

Stream Technologies Inc.

Cloud Connect



Instruction Manual

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1 Introduction

Welcome to Cloud Connect! Stream Technologies takes great pride in the quality and performance of our product. If you have any questions concerns, please call our customer service department at 780-800-1900 x104.

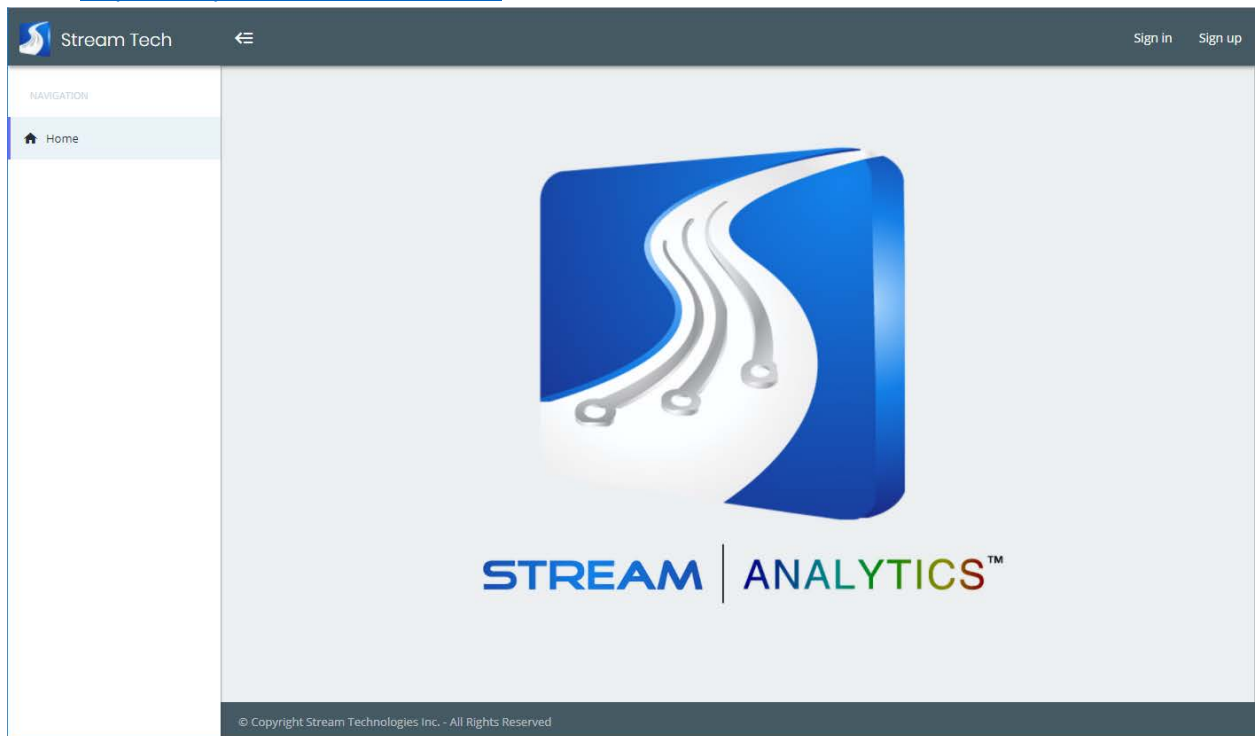
What's in the box?

- Cloud Connect
- Power supply

2 Getting Started

2.1 Sign up for Stream Analytics Account

1. Go to <http://analytics.streamtechinc.com>



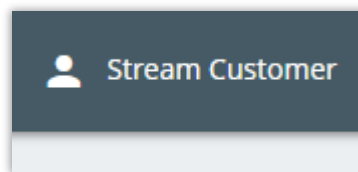
2. Next, click [Sign up](#) in the top-right corner, and choose a service to use with Stream Analytics. If you're creating a new Stream Technologies account, enter your email address, and click [Send verification code](#) to send a code to that address. Once you receive your code, enter it into the form and fill in all information fields before clicking Create account.
3. You will next be asked for your company's name. Enter it into the field and click [Create](#) to continue.

Create your Company!

Name

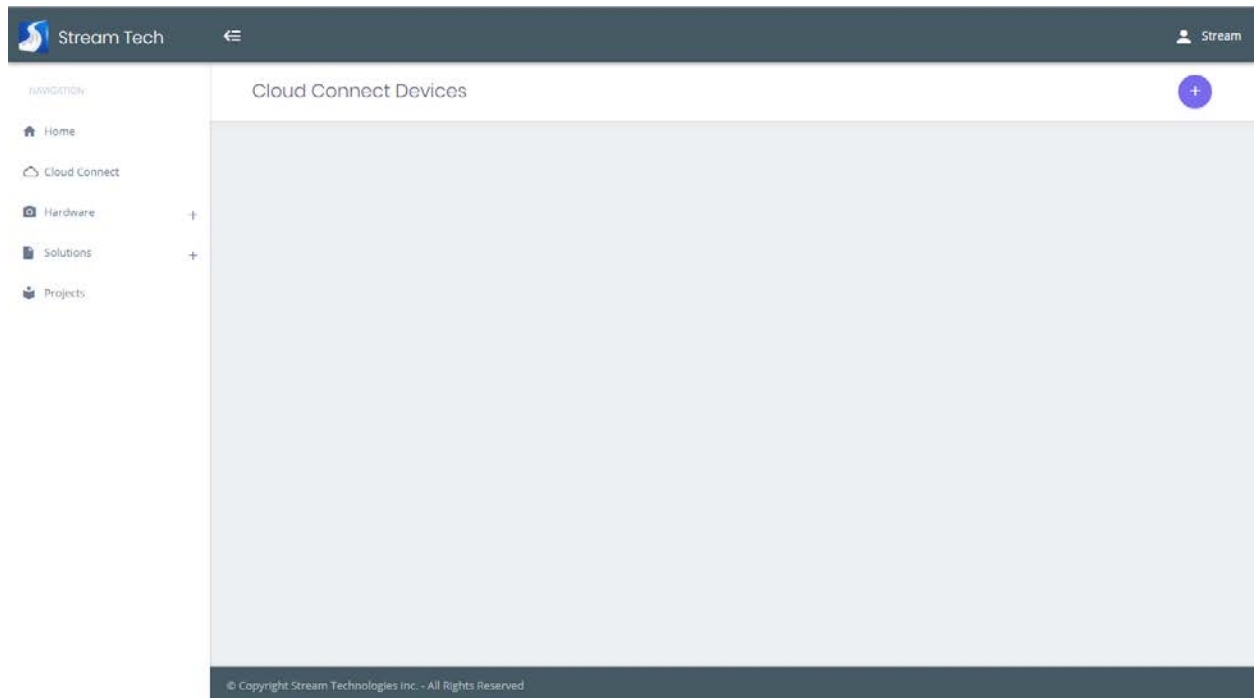
CREATE


- You will now be signed into Stream Technologies' **Analytics** web services.

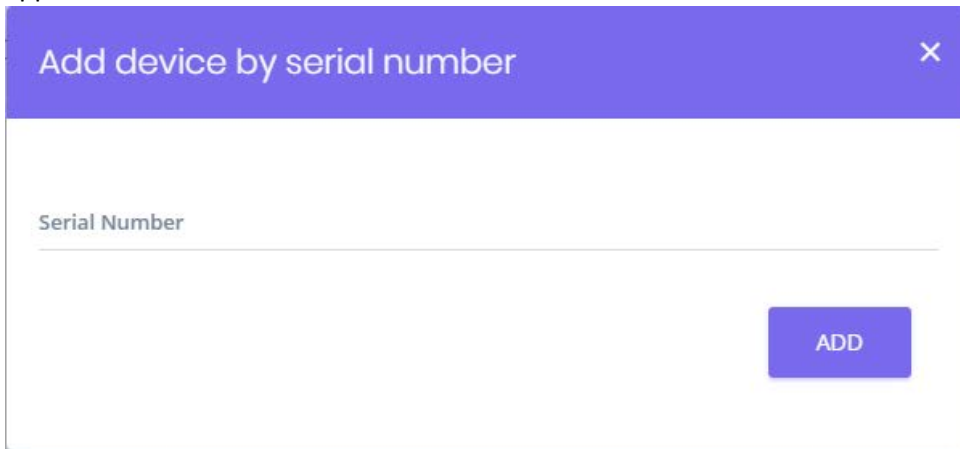


2.2 Registering Cloud Connect device

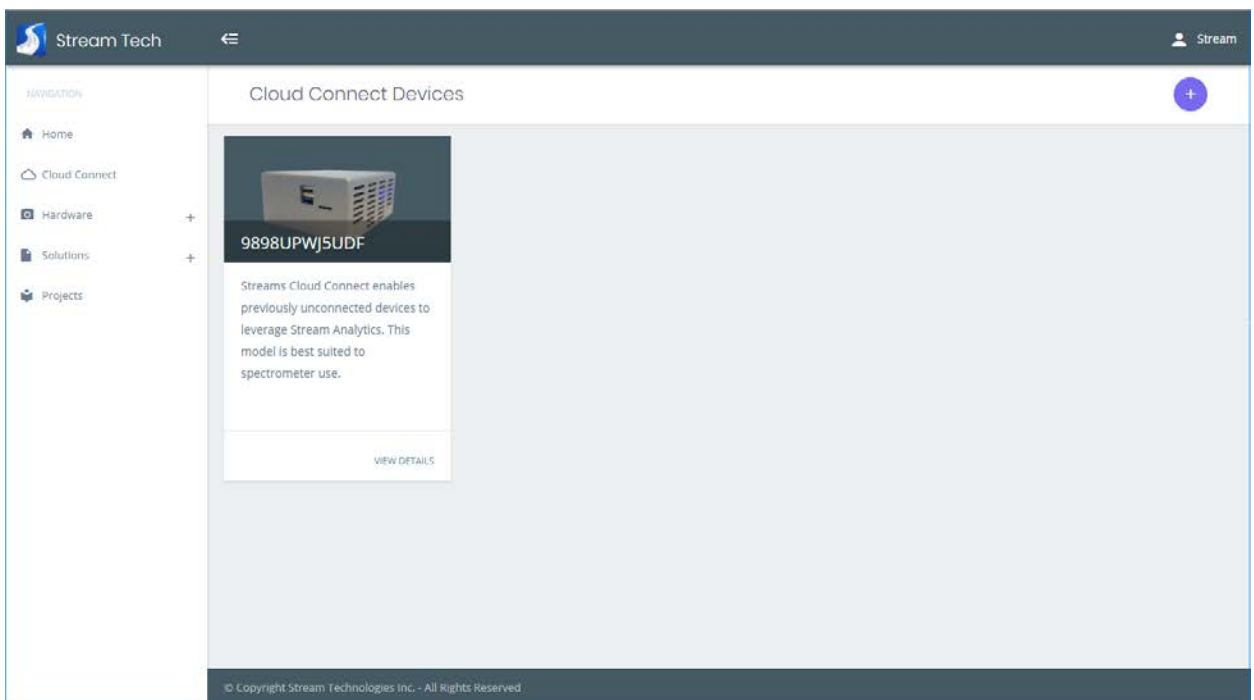
- Click on **Cloud Connect** in the left menu of site.



- Click on  button to begin registering a Cloud Connect device. The following window will appear on screen.



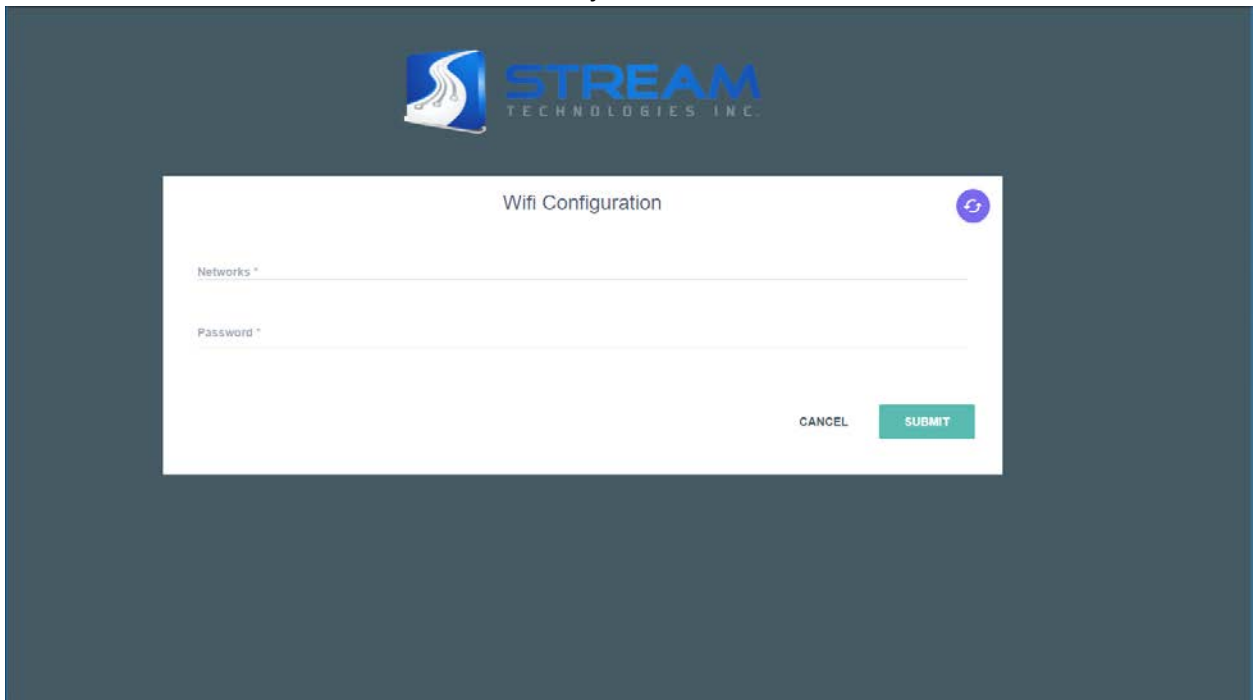
- Enter the serial number located on the sticker on the device and click [Add](#). Once successfully added the device details will now be displayed on the screen and is linked to your company's owned.



- Click on [View Details](#) to see information regarding the device such as the PIN that will be used in the next section.

2.3 Setup of Cloud Connect device

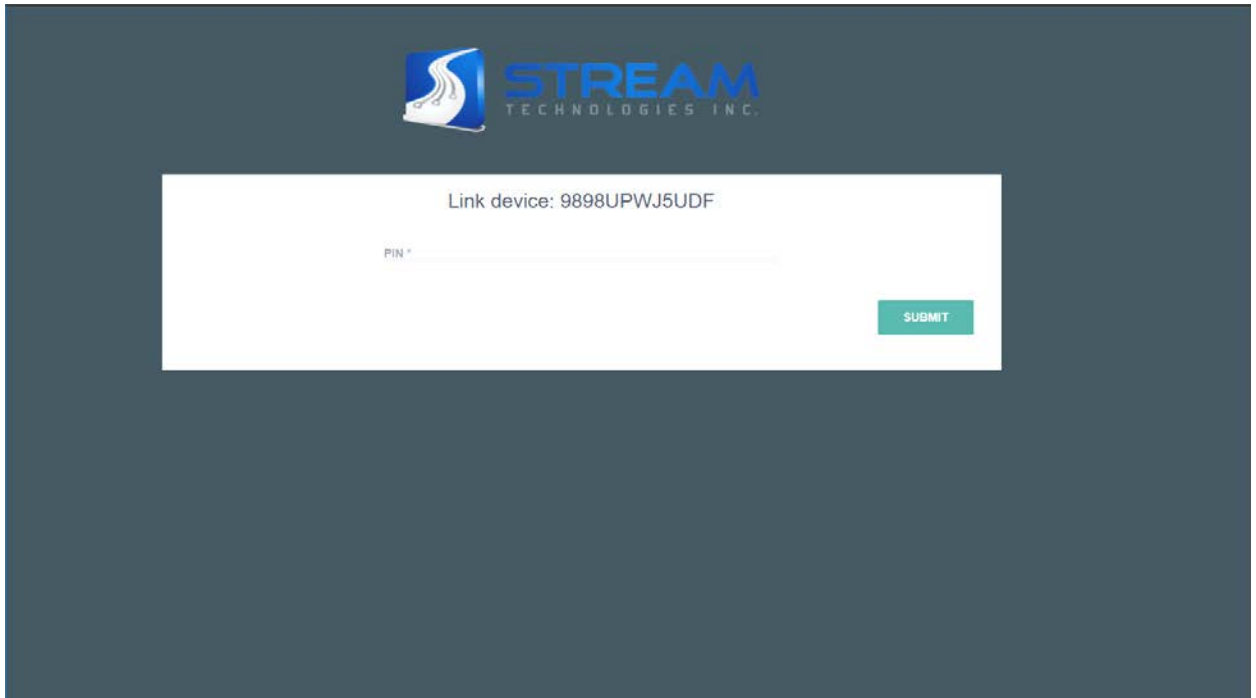
1. On a computer, phone or tablet in close range to the Cloud Connect device switch Wi-Fi network to one with SSID matching the serial number of the device. The password is located on the sticker on the device. NOTE: You will lose internet connectivity during this process.
2. Once connected to network open a browser and navigate to <http://{{serial number}}:3000>.
3. If not connected using ethernet the Wi-Fi Configuration screen will be shown. Select the Network and enter Password and click [Submit](#) to join.



The screenshot shows a web interface for 'Wifi Configuration'. At the top left is the Stream Technologies Inc. logo. The title 'Wifi Configuration' is centered at the top of the form area. Below the title are two input fields: 'Networks *' and 'Password *'. At the bottom right of the form are two buttons: 'CANCEL' and 'SUBMIT'.

4. After joining the network, you can change your computer, phone or tablet back to the network the Cloud Connect device was just connected and click on the link displayed to continue process.

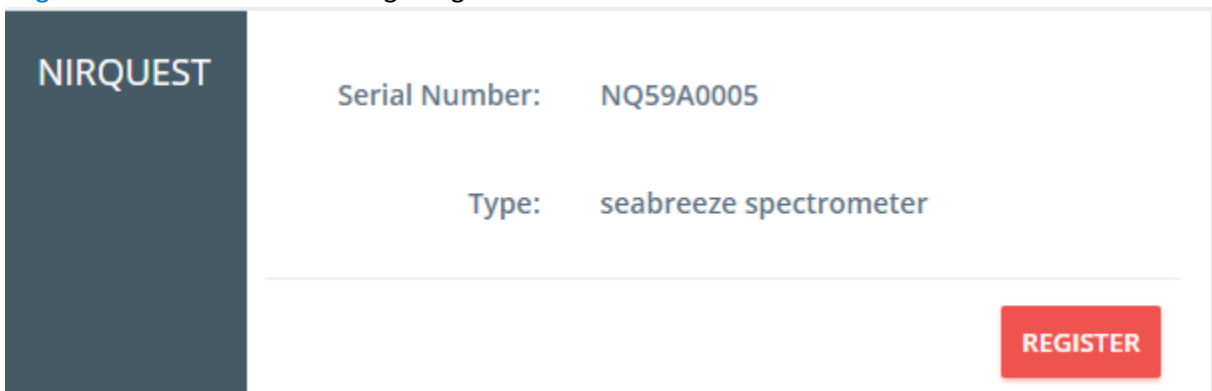
5. In the previous section after adding Cloud Connect device to company a PIN was generated (see section 2.2.4). To link the device, insert the PIN and click on [Submit](#).



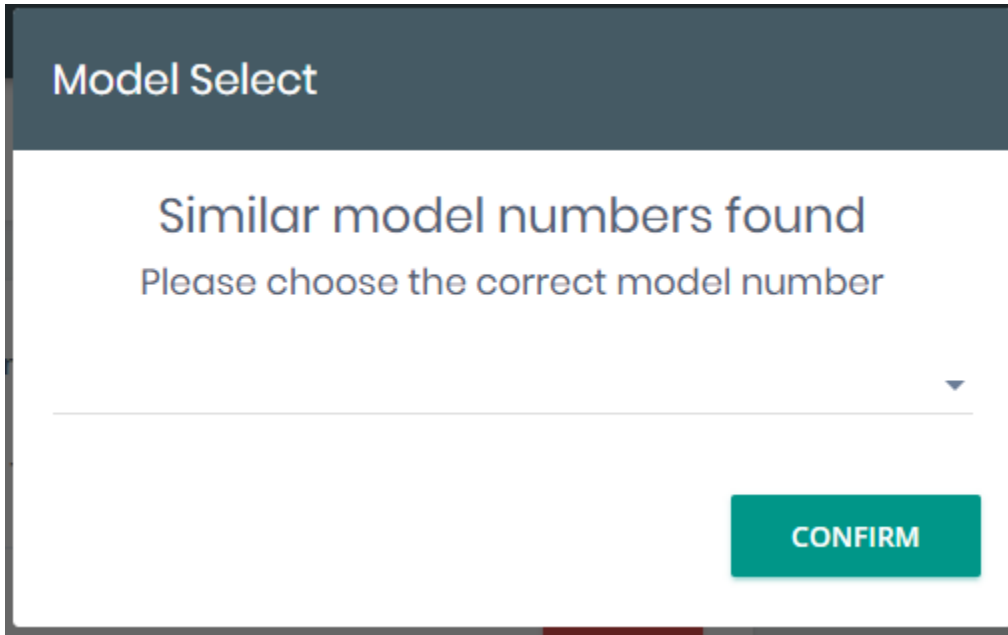
6. After PIN has been verified you will be redirected to the homepage.

2.4 Registering connected device

1. After plugging a supported device in it will appear in the list on the homepage. If nothing appears check the device connections and press refresh.
2. If device is being used for the first time on Cloud Connect device the device card will display a [Register](#) button. Click that to begin registration.



3. If similar device model numbers are found a pop up will be displayed asking to specify the exact model of the device being registered. Select the model number and click on [Confirm](#).



4. After confirming model number, the device is now ready to use.

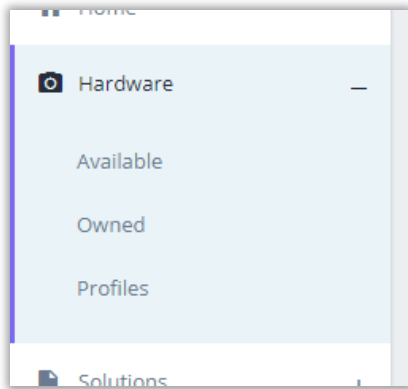
3 Making a solution


The purpose of the Cloud Connect is to enable easy scanning of objects of interest using supported devices, which can then be used as training data for the Stream Analytics engine. The result of this training is a Solution, which can then be incorporated into Projects for later use. In this section, you'll learn how to make your own Solution with a simple example problem – differentiating between different color patches using a spectrometer.

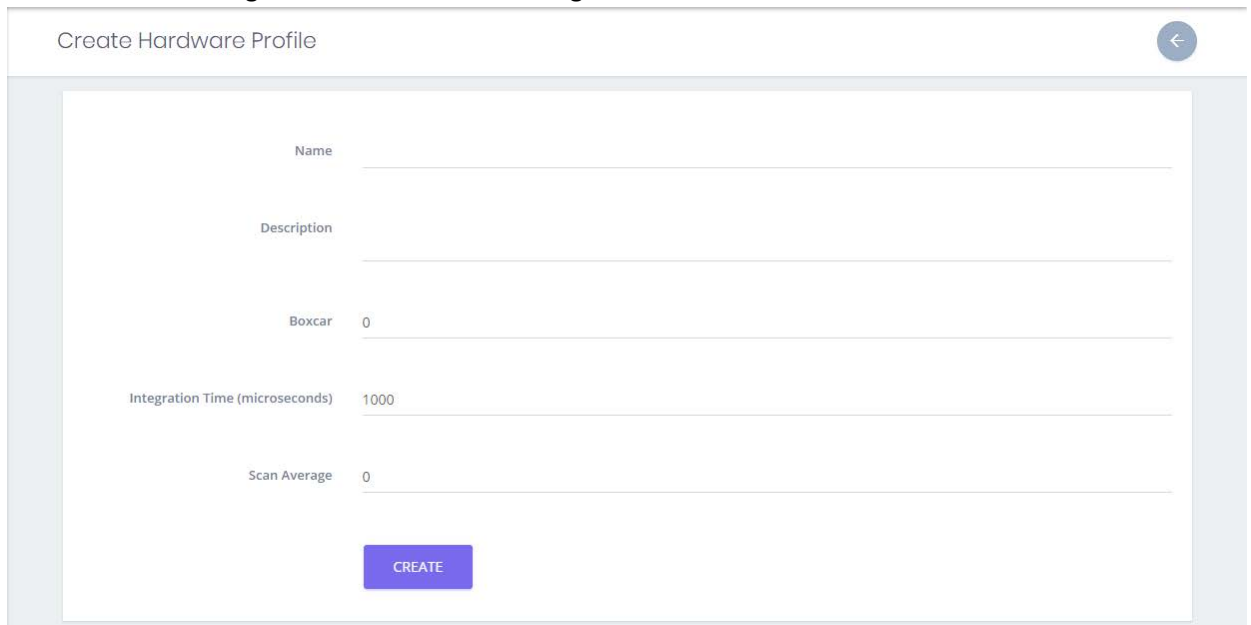
3.1 Choose a Hardware Profile

1. The first step in creating a Solution is to choose a Hardware Profile that optimizes your device settings for the conditions under which you're capturing scans for that Solution. First, go to the main Analytics website and in the sidebar click on [Hardware](#), then [Profiles](#). You will see a list of

hardware options available for your hardware. Choose your device model number.



2. You can click on an existing profile to view the details or click on the  button in the top right to create a new one.
3. When creating a new profile you can set settings required for your solution. After entering the values for the settings click [Create](#) to save changes.



Create Hardware Profile

Name

Description

Boxcar

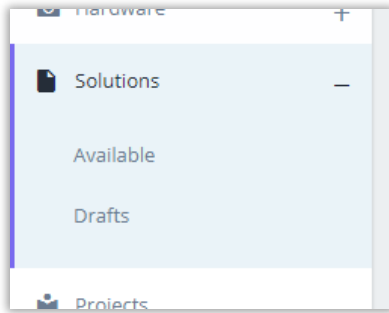
Integration Time (microseconds)


Scan Average

[CREATE](#)

3.2 Create a new Solution

1. Next, it's time to make a new Solution. Return to the main Analytics page and click [Solutions](#), then [Drafts](#). This will bring you to the Draft Solutions page, which allows you to create new Solutions and lists your Solutions currently in progress.



2. Click the  button to create a new solution.
3. You will see several information fields that need to be filled out to create your Solution. Click **Create** when the information is complete.
 - **Name** – The name of your Solution. Our example will be named “Color patches - Spec”.
 - **Description** – A place to describe your Solution and enter notes.
 - **Photo** – Choose an image file for your Solution to display on the Analytics website.
 - **Camera Model** – Choose the model of camera being used to obtain image data, in this case, the NIRQuest512.
 - **Hardware Profile** – Choose an appropriate Hardware Profile for your scan acquisition conditions. We’ll choose the “Tutorial” Profile.
 - **Solution Type** – Choose the type of Solution that will be trained by the Analytics Engine. Several Solution types are available, and in general, Class and Multi-Class Solutions can be used to classify objects in images (e.g.: types of plant species) and Regression Solutions can be used to quantify properties of objects in images (e.g.: percentage of nitrogen content in leaves). Our example will be to differentiate between several color patches, so we’ll choose an “Multi-Class Neural Network”.
 - **Tags** – Enter any tags that will facilitate finding your solution in later searches.
 - **Labels** – Enter any labels used to help identify scans
 - **Add Component** – These define the objects in your images that the Solution will be trained to identify. Click **Add Component**, then fill in the Name and Description, and choose a color for that component. At least one component must be added for the Solution to be created, but more can be added later. In our example, we will have five components – Green, Red, Yellow, Blue, and Background. When possible, training for a background component in a Solution can improve results significantly.
4. Now that your new Solution is created, you will be taken to a page where you can view the Solution’s status. There are also several functions that can be accessed here using the buttons in the title bar. These are:



Back – Go to the main Draft Solutions list.



Refresh – Refresh the page (works the same way as refreshing from the browser)



Edit – Edit the properties of the current Draft Solution.



Training scans – Train scans taken using the connected hardware.



Training Reports – View reports summarizing the results of image training.




Train – Train the solution using the training images. This button will become available once images are taken.

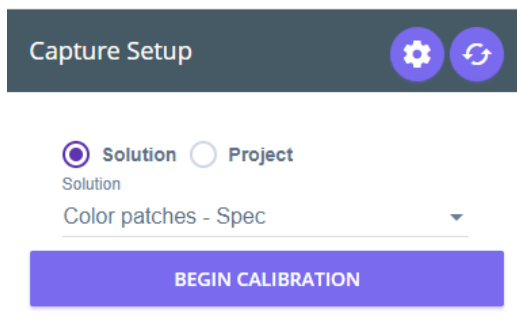


Publish – Publish the Draft Solution for future use. This button will become available once the solution has been trained.

3.3 Collecting Training scans

Now that we have a solution ready to be trained, we need to obtain scan data with a spectrometer and Cloud Connect.

1. Setup spectrometer as required by solution. For this example, we will be using a simple reflectance measurement setup.
2. Navigate back to Cloud Connect device: <http://{{serial number}}:3000>
3. Locate device in list and click [Use](#)
4. We are now ready to begin Capture Setup
 - a. Select 'Solution' as capture type
 - b. If no solutions are found, click on the  button to load from Analytics site.
 - c. After selecting solution, click on [Begin Calibration](#) to start the calibration.

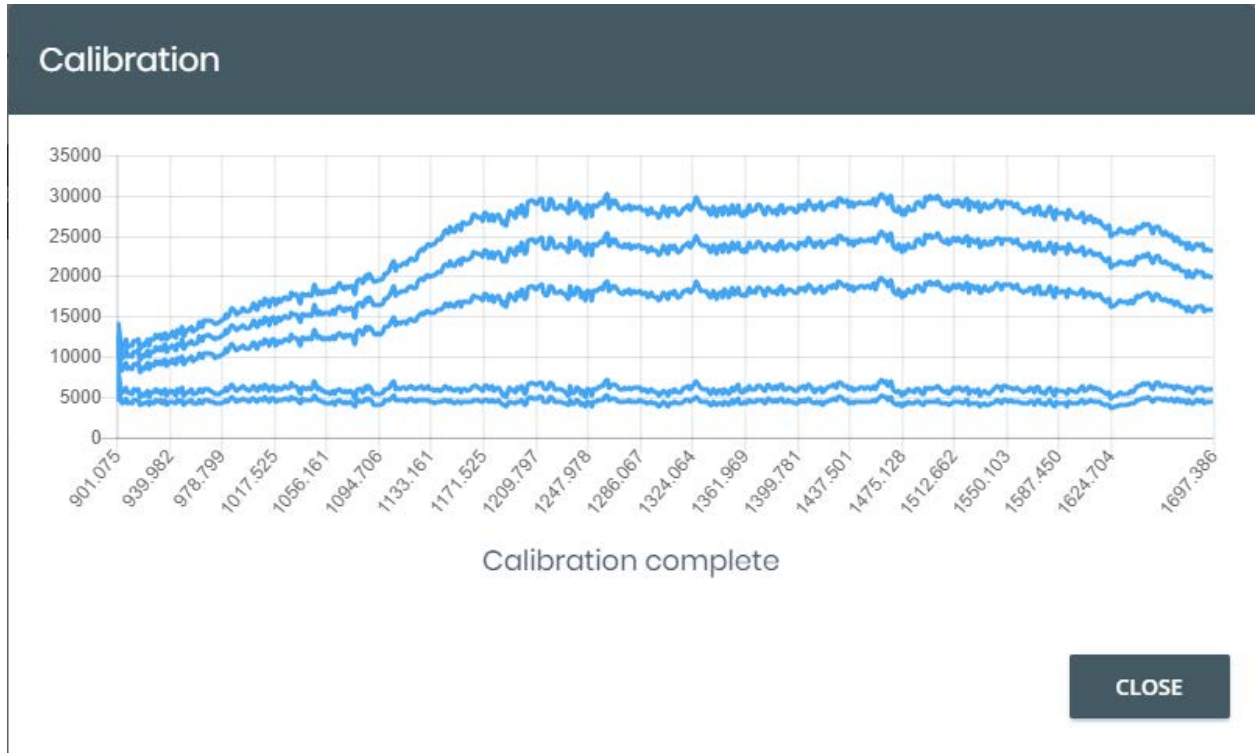


3.3.1 Calibration

To calibrate the spectrometer to be used in a solution or project calibration, standards from Spectralon are required to be used.

1. After clicking [Begin Calibration](#) a pop up will be displayed and guide you through the process, starting with capturing dark scan. Block off the light source, if applicable, click capture.

2. Once all standards have been captured you will have a chance to review scans to make sure charts look correct.

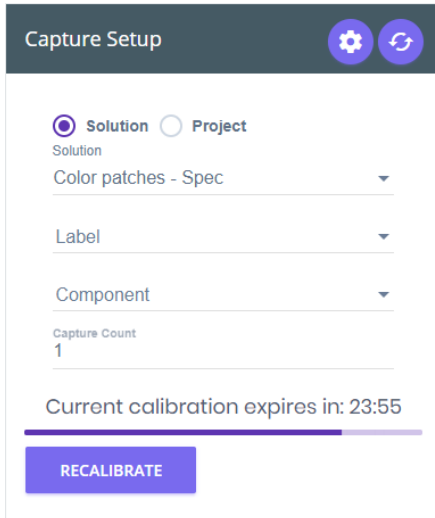


3. [Close](#) the pop up to either keep scanning or to redo the calibration

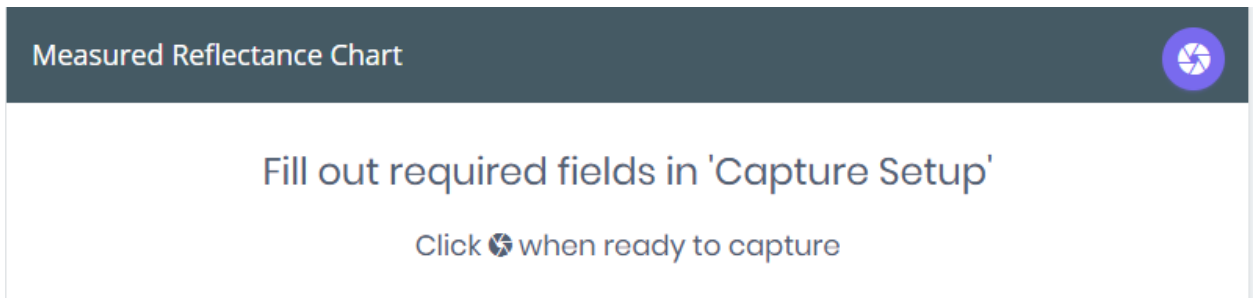
3.3.2 Capturing Scans

Once calibration is done you will have 30 minutes to capture scans until the calibration needs to be done again. This is done to reduce the amount of shifting due to temperature changes in the spectrometer during use.

1. Begin by choosing a label and component from the list. These are required to capture a scan.



2. To enable continuous scanning, enter the number of scans to capture in 'Capture Count'. Minimum of 100 scans per component are required to train a solution.
3. Once all required fields are filled out the capture button will be enabled, and scanning is ready to start.




4. While scanning the chart will update with each scan processed. If capturing more than 1 scan at a time, a counter will be displayed and updated to show progress.





5. After the scan is captured it is automatically uploaded in the background and will be processed in the cloud.


3.4 Training a solution

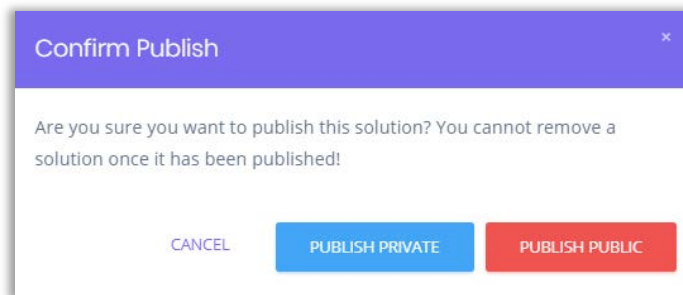
1. Go back to the Analytics website on your Solution Details page. Now that all components have the minimum number of scans associated to them and uploaded we are ready to begin training.

2. You can review the uploaded scans by clicking on the  button located in the top right.

3. Once complete, go back to the main Solution Details page and click the  button to train. You will see a Pre-Training Report that with information on the training data that will be used. If everything is in order, click the [Train](#) button. The Solution Status will change to indicate the progress of the training and will say “trained” when it’s complete. Once training is completed,

you can check the results by clicking the  button to see the Training Report. If you’re

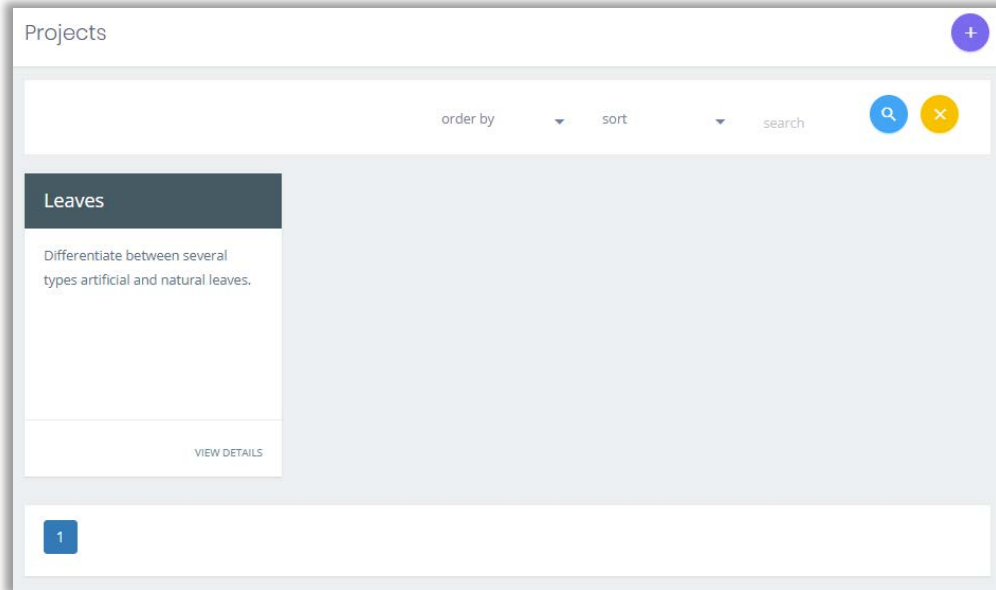
satisfied with the report, press the  button to publish and you will be asked to make a private (available only to your company) or public (available to everyone) Solution. Select the [Publish Private](#) option and your Solution will be ready for use in a new Project.



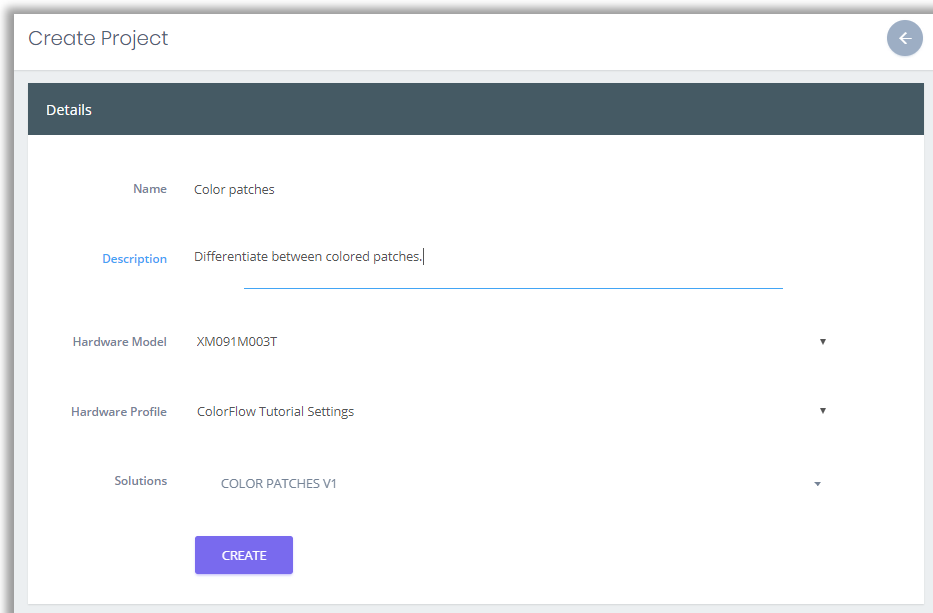
3.5 Creating a Project

1. On the main taskbar, click on Projects. This will take you to the Projects page, which displays a

list of Projects available to your account. Click the  button to create a new Project.



2. Enter the required information and select the Solution you want to use for the Project, then click **Create**.



3. The list of available Projects will update to have your newly created Project, which will now be available to your Cloud Connect hardware. Clicking on the Project in the list will take you to a page summarizing your Project with a list of images associated with that Project (currently empty).
4. Capture scans by following the same process for captures scans for a solution except pick 'Project' as the work type and find the new project in the list.

5. Once your scans are processed and uploaded to the Cloud, go back to the Projects webpage and click [View Details](#) to see your new Project. The page list all the scans you've taken for this project. Click on [View Details](#) for the scan you just took to see the results.
6. You will be taken to a page with more information about the scan.