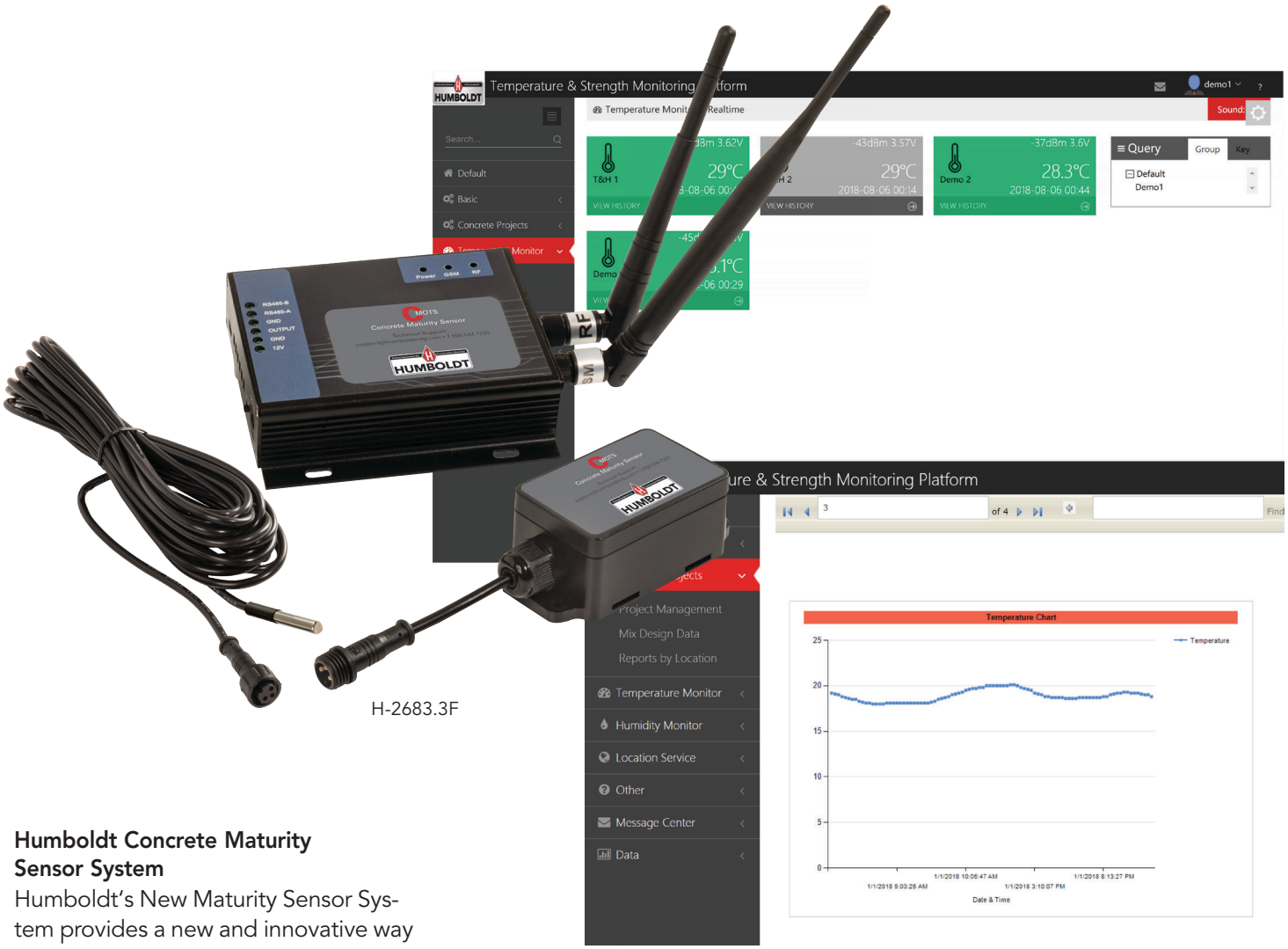
Testing Equipment for Construction Materials

HUMBOLDT

H-2683 Concrete Maturity Sensor System



H-2683.3F

Humboldt Concrete Maturity Sensor System

Humboldt's New Maturity Sensor System provides a new and innovative way to monitor concrete strength using the maturity testing method. CMOTS provides a wireless, accurate, durable and reusable method for charting concrete temperatures, maturity and strengths, which allows constant monitoring from any device (computer, phone or tablet) with an internet connection.

CMOTS is ideal for monitoring maturity in massive concrete pours, walls, suspended slabs and pavements, as well as for footings, cylinders and beams for monitoring compliance with curing requirements.

The Humboldt Maturity System provides a wireless solution to collecting data avoiding loss of data due to cable damage during construction activities. Temperature and compressive strengths can be accessed from anywhere without visiting the construction site. And, the system is very cost effective when compared to other semi-wireless systems.

The unit is comprised of three key components— a transmitter, sensor and receiver. The sensor is connected to the transmitter with a waterproof connection via a 20ft. (6m cable). The sensor is then embedded at a desired location within a concrete pour. The attached transmitter is then placed alongside the pour and can be secured, if desired. The wireless receiver is then located within 1000 ft (300m) of the furthest installed transmitter/sensor.

When the sensors are installed, they are activated by registering them with your website account using a sensor-specific ID number. Once this step is completed, the transmitters for each sensor will begin to receive data from the sensor and transmit that data to the receiver. The receiver then relays this information to your account on the web-based cloud platform. This information/data is available to you in real time, 24/7, 365

H-2683 Concrete Maturity Sensor System

days a year by simply logging into your account, using your user name and password.

Raw data received by your sensors is transformed by the web-based platform into compressive strength, using the specific maturity curve developed for that specific concrete mix design.

Because the maturity sensor system is wireless, there is no limit to the number of sensors that can be used or the number of pours done at one time. Since the transmitter component of this system is reusable, battery life is 3 years from the activation date, it can be reused by purchasing replacement sensors for subsequent uses, which can be connected to the existing transmitters via the waterproof connector. Sensors are available with 20ft (6m) cables, but extension cables are also available in similar lengths for extended sensor placement.

The Maturity Sensor System is available as a kit, which includes (1) Receiver, (5) Transmitters, (5) Sensors with 20ft (6m) cables and a website platform account. Voltage: 120/220V 50/60Hz.

Humboldt Maturity Sensor System Components

Description	Part No.
Temperature Transmitter w/20ft (6m) cable	H-2683.4
Sensor w/ 20ft (6m) cable	H-2683.6
Extension Cable, 20ft (6m)	H-2683.7

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Humboldt Mfg. Co.
www.humboldtmfg.com
875 Tollgate Road
Elgin, Illinois 60123 U.S.A.

U.S.A. Toll Free: 1.800.544.7220
Voice: 1.708.456.6300
Fax: 1.708.456.0137
email: hmc@humboldtmfg.com

Testing Equipment For Construction Materials

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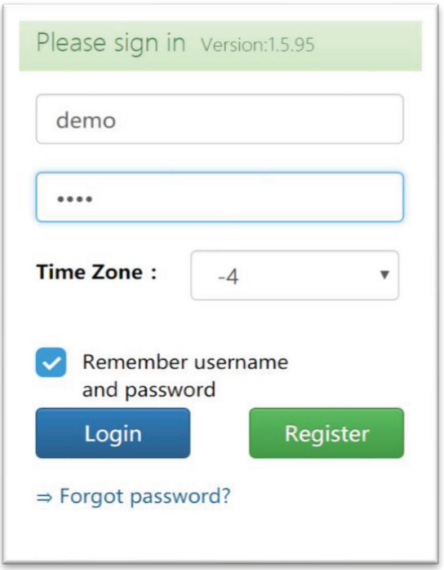
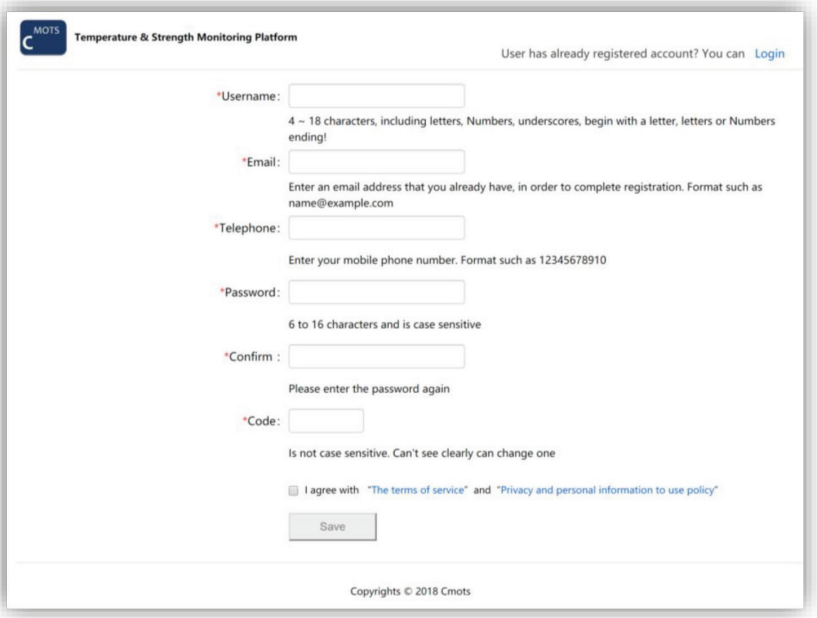
Humboldt Concrete Maturity Sensor

01.19

How to Register:
Visit www.cmots.ca and click on Register.

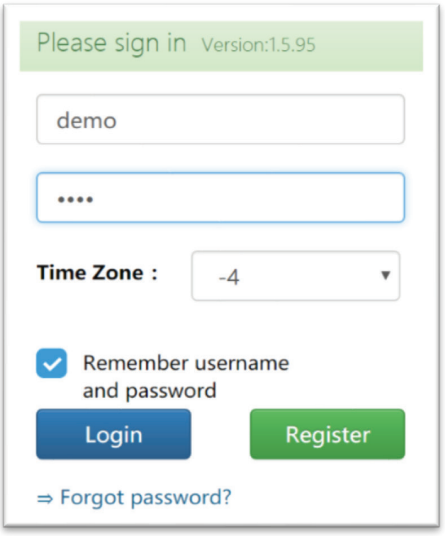


Fill out the registration form and click **Register** at the bottom. This will create a Mother account which is a step below Administrator account. Sub Account (discussed later) is created by the Mother account holder.



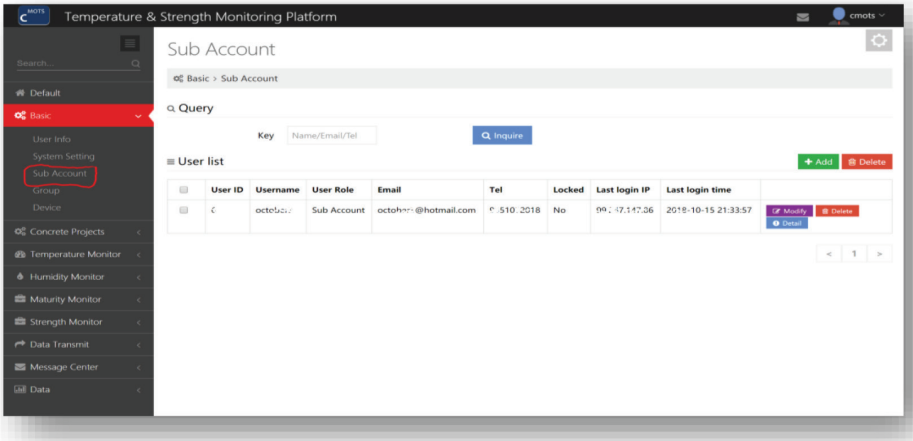
Login to Portal

Registered users can access the CMOTS portal by visiting www.cmots.ca and login by using their Username and Password, created during registration process. Pay attention to your local time zone with reference to UTC in the login window. If your time zone is UTC-6, choose -6 from drop-down menu below Passoword.

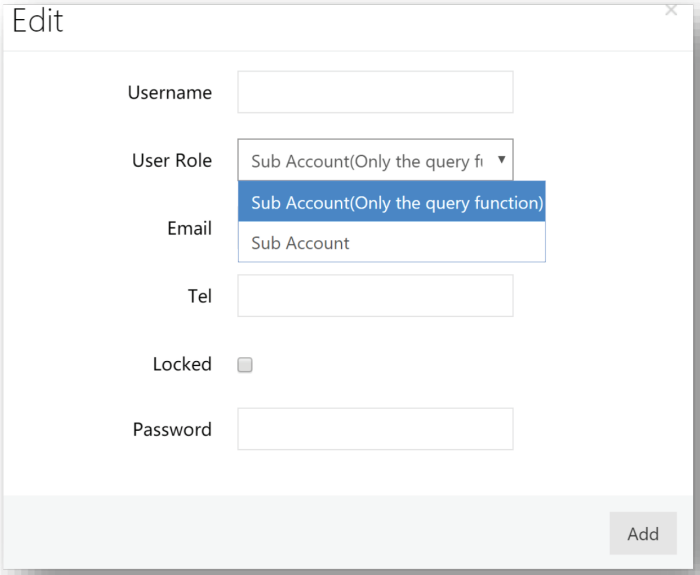


Create Sub Account

There are two types of sub accounts that can be created by Mother Account — Sub Account and Sub Account (Only the query function). Only difference between the two is the ability of the Sub Account to Add Device, which is not available in Sub Account (Only the query function).

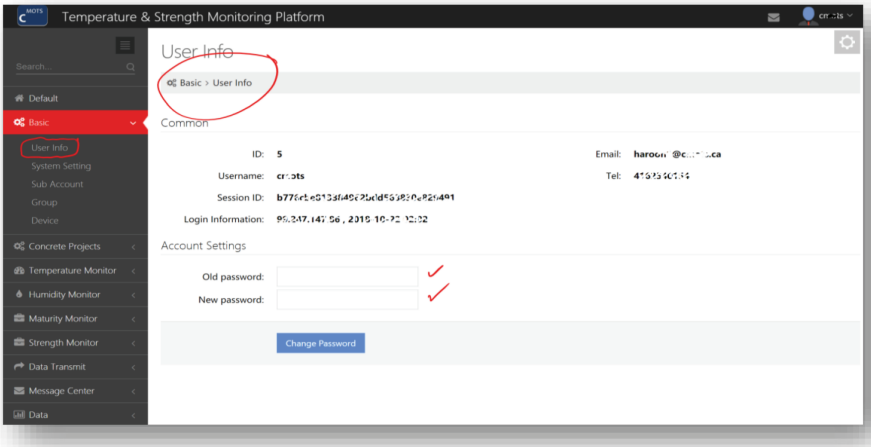


Sub accounts are created in Mother Account for limited access by select individuals. There are two types of sub accounts - Sub Account and Sub Account (Only the query function). Only difference between two is that Sub Account can add devices in the portal. Access to Sub Account can be blocked by checking the Locked box.



Change Password

Basic – User Info



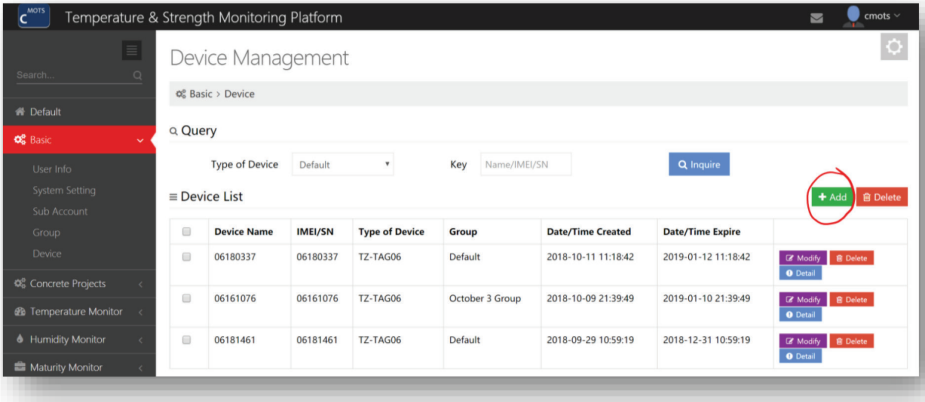
Add Device

If your account permits you to add device, you can do so as follows.

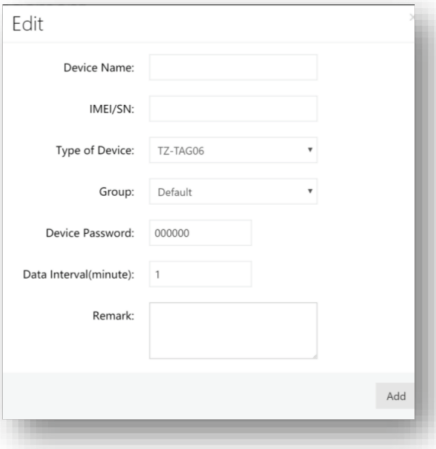
Basic - Device and then Add

Ignore Date/Time Expire in last column shown in figure below

Device Name and Group can be modified later when assigned to projects.



Click Add. Choose TZ-TAG06 from dropdown menu (for temperature, maturity and strength determination).



Change Settings

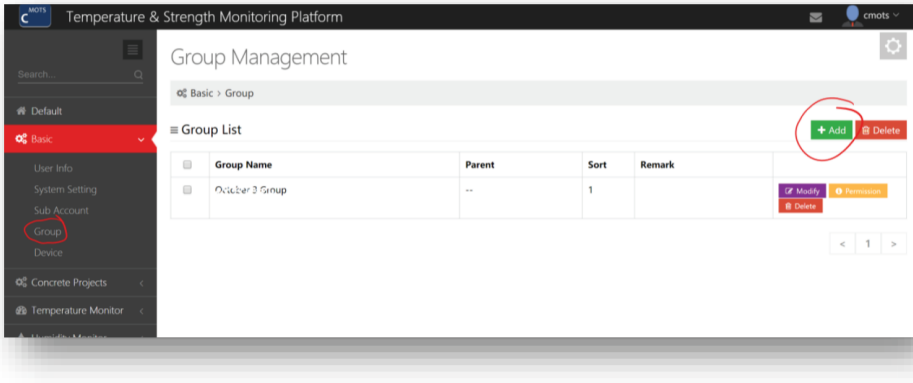
Do not change settings

Add Group

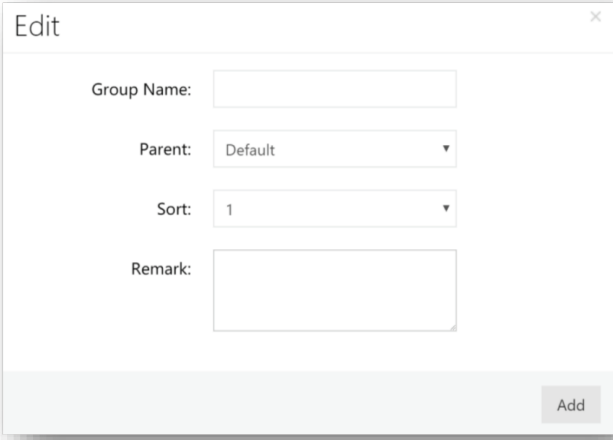
When devices are assigned to various projects, a good strategy is to create groups for easy identification. This may require creating multiple Groups. Note from the Add Device section that Group name is required when a device is added.

You can add Group by clicking

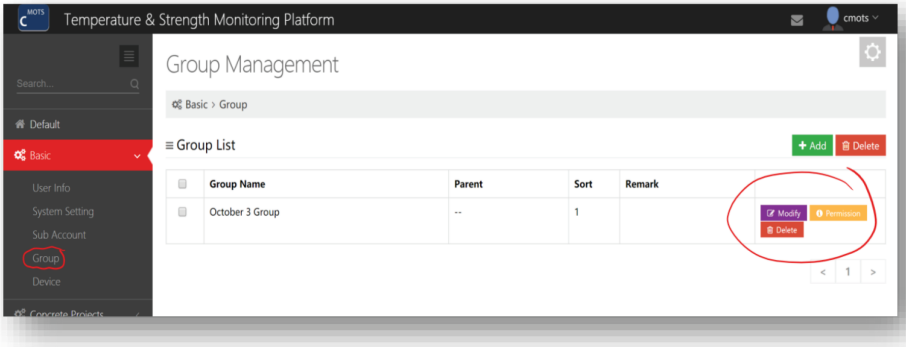
Basic – Group and then Add



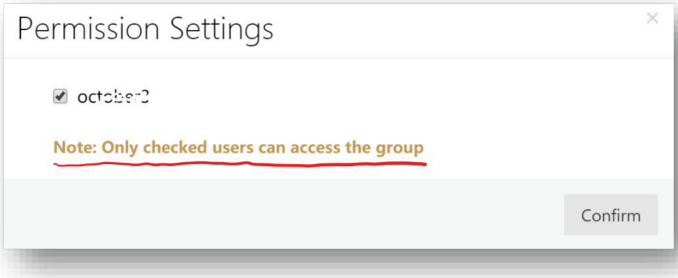
Click Add and select Default as Parent if this is the first time you are creating a Group. For the next one, you can either choose Default as Parent Group or choose an existing Group as Parent Group.



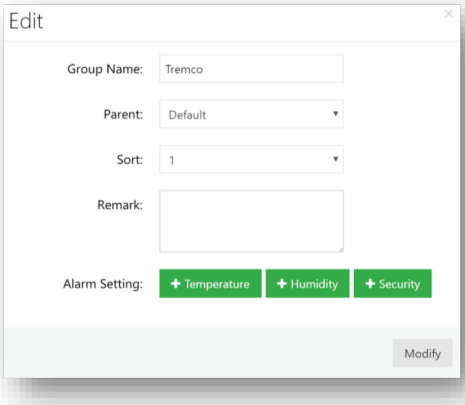
Once a Group is created, permission to access the Group is granted to relevant Sub Account by clicking Basic - Group and then Permission.



All Sub Accounts you created will be listed here. You can choose any number of Sub Account you feel necessary to give access to a Group by checking the relevant boxes.

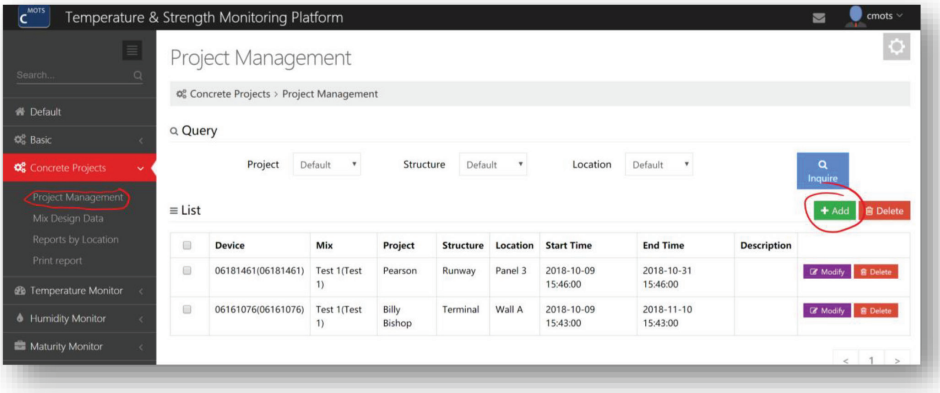


Group can by renamed or moved to different Parent Group by clicking Basic - Group and then Modify. You can also set Alarms here.

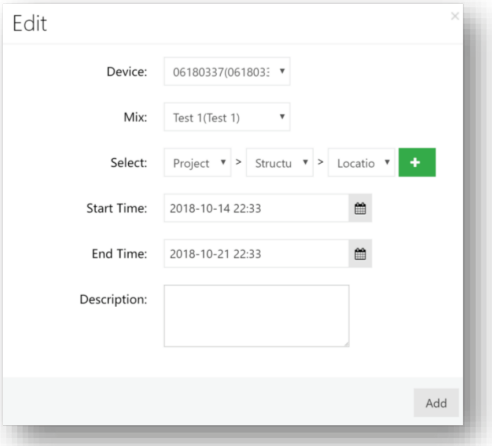


Add Maturity and Strength Option

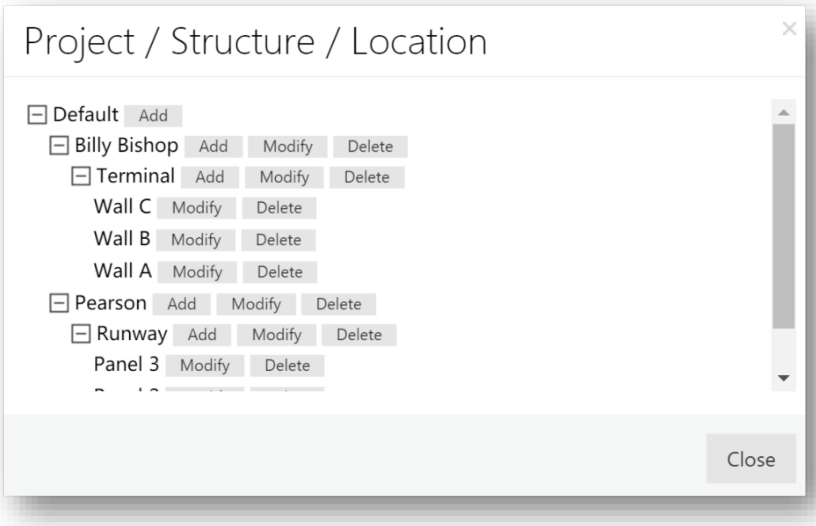
When temperature measuring device is used for real-time monitoring of maturity and strength of concrete, the probe is embedded in fresh concrete and additional information is added in the system as follows:
Concrete Projects – Project Management – Add



You can create new Project, Structure, and Location by clicking on "+" or you can choose an existing Project, Structure, and Location from the respective dropdown menu.



This screen appears when you click on "+"



Add concrete mix design identification in Mix. Make sure this mix design information is already added in the Mix Design Data (discussed later). Once added, the system will automatically connect this added device and the Mix.

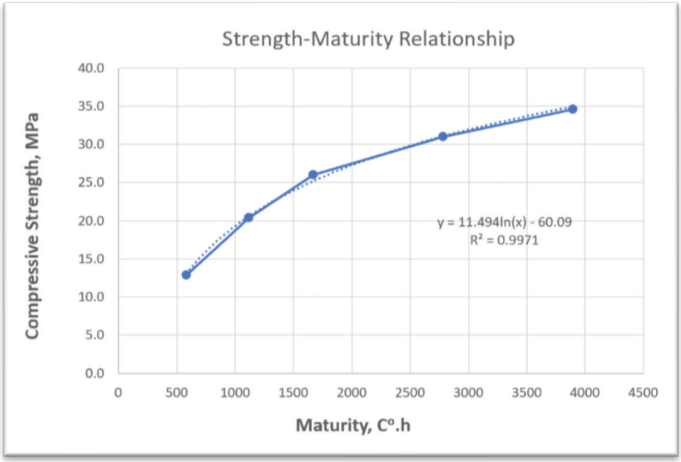
Start Time refers to the time when fresh concrete comes in contact with the sensor and NOT the time when probe was installed. It is important to enter precise Start Time (and date) since C^{MOTS} will start calculating maturity and strength for this location from this time onwards. End Time is the time when system will stop taking further readings for this device. One month is generally a good time frame for this purpose but depends on user requirements.
Enter 8-digit device identification in Device. You can add more details about concrete pour in Description section.

Add Mix Design Data

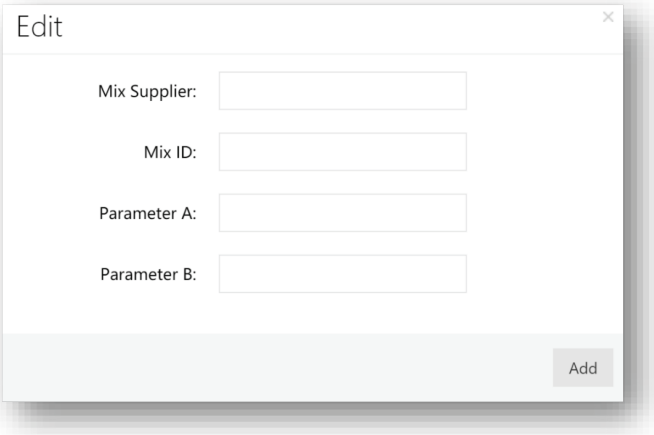
If real-time maturity and strength of concrete is desired, the Strength-Maturity relationship should first be established in the lab in accordance with ASTM C1074, Standard Practice for Estimating Concrete Strength by the Maturity Method. The resulting relationship is in the following form:

Strength = A * Ln (Maturity) + B

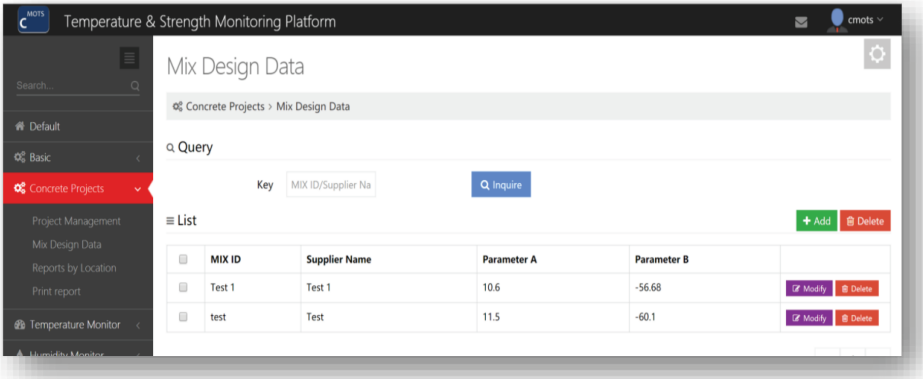
A sample relationship is shown below where A = 11.49, and B = - 60.09



Each concrete mix has its distinct set of Parameters A and B so use values of these parameters (Concrete Projects – Mix Design Data – Add New Mix) from your Strength-Maturity relationship.

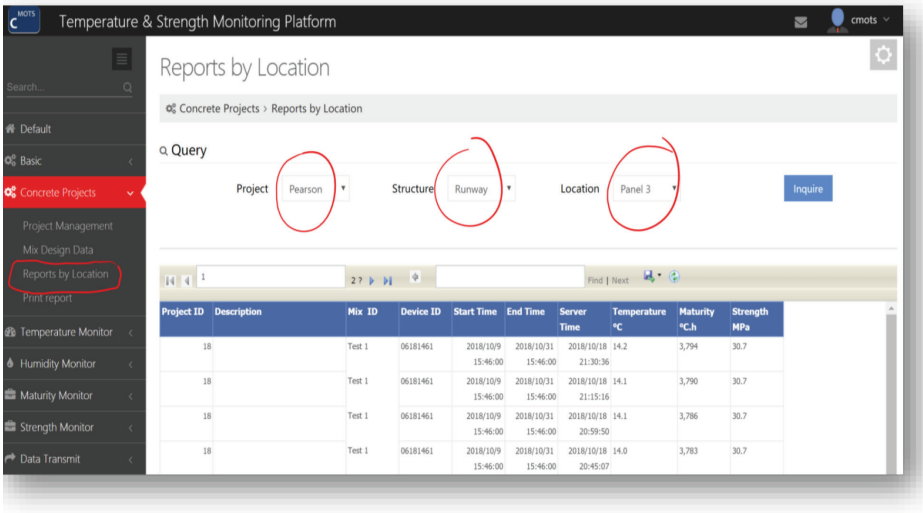


Once added, the concrete mix design can be assigned to devices using Mix ID (as Mix noted above).

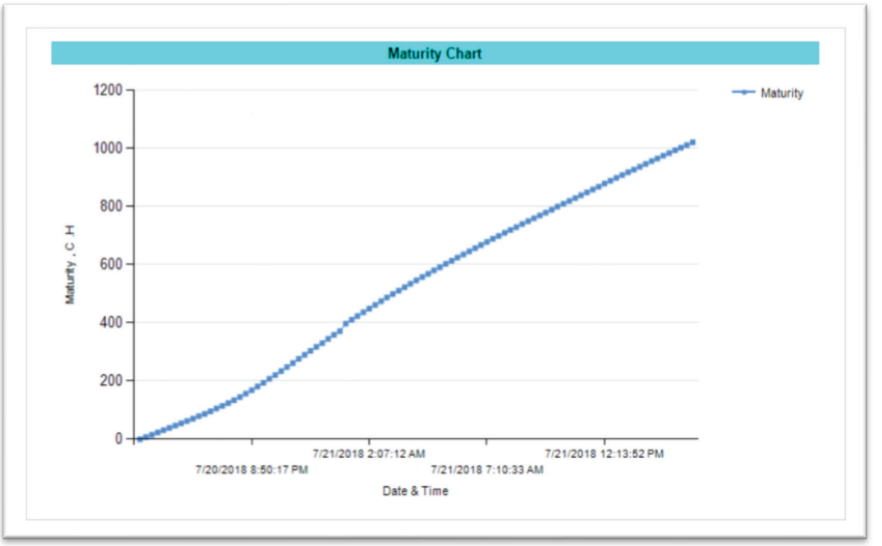


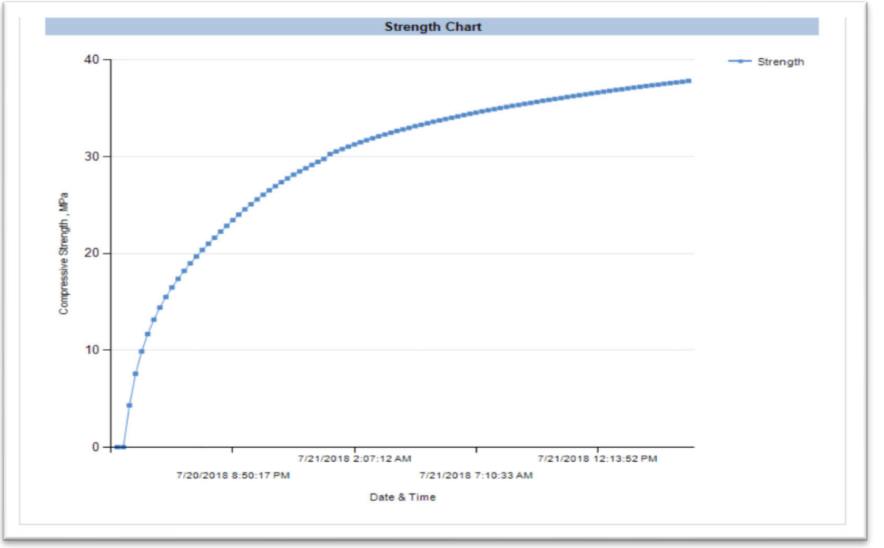
View and Download Temperature, Maturity and Strength Data
Users can view and download real-time and stored data as follows:

- Select Concrete Projects and then Reports by Location
- Select Project, Structure, and Location associated with the device
- Data can be exported in Excel, Word or PDF by clicking



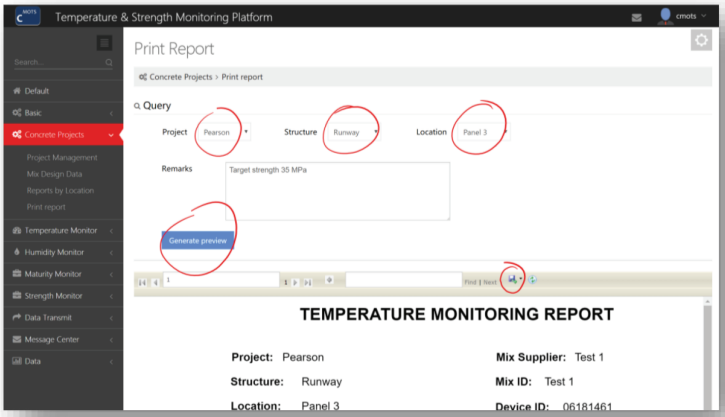
Temperature, Maturity, and Strength charts can be viewed on the last two pages of this report



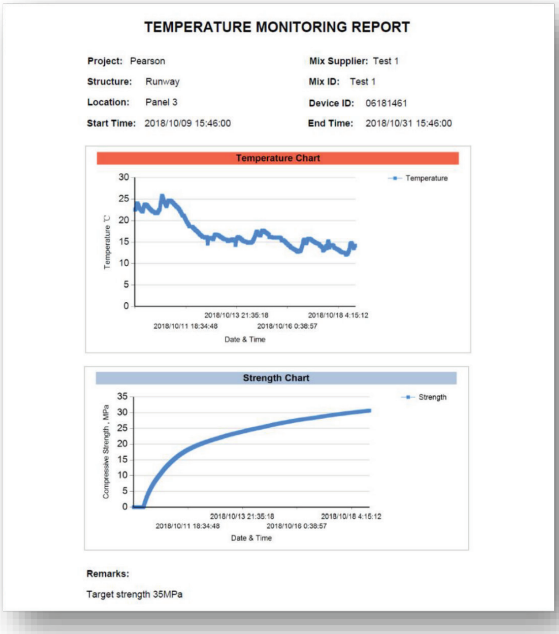


Print Report

This feature allows CMOTS users to generate a report for each device location. Simply select Project, Structure and Location from drop-down menu and click Generate Preview.



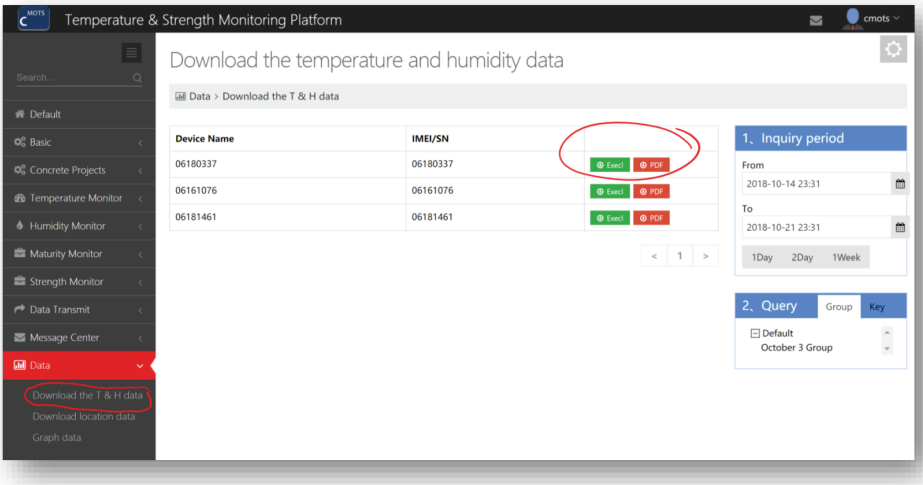
This report can be downloaded in Excel, PDF and Word.



Realtime Temperature Monitoring

- Select project Group from the top-right corner
- Click Temperature Monitor and then Realtime
    - Online loggers will appear green
    - Offline loggers will appear grey
- For historical temperature data, click Temperature Monitor and then History to access

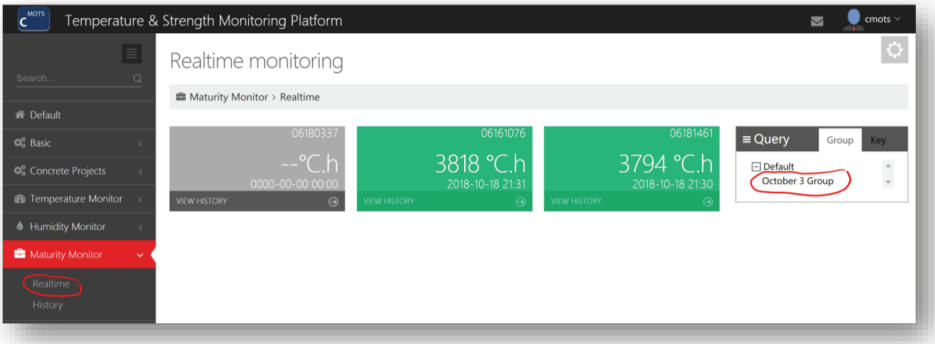
To download temperature data, click Data and then Download T&H Data. If the device is capable of recording both temperature and humidity, both types of data will be displayed, otherwise only temperature.



A	B	C	D	E	F
2018-08-13 22:37 ~ 2018-08-20 22:37					
ID	Device Name	Temperature	Humidity	Time (RTC)	Time (ServerTime)
1	T&H 1	26℃	59.00%	2018-08-20 22:34	2018-08-20 22:34
2	T&H 1	25.9℃	59.00%	2018-08-20 22:28	2018-08-20 22:30
3	T&H 1	25.9℃	59.00%	2018-08-20 22:23	2018-08-20 22:24
4	T&H 1	25.8℃	59.00%	2018-08-20 22:18	2018-08-20 22:20
5	T&H 1	25.8℃	59.00%	2018-08-20 22:08	2018-08-20 22:09
6	T&H 1	25.7℃	59.00%	2018-08-20 22:02	2018-08-20 22:03
7	T&H 1	25.7℃	58.00%	2018-08-20 21:57	2018-08-20 21:59
8	T&H 1	25.7℃	58.00%	2018-08-20 21:52	2018-08-20 21:52
9	T&H 1	25.8℃	58.00%	2018-08-20 21:47	2018-08-20 21:48
10	T&H 1	25.8℃	58.00%	2018-08-20 21:36	2018-08-20 21:38
11	T&H 1	25.8℃	58.00%	2018-08-20 21:26	2018-08-20 21:28
12	T&H 1	25.8℃	58.00%	2018-08-20 21:21	2018-08-20 21:21
13	T&H 1	25.9℃	58.00%	2018-08-20 21:16	2018-08-20 21:17
14	T&H 1	25.9℃	58.00%	2018-08-20 21:10	2018-08-20 21:11
15	T&H 1	25.9℃	58.00%	2018-08-20 21:05	2018-08-20 21:07
16	T&H 1	25.9℃	58.00%	2018-08-20 20:55	2018-08-20 20:56

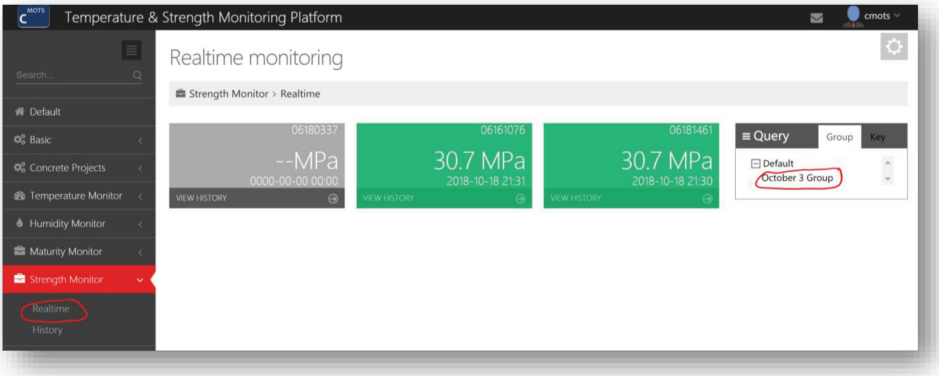
Realtime Maturity Monitoring

- Select project Group from the top-right corner
- Click Maturity Monitor and then Realtime
  - Online loggers will appear green
  - Offline loggers will appear grey
- For historical Maturity data, click Maturity Monitor and then History



Realtime Strength Monitoring

- Select project Group from the top-right corner
- Click Strength Monitor and then Realtime
  - Online loggers will appear green
  - Offline loggers will appear grey
- For historical Strength data, click Strength Monitor and then History



Warranty

Humboldt Mfg. Co. warrants its products to be free from defects in material or workmanship. The exclusive remedy for this warranty is Humboldt Mfg. Co., factory replacement of any part or parts of such product, for the warranty of this product please refer to Humboldt Mfg. Co. catalog on Terms and Conditions of Sale. The purchaser is responsible for the transportation charges. Humboldt Mfg. Co. shall not be responsible under this warranty if the goods have been improperly maintained, installed, operated or the goods have been altered or modified so as to adversely affect the operation, use performance or durability or so as to change their intended use. The Humboldt Mfg. Co. liability under the warranty contained in this clause is limited to the repair or replacement of defective goods and making good, defective workmanship.

Humboldt Mfg. Co.
875 Tollgate Road
Elgin, Illinois 60123 U.S.A.

U.S.A. Toll Free: 1.800.544.7220
Voice: 1.708.468.6300
Fax: 1.708.456.0137
Email: hmc@humboldtmfg.com

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