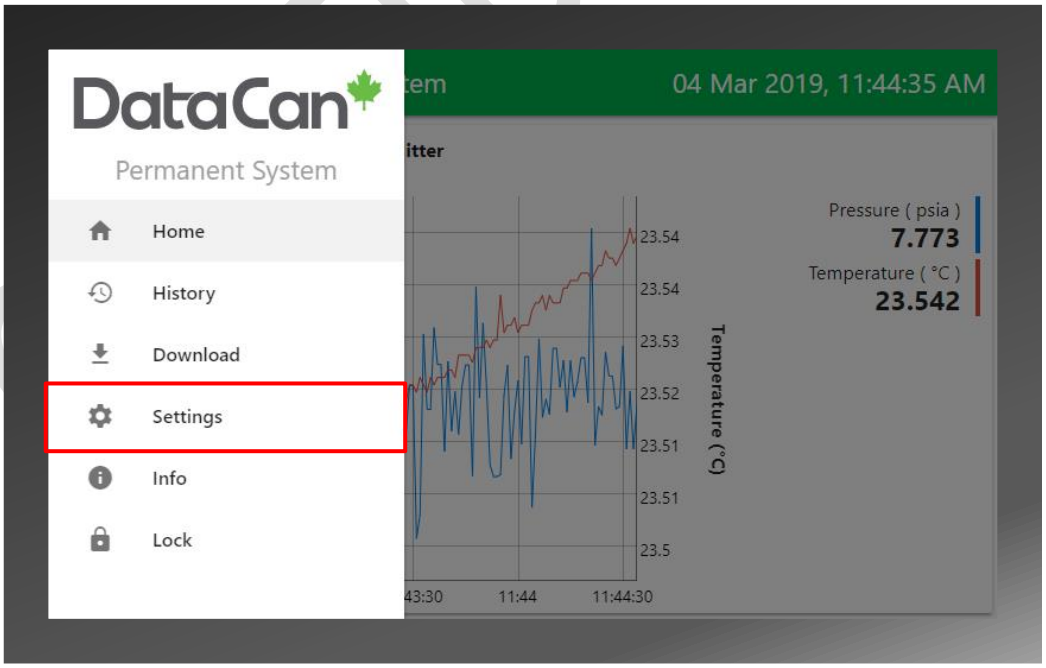


5.3.2 Modifying a Device

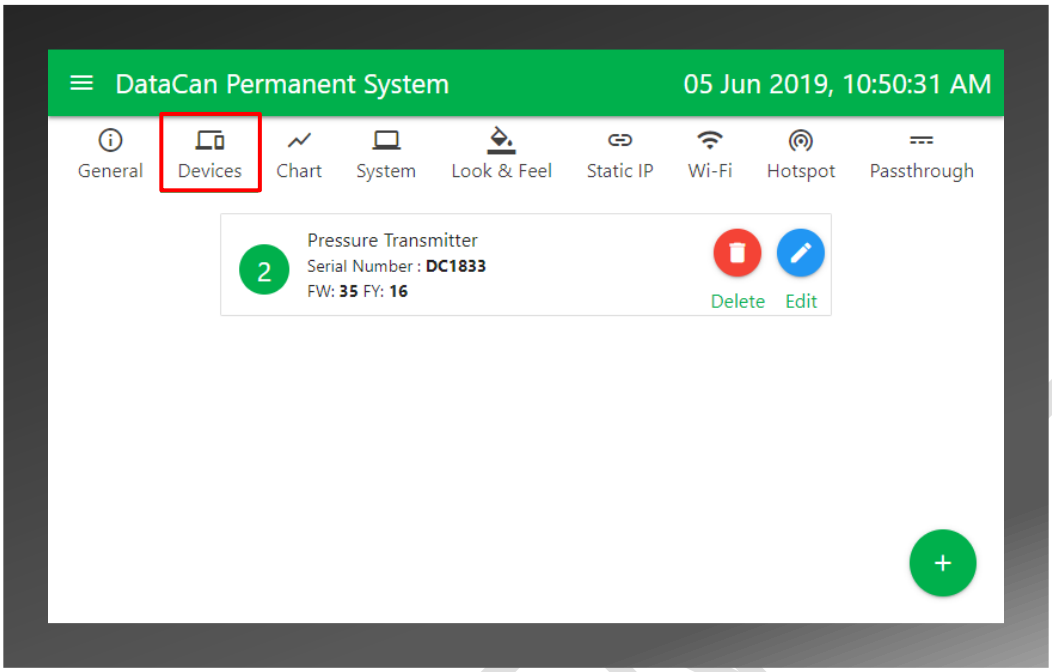
4. From the Home Page screen, click on the Menu bar.



5. Click on the **Settings** menu item.

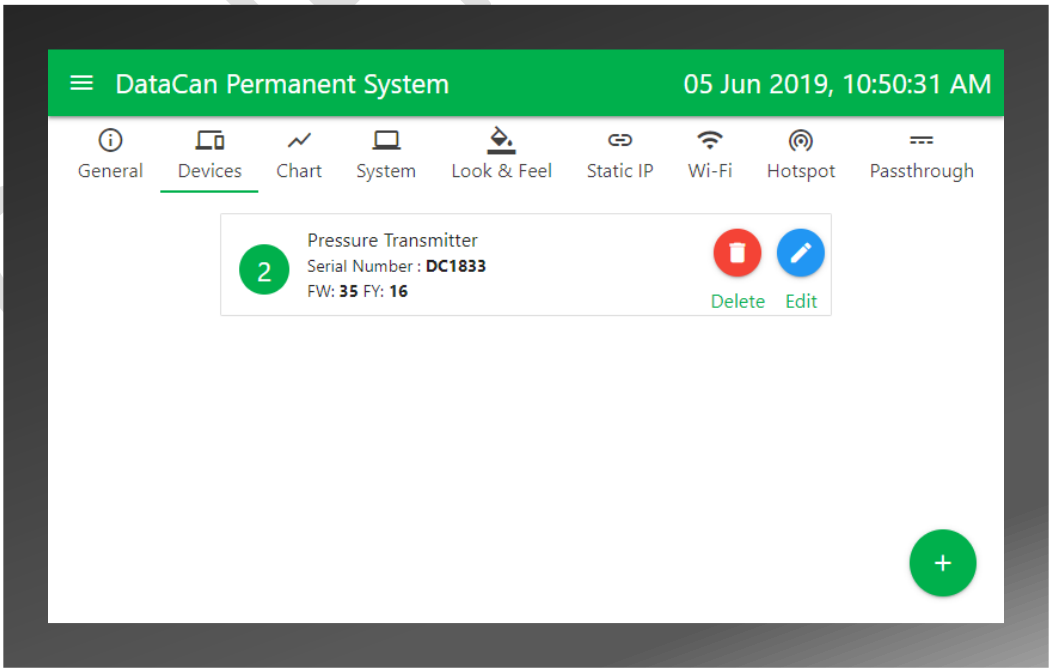


6. From the Settings main page, click on the **Devices** tab.

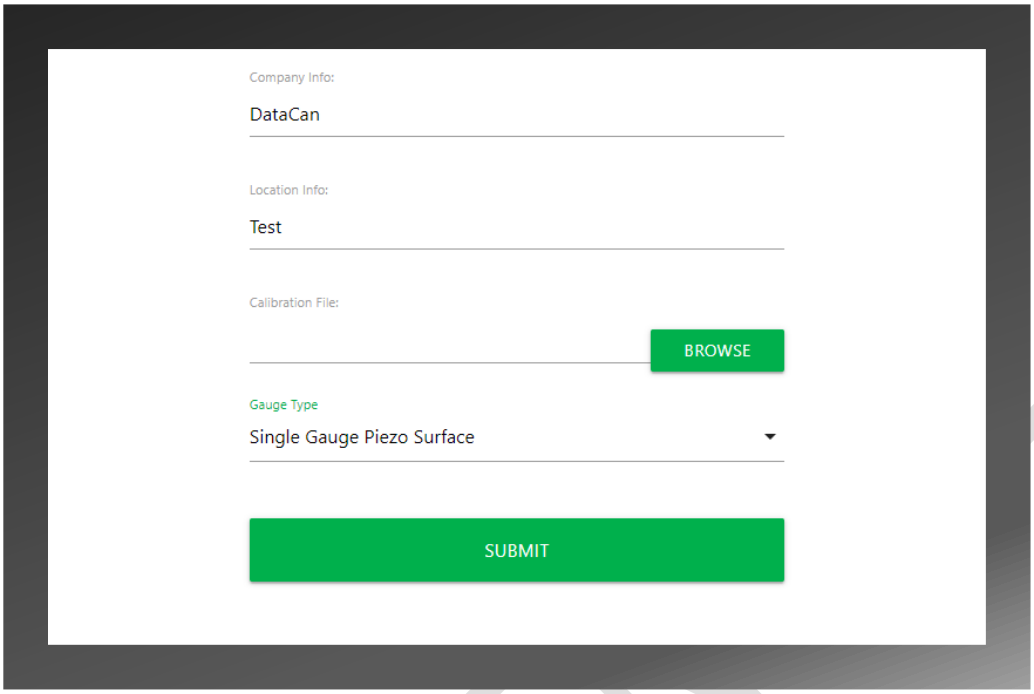


7. From the list of devices, choose the device you wish to modify and press the **Edit** button.

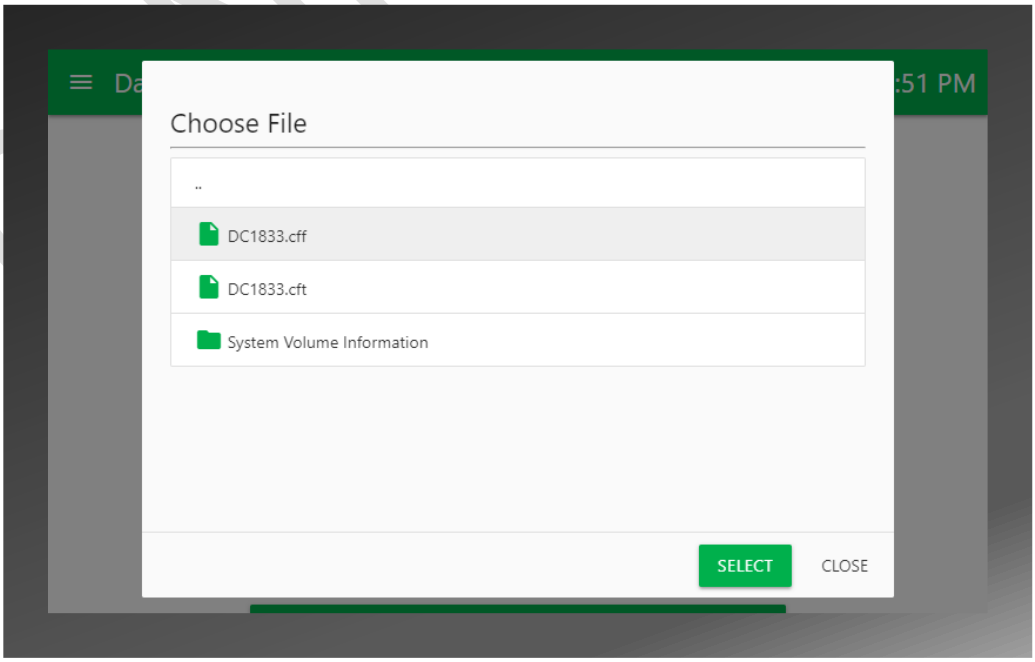
   Note: For multi-gauge telemetry cards, there is no **Edit** button. These cards must be configured using the DataCan Download Software on a PC. If needed, please refer to the Multi Gauge Telemetry Card User Manual for more information.



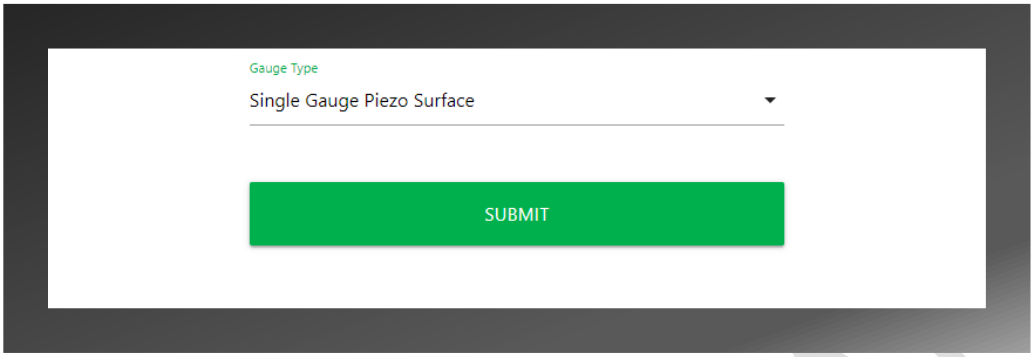
8. Set up company name and location information for the device found if needed.



9. Change Calibration if the tool needs a firmware upgrade.
    e. Plug in a USB drive with calibration files in it.
    f. Under the "Calibration File" field, press the **BROWSE** button to view the calibration files from the USB drive.
    g. Choose the [Serial Number of Device].cff (Example: DC1833.cff)
    h. Press **SELECT** button to select the file.



10. Select appropriate Gauge Type under the Gauge Type field.

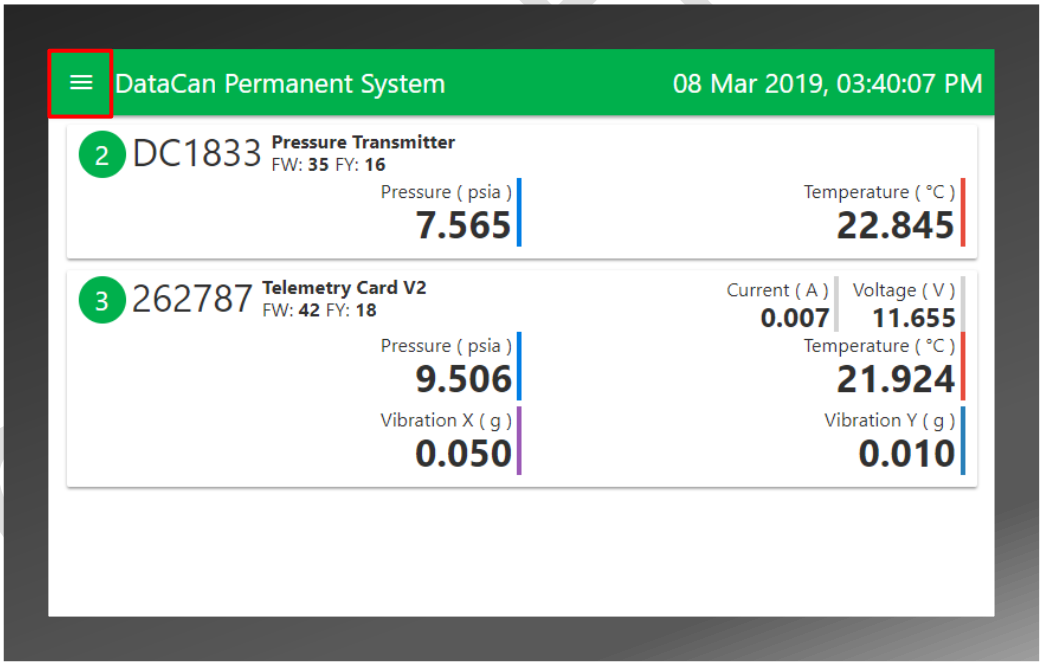


11. Press the **SUBMIT** button to finish modifying the device.

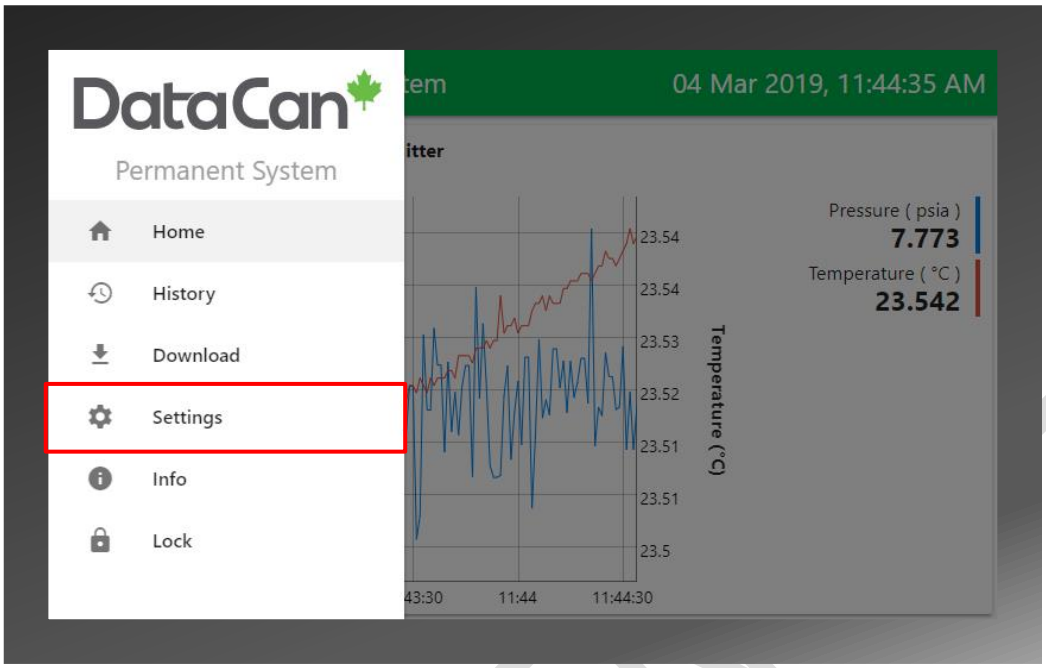
    Note: This action stops logging, adds the tool to the system, and restarts logging.

5.3.3 Deleting a Device

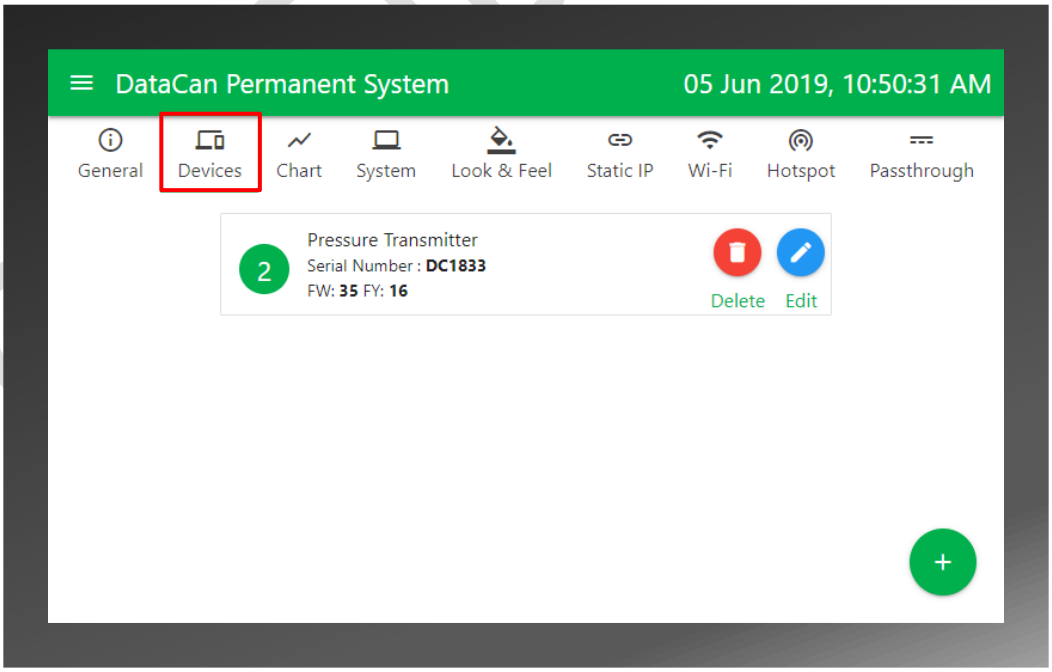
1. From the Home Page screen, click on the Menu bar.



2. Click on the **Settings** menu item.

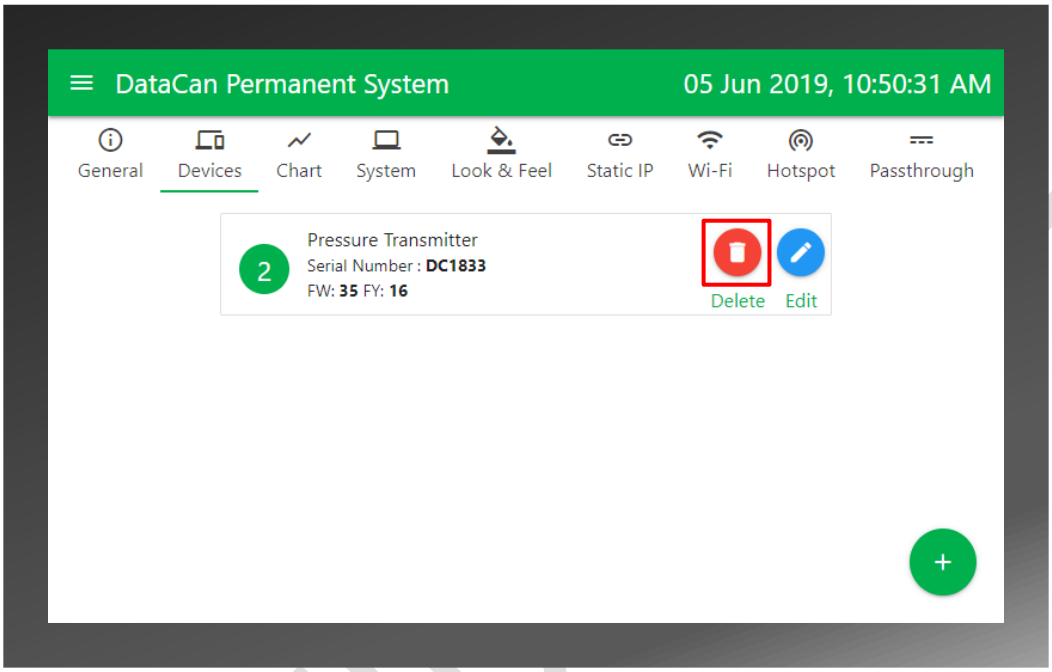


3. From the Settings main page, click on the **Devices** tab.



4. From the list of devices, choose the device you wish to delete and press the **Delete** button.

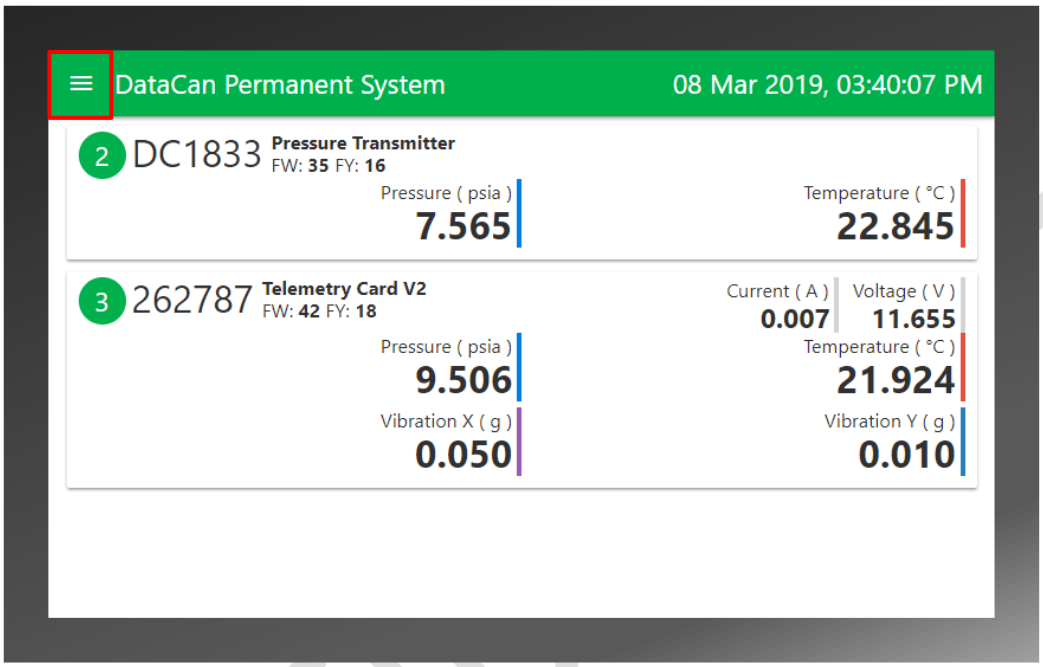
   Note: A message prompt will appear saying “Are you sure you want to delete this?”. Press **YES** to confirm the operation.



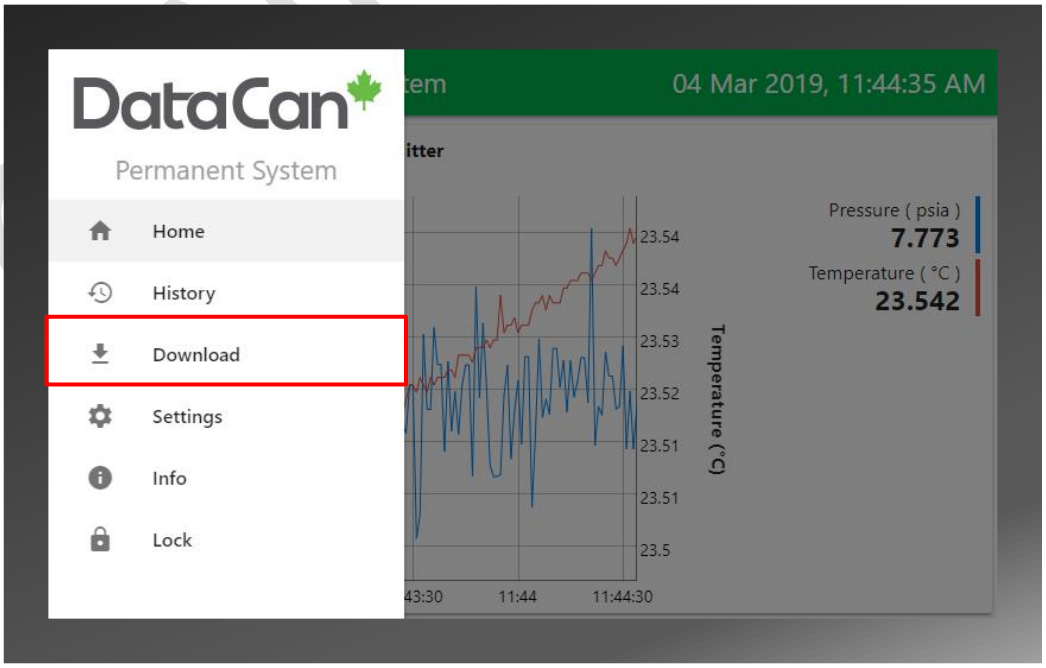
5.4 Jobs

5.4.1 Viewing Jobs

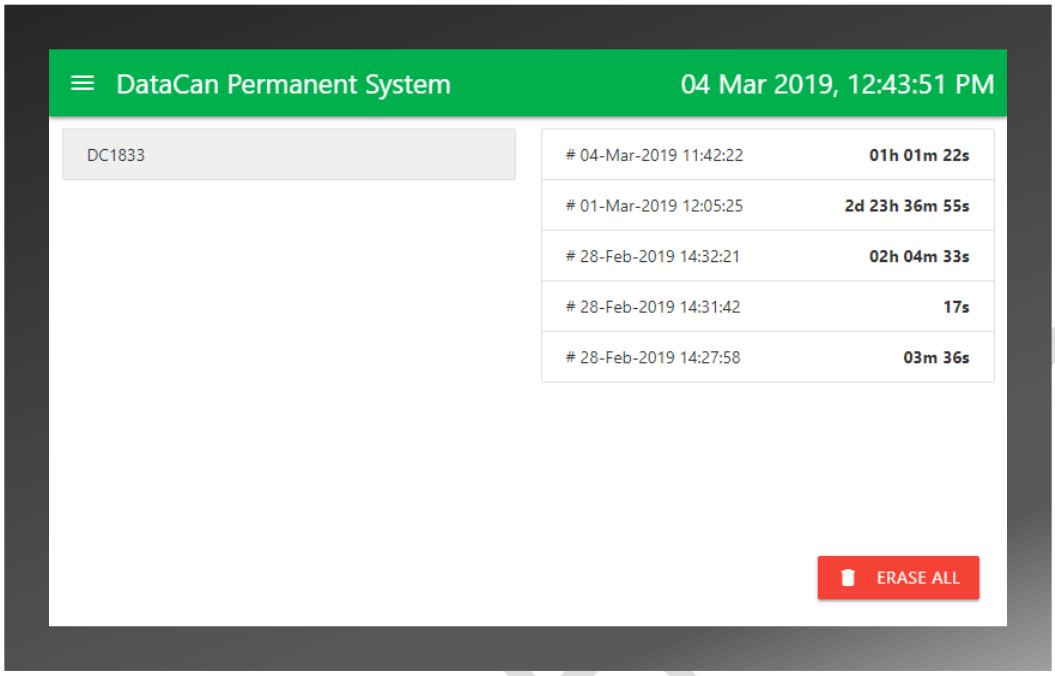
1. From the Home Page screen, click on the Menu bar.



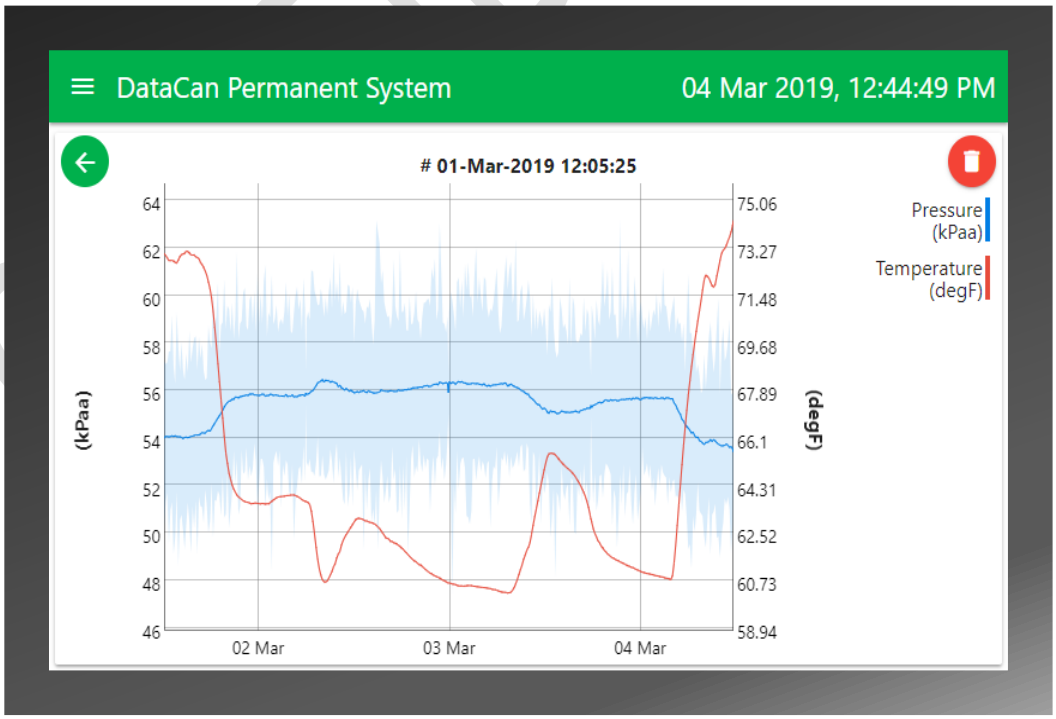
2. Click on the **History** menu item.



3. The history page should list the serial numbers of all devices attached. Tap on the Device Serial Number to see all of its jobs on the right.

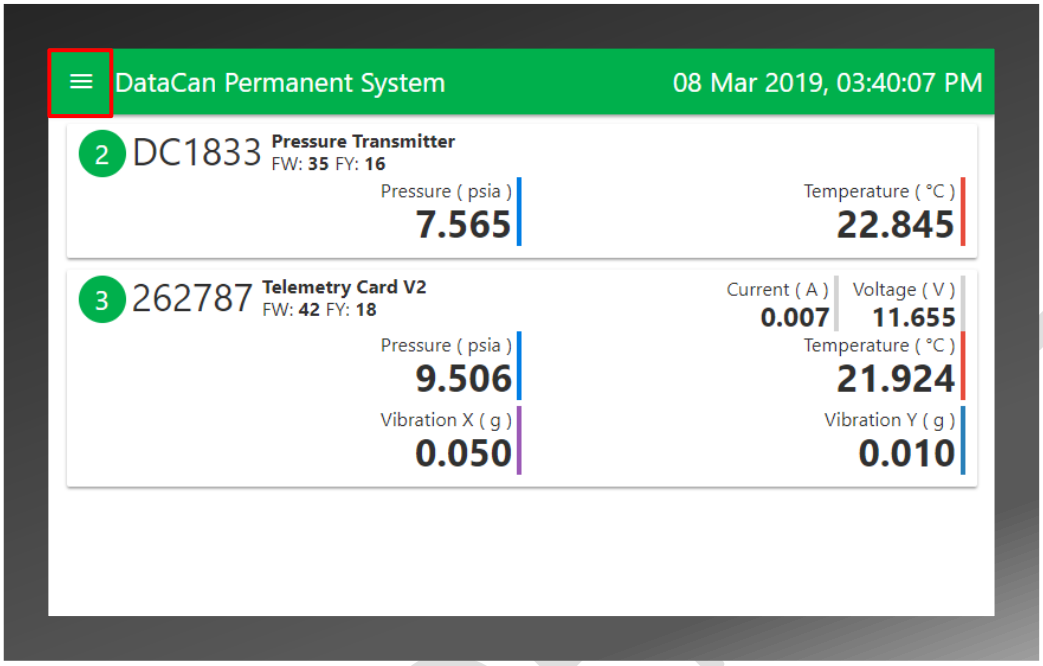


4. To see a historical graph view, tap on an individual job on the right. A sample of a graph display is shown below.

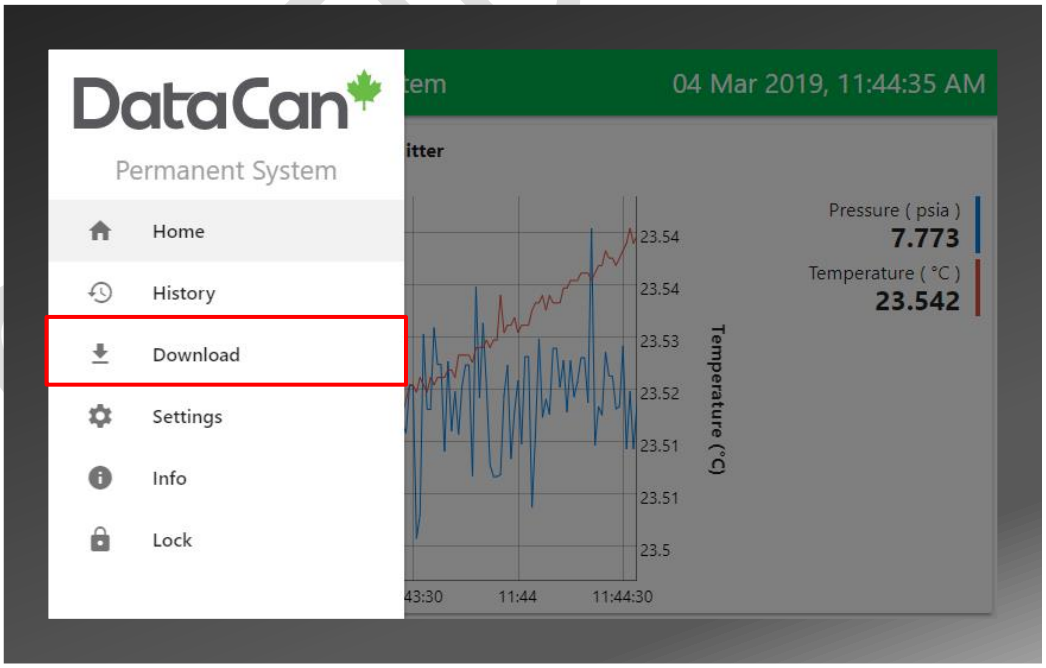


5.4.2 Erasing Individual Jobs

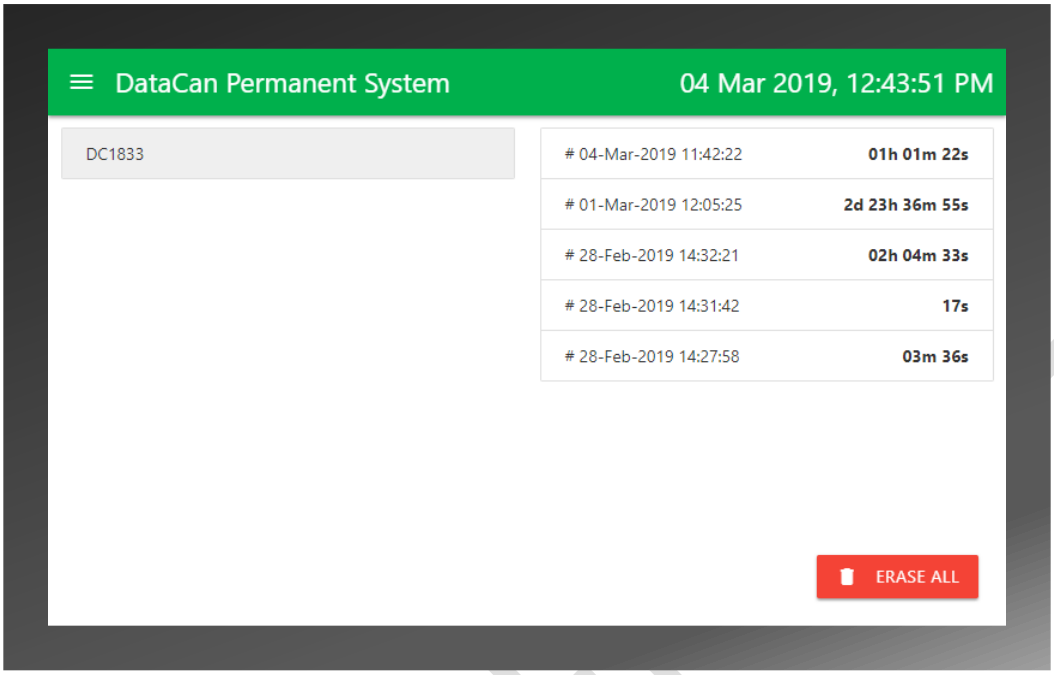
1. From the Home Page screen, click on the Menu bar.



2. Click on the **History** menu item.

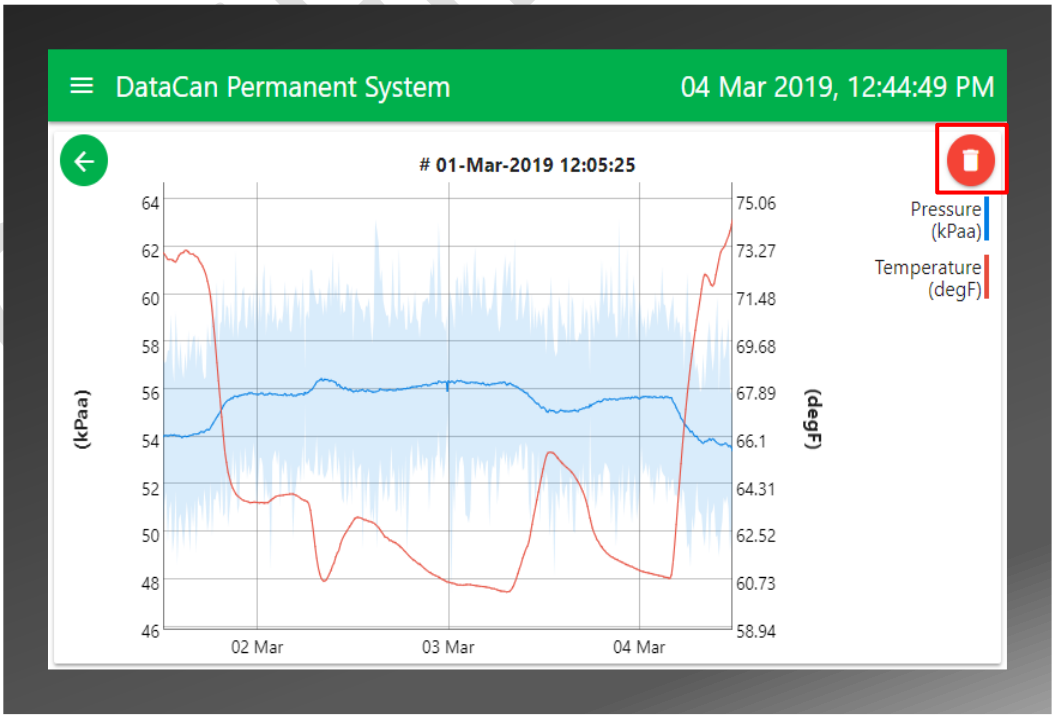


3. The history page should list the serial numbers of all devices attached. Tap on the Device Serial Number to see all of its jobs on the right.



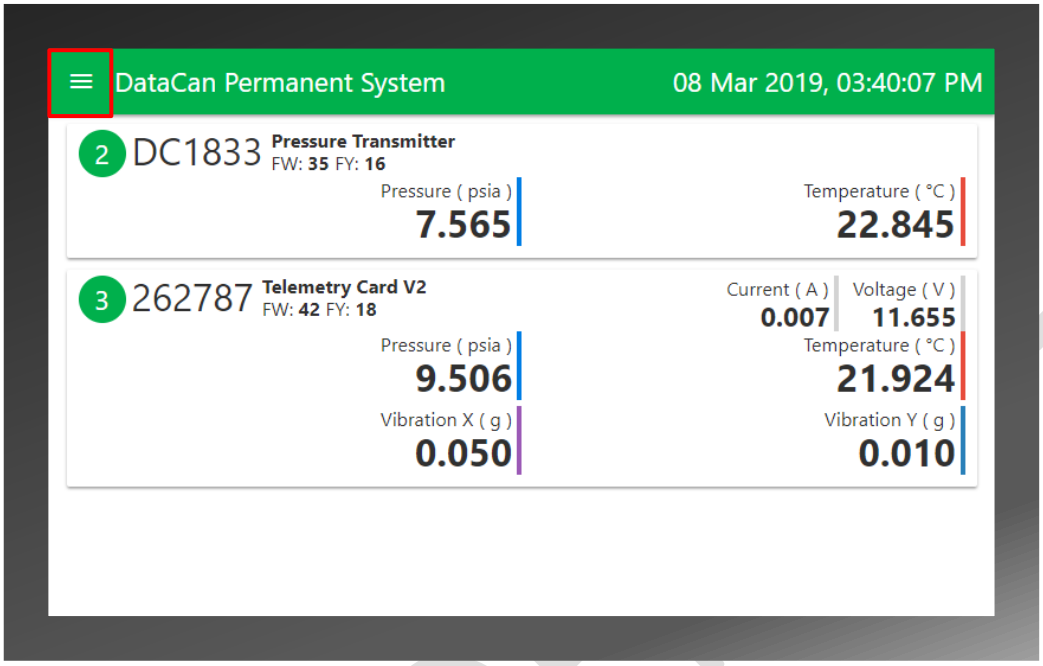
5. To see a historical graph view, tap on an individual job on the right.
6. Press the delete button on the top right corner.

   Note: A message prompt will appear saying "Are you sure you want to Erase all the Jobs?". Press **YES** to confirm the operation.

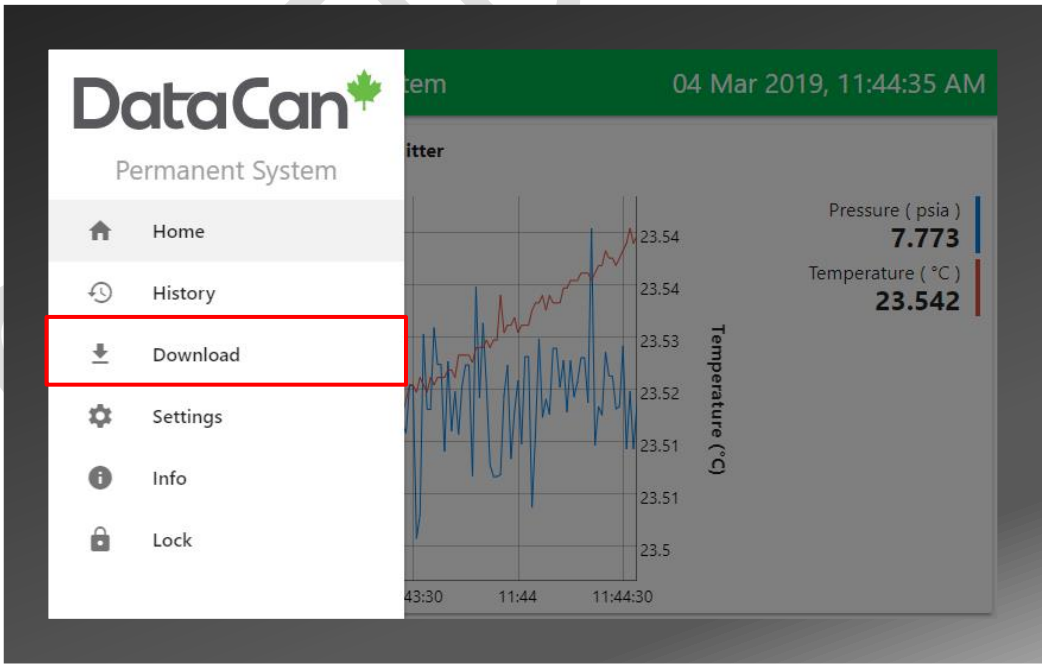


5.4.3 Erasing All Jobs

1. From the Home Page screen, click on the Menu bar.

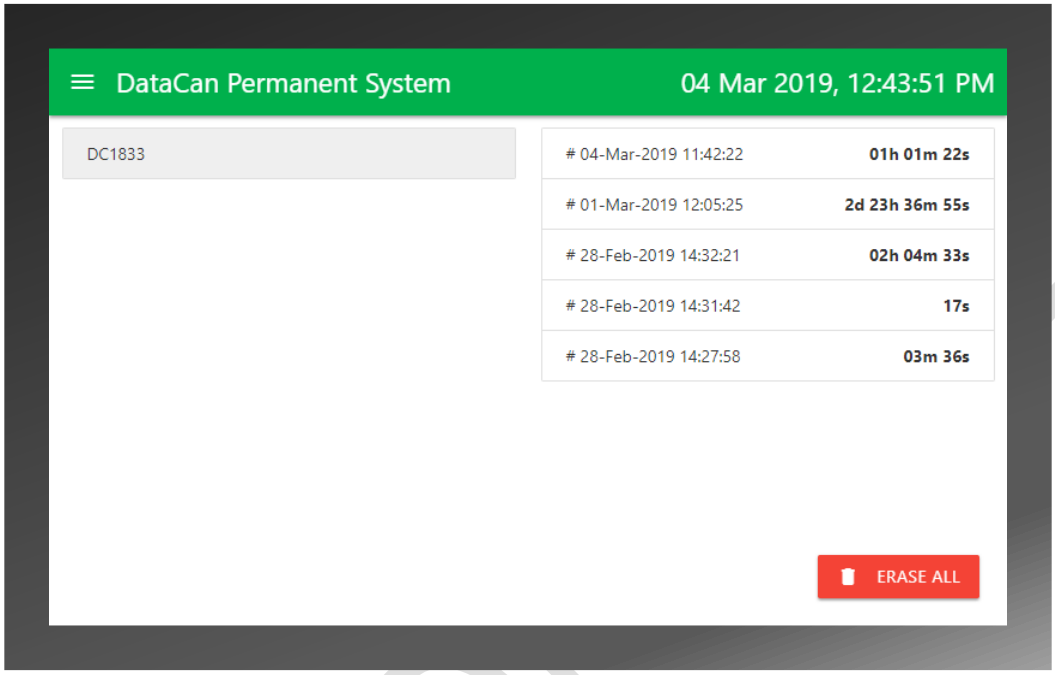


2. Click on the **History** menu item.



3. On the bottom right corner, press the **ERASE ALL** button.

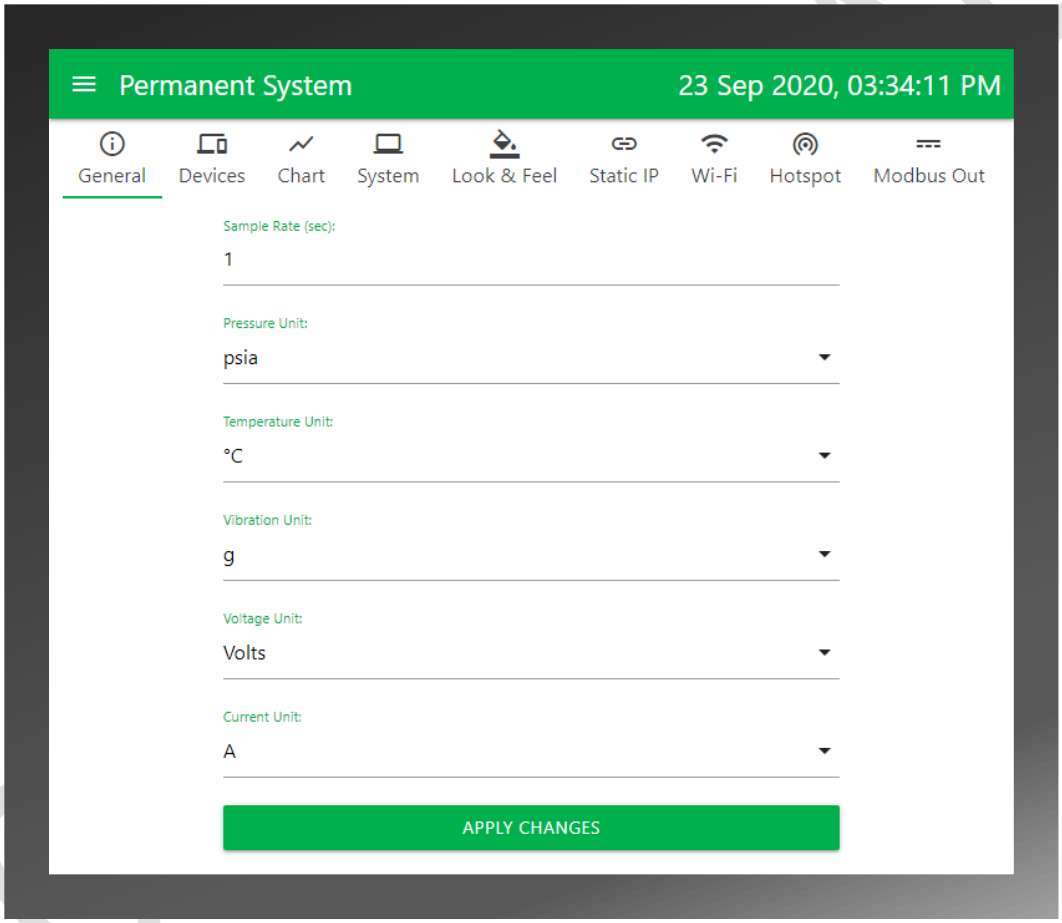
   Note: A message prompt will appear saying "Are you sure you want to Erase all the Jobs?". Press **YES** to confirm the operation.



5.5 Settings

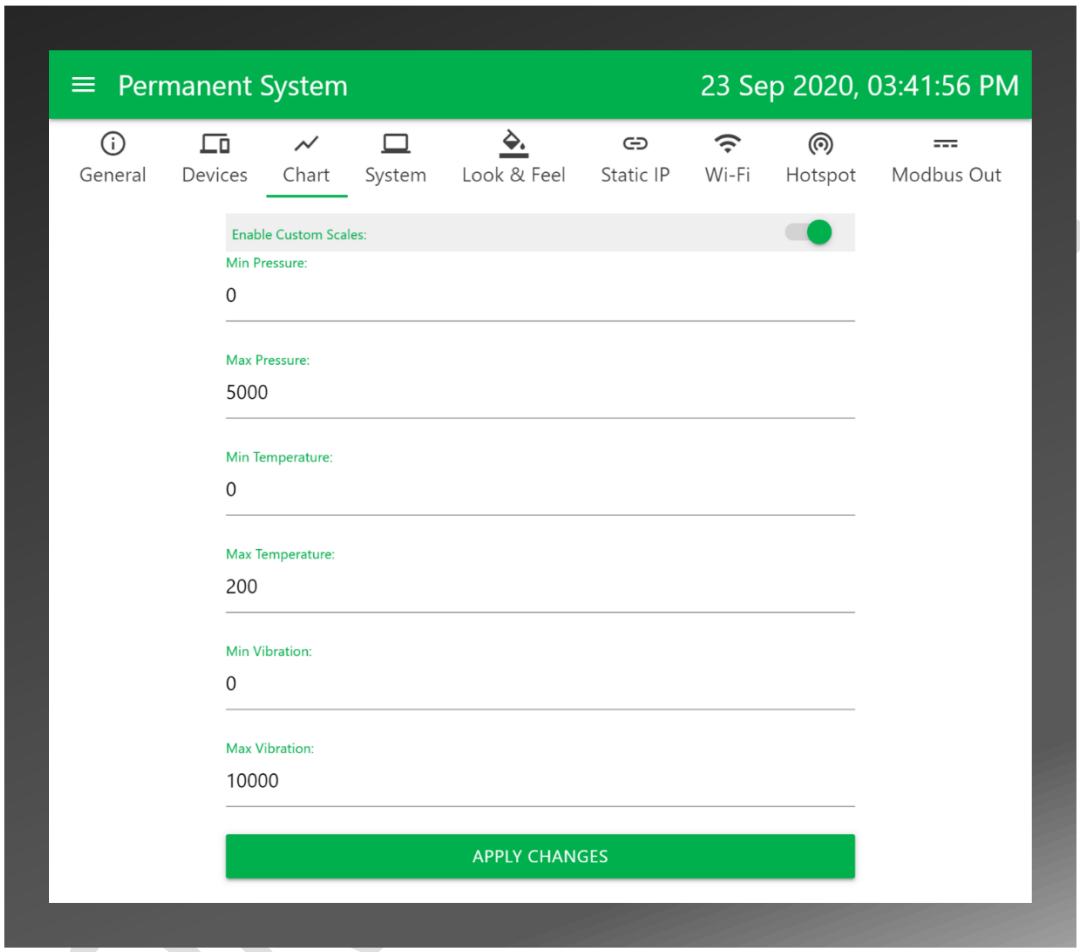
The general settings page is displayed as shown below. Notice that there are various subsections that you can navigate to using the submenu.

You may change the sample rate and units for your device by selecting from each drop-down list. Be sure to press **APPLY CHANGES** to confirm your changes.

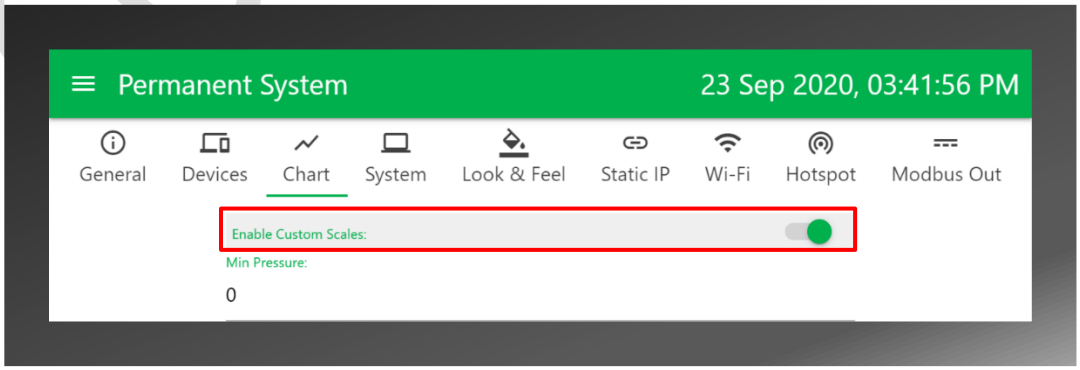


5.5.1 Chart / Graph Settings

1. From the settings main page, press the **Chart** tab. The following page will appear as shown below.



2. Press the switch on the top right corner to enable custom scales.

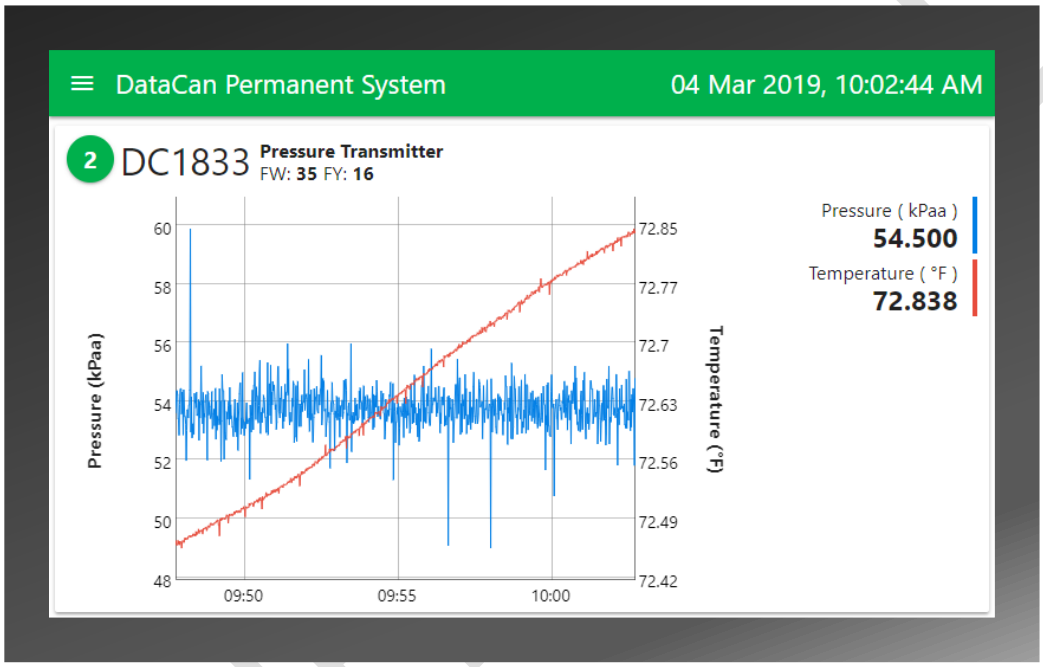


3. Change scales as required.

   Note: Tapping on the fields opens a touchpad. After you have changed your values, simply press outside of the touchpad to save your new value

4. After all changes have been made, press **APPLY CHANGES** to enable chart settings.

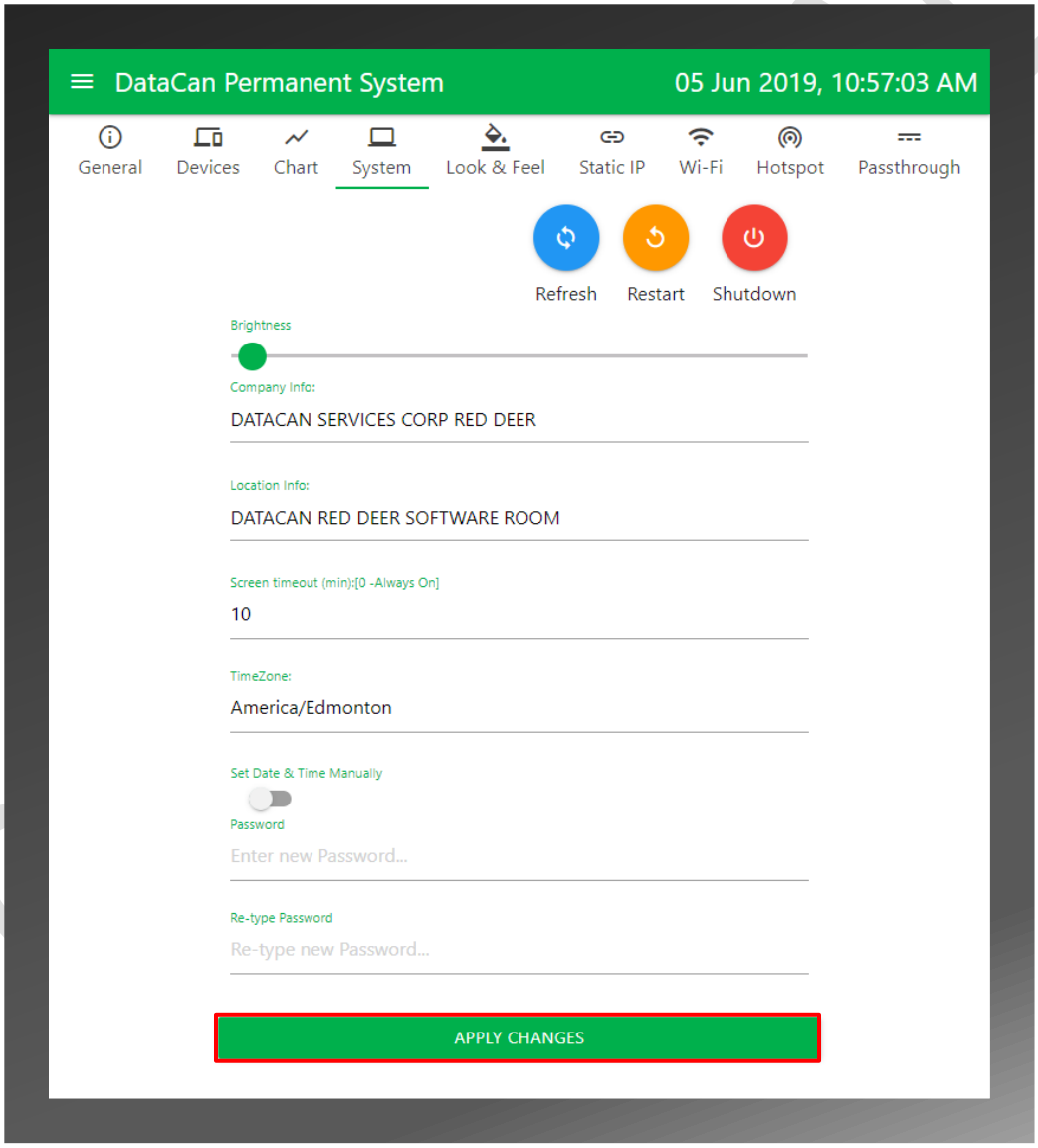
   Note: The changes are applied to the live graph on the main page. A sample is shown below.



5.5.2 System Settings

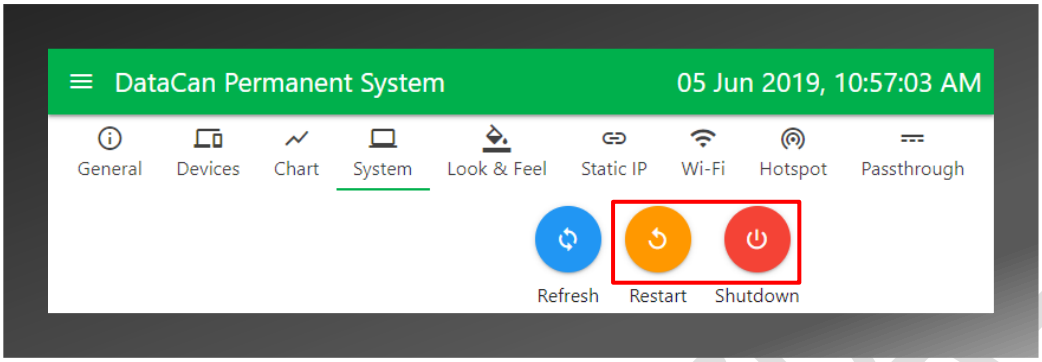
From the settings main page, press the **System** tab. The following page will appear as shown below.

Note: Please press the **APPLY CHANGES** button whenever any changes are made.



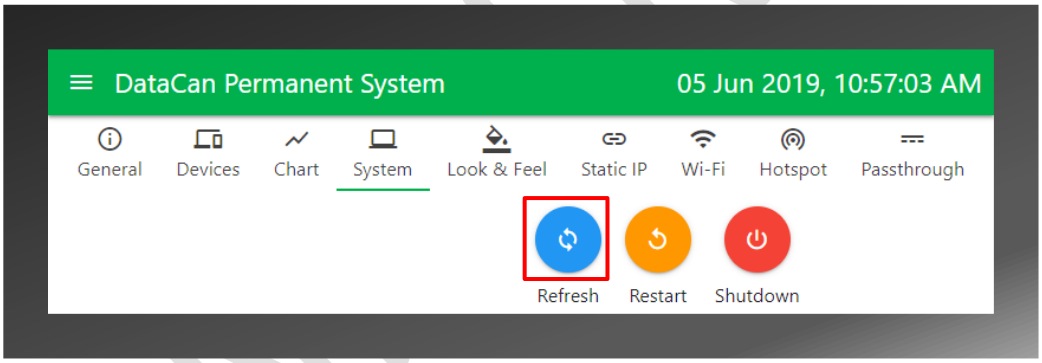
Restarting the System:

- Use the **Shutdown** and **Restart** buttons for turning off and restarting the system.



Reloading the Application:

- To reload the application, click on the **Refresh** button.

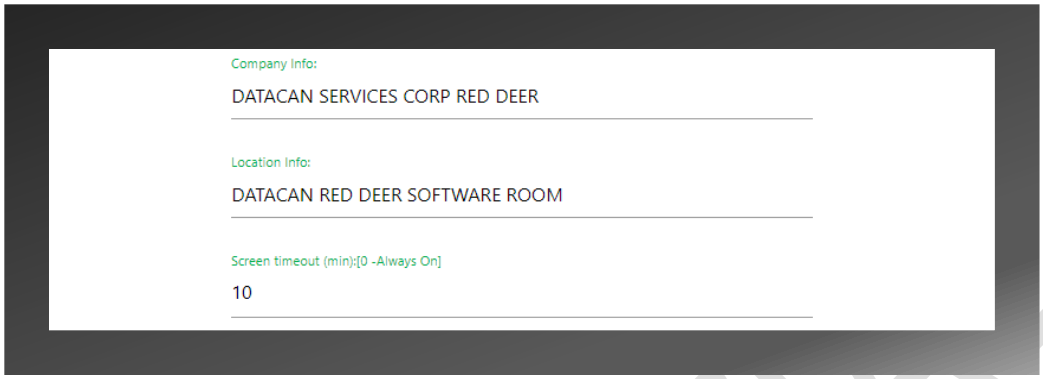


Changing brightness:

- Use the slider to increase / decrease brightness.

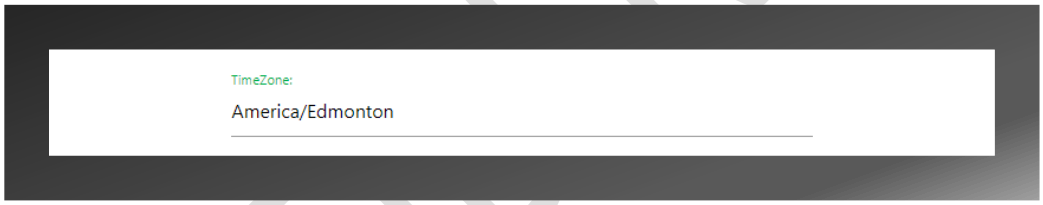
Changing company information, location information, and screen time out:

- Tap on the fields below each heading to access a keyboard and input text.



Changing Time Zone:

- Tap on the field below the heading to select the time zone.



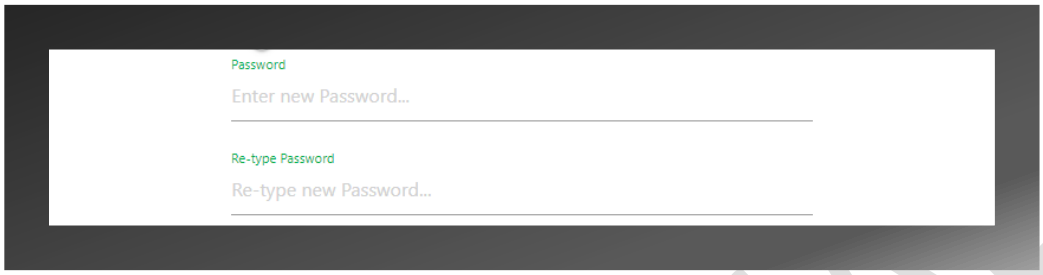
Setting Time Manually:

1. Press the switch.
2. Fill out the additional information fields that appear once the switch is enabled.

   Note: If **Set Date & Time Manually** is disabled, the system automatically gets the Date and Time from the time servers.

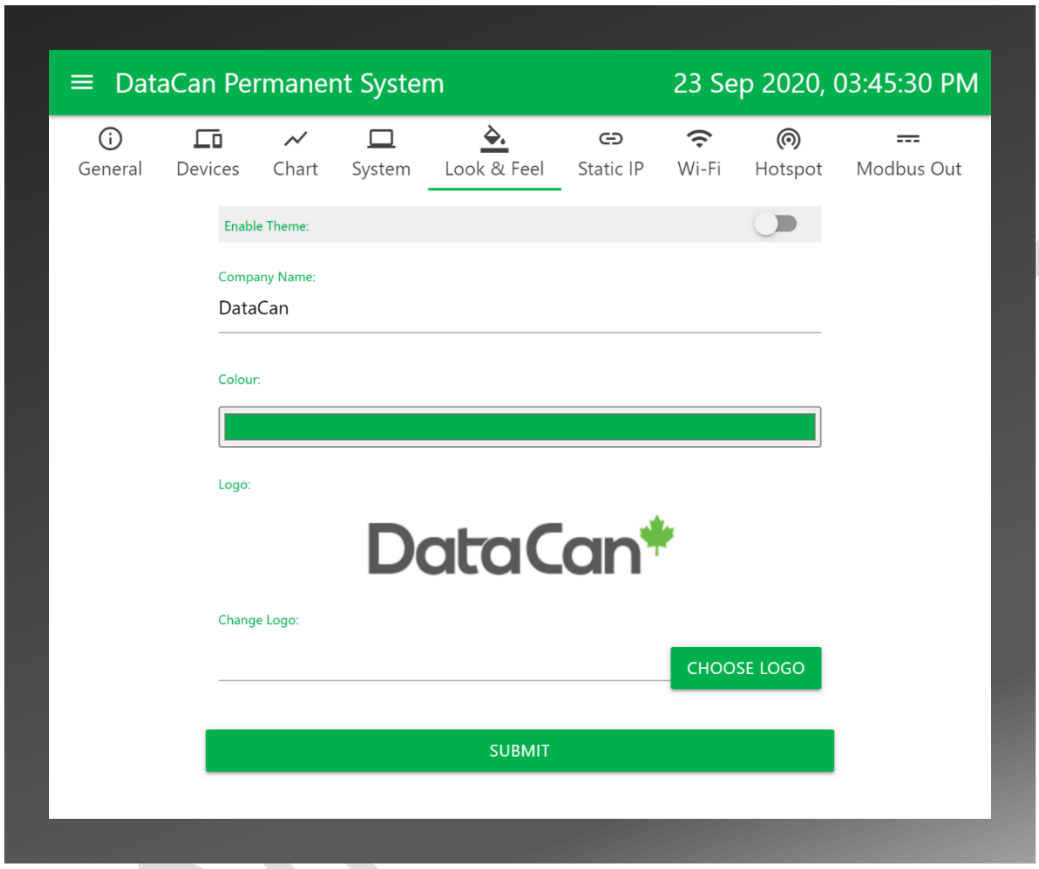
Changing System Password:

1. Type in the new password you wish to use for your system.
2. Retype the new password in the field below.



5.5.3 Look & Feel Settings

1. From the settings main page, press the **Look & Feel** tab. The following page will appear as shown below.



2. To enable the Look & Feel theme, press the switch on the top right corner.

3. You may change the Company Name by filling out the field below it.

4. The color may be changed from the options provided.

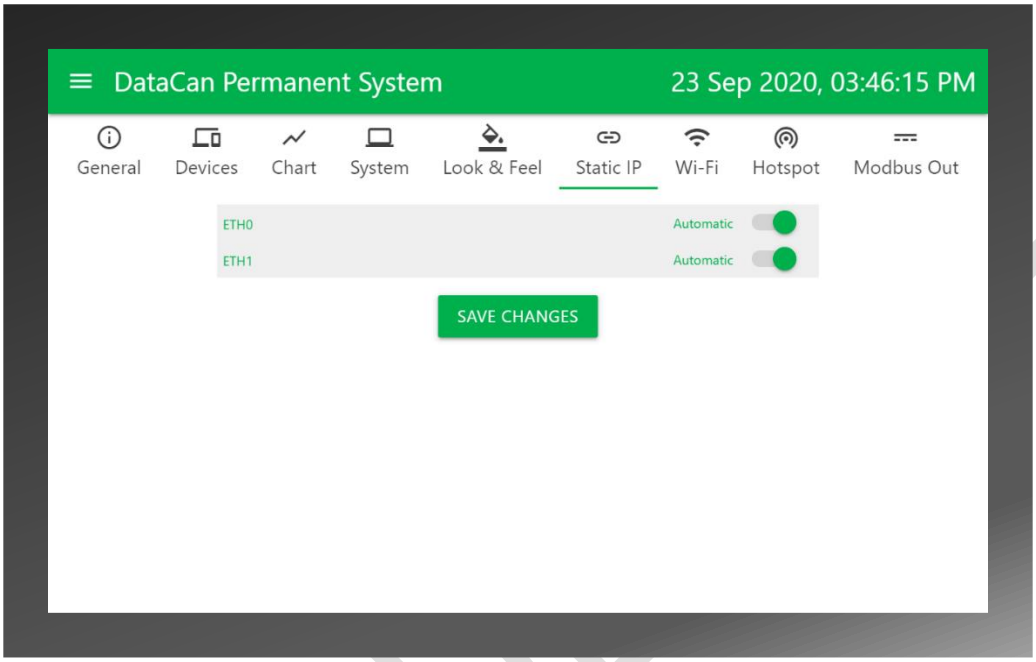
5. Changing the Logo:
    - Insert an USB drive with the image downloaded.
    - Press **BROWSE** to see all the images from the USB drive.
    - Choose the image and press **SELECT**.

6. Once all preferences have been made, press **SUBMIT** to confirm all changes.

    Note: Disabling the theme will revert back to the default DataCan theme.

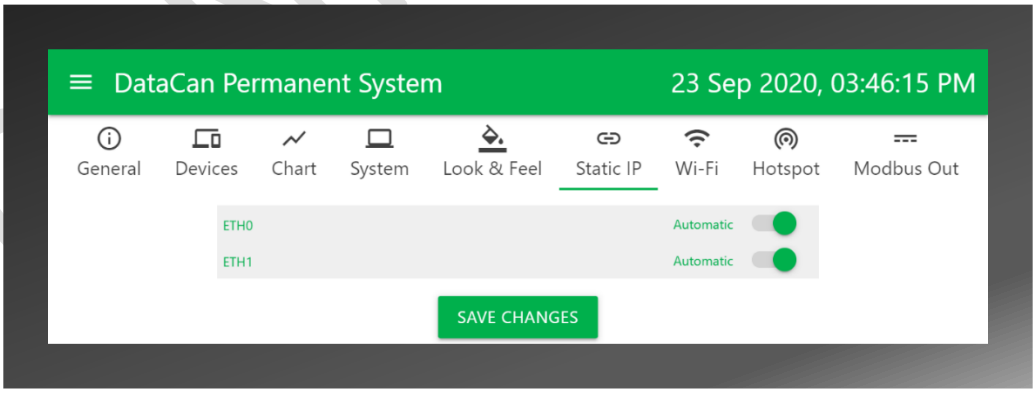
5.5.4 Static IP Settings

1. From the settings main page, press the **Static IP** tab. The following page will appear as shown below.



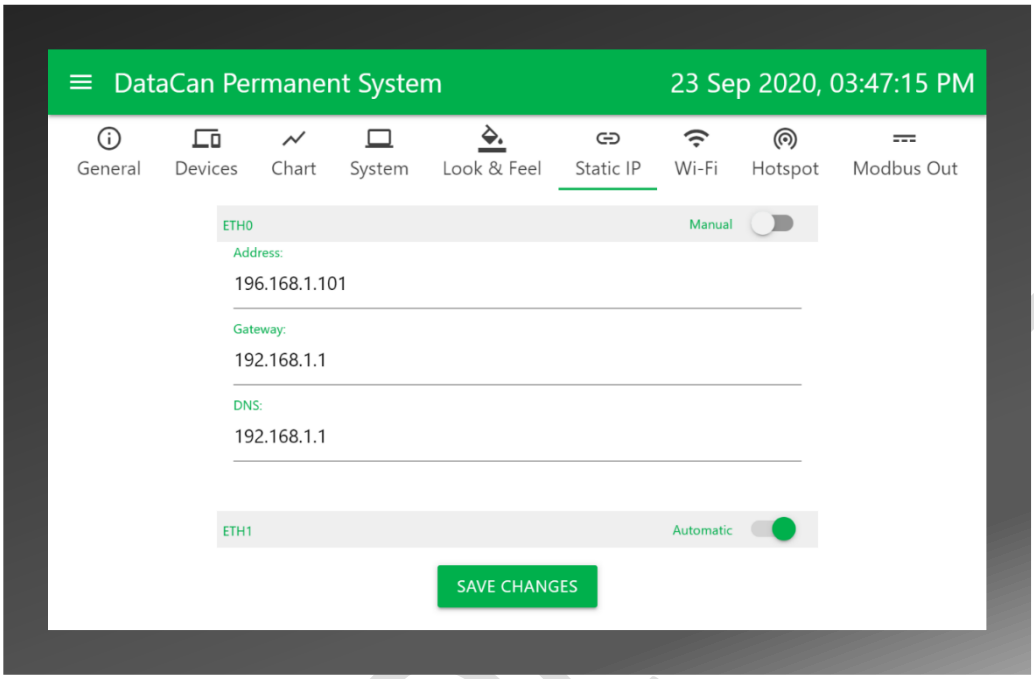
2. Press the switch to enable manual IP configuration.

   Note: By default, both Ethernet ports are set to automatic (An automatic IP address is assigned by host network).



3. Once manual IP configurations are enabled, additional fields will appear. Fill out the information needed in each field for the Ethernet port you want manually configure.

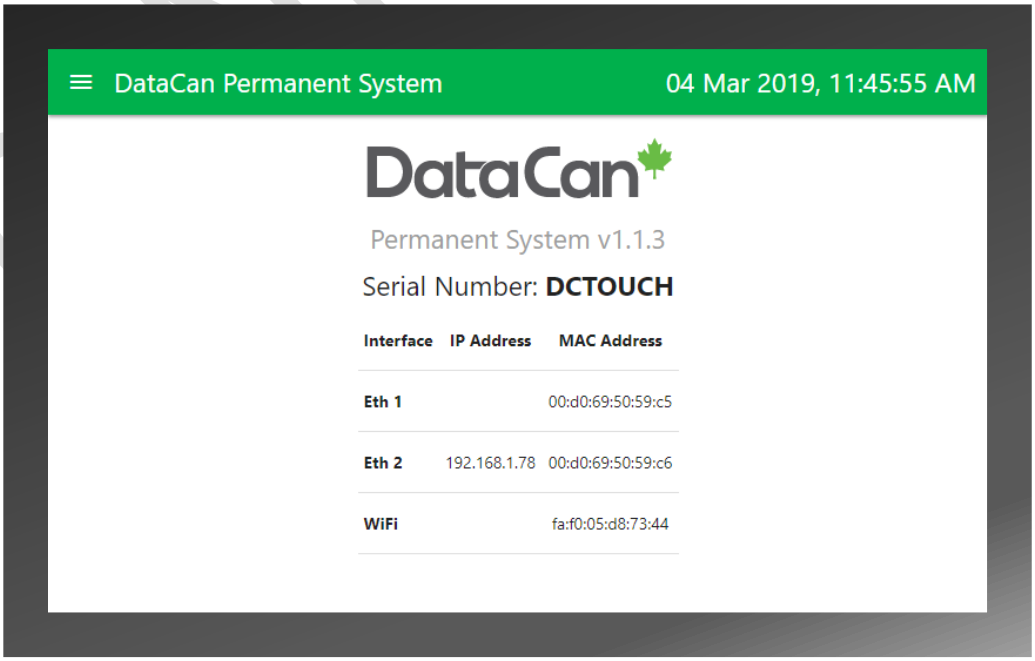
   Note: The subnet mask is set to default at 255.255.255.0 and Address set to public.



4. Once you are finished configuring the desired Ethernet ports, press **SAVE CHANGES**.

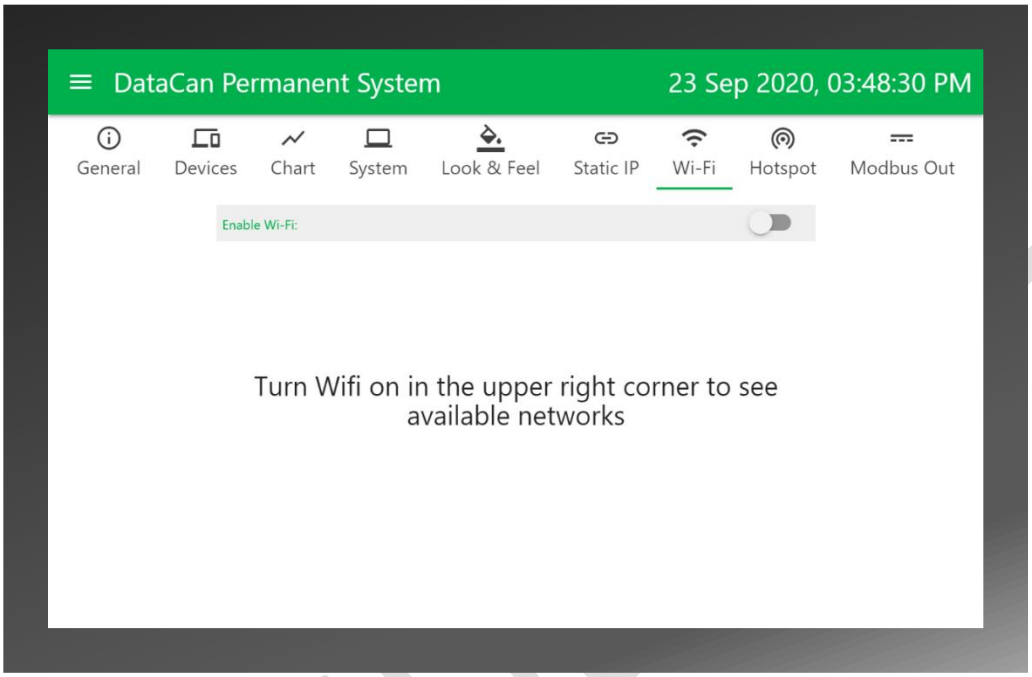
   Note: To have new static the system needs to be restarted (please refer to *System Settings* to restart the system)

5. After rebooting the system, check if the IP is static on the information page.



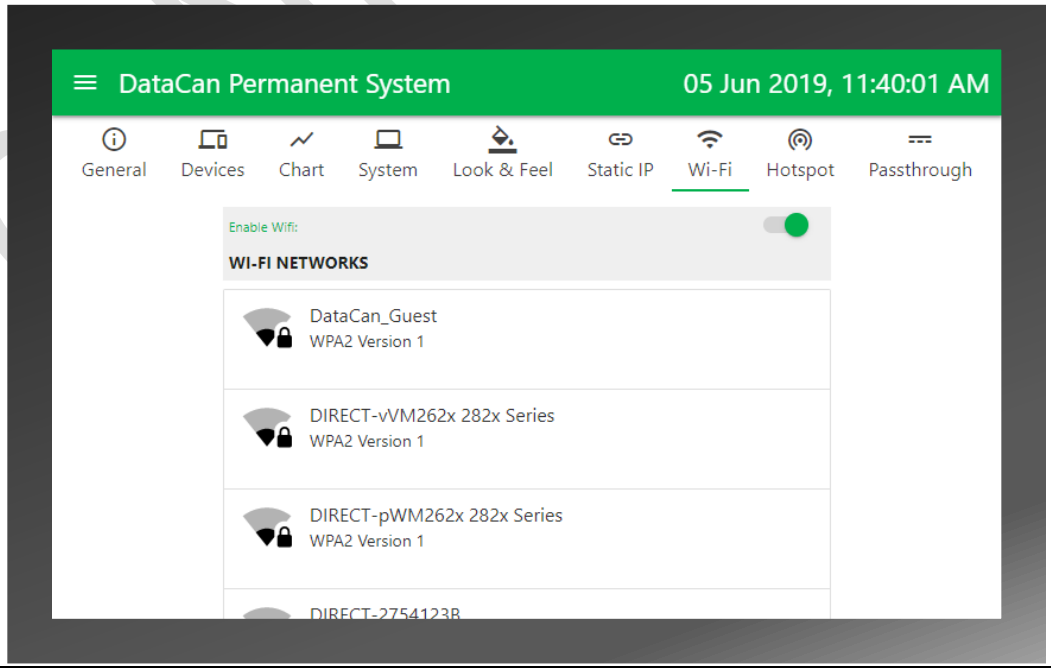
5.6 Connecting System to Wi-Fi [Optional]

1. From the settings main page, press the **Wi-Fi** tab. The following page will appear as shown below.

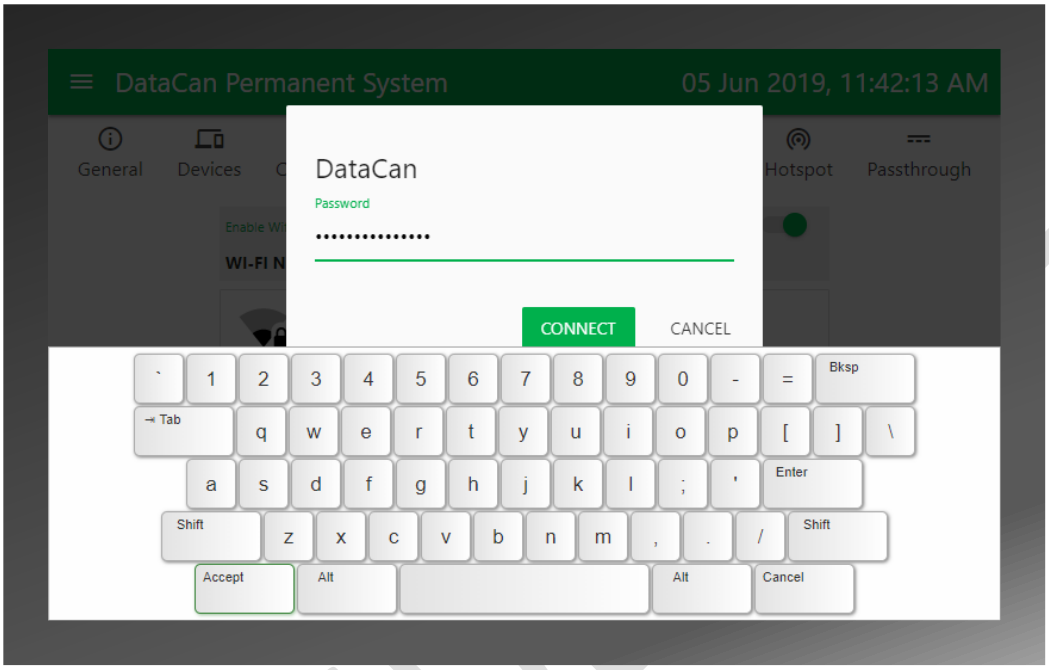


2. Turn on the Wi-Fi by pressing the switch in the upper right corner.

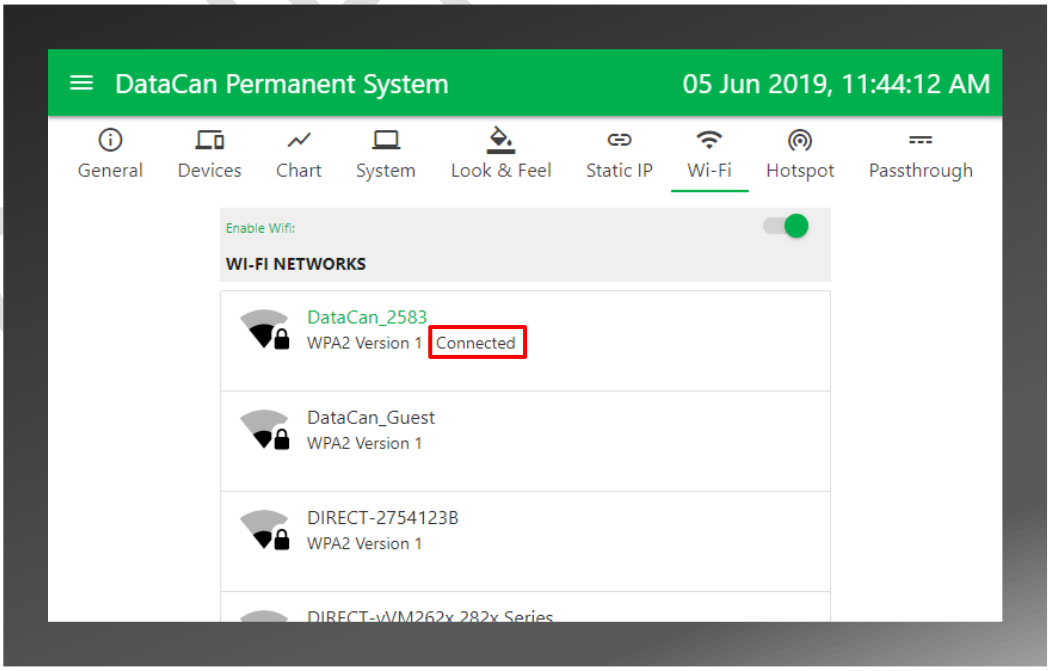
   Note: If the System is already configured with a network, it will connect automatically. Turning on Wi-Fi will display all the available networks in range.



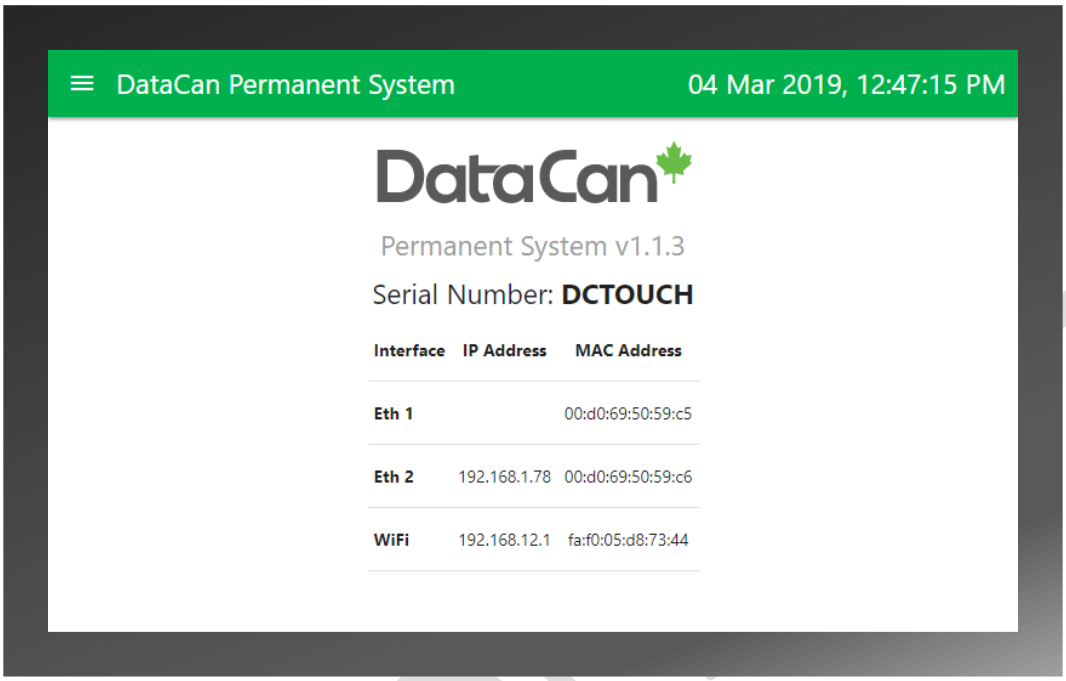
3. Choose your network and press on it.
    - If the network is open, it connects to the system automatically.
    - If the network is password protected, the system prompts for the password to connect. Enter the password and tap on **CONNECT**.



4. Once successfully connected, the available networks list will contain the network with "connected" status.

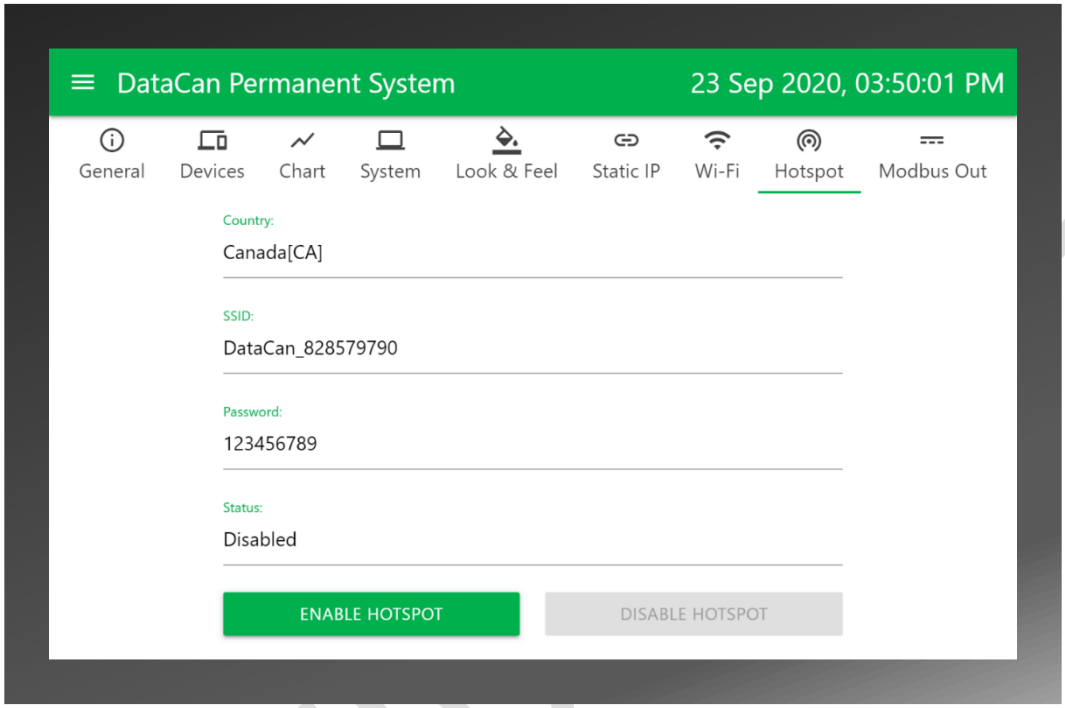


5. To view the IP Address and MAC Address:
    - Click on the menu bar and select the **Info** menu item.



5.7 Wi-Fi Hotspot [Optional]

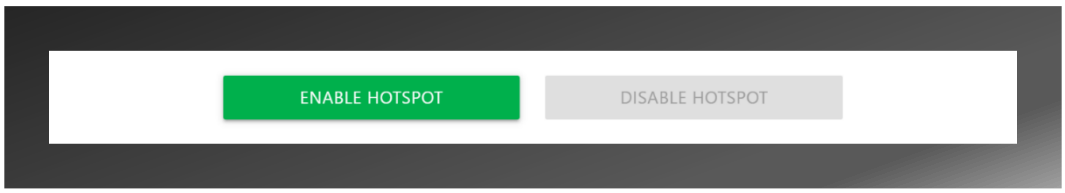
1. From the settings main page, press the **Hotspot** tab. The following page will appear as shown below.



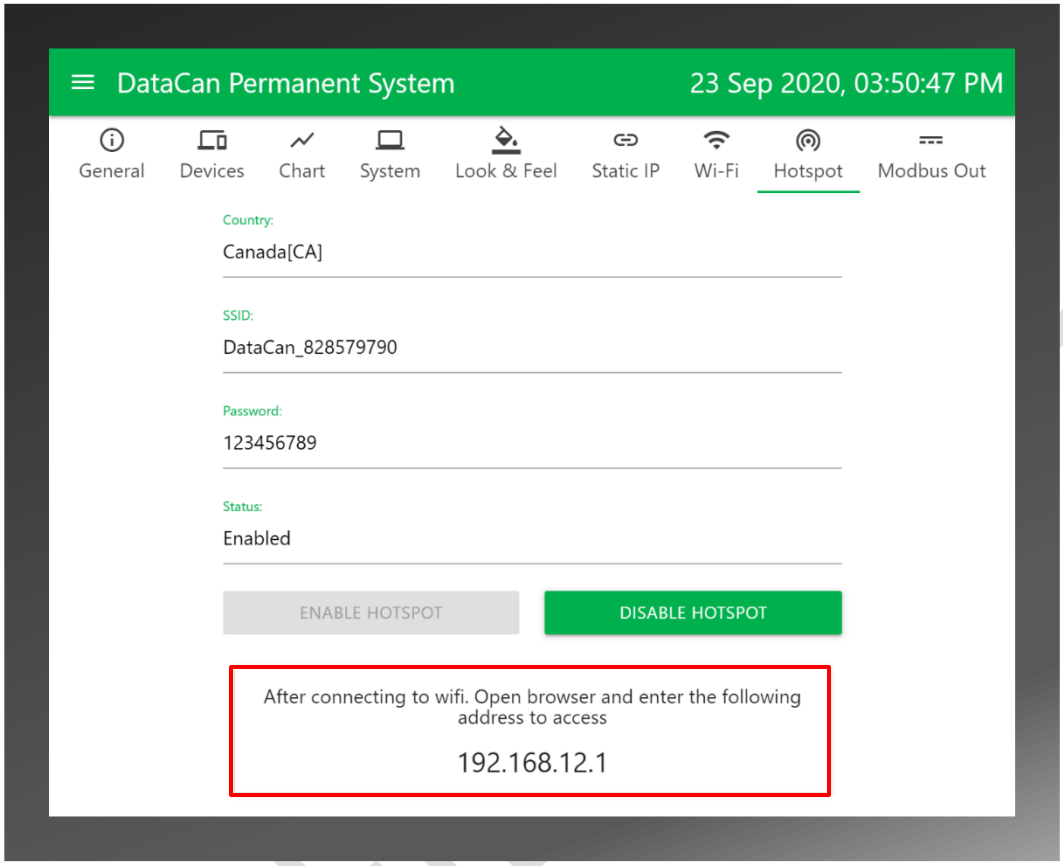
2. You may choose Country Code.

   Note: The **SSID** and **Password** fields are auto generated and are only read-only fields.

3. Press the **ENABLE HOTSPOT** button to enable hotspot.

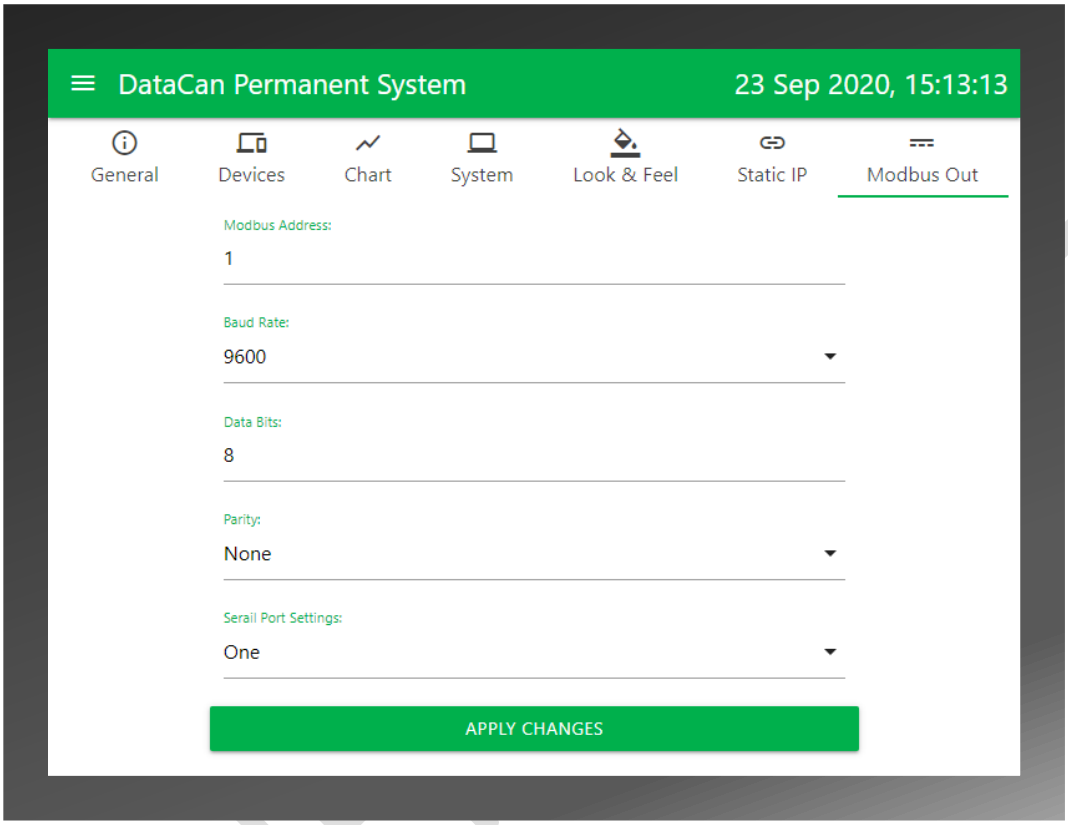


4. Once connection is successful, the page shows additional information to access the system.



5.8 Modbus Out

1. From the settings main page, press the **Modbus Out** tab. The following page will appear as shown below.



2. Enter the Modbus Address (Master Address).

3. Change Serial Port Settings as required.

4. Press **APPLY CHANGES** to apply settings.

5.9 Locking the System

1. Press on the menu bar.
2. Press on the **Lock** menu item to lock the system.