

VAKKA Instructions

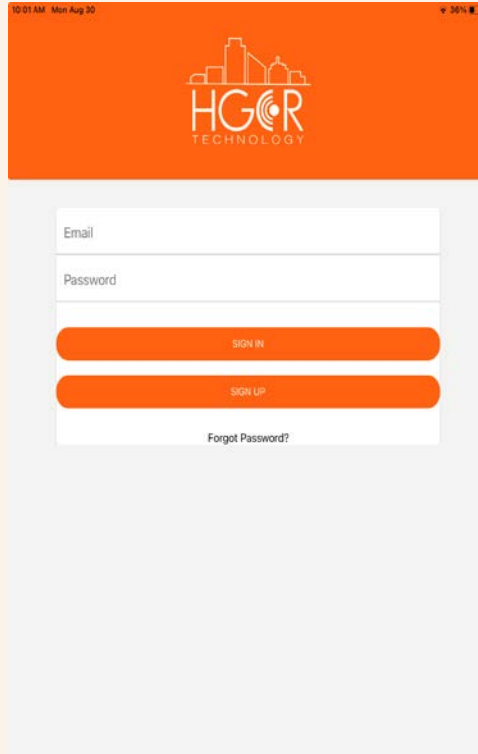
Wireless Temperature and Relative Humidity Sensors in Concrete



Project Setup

1

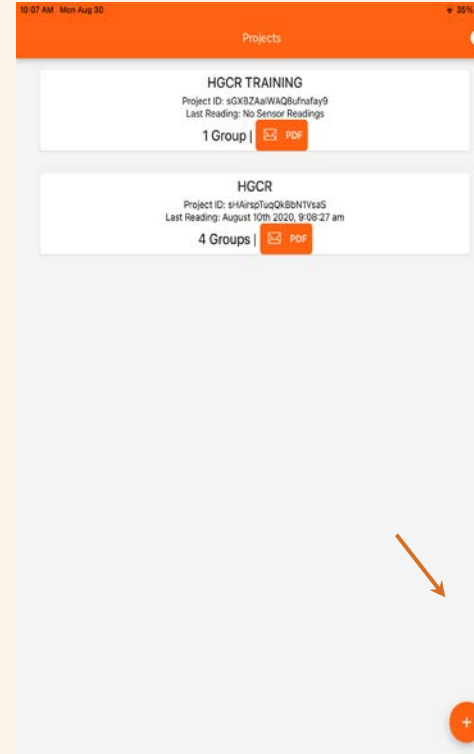
Login or
Create an
account with
your email



The screenshot shows the login and sign-up interface. At the top is the HGCR TECHNOLOGY logo. Below it are two input fields for 'Email' and 'Password'. There are two orange buttons: 'SIGN IN' and 'SIGN UP'. At the bottom, there is a link for 'Forgot Password?'.

2

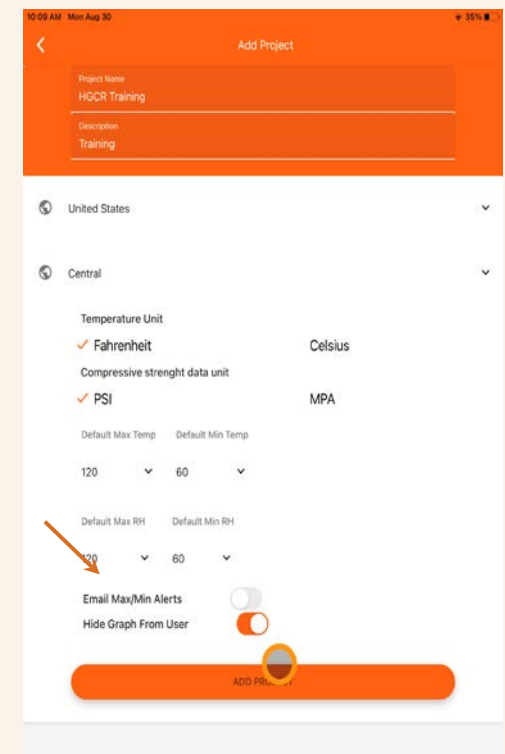
In the Projects
menu select a
project or click
the “+” icon to
create a new
project.



The screenshot shows the 'Projects' menu. It lists two projects: 'HGCR TRAINING' (1 Group) and 'HGCR' (4 Groups). Each project entry includes a PDF icon. At the bottom right corner, there is a red circular button with a white plus sign, which is highlighted by an orange arrow.

3

Enter a project
name, description,
and settings. Click
“Add Project” to
continue and add
contributors to
your project.



The screenshot shows the 'Add Project' settings screen. It includes fields for 'Project Name' (HGCR Training) and 'Description' (Training). Below these are settings for 'United States' and 'Central' locations. There are dropdown menus for 'Temperature Unit' (Fahrenheit), 'Compressive strenght data unit' (PSI), 'Default Max Temp' (120), 'Default Min Temp' (60), 'Default Max RH' (90), and 'Default Min RH' (60). There are also toggle switches for 'Email Max/Min Alerts' and 'Hide Graph From User'. At the bottom, there is a large orange button labeled 'ADD PROJECT'.

Project Setup

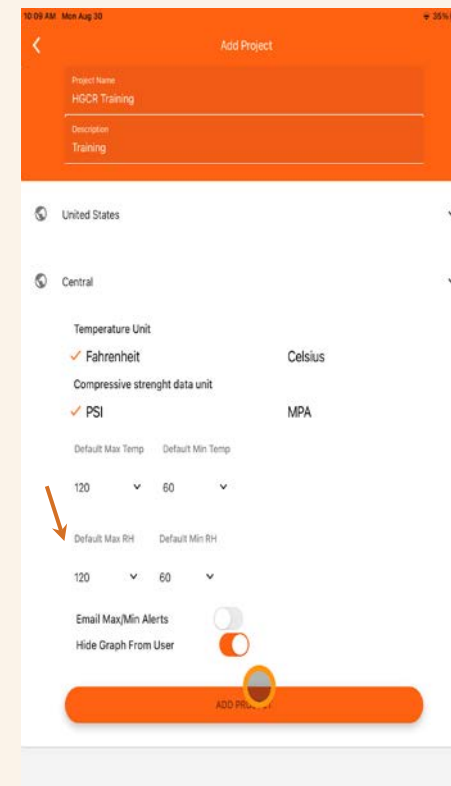
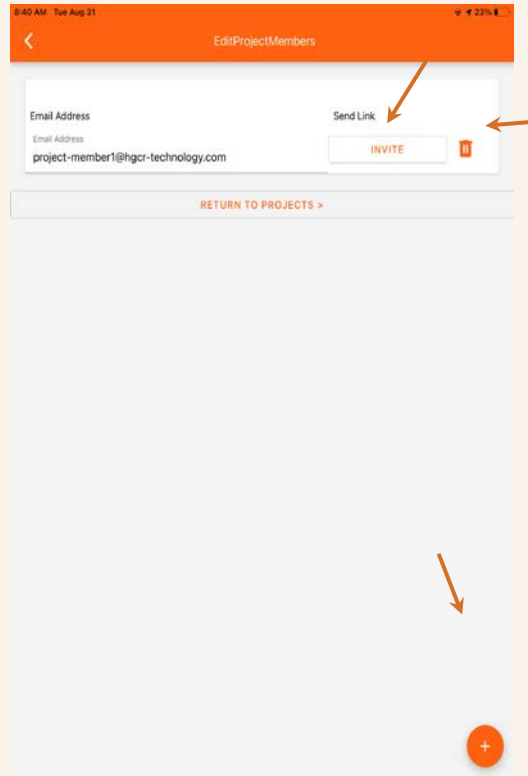
4

Click the “+” icon to add a member. Enter their email address then click “invite” to send an invitation link.

Click the trash can icon to remove a member.

When finished click the arrow at the top left of the screen to return to your project information.

Click “Save Changes” to save your project.

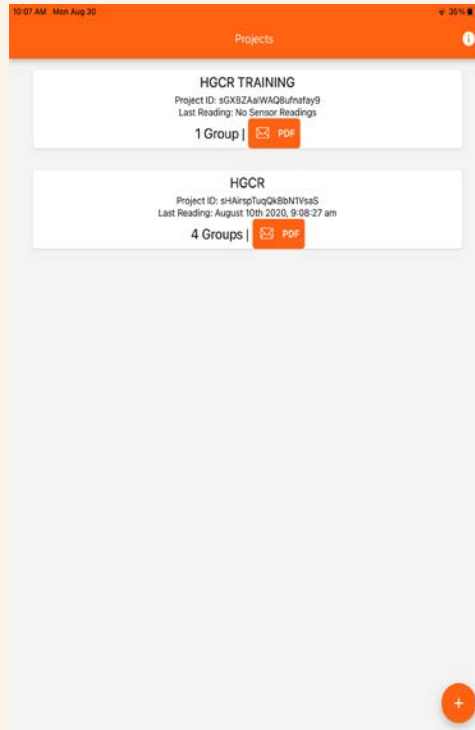


- ✓ *The Project Administration/Manager has the ability to make changes to the project. Project Members can only update or add information on a project.*
- ✓ *CAUTION: When deleting a project, all groups and sensors in the project will also be deleted.*

Concrete Mix Setup for Testing Laboratories

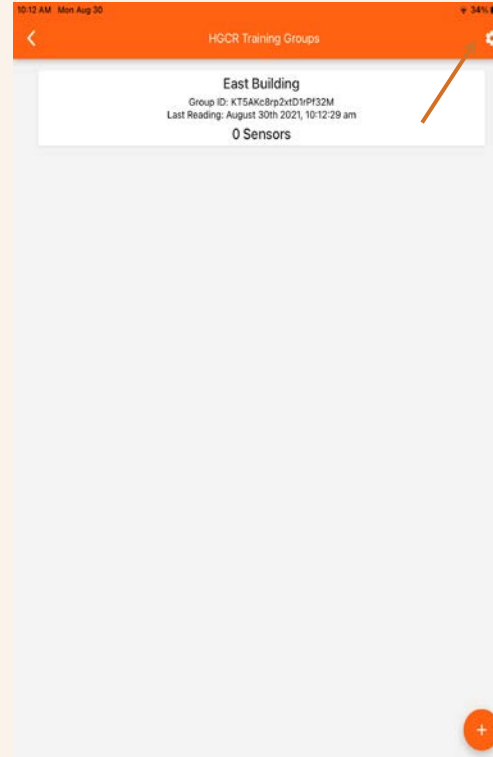
1

Login or Create an account with your email (see Project Setup)
Select your project from the main menu.



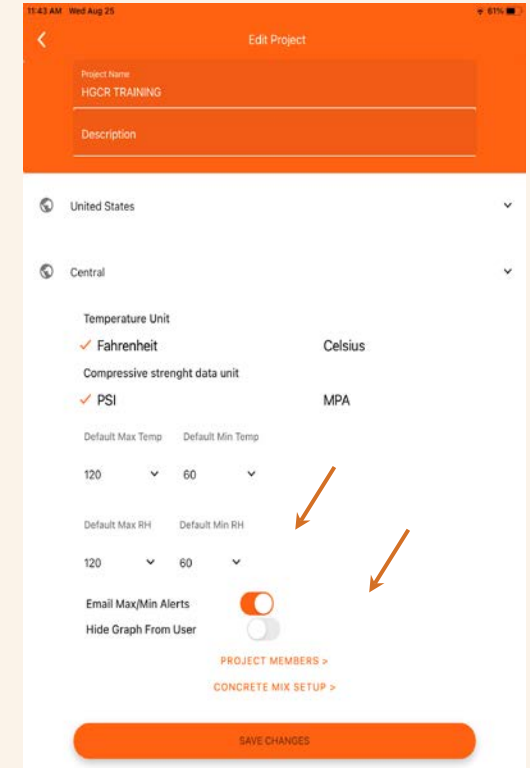
2

Select the gear icon in the top right corner of the screen to access your project settings.



3

Toggle "Hide Graph From User" button to chart Temperature and Humidity Data.
Select "Concrete Mix Setup" to navigate to your concrete mixes menu



Concrete Mix Setup for Testing Laboratories

5

Select a concrete mix or click the "+" icon to enter a new concrete mix

Concrete Mixes

Trial Mix
Date Added: July 6th 2020, 4:22:26 pm
Date Updated: July 6th 2020, 4:22:26 pm

6

Name your mix, select your sensor, input the date the lab cylinder was made, and add the age of the concrete and the compressive strength. Select the maturity function: Nurse Saul (Temperature-Time Factor) or Arrhenius (Equivalent Age). All sensors need to be updated to the current time before any field can be populated.

The default perimeters for the Datum Temperature and Q value are displayed. Change the perimeter associated to the maturity method. Start populating the time and compressive strength fields below.

Concrete mix 2

Sensor NE 1

Current Date and Time
Wed 08-04-2021 09:08 pm

Casting Date and Time
Thu 07-01-2021 09:00 am

Compressive Strength Method
Please select a primary method for calculating concrete compressive strength and update default values for both primary and secondary methods.
(Note: It is important to confirm the default values for the secondary method just in case you need to switch methods as you won't be able to update these values after the mix design process begins.)

Arrhenius Method
Q Value: 4700 Activation Energy

Nurse-Saul Method
Datum Temperature: 0 Degrees Celsius

Day #	Date / Time	Cumul. Age at 20° C	Concrete Strength (PSI)
6	Wed 07-07-2021 09:05 am	172.70	1600
13	Wed 07-14-2021 09:00 am	351.22	3400
20	Wed 07-21-2021 09:00 am	532.08	5400
27	Wed 07-28-2021 09:00 am	722.36	6250
	select date and time		

SAVE MIX CHANGES

- ✓ All fields must be populated before the Maturity Index be applied to a concrete mix on site. Any change made to the mix design will require a recalculation of the Maturity Index.
- ✓ Once the Maturity Index is established, it can be selected as the mix design for the sensor on the project.

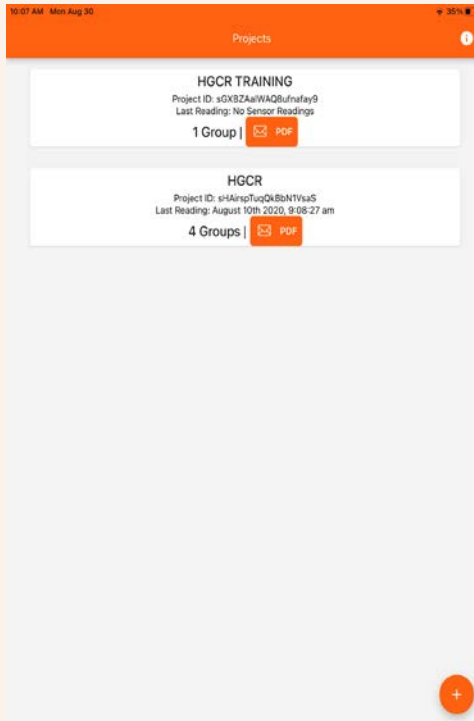
The Strength Maturity Relationship will be automatically calculated and can then be used to estimate the strength of the concrete on site. When finished click "Add New Mix" to add your mix to the project.

NOTE: Once saved, no changes can be made to the mix design.

Adding Sensors to Project

1

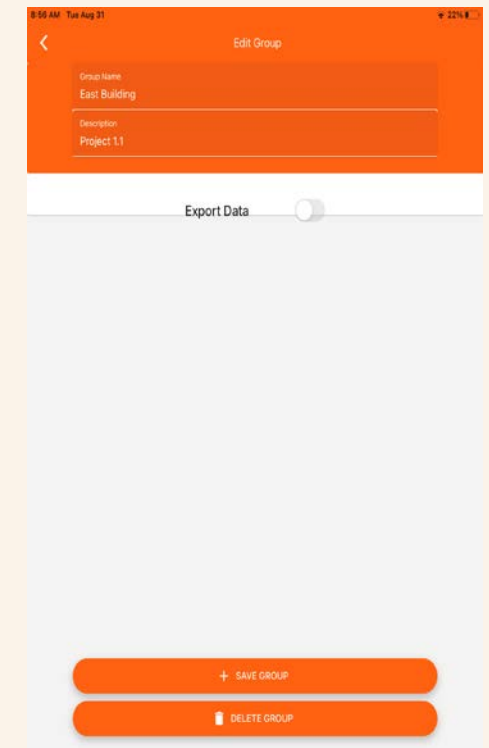
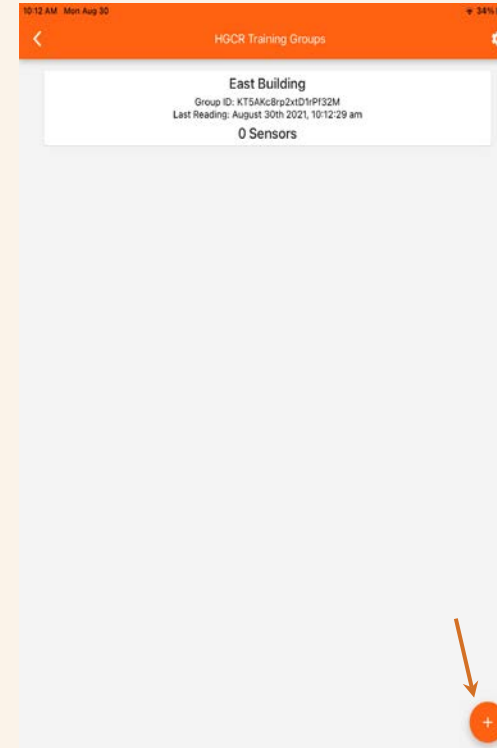
Login or Create an account with your email (see Project Setup)
Select your project from the main menu.



2

Select a group or click the "+" icon to create a new group.

Enter a name and description for your group and click "save group"



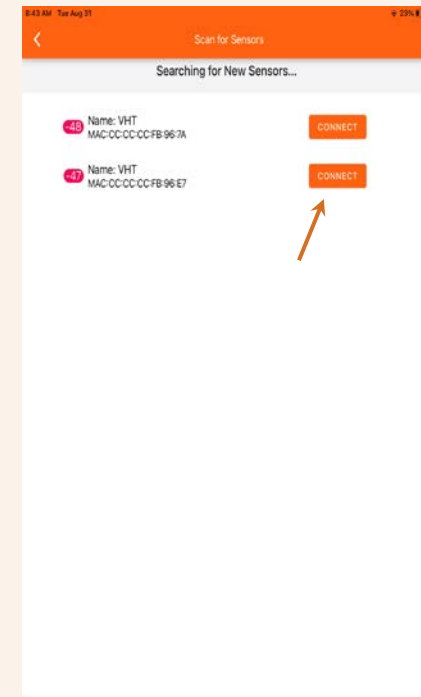
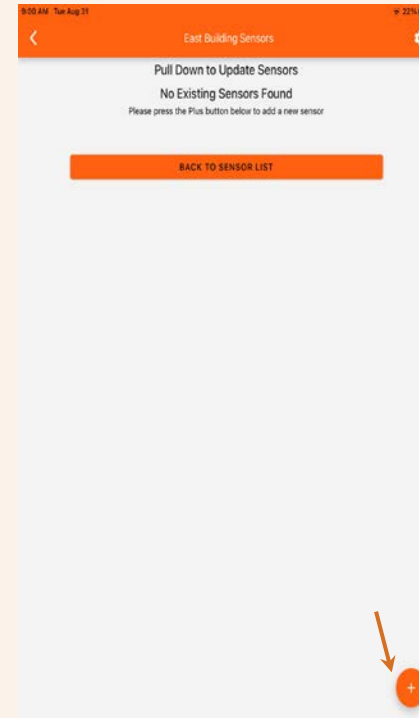
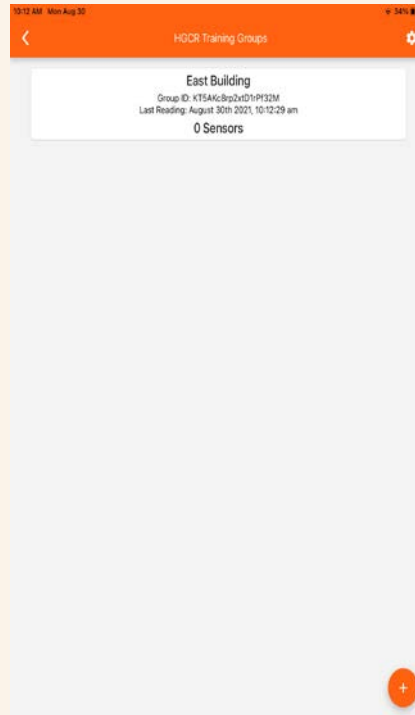
CAUTION: When deleting a group, all sensors in the project will be deleted.

Adding Sensors to Project

3

In the groups menu, select a group to see your sensor list.

Click the "+" icon to add a sensor to the group. When adding a new sensor, use the MAC address on the app to select the sensor you want to add and click "CONNECT"



List of sensors only include sensors that have not been previously connected to a project

Adding Sensors to Project

5

Enter a sensor name, description, casting date and time then click “save sensor.”

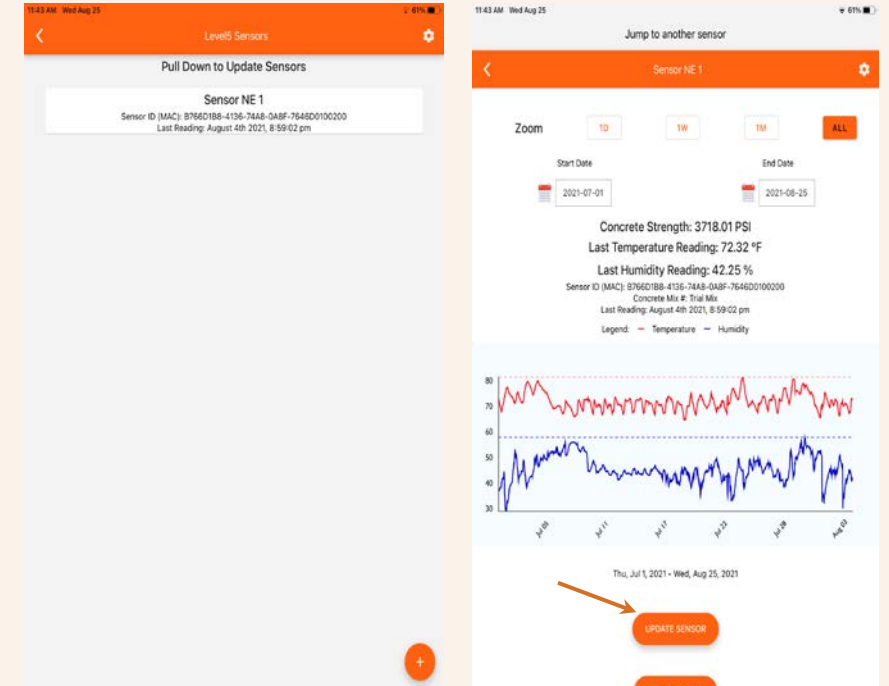
Select a mix design associated to the location where the sensor will be installed. A “TRIAL MIX” has been provided.

6

From your sensor list, select a sensor to access your data.

When within range of the sensor, click “Update Sensor” to synchronize your data.

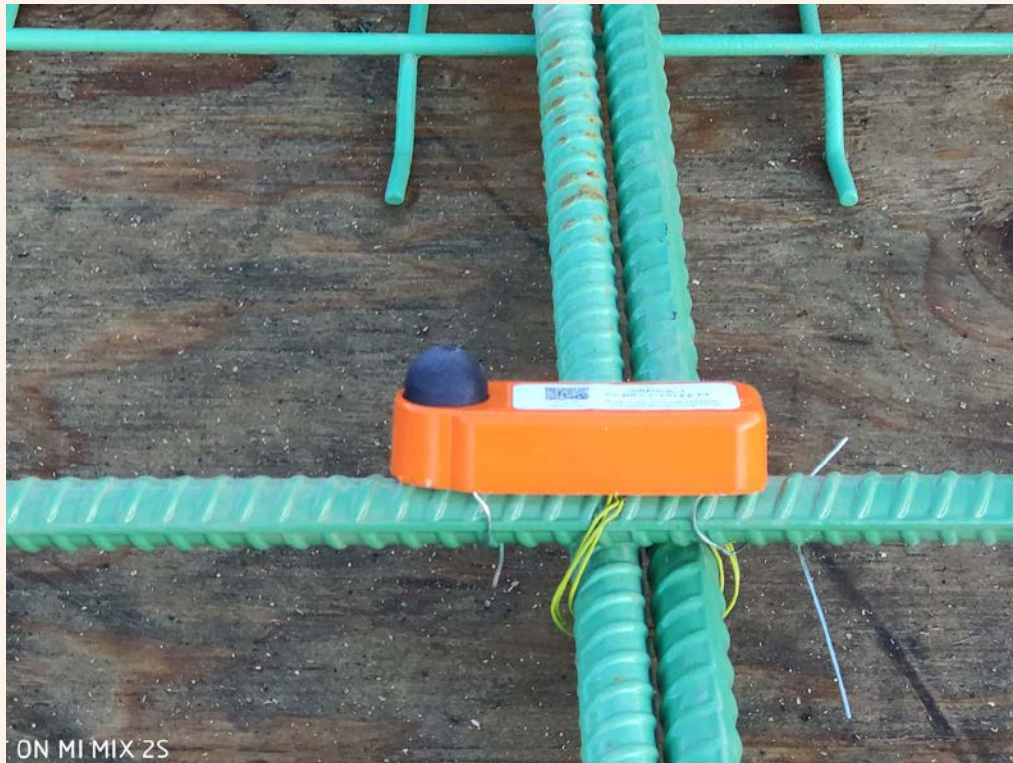
Click “View Data” to export CSV data file.



✓ **CAUTION:** When deleting a sensor, all data from the sensor in the project will be deleted on the app. The data on the sensor will not be deleted. You can reconnect to the sensor to retrieve the stored data. Wait five minutes before reconnecting to a deleted sensor, to ensure the delete process is complete.

✓ It is recommended that the interval between updates be no more than twice a day, allowing for changes in concrete properties to be identified.

Installing the Sensor



- ✓ For best transmission of the wireless signal, the main unit has to be installed at the top mat of reinforcing or no more than 50 mm (2 inch) from the surface. The 1 M or 3 M remote probes should be used to monitor the deeper environments.
- ✓ Avoid any physical obstructions between the sensor and mobile device while updating sensor.
- ✓ Best practice is to update sensors every 1 to 3 days.

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