CAS-LINK™

MONITOR + CONTROL

With

SCADA COMMUNICATION MODULE

RECEIVING AND INSPECTION

Check for any signs of damage upon receipt, and if found, report it immediately to the carrier. Check that all items are accounted for and free of damage.

WARNING!!

Wiring of the Communication Module and associated devices may involve working inside of a UL508A electrical panel. Proper precautions must be taken to reduce potential risk of shock. Wiring should be performed by qualified personnel only.

WARNING!!

Installation of this package should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment, and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. ALWAYS disconnect power prior to working on electrical equipment.

Save these instructions: This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.

Table of Contents

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 2-years from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product.
2. The equipment is not installed in accordance with Federal, State, and Local codes or regulations.
3. The equipment is misused or neglected, or not maintained per the MANUFACTURER'S maintenance instructions.
4. The equipment is not installed and operated within the limitations set forth in this manual.
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 2-year warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization, and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

Product Overview

The SCADA CAS COM Board is a communication module that relays product information to CASLink. The module is offered in 2 configurations; Rodgers Cellular or Verizon Cellular.

Module information may be found on the back of the board, on the electrical package, or back of the manual.

Figure 1 - SCADA Label

INSTALLATION

It is imperative that this unit is installed and operated with the designed electrical supply in accordance with this manual.

If there are any questions about any items, please call the service department at **1-866-784-6900** for warranty and technical support issues.

Wiring

WARNING: Wiring should be performed by qualified personnel only. Most wiring related to the CASLink Building Management System is low voltage signal wiring. However, this low voltage wiring is typically installed near high voltage wiring, posing a risk of shock. Proper precautions must be taken when working with electrical wiring.

The board may be powered by 24V AC or 24V DC. For 24V AC connections, use the COM and HOT connections on the board. For 24V DC, use the (-) and (+) connections on the board. **The board should not be powered by AC and DC voltages at the same time**.

If the unit is using an Ethernet cable for communication, verify Ethernet cable is connected and fully inserted into Ethernet jack before powering up the SCADA board.

If operating on cellular connection, verify the cellular board is in place, and the two antenna connections are secured onto the board.

The SCADA Communication Module Board can be connected via an Ethernet cable. An RJ45 cable is needed to be run between the router and the board. Connect all PCB board products to the ModBus jack on the SCADA boards. If using a cellular kit option, you may choose between Rodgers or Verizon.

Figure 2 - SCADA CAS Com Board
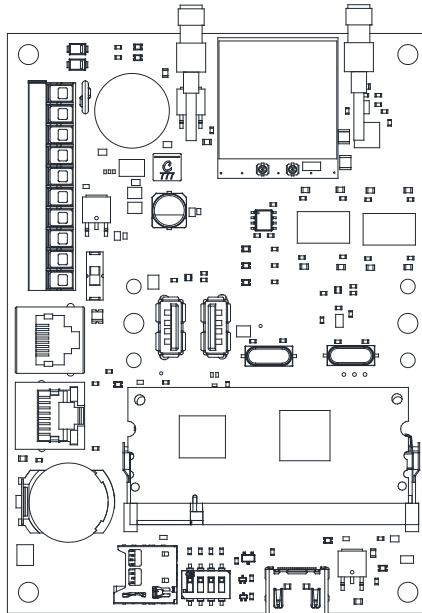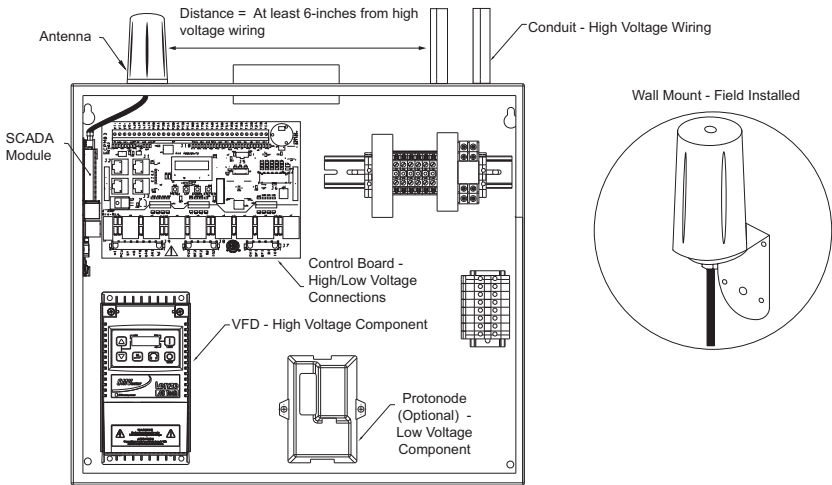
Antenna Installation

Before installing the antenna, locate power lines, conduit, and wires in the area. The antenna must be installed at least 6-inches away from high voltage power wiring (110V and higher).

When installing on painted Electrical Control Panels (ECP) or Utility Cabinets (UC), use sandpaper to expose bar metal on the inside of the box where the lock washer and nut will contact the surface.

If the network seems poor or spotty, relocate the antenna away from the ECP/UC, where conduit and power lines may be affecting the signal.

Always mount the antenna in a vertical position, facing straight up. If there are still connectivity issues, use an antenna extension cable to move the antenna to a location where there is a strong signal connection.
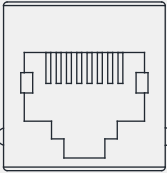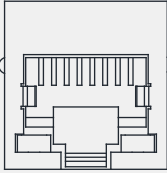
Figure 3 - SCADA Wiring Details

Connector Descriptions

Terminal Strip Power Connections	
	24VDC 24VAC + ' HOT COM ○ ○ ○ ○
24V AC – Pin Hot (Positive), Pin Com (Negative).	24V DC – Pin (+) (Positive), Pin (-) (Negative).

Terminal Strip CORE connection – Used if board is covering CORE Protection Fire System	
	CORE CC CB CA ○ ○ ○
CORE – Pin CA (Positive), Pin CB (Negative), Pin CC (Common).	

RJ 45 Connection for ModBus	
	MODBUS
ModBus connection for connecting Cat-5 cable to other circuit boards.	

Ethernet Jack	
	ETHERNET
There are two LEDs that will light up when the Ethernet jack is in use.	

Battery	
	CR2032s
3.2V battery installed on board.	

Micro SD Card Holder **NOTE: Never remove SD card from card holder.**	
Always verify the SD card is secured into the slot.	
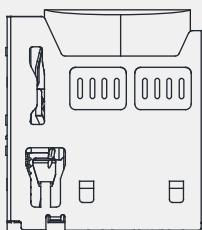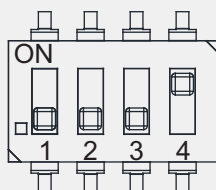
DIP Switches	
	ON 1 2 3 4
DIP Switches are used to program the configuration on the SCADA Board. DIP Switch 1, 2, 3 are always Off (Down). DIP Switch 4 is always On (Up).	
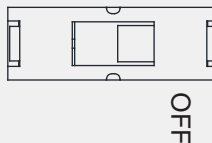
ModBus Switch	
	OFF
24V DC to ModBus switch connection.	
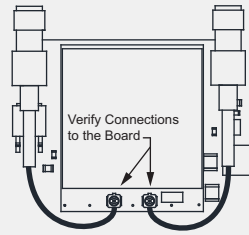
Cellular Module Board	
	Verify Connections to the Board
If a cellular module board is installed, verify antenna wire connections are secure to the board.	

Sim Card Holder **NOTE: Remove Cellular Module Board to gain access to Sim Card.**	
Verify Sim Card is secured into the slot.	
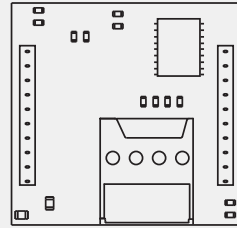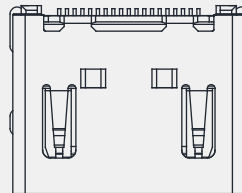
HDMI Connector	
For use with devices that display HDMI output. There is one HDMI port on the board.	
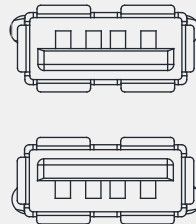
USB Connectors	
There are two USB connectors provided on the board.	

Obtaining a Valid Internet Connection

A wireless cellular gateway can be used to connect the module in the event that a LAN connection is unavailable (cellular data charges will apply). A reliable internet connection is required for proper data transfer using the communication module. This connection can be in the form of a hard-wired Cat-5 Ethernet connection directly from the building's Local Area Network (LAN).

ETHERNET

Cellular Connection

Figure 5 - Cell Module Boards

SCADA modules utilize the cellular module to connect to CASLink and comes with it installed on the board. Antenna connections will be from the cell module to the board, refer to **Figure 2 on page 5**. Every cell module will come with antennas that should be installed on the outside of the electrical package to obtain a strong cellular connection.
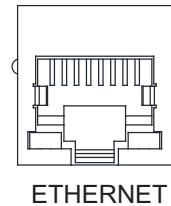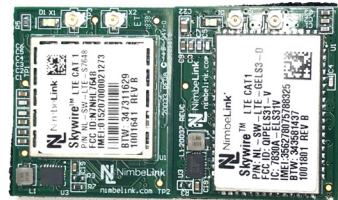
Rodgers Left, Verizon Right

Network Requirements

The Communication Module uses Dynamic Host Configuration Protocol (DHCP), although the module can be set to use a static IP address if needed. The module requires User Datagram Protocol (UDP) ports 1444 and 1445 to be open for outbound communications only. Refer to **"Changing the Network Settings for the SCADA Board" on page 12**.

Wiring to the Local Area Network (Direct Internet Connection)

1. The first step in connecting to the Local Area Network is to identify the closest permanent Ethernet source location. The best sources are Ethernet Switches or Wireless Routers.
2. Wire from the Ethernet port directly on the Communication Module to a spare port on the Ethernet Switch or Wireless Router.

Figure 6 - Wireless Router/Ethernet Switch

Wireless router (left). Ethernet switch (right), for hardwired connections.

Power Cycling the SCADA Board

NOTE: Power to the SCADA board should be off before proceeding with the following steps.

1. Turn the following DIP switches #1, #2, #3 to ON.
2. Plug in an Ethernet cable between the SCADA board and another computer.
3. Set the computer IP address to one in range of 192.168.1.x.
4. Power ON the SCADA board.
5. After a few seconds, the Net Status RGB light will stay solid blue.
6. Access the SCADA website at the default static IP address: 192.168.1.20
7. Make changes using the web form.
8. Save the changes.
9. Power OFF the SCADA board.
10. Place DIP switch #1 to OFF. The custom static profile will be active.
11. Keep DIP switch #2 and #3 in the ON position.
12. Unplug the Ethernet cable between the SCADA board and the computer.
13. Set the computer IP address to one in the range of the new IP scheme.
14. Power ON the SCADA board.
15. The SCADA board sets the Net Status RGB to green using the custom static Ethernet profile.
16. The SCADA device operation proceeds as normal.
17. After the power cycle in complete, turn OFF DIP switch #3. This will disable the web server.

Changing the Network Settings for the SCADA Board

1. The user has the ability to change the network settings on the SCADA board. To enable the networking mode, place DIP switches 1, 2 and 3 in the on position. The NET STATUS LED on the board will turn BLUE.
2. Connect the Cat-5 cable to the Ethernet jack on the SCADA board.
3. Connect the other end on the Cat-5 cable to a computer.
4. Now open a browser and type 192.168.1.20. The following screen, **Figure 7** will appear. Here is where the user can change the network settings.
5. Once the changes are completed, place DIP switch 1 and 3 to the OFF position. The LED will turn RED, and the SCADA module will be programmed with the new network settings.
6. If all settings are properly set, connect Ethernet cable. When the LED turns Green, this indicates there is an active connection.

Figure 7 - Network Setting

Confirming Internet Connection for CASLink

The Communication Module conveniently has two LED indicators on the board. An **RGB NET STATUS** LED is used to indicate the network connection and a Red **STATUS LED** to indicate operational status of the module.

The table below should be used to diagnose the flashes of the **STATUS LED**. *One short flash every 3 seconds is the only method to confirm that a valid connection has been made to the CASLink servers.* The **STATUS LED** takes approximately 10 seconds to begin flashing upon power-up.

Note that certain configuration changes on the module may take up to 10 minutes to take effect. If a module local setting is modified, give it 10 minutes to update the STATUS LED.

Blink Codes

Codes are shown for **STATUS LED** only.

Table 1 - STATUS LED

Error/State	Description	On (ms)	Off (ms)	Notes
Normal Operation	1 Blink	30	3000	Data is flowing, no exceptions
Waiting for ModBus Readers from CASLink	5 Blinks	500	500	ModBus services are enabled, but no ModBus Reader definitions have been received from CASLink.
CORE Interlock Network Traffic Not Detected	4 Blinks	500	500	CORE Interlock services are enabled, but no data has been detected.
Serial Port Failure	Continuous Blinking	125	125	The physical serial port cannot be opened for reading/writing. Quick, on/off blink which is unending.
Waiting for Heartbeat Response from CASLink	50 Slow Blinks	1500	125	Waiting for the first heartbeat response to be sent by CASLink.
Network Not Available / Offline	50 error flashes (long slow blink)	5000	500	No network connection is available for the host/ application container.

Net Status LED

Blink codes for the Net STATUS RGB LED are mentioned below.

Table 2 - NET STATUS LED

Error/State	Description	RGB
SCADA Services Started	Solid Blue when SCADA services have started. Approximately 3 seconds.	**BLUE**
Modem Not Ready	Continuous very fast Red blinking. • occurs when all DIP Switches are in the ON position during power-up. • occurs when the device was booted with DIP switch 4 OFF, and then if DIP switch 4 is turned ON while the board is powered on.	**RED**
Modem Check Pending Dip Switch #4 ON	Continuous Blue blinking during the time the modem's baud rate is being confirmed/set. Approximately 35 seconds.	**BLUE**
Modem Configuration Set	Very fast continuous Green blinking for 10 seconds. This indicates the modem either A) has the correct baud rate already set or B) the baud rate was successfully set.	**GREEN**
Modem Configuration Failed	Very fast continuous Red blinking for 10 seconds. This indicates a failure when attempting to query and/or set the modem baud rate.	**RED**
Network Online / Normal Operation	Solid Green for 1 minute, then 1 blink every 2 seconds indicating "all is correct."	**GREEN**
Downloading Software Updates	Continuous blinking until software update downloads have completed.	**GREEN**
Network Offline	Solid Red RGB until the network connection is restored.	**RED**

Settings for Module in CASLink
Defining the Occupancy Schedule

The range and activation of most email alert events depend specifically on the occupied/unoccupied state of the building. A simple example of this is the "**Fan Run Status**" alert. If a fan is running during the occupied period, this is considered normal operation; however, if a fan is running during the unoccupied period, this is considered an alert condition.

As such, a properly defined Building Schedule is an extremely important item in the CASLink monitoring setup procedure.

NOTE: **A schedule must match the end-user's building occupancy to prevent nuisance alert emails.**

By default, all Modules are preset with a 7:00 AM – 10:00 PM schedule. To modify the Occupied/Unoccupied schedule follow the steps below:

- Enter the settings area by selecting the "**SETTINGS**" icon.
- Select the "**OCCUPANCY**" Icon to access the Occupancy Editor.
- Click and drag the grid over the desired occupancy ranges.
- If starting on an empty time block, all blocks will be filled when the cursor is released.
- If starting on a filled time block, all blocks will be emptied when the cursor is released.
- Each block represents 15 minutes of time.
- Confirm that the text version of the schedule, shown below the schedule editor itself, matches what is expected.
- Select "**SAVE**" to complete the Occupancy Editor.
- Select "**ROLLBACK**" only if trying to revert to the previously saved schedule.

Figure 8 - The Occupancy Editor
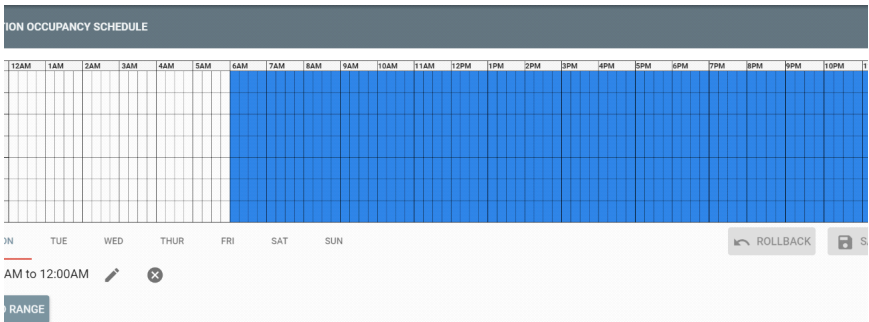
Module Editor (Service or Admin Access Only)

By default, when completing the Module Registration Process, each module is given a standard pre-defined set of Alert Ranges, Sensor Names, Areas, and Email Events. All of this information should be customized to suit the specific needs of the customer.

To access the module editor, log in using Employee Credentials (NOLA credentials). If you are not a CASLink employee and do not have NOLA credentials, contact your service or sales region for documentation. If the Module Registration Process was just completed, you should already be signed in.

Once logged in, you may select the specific module by searching for the name, location address, or job number.

The Module Editor can be accessed by selecting the "**Location**" tab. Use the search bar to search for a location, all communication modules with that location will appear. Select "**Communication Modules**." After loading the module, you should now see the module's Mac Address (00:xx:00:xx:00:xx). Most installations will only have one MAC Address listed on this page. If there is more than one module at the location, each module must be edited individually. However, the data from the modules will be presented as one location to the end-user.

Figure 9 - Accessing the Module Editor

Module Activation & Registration

Once a valid connection to the CASLink server has been established, a flashing green light (Net Status LED) and one short Red flash (Status LED) every three seconds. Proceed to activate the module through the CASLink Module Registration Wizard.

Module Information

Each Module is given a unique MAC Address and Authentication Key. These two items are located on a label on the door of the Electrical Control Panel housing the module (**Figure 10**). Additionally, the label will be located on the back of the board and at the back of this manual. Obtain this MAC address along with the Authentication Key, and proceed to the following URL in any standard web browser on any device: www.CASLink.com. The module page may be accessed through scanning the QR code on the label or back of this manual.

**Figure 10 - The Auth. Key and MAC Address Locations**

When scanning the QR code, the web page associated with the job location will open. If not, the module is not registered. Follow the steps below to activate the module on-line and assign a location.

Module Registration

The login page will be shown as below (**Figure 11**) on a tablet or computer.
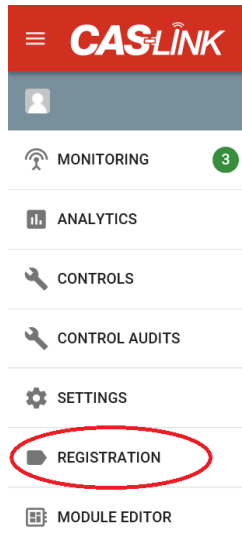
Figure 11 - The CASLink Home Screen
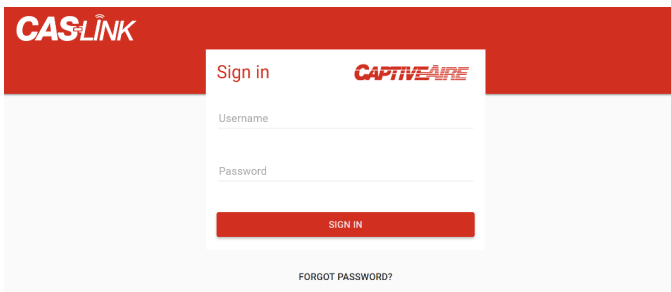
Login

Log in to the website utilizing your NOLA credentials. If you do not have NOLA credentials, please contact your local sales representative for additional instructions.

Select **"Registration"** (circled below) to initiate the Module Registration Wizard.

1. Enter the last 4 digits of the MAC Address: You may obtain this information from the label on the door of the electrical control panel. Select "**Next**."

Alternately, you may enter the job number then MAC Address to move to module registration.
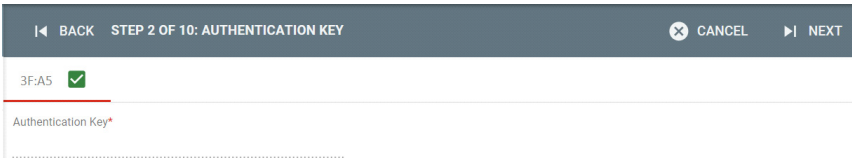
2. Locate the authentication key. This may be found on the label (back of the board, front of the electrical package, or back of the manual). Enter the authentication key. Select "**Next**."
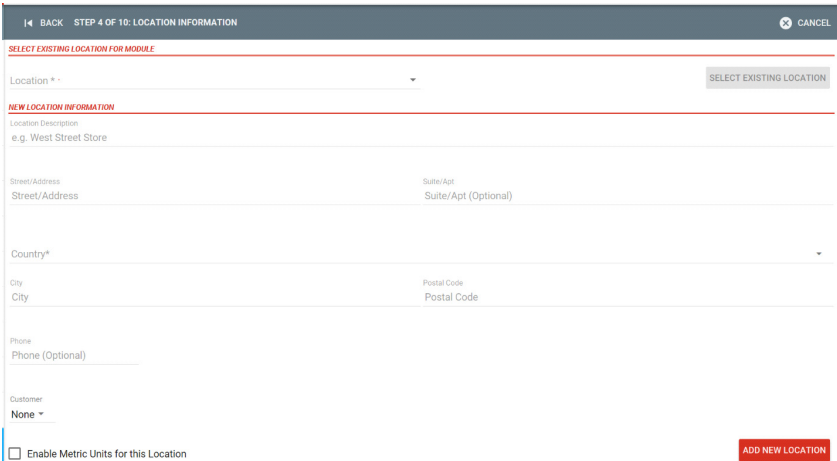
CANCEL   NEXT

3F:A5 ✅

Authentication Key*

3. Select the type of cellular device. Once complete, select "**Next**." You may add a job number if available.

CELLULAR DEVICE INFORMATION

None

Nimbelink

Netcomm

Cradlepoint

4. Select or add new location. If there are previous locations, select the location needed from the drop-down menu. If there is not a location, add the location. Only adjust if necessary, then select "**Next**."
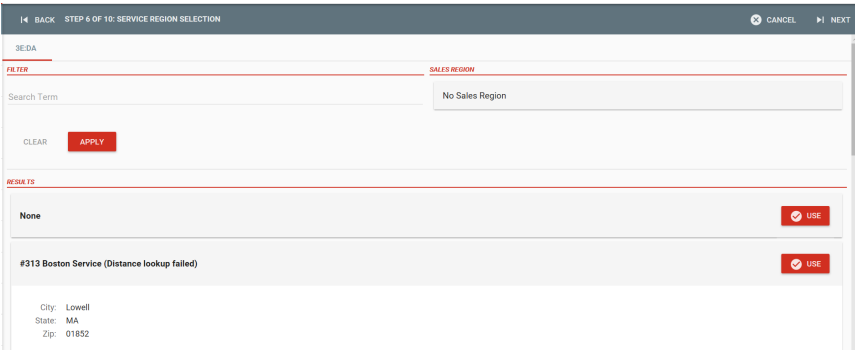
CANCEL

SELECT EXISTING LOCATION FOR MODULE

Location * ·   ▾   SELECT EXISTING LOCATION

NEW LOCATION INFORMATION

Location Description
e.g. West Street Store

Street/Address   Suite/Apt
Street/Address   Suite/Apt (Optional)

Country*   ▾

City   Postal Code
City   Postal Code

Phone
Phone (Optional)

Customer
None ▾

☐ Enable Metric Units for this Location   ADD NEW LOCATION

5. Find the module. Depending on how many modules are connected, you may need to scroll through to find the Comm. Module. Select all devices connected to the module that is currently being registered. Click "**Next**."
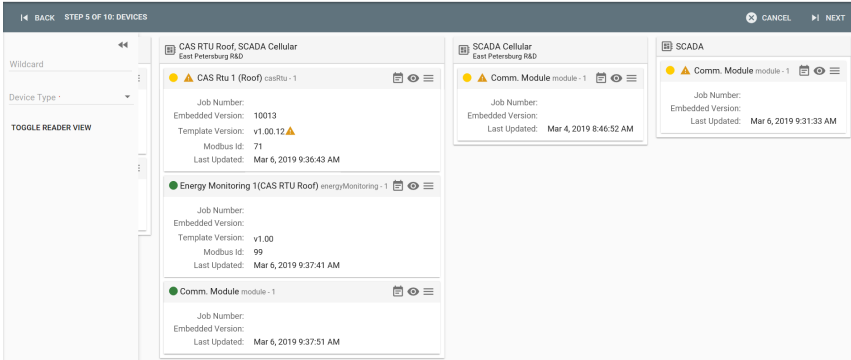
6. Select the closest service region. Click the "**Use**" button for that region. If you do not select a service region, None will be selected by default. Select "**Next**."

7. Verify information on the "Confirmation" page. Select "**Next**." Select "**Yes**" or "**Cancel**" from the pop-up prompt.


8. Select the product from the "**Device**." If there are any alerts, they will be displayed. Select "**Next**."


9. Select or add the appropriate area.

10. Set the occupancy schedule for the product. Once the schedule is set, select "**Finish**." There will be a pop-up to finish registration. Select "**Yes**" to complete or "**No**" to make changes.

Alternate Method to Add Devices to Modules

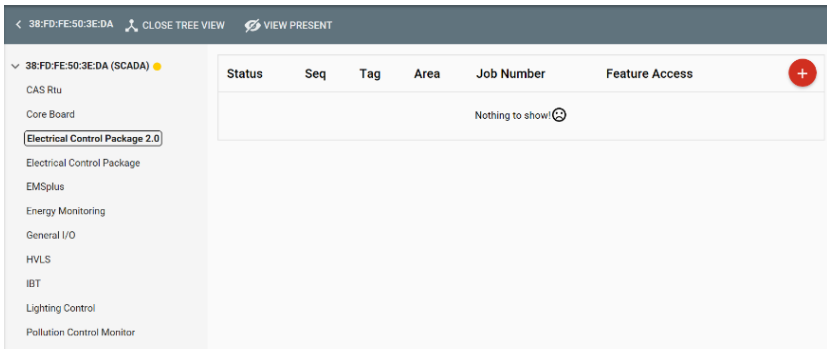- After activating a module, you may add devices. Follow steps 1 through 4 **"Module Activation & Registration" on page 17**. Find the module, select the "**View Module Editor**" (Eye Icon).
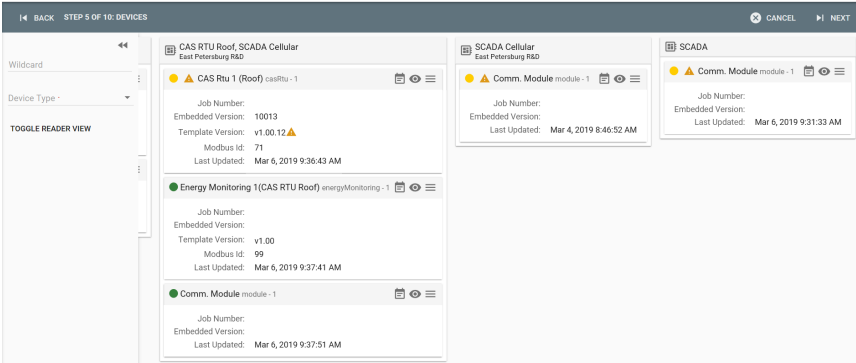
- Select "**View All**." The tree view on the left will display products that can be associated with the Comm. Module.
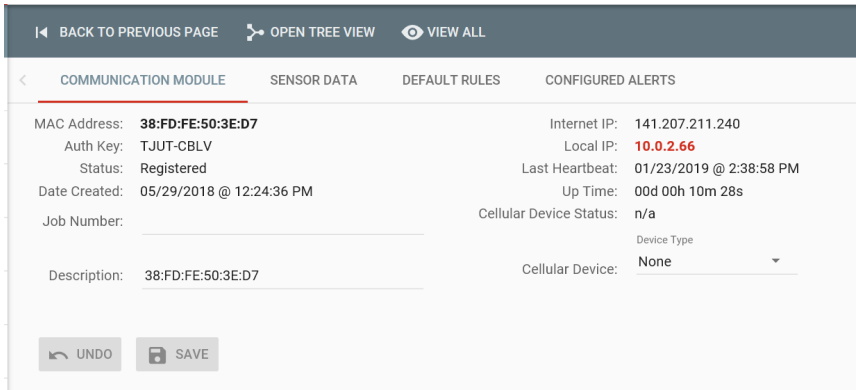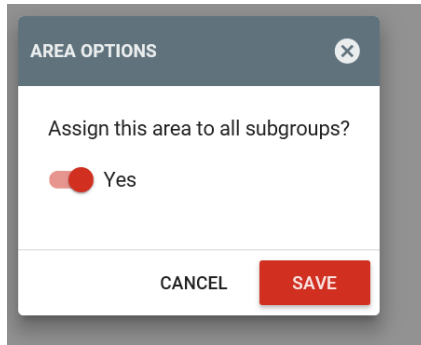

- Select the product that is connected to the SCADA module from the left-hand menu.
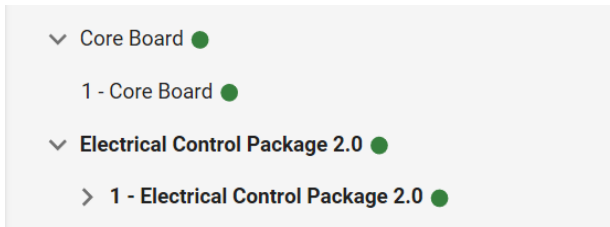
- Assign the "**Area**" and enter "**Job Number**." Select the save icon.
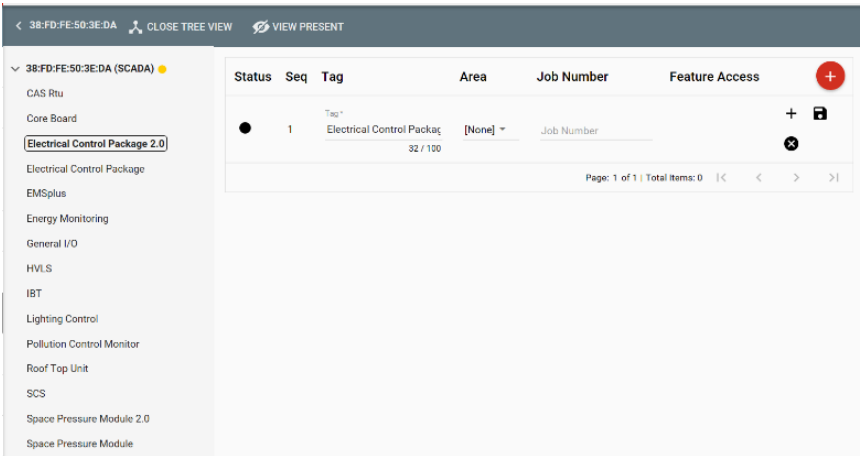
- Move the slider. "Yes" will be visible. Click "Save" to assign settings.

- The tree view on the left will display products associated with the Comm. Module.

Defining Tags and Areas (Name and Location)

Hardware components and sensors may be assigned a tag and area while registering the module, refer to **"Module Registration" on page 14**. To manually assign tags and areas to a component, follow the method below. For example, "CoreBoard 1" is the generic hardware component title for a CORE system. The area for this system is blank.

An example of a properly named hardware component would be "CoreBoard Hood #1".
An example of a properly named area would be "Kitchen Area."
Tags and areas can be defined by the following procedure:
1. Select the hardware component, e.g. "CoreBoard," from the hardware tree that needs the area defined.
2. To edit the tag and area, select the "**Pencil**" icon:
    *   To edit tag name, select the tag box. Type in new tag name.
    *   To add a new area, select the "**+**" icon. Type in new area name.
    *   To add an existing area, select the drop-down menu.
3. To save, select the "**Save Disc**" icon. To cancel, select the "**x**" icon.

Figure 12 - Editing a Complete Hardware Name and Area
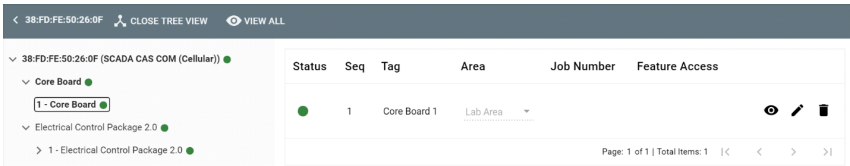
Proper sensor naming convention should indicate the sensor type and the component it is associated with (hood #1, exhaust fan #4, etc.). Appliance type, if available, can be valuable as well.

Sensor areas can be defined by their hardware area (if no specific sensor area is defined) or individually. They are not required to be in the same area as their hardware component. It is recommended to keep the number of areas to a minimum. Placing sensors in the same area allows for overlaying plots, which is critical for data analysis.

An example of a properly named sensor would be "Hood #1 (Fryer) Duct Temp."

An example of a poorly named sensor would be "Duct Stat #1."

Tags and areas can be defined by the following procedure:

1. Select the sensor from the hardware tree that needs the area defined.
2. To edit the tag and area, select the "**Pencil**" icon:
   - To edit tag name, select the tag box. Type in new tag name.
   - To add a new area, select the "**+**" icon. Type in new area name.
   - To add an existing area, select the drop-down menu.
3. To save, select the "**Save Disc**" icon. To cancel, select the "**x**" icon.
4. After all of the sensors have been appropriately named and correspond to appropriate areas, review the main screen. Confirm that the areas are defined, sensors are where expected, and unnecessary areas are not present. Keep in mind that having too many areas makes the navigation cumbersome. Simple and effective area naming is the best approach.

Figure 13 - Editing a Specific Sensor Name and Area

NOTE: Sensors can be placed in areas separate from their hardware location. For example, a temperature sensor could be mounted in a back kitchen, while the hood control panel is mounted in the front kitchen. For this reason, it is extremely important during startup to properly label the sensors so that each can be defined without on-site knowledge.

Defining & Customizing Alert Emails & Alarms

Alarms are what drive the email and service notification portion of CASLink BMS.

By default, upon completion of the Module Registration Process, each module is given a standard pre-defined set of alarms and a pre-made email notification set.

NOTE: Pre-defined alarms cannot be changed. However, email functions can be enabled/disabled.

By default, an email notification is added to all sensors for warning conditions for the following users:

- The engineering sales office associated with the original design.
- The service region selected during module registration.

Additional custom alerts or email notifications can be added to individual sensors or parameters by following the instructions below. Valid reasons for setting up additional alerts would be to:

- Monitor a specific sensor for a suspect component.
- Define alarm variable email activation set points that are more reactive than the standard set points.
- Monitor activation time by daily email for a component or sensor to watch for trends.

Adding Custom Alarms

NOTE: Adding a custom alarm variable does NOT automatically add the email link. See below section titled "Adding Custom Email Alerts" to link the new alarm variable to email account(s).

To add a custom alarm variable:

1. Select the specific sensor for the new alarm in the Module Editor.
2. Next, select the "**Ranges & Alerts**" tab.
3. To add a new alarm, select "**+**" to open the Sensor Range Editor.
4. In the Sensor Range Editor, adjust and enter the data as defined below.

Notice that alarms may already exist for that sensor. These are typically the default alarm variables and cannot be changed. They will show up under the "**Default**" heading, which can be collapsed via the adjacent arrow.

Figure 14 - Adding Custom Alarms

Figure 15 - Range & Alerts

Figure 16 - Sensor Range Configuration

- **Sensor:** Confirm the appropriate sensor is selected.
- **Alert Level:** This will dictate the alert severity level. Info, OK, Warning, and Alert are the available options. "**Info**" should be used for standard data monitoring. "**OK**" is to confirm proper operational status. "**Warning**" is used for moderate failure or data. "**Alert**" is used for severe failure or critical data.
- **Occupancy:** This defines when the alert can be sent. Select "**Occupied**," "**Unoccupied**," or "**Any**." Refer to **"Defining the Occupancy Schedule" on page 12** for further information.
- **Comparison:** Defines the mathematical function used for the alert variable.
- **Minimum Value:** Enter the minimum value for activating this alarm.

NOTE: This does not apply to binary data such as On/Off variables. If no minimum, select "None." If no maximum, select "None."

- **Maximum Value:** Enter the maximum value for activating this alarm.

NOTE: This does not apply to binary data such as On/Off variables. If no minimum, select "None." If no maximum, select "None."

- **Hysteresis (min & max):** Unless purposely defining for a specific purpose, set the hysteresis to "**1**" to prevent cycling of the alert and unnecessary emails.
- **Delay Count:** This determines how many data packets must come through the server continuously with the fault active before considering it an active alert. A default of 30 is recommended. Some sensors, such as building pressure, will fluctuate throughout the day. It is therefore practical to fine-tune this number to only activate on a true constant failure mode.
- **Can Repeat:** If checked, the alert can repeat more than once for the same qualifying condition. This should never be checked unless specifically required.
- **Can Snooze:** If checked, this alert can be delayed by standard users in the "**Alert**" tabs of the website. This feature is only available if the "**Can Repeat**" option is enabled.
- **Snooze Minutes:** This is how long the snooze is effective before the sensor can create an alert again.
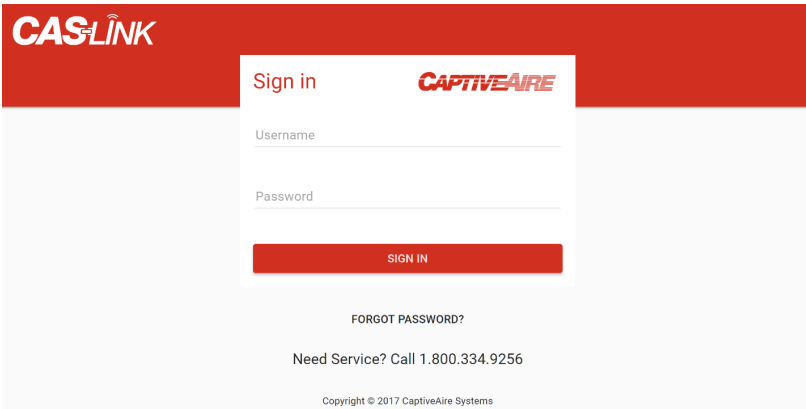
End-User Guide

The alerts, zones, and customized events explained in the preceding sections should be set up by a CASLink service or sales representative. The end-user (i.e. restaurant owner, manager, or employee) can access CASLink by logging in with the account provided by CASLink service or sales representative. The following sections describe ways to access and interpret the information gathered through CASLink.

Login

To log in, go to www.caslink.com, and use the user-name and password provided by CASLink service or sales representative.

Figure 17 - CASLink Login Page

Main Page Navigation

Immediately after signing in, the main CASLink page will appear. The search bar at the top of the page allows the user to load their job-site by searching the name or location in the search bar. If you have multiple locations, they will appear in the drop-down menu. Once the page has loaded, the monitoring, control, and analytical buttons will appear the left-hand side of the screen.

There are multiple sections, each highlighted either in green (if there are no alerts), yellow (if there are non-critical alerts), red (if there are critical alerts that need immediate attention), or gray (if the section is not available). The primary sections are:

- **Monitoring**: Contains sensor values, alerts, and graphs
- **Analytics**: Contains graphs and interpretations of sensor data
- **Control**: Used to control certain functions/scheduling of events

Figure 18 - CASLink Home Page
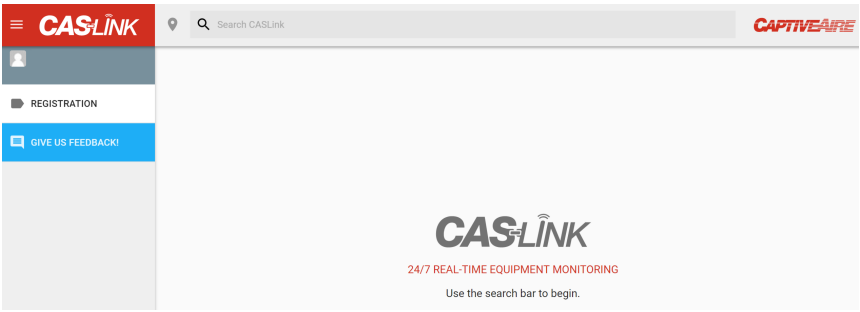
Figure 19 - Indication of a Critical Alert
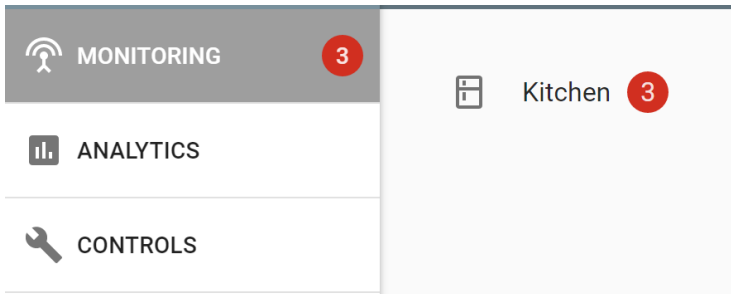
Monitoring

The Monitoring section of CASLink shows all sensor areas that were set up for that specific location. To view current sensor values, click on any of the sensor areas shown.

Figure 20 - Sensor Areas
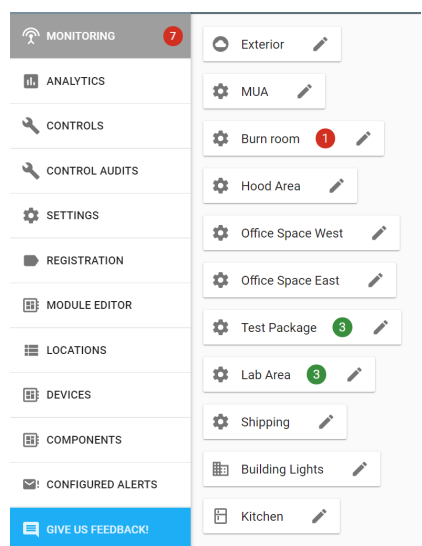
Field Wiring Equipment to the CASLink Communication Module

The SCADA Communication Module is included in all CASlink equipped panels. The module collects jobsite data from various jobsite components. Each component is connected to one of two communication lines, the ModBus Communication Network or the CORE Interlock Network. The communication wiring is either RS-485 shielded twisted pair wiring or RJ45 Cat-5 Ethernet wiring.

Figure 21 - Typical RS-485 CORE Interlock Network (Example)
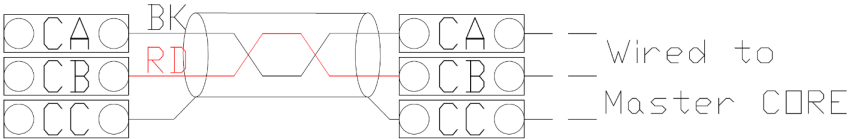
Most communication wiring is completed at the factory, with the following instructions provided for those items which are field wired.

NOTE: There are only two network lines. All field wiring for the Communication Module will use one of the two lines.

Figure 22 - Cat-5 ModBus Network (Example)
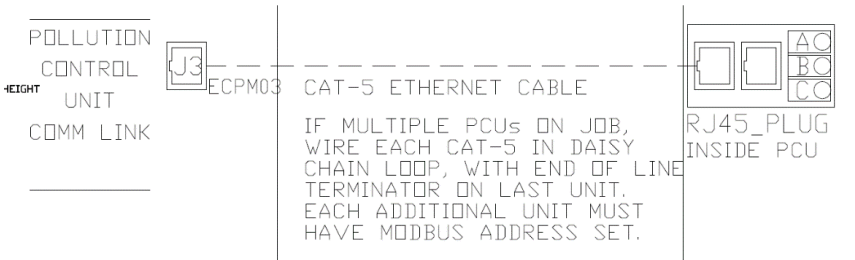
Remote Wall Mounted CORE & PCU CORE

Remote (Wall Mounted) CORE Hood & PCU CORE Fire Protection circuit boards transfer data to the Communication Module through the CORE Interlock Network only. This is typically shown as terminal blocks CA, CB, and CC in each respective panel.

1. Wire CA, CB, and CC of the Master CORE circuit board to CA, CB, and CC of the Hood Control Panel housing the Communication Module, refer to **Figure 21 on page 31**.

2. If additional CORE boards are present (such as PCU CORE, 2nd Remote CORE, etc.) wire CA, CB, CC of those panels to CA, CB, CC of the Master CORE panel.

NOTE: CORE boards in the same fire group will activate simultaneously if any panel activates due to a fire. You may use DIP switch 6 and 7 on the CORE board to edit fire groups. Refer to CORE Operation & Installation Manual.

3. Confirm DIP Switch Settings on all CORE circuit boards vs. the current CORE Operation & Installation Manual. See **Table 3 on page 34** for typical arrangements of 1 or 2 CORE panels.

NOTE: Improper DIP Switch settings will result in failed communication with the Communication Module. Power must be cycled to the CORE circuit board for new dip switch settings to initiate.

4. For ECPM03 based Hood Control Panels with digital LCD Interface, a Cat-5 Ethernet Cable must be run from J3 of the ECPM03 board to J5 of the Master CORE board. An end of line resistor plug (PN: EOL120A) must be installed in J6 of the CORE circuit board if it is the final component in this ModBus Communication Loop.

CORE Fire Protection

If there are one or multiple CORE fire systems (Hood or PCU) connected to a communication module, then the following conditions can be monitored at all times:

Fire Status: Reports Fire Condition.

Wash Solenoid Malfunction: Alerts user if plenum and duct water system solenoid is malfunctioning.

Appliance Solenoid Malfunction: Alerts user if the appliance protection fire system solenoid is malfunctioning.

Micro-controller Fault: Reports an alert if the circuit board is malfunctioning.

Surfactant Pump Malfunction: Alerts if there is a problem with the surfactant pump.

Supervised Loop Issue: Reports issue with Pull/Push station and/or fire sensor connections.

Ground Fault: Reports issue with Pull/Push station and/or fire sensor connections.

Surfactant Low: Alerts when the surfactant level is below 50%.

Battery Voltage Low: Alerts if the backup battery voltage is low.

AC Power Failure: Alerts if there is a problem with the feeding power line.

Door Panel Open: Triggers alarm if CORE door panel is opened when the system is armed.

Test Mode: Reports if CORE system is currently in Test Mode.

Network Communication Error: Reports an issue with the CORE interlock network.

Fire Suppression System Activated by Fire Sensor: Alerts user if CORE has activated based on temperature readings.

Fire Suppression System Activated by Button: Alerts user if CORE has activated by push station.

Gas Is On: Reports if the gas line to the appliances is open.

Successful Wash Has Not Occurred: Alerts user if a wash has not occurred in 24 hours.

Washing: Reports when hot water wash is active.

For further reference to these conditions, please consult the CORE Fire Protection manual.

Table 3 - Typical CORE DIP Switch Arrangement

CORE Board #	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7	DIP 8
1st (Master)	Closed	Open	Open	Open	Closed	Open	Open	Closed

Only one CORE Panel on the network.

CORE Board #	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7	DIP 8
1st (Slave)	Closed	Open	Open	Open	Open	Open	Open	Closed
2nd (Master)	Closed	Open	Open	Open	Closed	Open	Open	Closed

Two CORE Panels on the network.

For 3 or more panels, refer to CORE Operation & Installation Manual.

Figure 23 - CORE Monitoring Parameters and Alert Screen
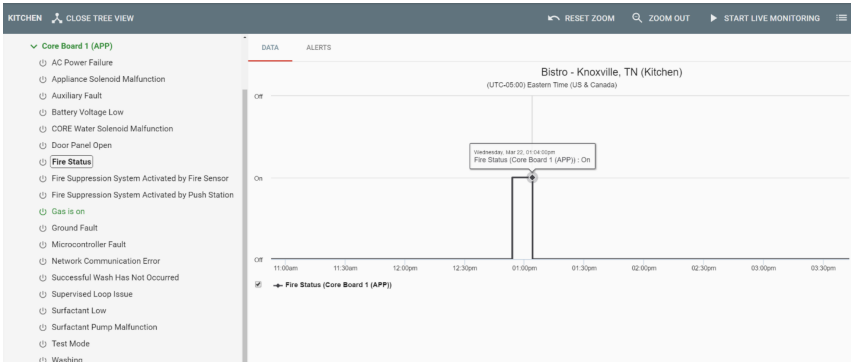
Pollution Control Monitor

The following information can be monitored for a Pollution Control Unit - Advanced Filter Monitoring (PCU AFM) System:

- **Clogged Filter**: One or more filters in the unit need to be replaced.
- **Missing Filter**: There are one or more filters missing in the unit.
- **Clogged Filter Shutdown**: Unit shut down due to clogged filter condition.
- **Fully Clogged Unit**: Unit is clogged.
- **Missing Door**: One or more doors in the unit are missing.
- **Unit Needs Calibration**: Perform calibration on the unit (see PCU AFM manual for reference).
- **24 Hour Clog**: Filters in a module are clogged for 24 hours, or the pressure drop across the PCU exceeds allowable limit for 24 hours.
- **72 Hour Clog**: Filters in a module are clogged for 72 hours, or the pressure drop across the PCU exceeds allowable limit for 72 hours. An access door left open in the duct for 72 hours may also cause this fault.
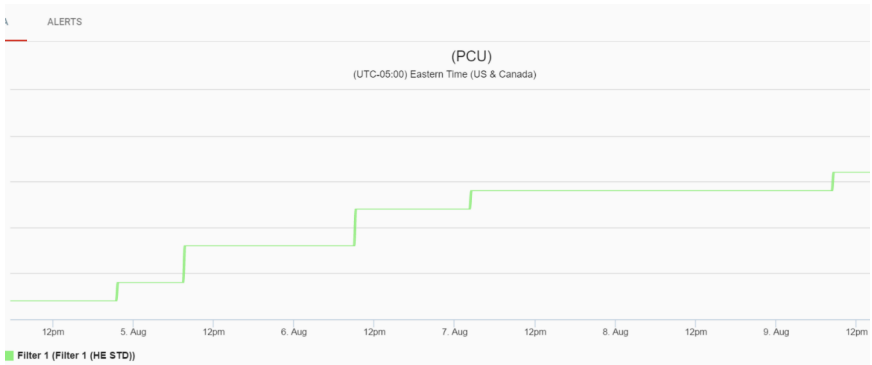- Individual Pressure and Filter status (analog variables).

Figure 24 - Monitoring Screen for PCU AFM

PCU Advanced Filter Monitoring Module with ECPM03

PCU Advanced Filter Monitoring Modules (AFM) are not fire-related, and therefore connect to the standard ModBus Network for communication. Each PCU AFM comes equipped, within its control panel internal to the PCU, a pair of RJ45 Cat-5 connection ports. ModBus wiring shall be run from J3 of the ECPM03 circuit board associated with the Communication Module, to either of these two RJ45 ports within the PCU AFM cabinet, refer to **Figure 22**. Additional PCU AFM modules should be wired on this same daisy chain loop with an end-of-line terminator at the final location. Communication in this arrangement travels from the PCU AFM through the ECPM03, and into the Communication Module.

ECPM03 Hood Control Panel (SC and DCV)

The following information can be monitored for an ECPM03 board connected to CASLink:

1. **Temperature Sensors** - All room temperature sensors and duct sensors: Temperature on vertical axis, time on horizontal axis.
2. **Make Up Air Units**:
   • **Speed**: VFD frequency.
   • **Amperage**: Current draw of the unit motor.
   • **Energy Usage**: Power on the vertical axis, time on the horizontal axis.
   • **Fault State**: Alerts if VFD is in a fault state.
   • **Fan Status**: Is MUA fan group on.
   • **Fan On Reason**: Why are fans on.

NOTE: Speed, Amperage, Energy Usage, and Fault State only apply to VFD controlled fans.

3. **Exhaust Fan Units**:
   • **Speed**: VFD frequency.
   • **Amperage**: Current draw of the unit motor.
   • **Energy Usage**: Power on the vertical axis, time on the horizontal axis.
   • **Fault State**: Alerts if VFD is in a fault state.
   • **Fan Status**: Is MUA fan group on.
   • **Fan On Reason**: Why are fans on.

NOTE: Speed, Amperage, Energy Usage, and Fault State only apply to VFD controlled fans.

4. **Hood Lighting State**: Shows if hood lights are ON or OFF.
5. **Wash Zone Status**: Reports if one or more wash zones are currently active.
6. **Alarms Active**: Reports any active alarms on.

### Figure 25 - Hood Duct Temperature Obtained from a DCV Panel
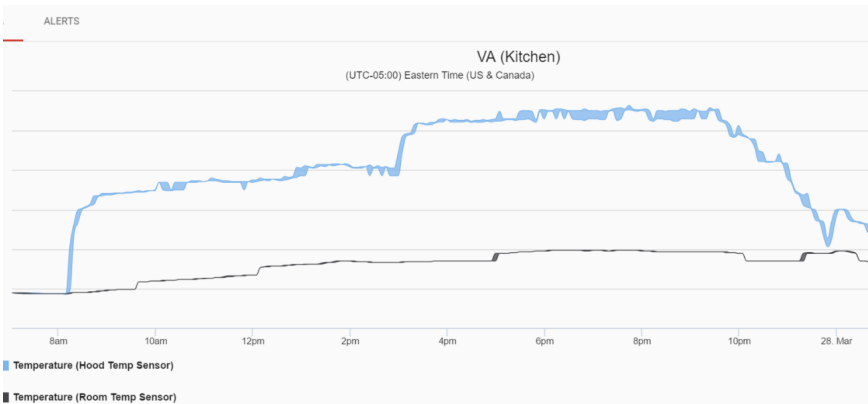
Control

The Control section of CASLink shows all sensor areas that have the capability to be controlled through CASLink user interface (UI). To view each piece of hardware that has control capabilities, click on the "**Control**" icon from the home page.

RTULink

The following RTU information can be monitored for every RTU that has an RTULink board installed in it.

1. **Temperature Sensors**:
   • Discharge Temperature
   • Return Temperature
   • Outside Air Temperature
   • Space Temperature (if installed)
2. **Unit Activity**:
   • Blower Status
   • Individual Cooling Stage Status
   • Individual Heating Stage Status
   • Unit Alarm Status
   • Cooling Setpoint (if in Full Control mode)
   • Heating Setpoint (if in Full Control mode)
3. **Faults/Alarms**: Reports any fault that is active on the RTULink control board or any fault that is configured through CASLink.

Figure 26 - Cooling Setpoint Graph Obtained from RTULink Board
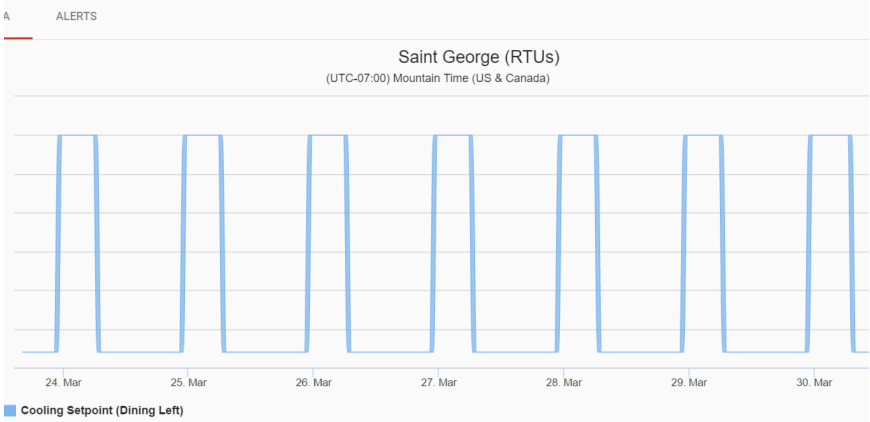
Navigating Sensor Data

All historical time data (temperatures, fan speeds, energy usage, and amperage) will be shown in graphs with time on the horizontal axis. The viewable time frame can be modified using the Zoom functions shown above the graph (Set View Range, Zoom Out, Reset Zoom). You may select multiple sensors on the left-hand side to overlay on the graph. Use the Start/Stop Multi Selection button to select sensors. Once selected, the sensor information will appear on the graph. Zooming in on a selected area of the graph is accomplished by clicking on a start time and dragging the mouse to an end time before releasing the click.

Figure 27 - Overlapping Sensor Data on Same Plot

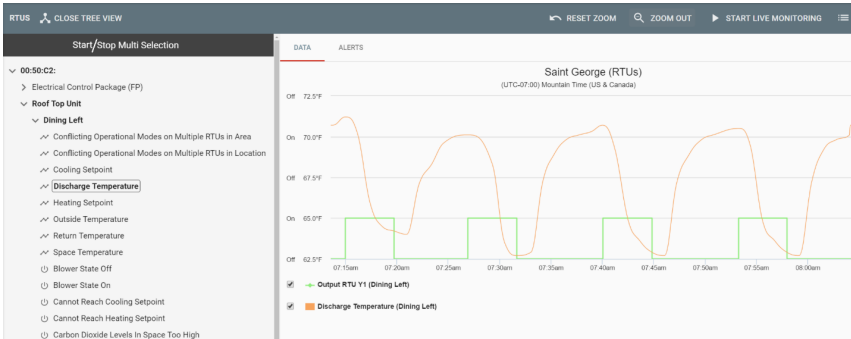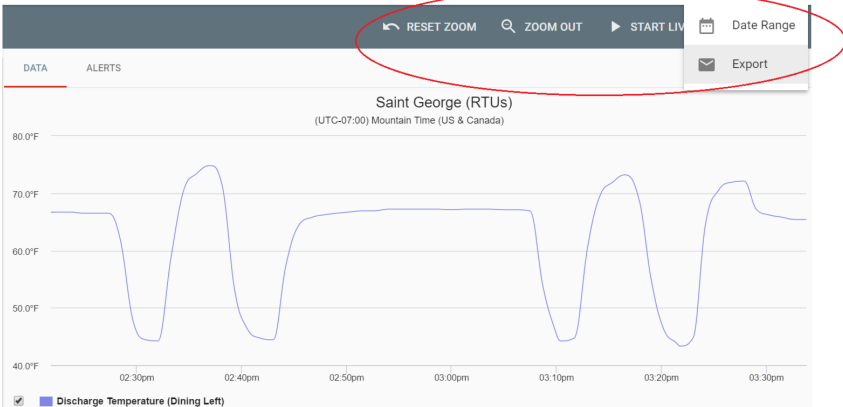**Figure 28 - Set Range and Export Tabs Shown Above Graph**

Any alerts for specific sensors can be viewed by clicking on the "**Alerts**" tab above the graphs. The data tab will display the graphs again. The "**Start Live**" button will let you view data as it comes in (refreshed a few times every minute). The "**Export**" button will allow you to download an excel file with sensor values and times of occurrence.

Figure 29 - Excel Sheet of Sensor Data Exported from CASLink

| DateTime	RawValue	DisplayValue
3/23/2017 16:12	64.4	64.4°F
3/23/2017 16:13	64.4	64.4°F
3/23/2017 16:14	64.4	64.4°F
3/23/2017 16:15	64.4	64.4°F
3/23/2017 16:17	64.5	64.5°F
3/23/2017 16:18	64.5	64.5°F
3/23/2017 16:19	64.5	64.5°F
3/23/2017 16:20	64.7	64.7°F
3/23/2017 16:21	64.4	64.4°F
3/23/2017 16:22	65.1	65.1°F
3/23/2017 16:23	67.1	67.1°F
3/23/2017 16:24	67.4	67.4°F
3/23/2017 16:25	68	68.0°F
3/23/2017 16:27	68.3	68.3°F
3/23/2017 16:28	67.8	67.8°F
3/23/2017 16:29	66	66.0°F
3/23/2017 16:30	65.4	65.4°F
3/23/2017 16:31	65.1	65.1°F

RTULink Control Board

If the RTULink board is in Full Control or External Control Mode, it is capable of being controlled through CASLink. The Full Control Mode offers the highest level of control, allowing set points and settings of each RTU to be changed and controlled through CASLink. External Control Mode offers limited control of each RTU, with the majority of the operation still being controlled by an external thermostat. The Pass-through Control Mode offers no control capability, and as a result, the CASLink Controls interface will not be accessible.

Each RTULink board will have a dashboard that appears in the Controls Area. The color of each individual dashboard indicates the current operation of the unit. A dashboard with a blue background means the unit is cooling, and a dashboard with a red background indicates a unit is heating.

- The yellow box shows the heating setpoint (to the right of the red bubble), the cooling setpoint (to the right of the blue bubble), and the blower mode (a rotating fan means the blower is in ON mode, and the absence of a fan means the blower is in AUTO mode).
- The red box indicates the spot on the dashboard where the space, return, outside, and discharge temperatures are displayed.
- The green box indicates the status of certain unit options. For example, if the emergency heat is ON or OFF, if the economizer is allowed, if the unit is in an occupied or unoccupied state, etc.

Figure 30 - RTULink Dashboard
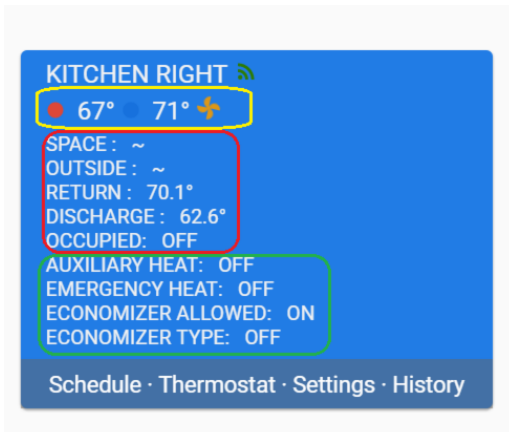
The three links at the bottom of the RTULink dashboard are Schedule, Thermostat, and Settings.

Schedule

The scheduling UI is where the 7-day schedule is set for each board. Click and drag over an area of the schedule and release click to highlight an area of the scheduler (press, drag and release for a touchscreen). Once an area has been highlighted, a popup will ask to create a new set point or to use an existing set point. If no set points have ever been created, it will only give the option to create a new one.
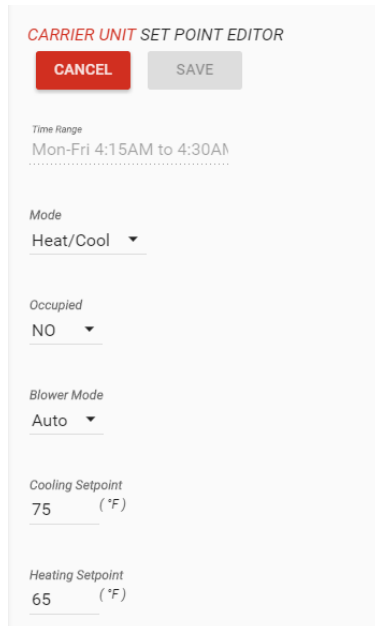
Figure 31 - Set Point Popup

The Setpoint Editor has the following information and editable points.
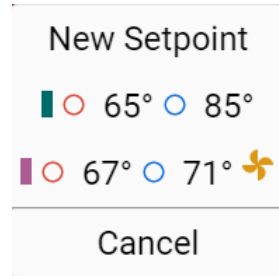
New Setpoint

○ 65° ○ 85°

○ 67° ○ 71°

Cancel

NOTE: The selections that are available in the Setpoint Editor are based on the control mode that the RTULink is in. As mentioned earlier, full control offers the highest level of control, so all points listed below will be shown, but all of the points may not be shown when in External Control Mode.

Figure 32 - RTULink Set Point Editor

- The time block that is being edited.
- The operational mode (Heat/ Cool, Heat only, Cool only, etc).
- Occupied/Unoccupied setting -This controls whether certain features will be enabled; such as CO2 based DCV, economizer, discharge tempering, etc.
- Blower mode - This is a separate setting from the Occupied/Unoccupied mode and controls the status of the blower (AUTO or ON).
- Cooling and heating setpoints.

CARRIER UNIT SET POINT EDITOR

CANCEL   SAVE

Time Range
Mon-Fri 4:15AM to 4:30AM

Mode
Heat/Cool ▼

Occupied
NO ▼

Blower Mode
Auto ▼

Cooling Setpoint
75   (°F)

Heating Setpoint
65   (°F)

Thermostat

The thermostat UI provides temporary override of the schedule. This is intended to make small adjustments to the schedule without writing over it. The thermostat editor will look identical to the setpoint editor except for the addition of the override time. The override time specifies the duration of time, in minutes, that the schedule override will last for.

Figure 33 - Thermostat Editor

Settings

The settings UI is where default board settings can be changed.

NOTE: The Selections that are available in the set point editor are based on the control mode that the RTULink is in. Only settings that apply to the current control mode will be viewable and editable in this interface.

Figure 34 - RTULink Settings Editor

Notes

MAINTENANCE

The CASLink Building Management System and Protocessor/ProtoNode modules, by their very nature, do not require physical maintenance unless a communication problem occurs.

If changes are made to the jobsite between standard 6-month checkup intervals for other equipment such as fans, fire system, etc. CASLink or Building Management Menus should be updated to reflect those changes.

Please record the Module Mac address, BAUD rates, Authentication Key, End-User information, and Module data in the Start-Up table. Present this manual to the end-user upon completion.

Module Registration Parameter Documentation

Record Initial Settings & upload settings to Service Job Notes using System Design Verification Procedures.

Item	Data
BAUD Rate	
Device ID	
End-User Email	
End-User Name	
End-User Password	
CAS Service Region	
CAS Technician	
Phone	
Email	

Contact Service

PLACE LABEL HERE