

# HUSSMANN®

## CoreLink™

Electronic Display Case Controller  
for use with Hussmann Modular Coils  
and Low Temperature Applications



## Installation & Operation Manual

**IMPORTANT!**

Keep with controller for  
future reference!

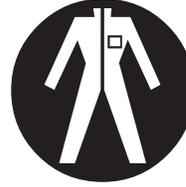
MANUAL- CORELINK CASE CONTROLLER

P/N 0557046\_C  
June 2022



## PERSONAL PROTECTION EQUIPMENT (PPE)

Personal Protection Equipment (PPE) is required whenever servicing refrigeration equipment. Always wear safety glasses, gloves, protective boots or shoes, long pants, and a long-sleeve shirt when working with this equipment.



Electrostatic discharge (ESD) is the sudden flow of electricity between two electrically charged objects caused by contact, an electrical short, or dielectric breakdown.



Hussmann reserves the right to change or revise specifications and product design in connection with any feature of our products. Such changes do not entitle the buyer to corresponding changes, improvements, additions or replacements for equipment previously sold or shipped.

Hussmann recommends industry workers use antistatic wrist straps, ESD wrist strap, or ground bracelet when working on electronic devices which can be damaged by ESD. Please consult chosen strap literature for best practices for usage.

### REVISION HISTORY

#### REVISION C

- Added HSXIO details
- Updated all out of date details
- Added updated Quick Connect Manual
- Removed n/a wiring diagrams
- Renumbered pages and sections accordingly

#### REVISION B Consolidated and Updated all Sections July - 2020

ORIGINAL ISSUE — May 2016

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#### ANSI Z535.5 DEFINITIONS

-  • **DANGER** – Indicate[s] a hazardous situation which, if not avoided, will result in death or serious injury.
-  • **WARNING** – Indicate[s] a hazardous situation which, if not avoided, could result in death or serious injury.
-  • **CAUTION** – Indicate[s] a hazardous situation which, if not avoided, could result in minor or moderate injury.
- **NOTICE** – *Not related to personal injury* – Indicates[s] situations, which if not avoided, could result in damage to equipment.



This warning does not mean that Hussmann products will cause cancer or reproductive harm, or is in violation of any product-safety standards or requirements. As clarified by the California State government, Proposition 65 can be considered more of a ‘right to know’ law than a pure product safety law. When used as designed, Hussmann believes that our products are not harmful. We provide the Proposition 65 warning to stay in compliance with California State law. It is your responsibility to provide accurate Proposition 65 warning labels to your customers when necessary. For more information on Proposition 65, please visit the California State government website.

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### WARRANTY

## CONTROLLER FEATURES

- ▶ CoreLink is a customizable, programmable controller that can interface with I/O expansions, drivers for electronic valves to specifically work with refrigeration and cooling equipment.
- ▶ All the inputs and outputs are factory configured for display case refrigeration systems.
- ▶ The program and parameters are stored in a permanent flash memory. No data is lost in case of power failure.
- ▶ Internal web server graphical interface with the CoreLink website with no special software or application required to access CoreLink.
- ▶ Application and firmware upgrades as well as configuration changes can be made via USB flash drive.
- ▶ BACNET communication protocol integration
- ▶ USB to Ethernet Adaptors (Husmann approved) can be used to connect CoreLink onto a local area network. Through the addition of the Husmann Wireless Connection Kit (PN 3053757), users have wireless connectivity to a phone, tablet or laptop. No special software or application required to access CoreLink.
- ▶ Technicians can bypass and view inputs/outputs from their personal smart devices.

### HARDWARE:

- ▶ USB Port
- ▶ Husmann LCD Remote Display
- ▶ Serial Port (LAN) Communication
- ▶ RS485

### CONFIGURABLE I/O:

- ▶ (x11) Digital Inputs
- ▶ (x8) Relay Outputs [Digital Out]
- ▶ (x6) Analog Input
- ▶ (x4) Analog Output
- ▶ Additional Power (Accessories)
- ▶ 12 VDC 200ma MAX
- ▶ 5 VDC 100ma MAX

### NETWORK

- ▶ USB port provide maximum flexibility of integration with the outside world.
- ▶ MODBUS RTU protocol used with refrigeration and all other building automation systems

- ▶ Wireless connectivity provides flexibility when troubleshooting in the field. Technicians are not linked to long cables while working in large areas.

#### Note:

Refer to “How to Connect to CoreLink” for first time connection.

Serial Port (LAN Connection) - CoreLink can connect to external peripherals through the LAN serial port and easily allow expansion to additional control devices.

CoreLink can connect to external peripherals through the LAN serial port and easily allow expansion to additional control devices.

#### Optional Husmann Remote Display:

A small surface mount display is available for customers that want direct control at the case level.

**AVAILABLE EXTENSION MODULES**

Modular Case Exp Modules  
 (Hussmann Stepper Valve Driver) = HSVD  
 (Hussmann Expansion I/O Module = HSXIO

HSVD is a Hussmann solution to address controlling cases with multiple coils. HSVD can control uni-polar and bi-polar valves and is not limited to step and pulse valves.

Available Modules:

HSVD20 – Dual Valve Driver  
 HSVD30 – Triple Valve Driver  
 HSXIO- Expansion I/O Module

**APPLICATION**

The application will have the option to support up to three coils by regulating superheat in addition to optimum case temperature. To maintain case temperature, the application will use discharge case temperature, return case temperature or a mixed combination of discharge and return temperatures.

**CONTROL MODES****3 Available Control Modes:**

Superheat Only

- ▶ Remote type cases with temperatures regulated by pressure/temperature relationship. User decides target.

Standard Mode

- ▶ Controller can support all self-contained operation including condensing unit. Temperature is maintained by a setpoint and deadband.

Continuous Mode

- ▶ Remote type cases with temperature regulated by combination superheat control and air discharge algorithm.

**INTERNAL WEB SERVER**

CoreLink Case Controller has a web browser interface. The browser UI can be accessed by in-store networks or using a Hussmann Wireless Connection Kit (PN 3053757) for viewing via a smart phone. No special software or application required to access CoreLink.

**DATA LOGGING**

CoreLink logs operation data that can be downloaded.

- ▶ 1-minute intervals
- ▶ 7-day capacity
- ▶ Advanced analytics Browser User Interface
- ▶ Exportable CSV format

Onboard data logging allows users to review performance data from the past week. User can see Min/Max/Average data along with saving data sets and importing data sets for viewing.

**FACTORY RESTORE**

The CoreLink application has a configuration file with the complete and optimized default case settings.

Anytime a user wants to default to factory settings they can simply access the user interface and force a factory reset.

**SAVE/LOAD FEATURE**

The CoreLink Case Controller is setup from the factory with a specific product configuration when a customer purchases a display case.

This specific configuration is hard-coded into the controller and is the factory default file.

There are three user save/restore presets that allow custom configuration settings to be used.

## SPECIFICATIONS

### WARNING

Make sure the machine is switched off before working on electrical connections. All operations must be carried out by qualified personnel. To ensure proper connections, comply with the following:

DO NOT work around live electrical equipment. All operations and installations should be carried out by qualified personnel only. For safety purposes, always make sure the device is switched OFF before touching connections.

All system components should be obtained from Hussmann to ensure system compatibility and reliability.

Under no circumstances is the device to be opened – Opening the case on the device will void the warranty.

Prevent the device from being dropped, knocked or shaken as this can cause irreparable damage.

The device must always be inserted inside an electrical panel that can be accessed by authorized personnel only.

Comply with the temperature and humidity limits specified in the manual . Prevent frequent and sudden changes in temperature and/or humidity.

Do not mount devices in extremely damp and/or dirt-laden areas; Electronics should never come in contact with water or any other type of liquid.

Separate the cables of the analog inputs from those of the digital inputs and the serial line cables from the power cables (resistive as well as inductive), in order to prevent malfunction due to electromagnetic interference.

Make connections as short as possible, and do not wind them around electrically connected parts.

Do not install device in area of high mechanical stress vibrations. Harsh vibrations can cause component level failure or unintended disconnection of controller cables.

Do not clean the device with corrosive chemical products, solvents or aggressive detergents. The device must not be used in applications that differ from that specified in the following material.

Do not install the device in the presence of flammable or explosive gas. Device is not ignition protected for application in flammable environments.

Do not expose device to Sulphur and Ammonia gas, smoke and salt spray that can cause corrosion and/or oxidation.

Do not install device near items that generate large amounts of magnetic interference. Abnormal operation can result.

Always make sure the area near the cooling slot is ventilated and that the controllers always receive sufficient passage for cooling air.

Always comply with the laws and regulations applicable in the country where the device is installed. Always protect and stow the device securely so it can only be accessed by authorized personnel. In case of malfunctions, always contact the relative distributor for the device to be repaired.

Hussmann is not responsible for misuse of device. Hussmann is not held responsible for deviation from this manual and its intended use. If you have any questions, please contact your local Hussmann Representative for details.


**WARNING**

Be aware of the current limits for the power output devices. Additional power outputs are available on the CoreLink case controller and valve drivers.

Please pay extra attention to the current limits when applying power accessories. Avoid overloading the devices.

Hussmann is not responsible for misuse of device. Hussmann is not held responsible for deviation from this manual and its intended use. If you have any questions, please contact your local Hussmann branch.

When utilizing the digital inputs of the CoreLink Case Controller, use another transformer in order to prevent the digital inputs from malfunctioning or being damaged.

**WARNING!**

DO NOT use the same secondary of the controller's power. Doing so can result in damage to case controller.

Any inputs that are powered with a voltage that differs from that supplied by the device (+12V or +5V) must be powered separately with another transformer.

DO NOT exceed the maximum current capacity of the onboard controller relays.

Always verify the capacity of the output used.

DO NOT use different voltages for the various groups of relays nor within each group.

Digital Output (RELAYS) have two separate groups with separate commons. Please refer to the wiring diagrams on the Web UI or within this manual for more details.

Electrical devices that are controller by the analog outputs must be powered separately with another transformer. (Do not use the same secondary of the controller's power)

DO NOT plug in accessory devices that are not approved by Hussmann.

**USB WARNINGS!**

USB port can support maximum 200mA.

DO NOT plug your smart device or tablet into the USB port of the controller. You cannot charge your personal devices from this port.

The CoreLink Case Controller can be connected to a computer via an external USB to ethernet adapter. This adapter is not set up for fixed or continuous connection. If the adaptor should be kept connected continuously, the room temperature must not exceed 50°C.

**CORELINK CASE CONTROLLER**

**Electrical Specifications**

Power Supply .....	24Vac (+10/-15%) 50/60Hz 20 - 36Vdc
Consumption .....	30VA (Vac) - 25W (Vdc)
Connectors .....	Molex connectors with low voltage wiring (for IPS100D and IPS400D) Phoenix quick coupling connectors for low voltage (for IPS200D) STELVIO 90° screw connectors for digital outputs (250Vac, 6A max)

**Mechanical Specifications**

Mount .....	On a DIN rail (EN 50022, DIN 43880) Fastened with screws via the removable plastic flaps.
Operating temperature .....	-10÷60°C; Storage: -30÷85°C
Relative humidity .....	20÷85% (no condensing)

**Digital Input**

Type .....	Opto-insulated live contact (24Vac/dc) External power 24 Vac/dc ±20%
Number of Inputs .....	11

**Digital Output**

Number of Outputs .....	8
Type of output .....	Relays with normally open contact
(Configurable via software parameter)	
Maximum load. ....	5A(250Vac) SPST 5(2)A



**NOTICE** .....

See Specifications Warnings

Verify the capacity of the output used. There is double insulation between the digital outputs and the low voltage of the rest of the circuit. Do not use different voltages for the various groups of relays nor within each group.

**CORELINK CASE CONTROLLER**

**Analog Input**

Number of Inputs .....	6
Type of Analog Input .....	NTC Dixell (-50T110°C; 10KΩ±1% at 25°C) PTC Dixell (-55T115°C; 990Ω±1% at 25°C) Digital input (potential free contact) Voltage: 0 - V, 0 - 5V, 0 - 10V (input resistance 3.7KΩ ) Current: 0 - 20mA, 4 - 20mA (input resistance 100Ω)
Additional Power .....	+12V: 200mA in total (between +12V and analogue outputs) +5v: 100mA



NOTICE .....  
See Specifications Warnings

Any inputs that are powered with a voltage that differs from that supplied by the device (+12V or +5V) must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged.

**Analog Output**

Type .....	Non opto-insulated internal power
Number of Inputs .....	4
Type of Analog Input .....	4 configurable outputs 0-10Vdc 4-20mA (Out1 - Out4)
Maximum Load .....	40mA (Out1 - Out4) max with configured out puts 0-10Vdc 400Ω max with configured outputs 4-20mA 22Ω per live analogue output



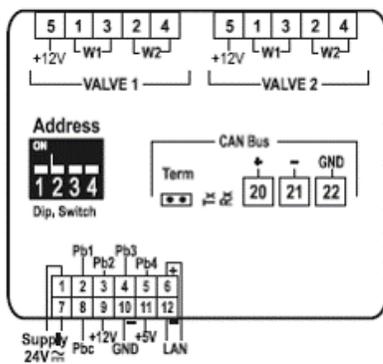
NOTICE .....  
See Specifications Warnings

The electrical devices controlled by these analogue outputs must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the outputs from malfunctioning or being damaged.

## HSVD20 - 2 VALVE DRIVER

### Electrical Specifications

Power Supply .....	24Vac (+10/-15%) 50/60Hz 20 - 36Vdc
Consumption .....	40VA (Vac) - 36W (Vdc)
Connectors .....	Molex connectors with low voltage wiring (for IPS100D and IPS400D) Phoenix quick coupling connectors for low voltage (for IPS200D) STELVIO 90° screw connectors for digital outputs (250Vac, 6A max)



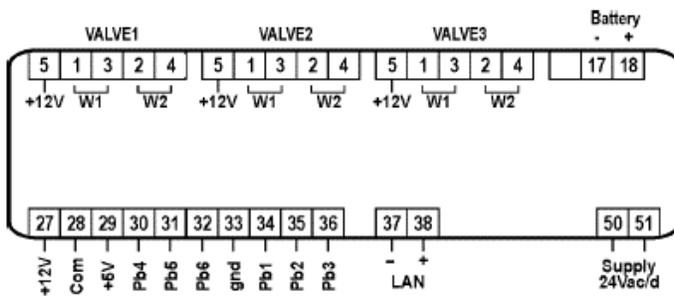
### Mechanical Specifications

Mount .....	On a DIN rail (EN 50022, DIN 43880) Fastened with screws via the removable plastic flaps.
Operating temperature .....	-10÷60°C; Storage: -30÷85°C
Relative humidity .....	20÷85% (no condensing)

## HSVD30 - 3 VALVE DRIVER

### Electrical Specifications

Power Supply .....	24Vac (+10/-15%) 50/60Hz 20 - 36Vdc
Consumption .....	60VA (Vac) - 54W (Vdc)
Connectors .....	Molex connectors with low voltage wiring (for IPS100D and IPS400D) Phoenix quick coupling connectors for low voltage (for IPS200D) STELVIO 90° screw connectors for digital outputs (250Vac, 6A max)



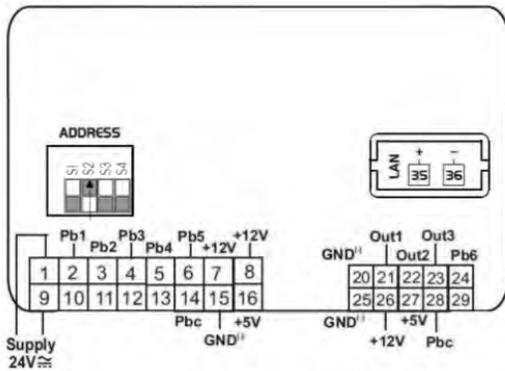
### Mechanical Specifications

Mount .....	On a DIN rail (EN 50022, DIN 43880) Fastened with screws via the removable plastic flaps.
Operating temperature .....	-10÷60°C; Storage: -30÷85°C
Relative humidity .....	20÷85% (no condensing)

## HSXIO – I/O EXPANSION MODULE

### Electrical Specifications

Power Supply .....	24Vac (+10/-15%) 50/60Hz 20 - 36Vdc
Consumption .....	60VA (Vac) - 54W (Vdc)
Connectors .....	Molex connectors with low voltage wiring (for IPS100D and IPS400D) Phoenix quick coupling connectors for low voltage (for IPS200D) STELVIO 90° screw connectors for digital outputs (250Vac, 6A max)



Input No.	Type of Input	Description
14	Pbc	Common for analog input temperature probes (CPC, NTC, PTC, PT1000) using Pb1-Pb5 (Pins 2-6)
15	GND(-)	Ground for analog inputs (0-20mA, 4-20mA, 0-10V, 0-1V, 0-5V) using Pb1-Pb5 (Pins 2-6). In addition to, 5Vdc and 12Vdc power reference (Pins 7, 8, 16)
20	GND(-)	Ground for analog outputs (0-20mA, 4-20mA, 0-10V, 0-1V, 0-5V) using Out1-3 (Pins 21-23)
25	GND(-)	Ground for analog inputs (0-20mA, 4-20mA, 0-10V, 0-1V, 0-5V) using Pb6 (Pin 24). In addition to, 5Vdc and 12Vdc power reference (Pins 26, 27)
28	Pbc	Common for analog input temperature probes (CPC, NTC, PTC, PT1000) using Pb6 (Pin 24)

### Mechanical Specifications

Mount .....	On a DIN rail (EN 50022, DIN 43880) Fastened with screws via the removable plastic flaps.
Operating temperature .....	-10÷60°C; Storage: -30÷85°C
Relative humidity .....	20÷85% (no condensing)

## VALVE DRIVERS EXPANSION MODULE

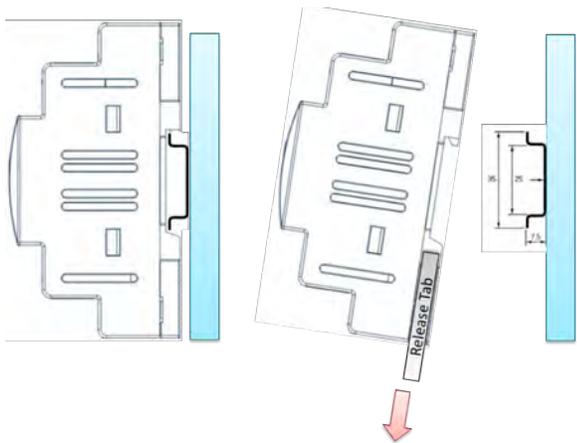
### Analog Input

Number of Inputs .....	HSVD20 = 4 HSVD30 = 6
Type of Analog Input .....	NTC 10K Thermistor 0-5V Pressure Transducer
Additional Power .....	+12V: 80mA in total (between +12V and analogue outputs) +5v: 6mA



**NOTICE** .....  
See Specifications Warnings

Any inputs that are powered with a voltage that differs from that supplied by the device (+12V or +5V) must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged.



Align controller to the DIN rail and snap into position. Use release tabs to remove devices, lifting up and rotating out of DIN rail track.

## How to connect to CoreLink Case Controller

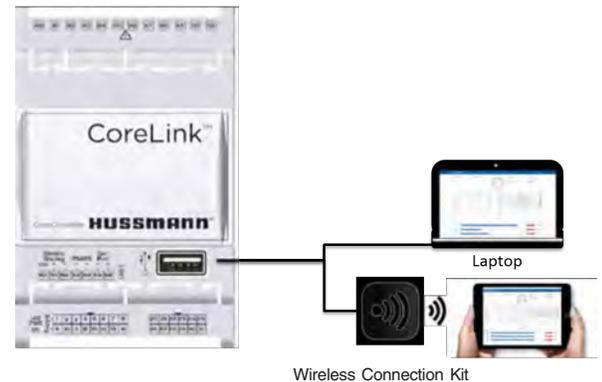
### Wireless Connection

#### Components Required

The following items are required for first time connect

#### Wireless Access Point

- One Wireless Connection Kit - PN 3053767
- One Computing Device
  - Smartphone / Mobile
  - Tablet
  - Laptop



#### Connect the CoreLink with Wireless Access Point

##### Step 1

Connect your wireless access point box to the CoreLink USB port.

##### Step 2

Allow the router boots up (about 30 seconds). Next, open your laptop/tablet/phone wireless network connection panel and use the default Wi-Fi Network/SSID Name and Network Key/Password noted below. These are also printed on the wireless connection kit.

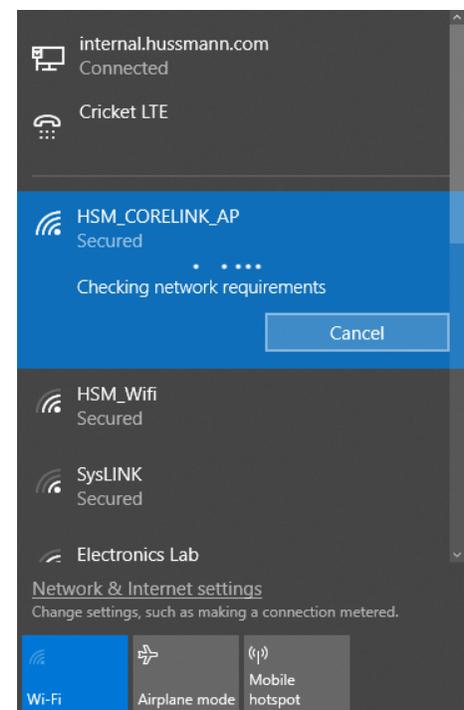
#### Wireless Network

##### Name/SSID:

HSM\_CORELINK\_AP

##### Network Key / Password:

HusmannCL1234



**ATTENTION: This device must not leave the store**

## 3-2

### Step 3

Launch a web browser

- Google Chrome
- Mozilla Firefox
- Microsoft Edge
- Safari

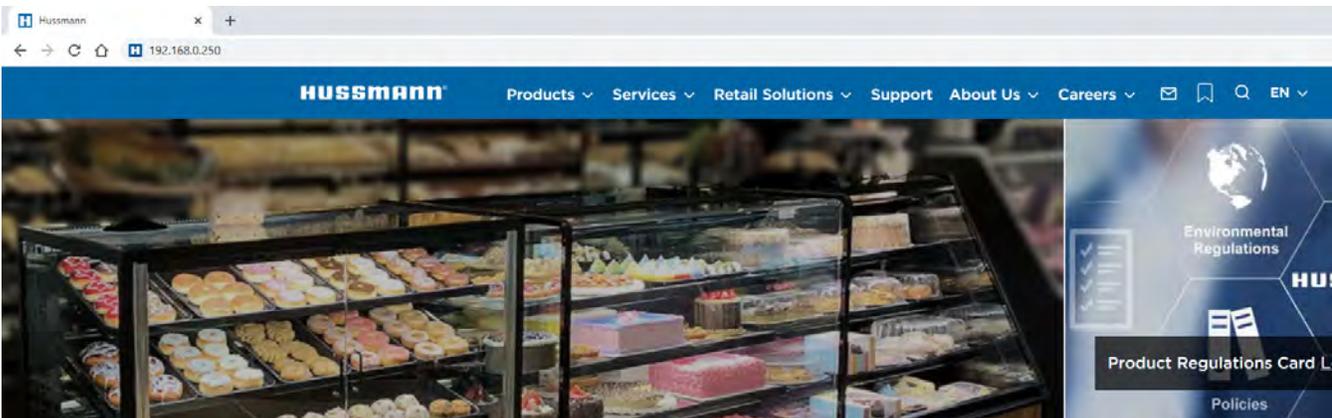
**Note:** Clear cache to see latest Web UI Version. If your browser is still not working, please try the other browsers before reporting an issue.

### Step 4

Enter controllers IP into the Address/Search Bar of your browser.

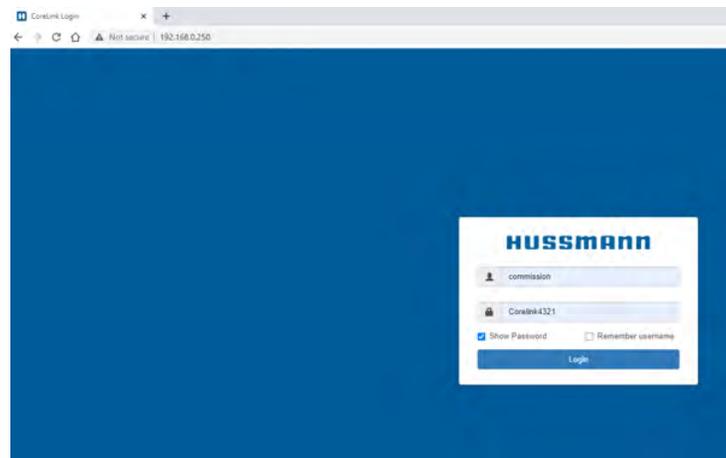
**Default** – 192.168.0.250

**Other** – Review Store Network Chart



### Step 5

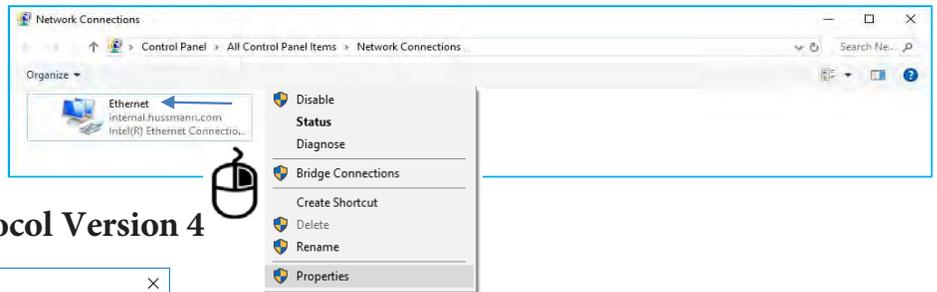
The controller login page will appear.  
Credentials are available on page 8



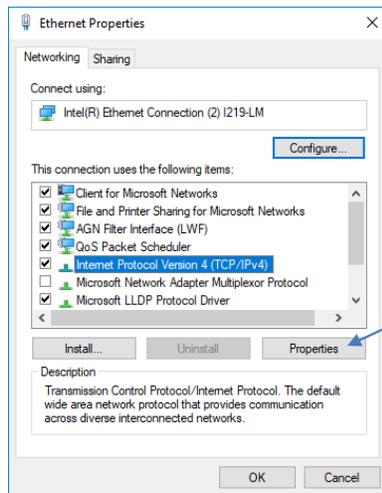
# Direct Wired Connection

**Step 1** - Connect laptop with RJ-45 ethernet cable/USB adaptor to CoreLink Case Controller

**Step 2** - Change laptop network settings – open laptop network settings, right click **Ethernet**, select **Properties**.



**Step 3** - Select **Internet Protocol Version 4 (TCP/IPv4)**



Click > Properties

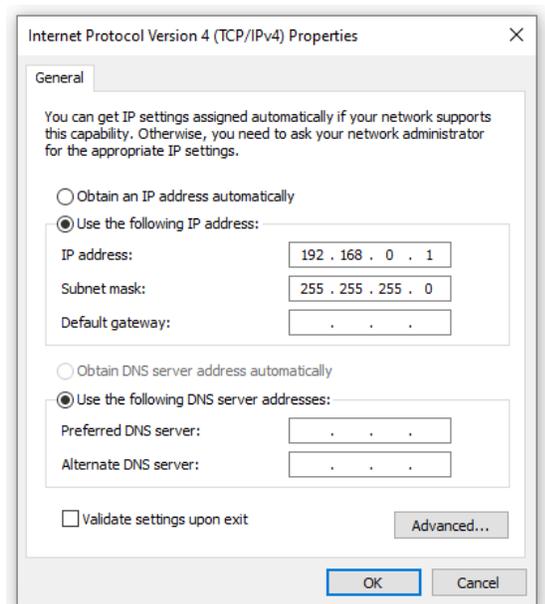
**Step 4** - Enter IP address and subnet mask  
**Internet Protocol Version 4 (TCP/IPv4) Properties**

Select Radial Button “Use the following IP address:”

IP address: 192.168.0.1

Subnet mask: 255.255.255.0

Select “OK”



**Note:** Changes to your ethernet port settings might affect normal connection to the internet with your personal laptop.

To revert ethernet settings, repeat Steps 1-4.

Select > **Obtain IP address automatically** button on the general tab of the dialog box shown in the illustration at right.

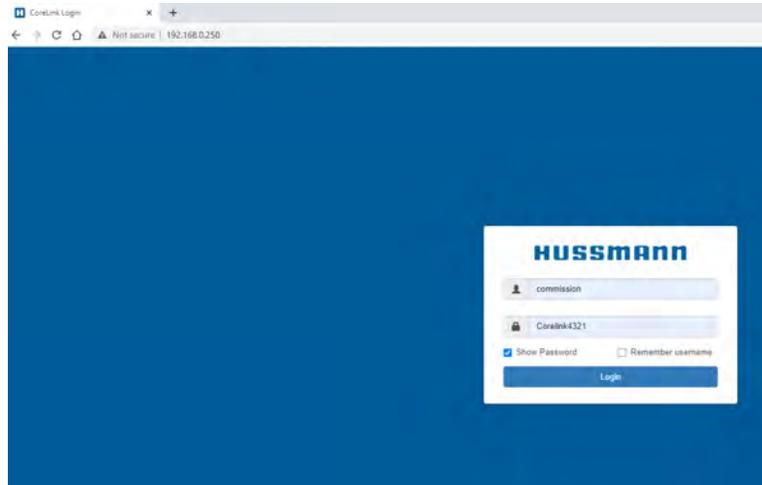
Click > OK

### 3-4

#### Step 5

Launch a web browser

Enter controllers IP into the Address/Search Bar of your browser



After logging in, the CoreLink Dashboard is displayed.

Zone 1	
Setpoint	31 °F
Discharge Air	35.3 °F
Return Air	35.2 °F
Valve Position	85 %
Coil Out Temp	49.3 °F
SH Setpoint	5 °F

Refrigeration:	On	Defrost:	Off
Anti-sweat:	Off	Drain Sensor:	Off
Lights:	On	Dual-Temp Mode:	Off
Evap Fan:	On	Door Switch:	Off
Cond Fan:	On	Night Curtain:	Open

Refrigerant	R449A	Anti-Sweat Heater	100 %
Saturation	27.5 °F		
Pressure 1	53.7 PSI		

Superheat

High Alarm	25°	20°	15°	10°	5°	0°	Low Alarm
OK	Coil 1 21.7 °F						OK
						Flood	

# CoreLink Login Credentials

SW version $\geq$ 2.6.0	All Previous Versions
<b>Level 1</b> User Name: user Password: Hussmann	<b>Level 1</b> User Name: Hussmann1 Password: Hussmann
<b>Level 2</b> User Name: service Password: Hussmann1234	<b>Level 2</b> User Name: Hussmann2 Password: Corelink1234
<b>Level 3</b> User Name: commission Password: Corelink4321	<b>Level 3</b> User Name: Hussmann3 Password: Corelink4321
<b>Admin</b> Not Available	<b>Admin</b> User Name: admin Password: Hussmann

## Direct Wired Connection

- One RJ-45 Ethernet to USB adaptor  
(Details Below)
- One RJ-45 Ethernet Cable
- A laptop with an RJ-45 Ethernet port

### USB 2.0 to Ethernet Adaptors

#### Approved RJ-45 Ethernet to USB adaptor

Amazon Basic AE2233X2

[https://www.amazon.com/gp/product/B00M77HLII/ref=ppx\\_yo\\_dt\\_b\\_search\\_asin\\_title?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B00M77HLII/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1)



Manhattan 506731

<https://manhattanproducts.us/products/manhattan-en-usb-20-fast-ethernet-adapter-506731>



Insignia NS-PU98505

<https://www.bestbuy.com/site/insignia-usb-2-0-to-ethernet-adapter-white/6233049.p?skuId=6233049>



## How to connect to CoreLink Case Controller in Store Network

### Custom Store Network

When visiting a store site, the technician might notice the USB to Ethernet adaptors installed and connected to RJ-45 ethernet cable at the CoreLink Case Controllers. The store likely has a custom CoreLink Case Controller network with all cases connected directly to an ethernet switch or multiple ethernet switches. To access these controllers, please consult the refrigeration service contractor, or Hussmann Representative.

Technicians will need to obtain details of the network setup. Some networks may only be accessed through direct wire connection and others may have Wi-Fi available onsite. Username and password will be needed to make connection to this network much like the access point instructions above.

Technicians will also need to know the IP addressed assigned to each case circuit. In this scenario each CoreLink Case Controller will have a unique IP address assigned. Technicians will only be able to gain access to the internal Web UI with the correct provided IP address.

Once connected to the network the technician will be able to access any of the controllers connected to the network.

## COMMON PROBLEMS

### Clearing Cache

Try clearing your browser's cache. If the Web UI has been revised you may need to clear your browser's cache in order for the Web UI to work correctly and see new updates.

If the CoreLink login screen does not appear after typing in the web address, first check that hard-wire connections or wireless connection are correct.

If connections are good and devices power up, please check mini router settings by logging into the routers Web UI. For cable setups, please review your computer's network settings. If ongoing problems continue, please contact your local IT Department or Hussmann Help Center.

Web browsers are updated on a continuous basis. Information presented below is subject to change. When in doubt, search the internet for up-to-date instructions for how to clear history for the web browser you are using.

WEB Browser	Clearing Web History Cache
Google Chrome (Android)	<ol style="list-style-type: none"> <li>1. Open Chrome.</li> <li>2. On your browser toolbar, tap "More".</li> <li>3. Tap History, and then tap Clear Browsing Data</li> <li>4. Under "Clear Browsing Data," select the checkboxes for cookies and site data and cached images and files.</li> <li>5. Use the menu at the top to select the amount of data that you want to delete.</li> </ol>
Firefox (Mozilla)	<ol style="list-style-type: none"> <li>1. Click the menu button, choose History, and then Clear Recent History</li> <li>2. Select how much history you want to clear. Click the drop-down menu next to Time Range to clear to choose how much of your history Firefox will clear</li> <li>3. Finally, click the Clear Now button.</li> </ol>
Safari (Apple/Mac)	<ol style="list-style-type: none"> <li>1. Click Safari in the upper lefthand side of your screen. In the menu that appears, click Preferences.</li> <li>2. In the window that appears, click the Privacy Tab. Click the button Remove All Website Data</li> <li>3. Click Remove Now in the pop up window that appears.</li> </ol>
Microsoft Edge (Not Recommended)	<ol style="list-style-type: none"> <li>1. Open the Settings Menu. In the top righthand corner you'll see three dots in the horizontal line,</li> <li>2. Locate Clearing Browsing Data</li> <li>3. Choosing What to Clear</li> <li>4. Restart the browser</li> </ol>
Internet Explorer (Not Recommended)	<ol style="list-style-type: none"> <li>1. Select Tools &gt; Internet Options.</li> <li>2. Click the General tab and then the Delete button.</li> <li>3. Make sure to uncheck Preserve Favorites website data and check both Temporary Internet Files and Cookies, then click delete.</li> </ol>
Safari Apple iPhone	<ol style="list-style-type: none"> <li>1. Launch the Settings App from the home screen of your iPhone or iPad.</li> <li>2. Scroll down and tap on Safari.</li> <li>3. Now scroll all the way to the bottom and tap on Advanced</li> <li>4. Tap on Website Data.</li> <li>5. Scroll to the bottom again and tap on Remove All Website data.</li> <li>6. Confirm one more time you'd like to delete all data.</li> </ol>
Chrome (Android Phone)	<ol style="list-style-type: none"> <li>1. Open Chrome browser and tap the Menu button</li> <li>2. Tap "Settings" in the menu that appears.</li> <li>3. Tap "Privacy" in the Advanced Section</li> <li>4. Scroll down and tap "Clear Browsing Data".</li> <li>5. Ensure that "Cache" and "Cookies, site data" are checked and then tap "Clear".</li> </ol>

## Browser User Interface

### Compatible Web Browsers

Launch a web browser

- Safari
- Google Chrome
- Mozilla Firefox
- Microsoft Edge
- Opera
- Internet Explorer (Not Recommended)

Note: Clear cache to see latest Browser UI  
Version For more details see end of section...

**Level 1** – The lowest access available on the Browser UI. This level is designed for store personal and is essentially view only with limited ability to change settings.

- |                                |                          |                           |
|--------------------------------|--------------------------|---------------------------|
| -Case Status Information       | -View Fan Mode           | -Start Defrost            |
| -Change Case Setpoint          | -View Alarm Settings     | -End Defrost              |
| -Change Case Superheat         | -View Active Alarms      | -Lights ON/OFF            |
| -Change Basic Defrost Settings | -View Graph Data         | -Open/Close Night Curtain |
|                                | -View System Information | -Reboot Controller        |

**Level 2** – Technician access on the Browser UI. This level is designed for intermediate technicians who are allowed to make small adjustments to the system. Expanded menus and options available.

- |                                   |                          |                         |
|-----------------------------------|--------------------------|-------------------------|
| -Refrigeration PID Control        | -View I/O Menus          | -Advance Command Menu   |
| -Compressor Protection & Safeties | -View Superheat Settings | -Advance System Menu    |
| -Defrost Control / Defrost Sync   | -View Valve Parameters   | -Upload/Download .hsm   |
| -Fan Menu                         | -View CT Setup           | -Factory Restore        |
| -Alarm Settings                   |                          | -Modbus Network Address |

**Level 3** – Commissioner access on the Browser UI. This level is designed for expert technicians who have a great understanding of controls case performance.

- Complete access to all menus
- Complete Network Settings / IP
- Ability to overwrite or create factory default files
- CT Setup / Commissioning

# CoreLink Dashboard

HUSSMANN
Status Config Name Parameters F.D. Settings Alerts Energy Displays Commission

ID5SM

Setpoint Distributed

Case Temp



36.0

Date: March 4, 2020

Status: REFW

Control Mode: Continuous

BAS Status: Offline

Time: 3:23:01 AM

Deleat Countdown: 3:51

Alarm: On

1. Case Temp Gauge and System Information

	Zone 1	Zone 2	Zone 3
Setpoint	31 °F	31 °F	31 °F
Discharge Air	37.8 °F	35.9 °F	33.7 °F
Return Air	30.8 °F	Error	Error
SH Setpoint	8 °F	8 °F	8 °F
Valve Position	99 %	99 %	47 %
Coil Out Temp	31.2 °F	33.7 °F	40.1 °F

2. Status Table

Refrigeration	1 <span style="color: green;">On</span>	2 <span style="color: green;">On</span>	3 <span style="color: green;">On</span>	4 <span style="color: green;">On</span>	5 <span style="color: green;">On</span>	6 <span style="color: green;">On</span>	7 <span style="color: green;">On</span>	8 <span style="color: green;">On</span>	9 <span style="color: green;">On</span>	10 <span style="color: green;">On</span>
Admission	<span style="color: green;">On</span>	Dismiss								
Control	<span style="color: green;">On</span>	Case Temp Floor								
Free Fan	<span style="color: green;">On</span>	Coil Switch								
Coil Fan	<span style="color: green;">On</span>	Night Cooler								

3. Indicator Table

Refrigerant	R449A	Saturation	17.9 °F
Dew Point	0.5 °F	Pressure 1	-41.8 PSI
Dash Temperature	°F	Dash RH	°F
Anti-Sweat Heater	%		

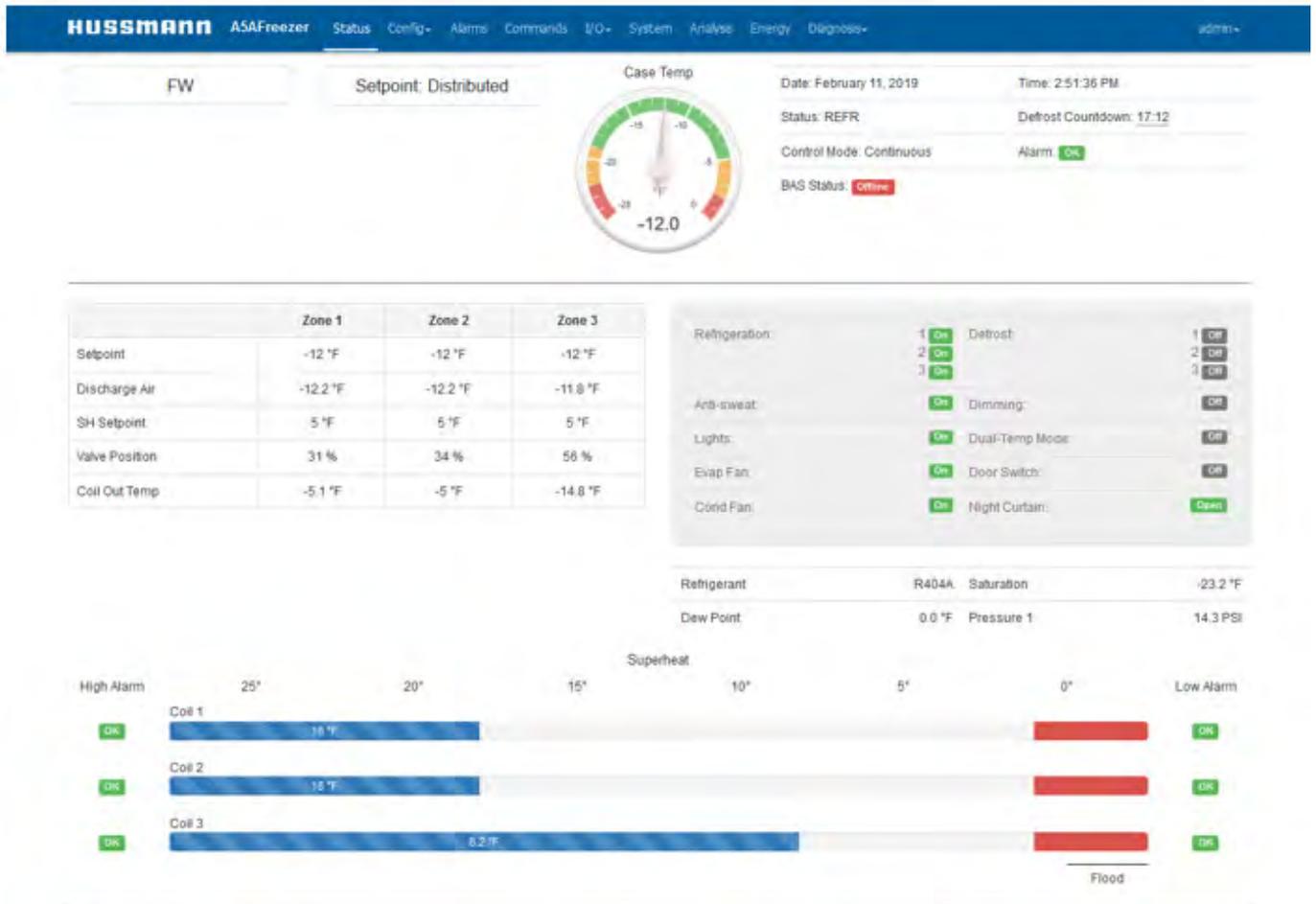
4. Refrigeration Information

Supersheat

High Alarm	25°	20°	15°	10°	5°	0°	Low Alarm	
Coil 1	13.5 °F						10°	<span style="color: green;">On</span>
Coil 2	30.0 °F						10°	<span style="color: green;">On</span>
Coil 3	22.0 °F						10°	<span style="color: green;">On</span>

5. Superheat Bars

### Web UI Status Home Page



Superheat Bar - Use this graphical interface to determine superheat stability of the system. These indicators are updated every 2 seconds on the page to show rapid fluctuations in superheat control. These provide the technician with an improved understanding of what is going on inside the heat transfer coil and can be used to help diagnose the setup or make adjustments.

It is normal to see the controller in a very steady state with elevated superheat readings. Technicians should not be alarmed with these higher values unless the case is not making temperature.

Sudden changes in suction pressure will create large shifts in the superheat bars. This could indicate a poor suction stability if rapid fluctuations are observed or overreactive valves.

Superheat BARS will hide if control mode does not use superheat calculation. Varies by system.

## 4-4

Status Table - Use this table for key temperature sensor or valve position information. This table is updated at a 10 seconds rate. The system menu settings will determine the configuration of this menu.

Number of Distributed Zones - Setting will adjust which columns are shown on the status table. Core-Link is capable of controller up to 3 evaporator coils.

Rule – This holds true for much of the CoreLink application.

1 Zone – Linked to all sensors with the labeled 1

2 Zones – Linked to all sensors with the labeled 2

3 Zones – Linked to all sensors with the labeled 3

	Zone 1	Zone 2	Zone 3
Inputs	Air Discharge 1	Air Discharge 2	Air Discharge 3
	Air Return 1	Air Return 2	Air Return 3
	Defrost Terminate 1	Defrost Terminate 2	Defrost Terminate 3
	Coil Out 1	Coil Out 2	Coil Out 3
	Pressure 1	Pressure 2	Pressure 3
	Compressor Discharge Temp 1	Compressor Discharge Temp 2	Compressor Discharge Temp 3
Outputs	Compressor Discharge Pressure 1	Compressor Discharge Pressure 2	Compressor Discharge Pressure 3
	Refrigeration 1	Refrigeration 2	Refrigeration 3
	Defrost 1	Defrost 2	Defrost 3

Exceptions – CT sensors are assigned to their respective loads and can be configured in the Aux Sensor menu.

Note: The controller is capable of sharing the suction pressure input for all three zones. The controller is defaulted to pressure 1 shared mode from the superheat menu with few exceptions such as large walk in coolers. The application is capable of using a pressure sensor per zone in larger systems that might experience pressure drops between coil distance.

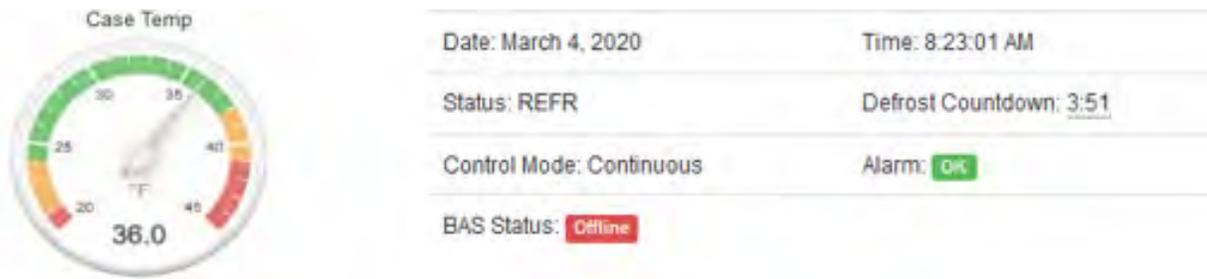
Case Type – Setting will adjust what information is shown within the columns on the status table. Some application setups are for EEV valve controller and others such as MDS control up to 3 compressors. The selection of this parameter will determine a lot of the major Web UI work flow and graphing for the case. Anytime there is a significant mode change the graphing will sometimes be deleted if moving onto a different graphing type.

Indicator Table – This table will provide details about controller outputs status.

Refrigeration:	1 <input checked="" type="checkbox"/> On	Defrost:	1 <input type="checkbox"/> Off
	2 <input checked="" type="checkbox"/> On		2 <input type="checkbox"/> Off
	3 <input checked="" type="checkbox"/> On		3 <input type="checkbox"/> Off
Anti-sweat:	<input checked="" type="checkbox"/> On	Dimming:	<input type="checkbox"/> Off
Lights:	<input checked="" type="checkbox"/> On	Dual-Temp Mode:	<input type="checkbox"/> Off
Evap Fan:	<input checked="" type="checkbox"/> On	Door Switch:	<input type="checkbox"/> Off
Cond Fan:	<input checked="" type="checkbox"/> On	Night Curtain:	<input checked="" type="checkbox"/> Open

Case Temp Gauge – Shows the average of any number discharge air 1-3 configured for case. If no discharge air sensors are configured users could expect a blank gauge. If two air discharge sensors are used the display will be the average of two sensors, if three, then the average of three sensors.

System Information - Shows basic information like current controller status, date/time, BAS connectivity or possible alarms related to case operation.



Refrigeration Information – Shows the refrigerant type, associated saturation temp and current suction pressure. Some case modes might not have the superheat calculation active which also means the suction pressure information is not likely available. This information will not be revealed in certain case modes.

Links – The Web UI has clickable links throughout the pages. Please use these links for additional information where available.

Mouse Hoover – Hoover the mouse on Web UI elements such as case parameters. This often times will provide additional information about the parameter or item in question. The Web UI is often times the best place to dive right into CoreLink and learn system operations.

Reveal – When changing different modes in menus, parameters that are un-related disappear altogether.

Gray Out – Some menus might have limited user access level, but information in these menus are still important useful information for technicians to understand the configuration.

## 4-6

System Menu – Critical system setup, refrigerant, network configuration, upload/download configuration files or application. Factory restore system. Number of configured zones or coils. Connectivity indicator to valve driver and BAS systems. In general this is the go to tab for system information.

The screenshot displays the HUSSMANN System Menu interface. The top navigation bar includes: HUSSMANN, Status, Config, Alarms, Commands, I/O, System (highlighted), Analysis, Energy, Diagnosis, and commission. The main content is divided into three sections:

- System Status:** A table of system information including Status (REFR), Case Model Family (ID5SM), Date (March 4, 2020), Bios Version (2019050800), Application Version (2.6.0), MAC Address (00:50:b6:bf:6f:1e), Case Name, Time (8:54:22 AM), Web UI Version (1.8.0), Application Date Code (61819), and IP Address (192.168.0.250). Pencil icons are present next to several fields.
- Network Configuration:** A form with fields for MSTP Protocol (Modbus), Modbus Address (1), Modbus Baud Rate (9600), BACnet MAC Address (1), and BACnet Device ID (30). Each field has an 'Apply' button and a pencil icon for editing.
- System Configuration:** A series of dropdown menus and buttons for configuring system parameters: Case Type (Remote Standalone), Temperature Units (°F), Light Units (FTC), Pressure Units (PSI), Refrigerant (R449A), Valve Driver (HSVD30), Number of Distributed Zones (3 Zones), Door Type (V-RL), Save/Restore Presets, Download/Upload Configuration (.hsm), Save Settings as Factory Default, Factory Restore Settings, E2 Master (Yes), Push Display Conf, and Reboot Controller.

Below the Network Configuration section is an **Indicator Panel** showing the status of various devices:

BAS	Offline
HSVD20_1	Offline
HSVD20_2	Offline
HSVD30	Online
IPEX	Offline

 Pencil – Allow users to edit information when available

Network Configuration – Set modbus network address and speed. Click the pencil next to the IP address to change additional settings. More advanced settings by clicking the pencil is only available at higher user access.

Indicator Panel – Used to show connected devices to CoreLink networks. BAS (Building Automation System) is a heartbeat signal provided every 30 seconds to CoreLink. This will indicate green if the signal is received. Other signals include the CoreLink serial port connection such as valve drivers and other devices.

### System Configuration

Temperature Units	°F	▼	Apply
Light Units	FTC	▼	Apply
Pressure Units	PSI	▼	Apply
Refrigerant	R404A	▼	Apply
Valve Driver	XEV30D	▼	Apply

Users can determine which units to display on the controller along with choosing refrigerant type.

Users can also define which valve driver is connected to the case controller.

Save/Restore Settings	▼	Save	Restore
Factory Restore Settings		Restore	
Reboot Controller		Reboot	

Factory reset will restore controller back to factory configuration.

Reboot controller is for the convenience of restarting case controller remotely.

### System Configurations

**Case Type** – Case type selection. Can change the arrangement of the user interface.

**Temperature Units** – F° or C° Light Units – FTC or LUX Pressure Units – PSI or BAR

**Refrigerant** – R22, R407C, R134A, R410A, R404A, R507A, CO2, R407A, R407E, R448A, R449A, R513A, R450A, R438A, R290

**Valve Driver** – HSVD20 (Two Valve Driver) or HSVD30 (Three Valve Driver)

**Number of Distributed Zones** – Select how many coils or compressor within the system.

**Save/Restore Presets** – Create custom configurations and save as a preset.

**Download/Upload Configurations (.hsm)** –

- Transfer configuration parameter settings from case to case
- Upload new user interface
- Upload new permission account settings/users
- Upload new system application

**Save Settings as Factory Default** – Overwrite factory default files. Only available at higher user access.

**Factory Restore Settings** – Restore factory default

**E2 Primary** – Recommend always set to Yes. Allows full communication to e2 BAS System.

**Reboot Controller** – Force controller to reboot.

**Helpful Hint:** Check the controllers time clock before reboot. If controller needs the time updated, set the time by clicking the pencil and click apply. This will set the controllers clock and also force a reboot.

#### System Configuration

Temperature Units	°F	Apply
Light Units	FTC	Apply
Pressure Units	PSI	Apply
Refrigerant	R404A	Apply
Valve Driver	XEV30D	Apply
Save/Restore Settings		Save Restore
Factory Restore Settings		Restore
Reboot Controller		Reboot

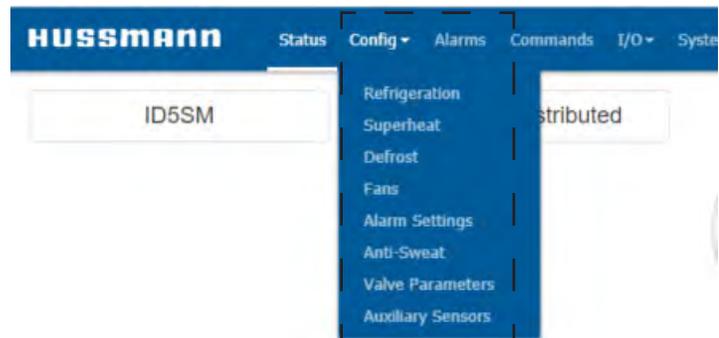
Users can determine which units to display on the controller along with choosing refrigerant type.

Users can also define which valve driver is connected to the case controller.

Factory reset will restore controller back to factory configuration.

Reboot controller is for the convenience of restarting case controller remotely.

**Configuration Tab** – The CoreLink case controller parameter menus are organized under the configuration drop down.



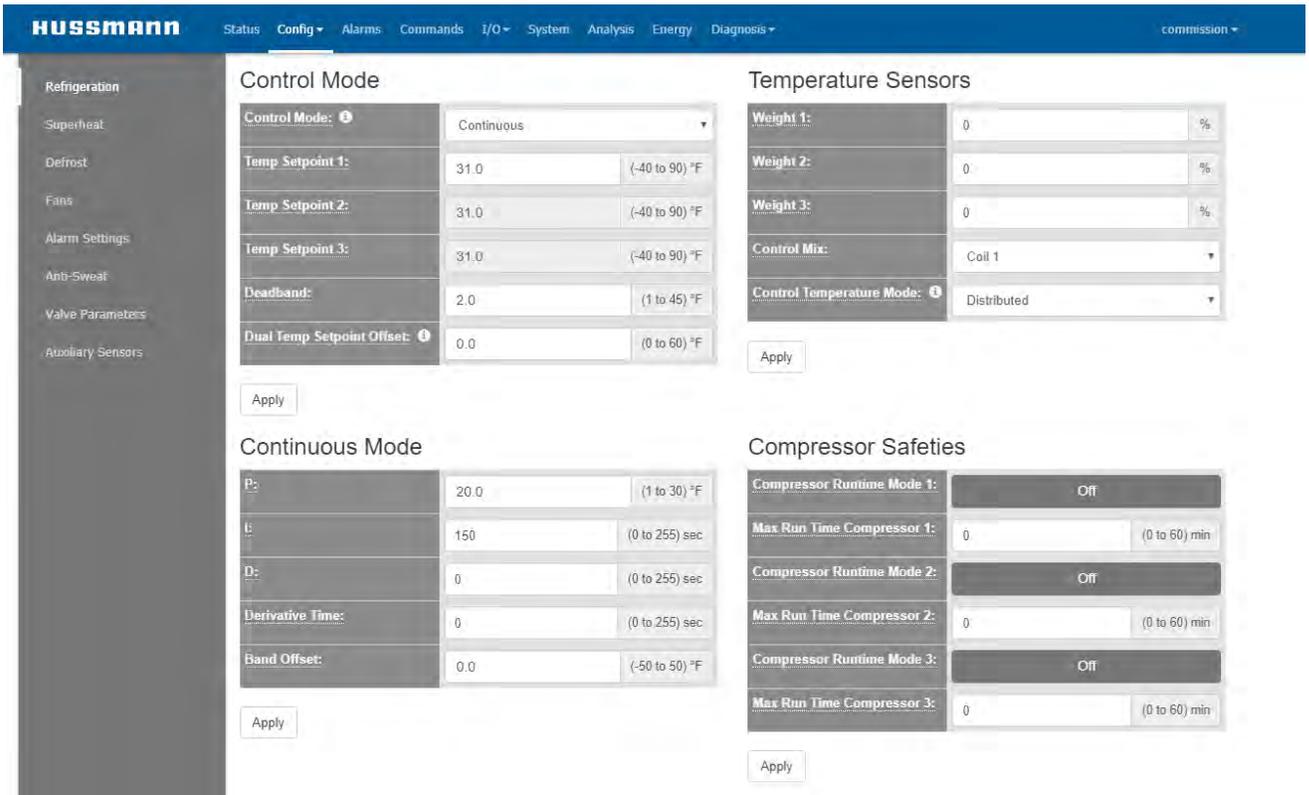
1. **Refrigeration** – Contains refrigeration mode, PID setup on the air discharge continues mode, varies compressor safeties or protections, door and clean modes.
2. **Superheat** – Contains superheat targets, option to share suction pressure between all coils, min and max valve positions limitations, PID setup on the superheat control, LOP/MOP pressure limits.
3. **Defrost** – Modes, Sequence Timers, Defrost Sync Setup, Dual Temp Output Options, Intervals, Terminate Temps
4. **Fans** – Modes, Dual Temp Mode Options, Timers fans ON after defrost, Temp fans ON after defrost
5. **Alarm Settings** – Alarm Modes, Superheat Fail Position, Superheat Alarm Protections, Alarm Delay Settings
6. **Valve Parameters** – Valve presets, Valve electric parameter setups as defined from manufacturer.  
**Note:** This is a general valve setup menu. Not the place to manipulate the valve operation range. To limit valve output range check out the superheat menu.

**4-10**

NOTES:

# APPLICATION

## REFRIGERATION



**Standard:** The control temperature is maintained by a setpoint and deadband. Once the control temperature reaches setpoint plus ½ deadband, the call for refrigeration is ON and both the compressor output and the superheat control are active.

If the control temperature is below the setpoint minus ½ deadband, the compressor output and superheat are not active.

**Continuous:** The control temperature is maintained by a PID and the superheat control is always active. The application will compare the percent output of the temperature control and superheat control and maintain at the minimum percentage the valve output. The compressor output will remain ON, unless the application is in defrost.

Two calculations are running at the same time. Each with a predicted valve opening. The calculation with the lower opening is the one the controller will apply. This helps maintain a higher case temperature when suction pressure temperature is too low.

**Suction:** The control temperature is maintained by a setpoint and deadband. Once the control temperature reaches setpoint plus ½ deadband, the call for refrigeration is ON and both the compressor output and the Suction Control are active.

**Superheat Only:** The control temperature is maintained by evaporator pressure. During this mode target superheat is maintained at all times except defrost. No temperature setpoint can be applied.

## REFRIGERATION

## Control Mode

Control Mode: ⓘ	Continuous ▼	
Temp Setpoint 1:	31.0	(-40 to 90) °F
Temp Setpoint 2:	31.0	(-40 to 90) °F
Temp Setpoint 3:	31.0	(-40 to 90) °F
Deadband:	2.0	(1 to 45) °F
Dual Temp Setpoint Offset: ⓘ	0.0	(0 to 60) °F

## Continuous Mode

P:	20.0	(1 to 30) °F
I:	150	(0 to 255) sec
D:	0	(0 to 255) sec
Derivative Time:	0	(0 to 255) sec
Band Offset:	0.0	(-50 to 50) °F

When in continuous mode the Continuous Mode PID menu will appear.

Users should use this menu to set the PID control for the air discharge portion of the continuous mode calculation.

The Superheat PID menus should be in auto adaptive mode unless user specified for the superheat portion of the calculation.

Case temperature will be regulated by these two PIDs, and the controller will always use whichever calculation with the minimum calculated valve opening.

If the control temperature is below the setpoint minus  $\frac{1}{2}$  deadband, the compressor output and Suction Control are not active. The Suction Control valve percentage output is provided by a PID.

**Superheat Only:** The control temperature is maintained by evaporator pressure. During this mode target superheat is maintained at all times except defrost. No temperature setpoint can be applied.

**Temp Setpoint:** Temperature setpoint in which refrigeration will start.

**Deadband:** Margin from temp setpoint in which refrigeration will not be active.

**Dual Temp Setpoint Offset:** In dual temperature mode, the refrigeration setpoint plus the dual temperature offset value provides the active setpoint for the refrigeration control mode (Standard, Continuous).

The switch occurs when the dual temperature digital input has a closure (active) and returns to the regular setpoint once the input is open (non-active).

Users will notice that some parameters do not pertain to all modes and will hide on the Web UI when certain modes are applied.

## DOOR OPERATION

The door function needs to be enabled in order to be operational. Once it is active, the door function will have the following options:

- If the digital input registers an open door, a timer starts to count until it reaches the user-adjustable delay time setpoint. Once it does, the alarm is active until the door closes. If the door closes before reaching the adjustable delay setpoint, the timer resets.
- If the digital input registers an open door, the refrigeration turns OFF and two timers start to count until they reach their user-adjustable delay times setpoint. Once reached, the first adjustable delay setpoint forces the refrigeration back ON, and the second adjustable setpoint activates the alarm. The alarm is active until the door closes. If the door closes before reaching the adjustable delay setpoint, the timer resets.

### Door Mode ⓘ

Door Switch Active:	No
---------------------	----

Apply

### Door Mode ⓘ

Door Switch Active:	Yes
Door Mode:	Shutdown + Alarm
Door Refrigeration Timer:	19 (0 to 120) x 10 sec
Door Alarm Timer:	120 (0 to 120) x 10 sec

Apply

### DOOR MODE:

If in alarm mode, door alarm will be active if digital input registers an open door longer than the door alarm timer.

If in shutdown + alarm, when door digital input registers an open door, the refrigeration will turn off and two timers will start to count until they reach their user adjustable delay times setpoints.

Time lapse refrigeration will be active after door refrigeration delay.

### Door Refrigeration Timer:

Amount of time until refrigeration restarts after a door is open.

### Door Alarm Timer:

Amount of time until door alarm becomes active after a door is open.

Clean Mode ⓘ

Clean Switch Active:

Apply

**CLEAN MODE**

If in alarm mode, door alarm will be active if digital input registers an open door longer than the door alarm timer. If in shutdown + alarm, when door digital input registers an open door, the refrigeration will turn off and two timers will start to count until they reach their user adjustable delay times setpoints. Time lapse refrigeration will be active after door refrigeration delay.

Clean Timer:

Amount of time until unit resumes normal operation in back on mode.

**CLEAN SWITCH OPERATION**

The clean switch function needs to be enabled for it to operate. Once it is active the clean switch function has the following options:

- If the digital input registers a closure (active), the application turns OFF the refrigeration. Refrigeration turns ON once the digital input is open (non-active).

Clean Mode ⓘ

Clean Switch Active:

Clean Mode:

Clean Timer:  (0 to 360) x 10 sec

Apply

**SUPERHEAT**

Superheat Setpoint ⓘ

Range (1 to 40) °F

SH1:	<input type="text" value="7.0"/>
SH2:	<input type="text" value="7.0"/>
SH3:	<input type="text" value="7.0"/>

Apply

**SUPERHEAT SETPOINT**

The superheat setpoint is used to regulate the superheat. Users should choose a practical superheat target for good system stability. Usually 6 – 12 ° is appropriate for most case setups.

Users can try more aggressive settings, but valve wear and compressor damage can result if caution is not used.

Always consult your local Hussmann Representative for best practices. Let our team of consultants help optimize your setup needs.

- SH1 = Left Coil
- SH2 = Center Coil
- SH3 = Right Coil

**⚠ WARNING**

When adjusting superheat settings pay attention to min/max superheat alarms. Some settings might drive the controller into constant alarms if those parameters are not adjusted in conjunction with superheat targets.

SUPERHEAT

### Superheat Setpoint ⓘ

	Range (1 to 40) °F
SH1:	8.0
SH2:	8.0
SH3:	8.0

Apply

### Valve Limits ⓘ

Min Valve Position 1:	16	%
Min Valve Position 2:	16	%
Min Valve Position 3:	16	%

Apply

### Shared Pressure ⓘ

Shared Pressure: Pressure 1 ▾

Apply

Max Valve Position 1:	85	%
Max Valve Position 2:	85	%
Max Valve Position 3:	85	%

Apply

**SHARED PRESSURE:**

Option to share a single pressure transducer for SH calculation or individual pressure transducers for more precise SH control.

Most controllers setups will utilize this pressure sharing mode in order to reduce component cost.

Some special applications might require all three pressure transducers for superheat control.

**MIN VALVE POSITION:**

Min valve position for coil. The valve cannot be closed less than the value calculated by the PID except in cases it is in alarm or the application is satisfied by the temperature.

**MAX VALVE POSITION:**

Max valve position for coil one. The valve cannot be opened more than the value calculated by the PID.

## 5-6

### AUTO ADAPTIVE MODE

#### Superheat Control PID ⓘ

Valve 1	
Autoadaptive Mode:	On
P:	0.0 (0 to 45) °F

Apply

P not equal to zero

#### Superheat Control PID ⓘ

Valve 1	
Autoadaptive Mode:	Off
P:	14.0 (0 to 45) °F
I:	120 (0 to 255) sec
D:	0 (0 to 255) sec
Band Offset:	0.0 (-50 to 50) °F

Apply

#### **AUTO ADAPTIVE MODE:**

Corelink Case Controller proprietary algorithm for regulating superheat control.

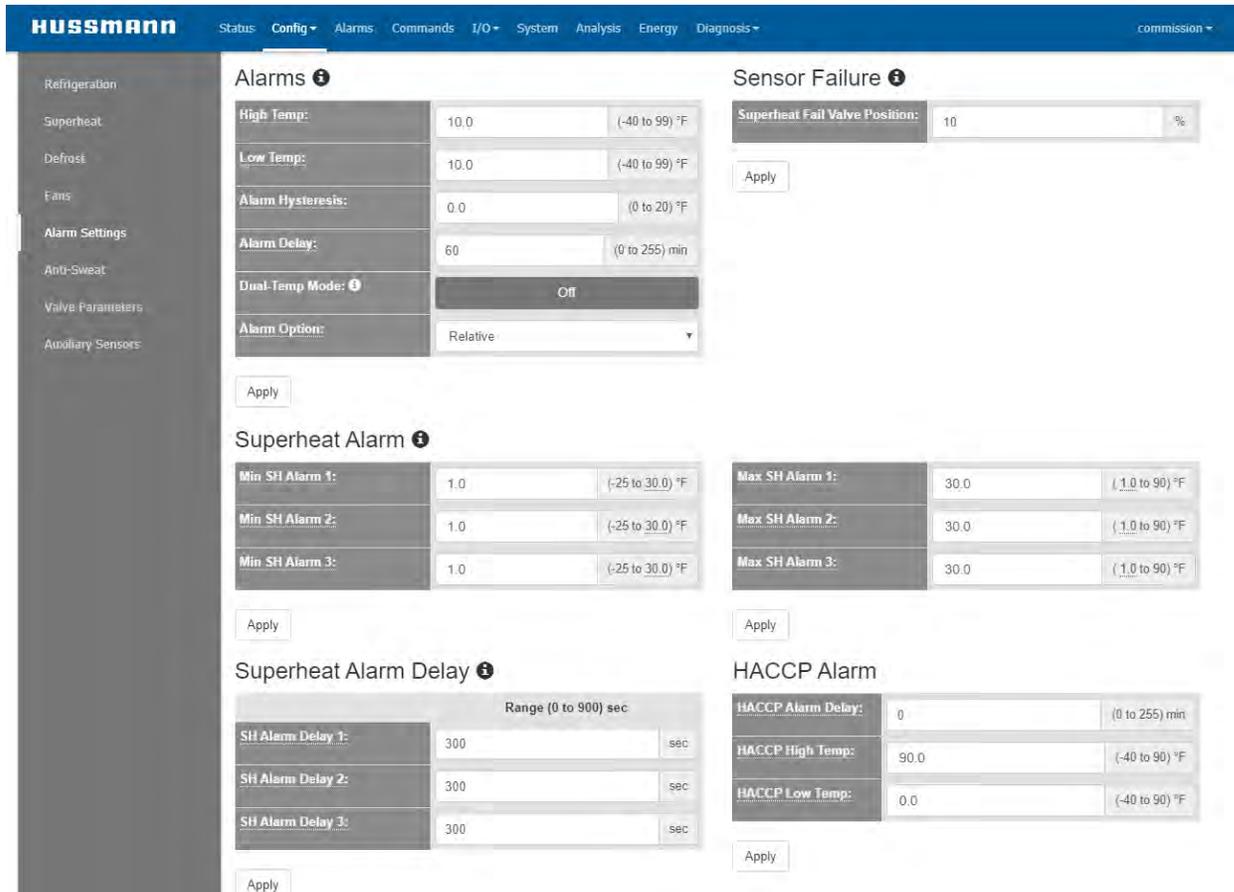
P = Proportional Band; 0 means auto adaptive mode.

I = Integral sampling interval

D = Derivative sampling interval

Band Offset = Offsets from the (P) value in the PID.

ALARMS



**HIGH TEMP:**

Highest temperature the case may reach before the alarm sets.

**LOW TEMP:**

Lowest temperature the case may reach before the alarm starts.

**ALARM HYSTERESIS:**

Temperature margin from alarm setpoint in which the temperature must drop before the alarm shuts off.

**ALARM DELAY:**

Time delay before the alarm activates if there is a problem.

**DUAL-TEMP MODE:**

The refrigeration temp setpoint plus the dual temperature setpoint value provides the active setpoint for the refrigeration control mode (Standard, Continuous, and Suction). The switch occurs when the dual temperature digital input has a closure (active) and returns to the regular setpoint once the input is open (non-active)

**ALARM OPTION:**

Relative Mode is Discharge Air Setpoint + High Temp and Discharge Air Setpoint – Low temp. Absolute Mode are the exact values entered into High and Low temp parameters. Default is Relative mode.

**MIN SH ALARM:**

Lowest superheat temperature possible before the alarm timer starts for coil one. After timer delay, valve is closed 0% to protect compressor. Any time superheat goes above min SH alarm setpoint, the timer resets and the valve position will return to minimum position or current PID calculated position.

If min SH alarm is set too high, large disruptions in air discharge can occur due to valve closing for a period of time. Appropriate settings need to be chosen along with target superheat for consideration.

**MAX SH ALARM:**

Highest superheat temperature possible before the alarm starts for coil one. After timer delay, valve is opened 100%. Anytime superheat goes below max SH alarm setpoint, the timer resets and the valve position will return to current PID calculated position.

**ALARM DELAY:**

Delay in seconds before the superheat alarm becomes active for coil one.

This is the time delay period when case controller is in low or high superheat alarm.

After the time delay, the controller will react based on type of alarm. That could be scrambling a valve to the closed position to prevent low superheat and hurting equipment, or opening a valve to max position due to high superheat resulting in high case temperatures.

When the alarm is cleared the delay time is reset for the next event.

**Superheat Alarm ⓘ**

Min SH Alarm 1:	1.0	(-25 to 30.0) °F
Min SH Alarm 2:	1.0	(-25 to 30.0) °F
Min SH Alarm 3:	1.0	(-25 to 30.0) °F

Apply

Max SH Alarm 1:	30.0	( 1.0 to 90) °F
Max SH Alarm 2:	30.0	( 1.0 to 90) °F
Max SH Alarm 3:	30.0	( 1.0 to 90) °F

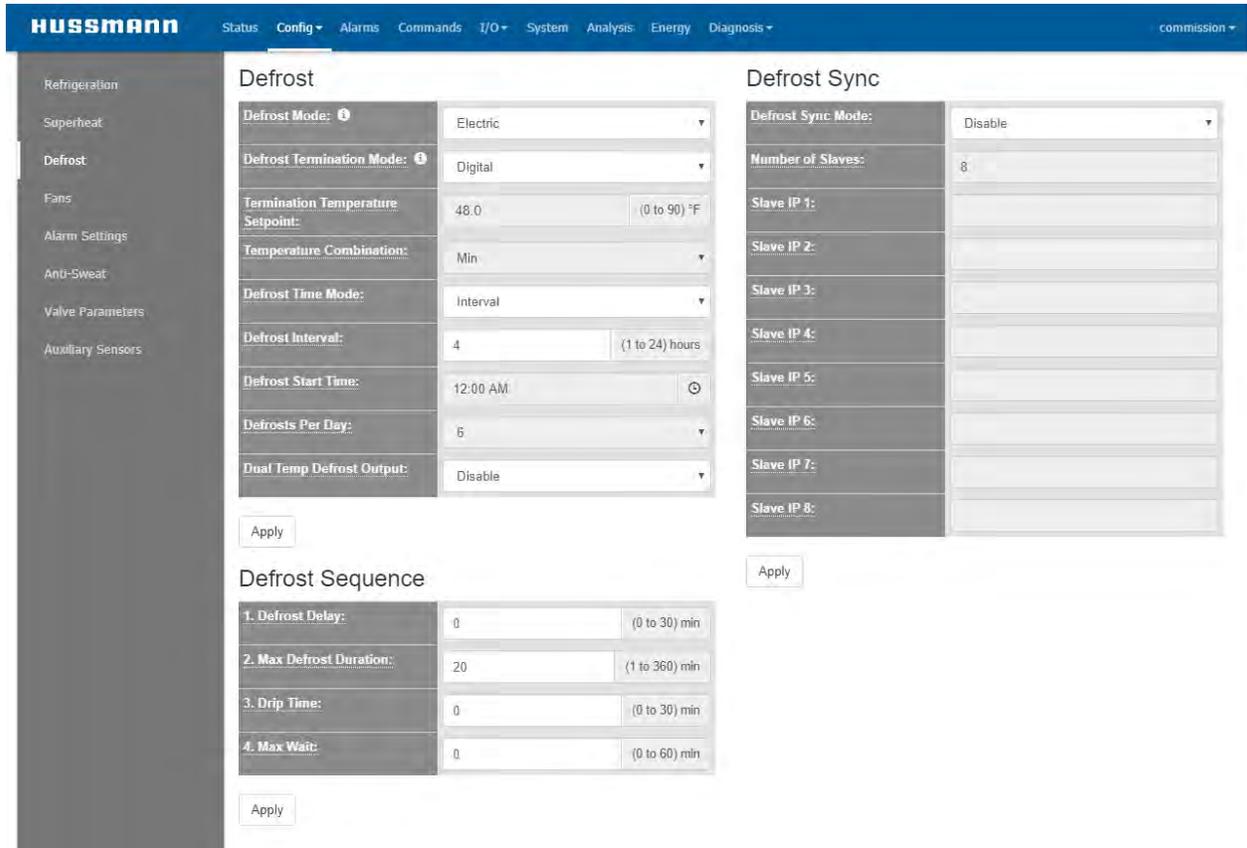
Apply

**Superheat Alarm Delay ⓘ**

Range (0 to 900) sec		
SH Alarm Delay 1:	300	sec
SH Alarm Delay 2:	300	sec
SH Alarm Delay 3:	300	sec

Apply

DEFROST



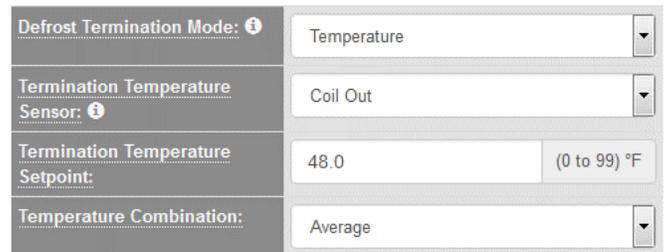
**ELECTRIC MODE:** Once in electric defrost mode, the application turns off refrigeration by deactivating the refrigeration output and closing the electronic valve if in use. After a user-defined delay, the defrost relay would be activated for a user-defined duration.

**HOT GAS MODE:** Once in hot gas defrost mode, the application turns off refrigeration by deactivating the refrigeration output and, if in use, keeps the electronic valve open or closed during defrost according to a user-defined selection. After a user-defined delay, the defrost relay would be activated for a user-defined duration.

**HOT GAS VALVE POSITION:** Valve position during defrost for all valves. 0% or 100%

**OFF CYCLE:** Once in off cycle defrost mode, the application turns off refrigeration. This mode does not activate to defrost digital output and will run the max duration only

**None:** Once in off cycle defrost mode, the application turns off refrigeration. This mode does not activate to defrost digital output and will only run the max duration.



# 5-10

## Defrost

Defrost Mode: ⓘ	Electric	▼
Defrost Termination Mode: ⓘ	Digital	▼
Termination Temperature Setpoint:	48.0	(0 to 90) °F
Temperature Combination:	Min	▼
Defrost Time Mode:	Interval	▼
Defrost Interval:	24	(1 to 24) hours
Defrost Start Time:	12:00 AM	🕒
Defrosts Per Day:	1	▼
Dual Temp Defrost Output:	Disable	▼

**TERMINATION TEMPERATURE SENSOR:**  
Use analog input coil out [BLUE Sensors] temperature sensor or analog input defrost [ORANGE sensors] temperature termination sensor.

**TERMINATION TEMPERATURE SETPOINT:**  
Temperature setpoint at which defrost ends.

**TEMPERATURE COMBINATION:**  
Maximum – Uses the highest value between all available/enabled coil-out temperature sensors or defrost-termination sensors.

**Minimum** – Uses the lowest value between all available/enabled coil-out temperature sensors or defrost-termination sensors.

**Average** – Uses the average value between all available/enabled coil-out temperature sensors or defrost-termination sensors.

**DEFROST INTERVALS:**  
Time between defrost cycles in hours.

**DEFROST TERMINATION MODE:**  
Use termination temperature sensor or digital/network input.

Max Defrost Duration:	30	(1 to 60) min
Min Defrost Duration:	8	(1 to 40) min
Defrost Delay:	0	(0 to 30) min
Drip Time:	0	(0 to 30) min
Max Wait:	0	(1 to 60) min
Defrost Intervals:	8	(1 to 255) hours

**MAX DEFROST DURATION:**  
Maximum time in minutes for active defrost mode. Prevents continuous defrost due to faulty termination temperature sensor failing to terminate cycle.

**MIN DEFROST DURATION:**  
Minimum time in minutes for active defrost mode. Prevents early defrost termination due to faulty termination temperature sensor.

**DEFROST DELAY:**  
Time between

**DRIP TIME:**  
Amount of time after defrost for the coil to drip.

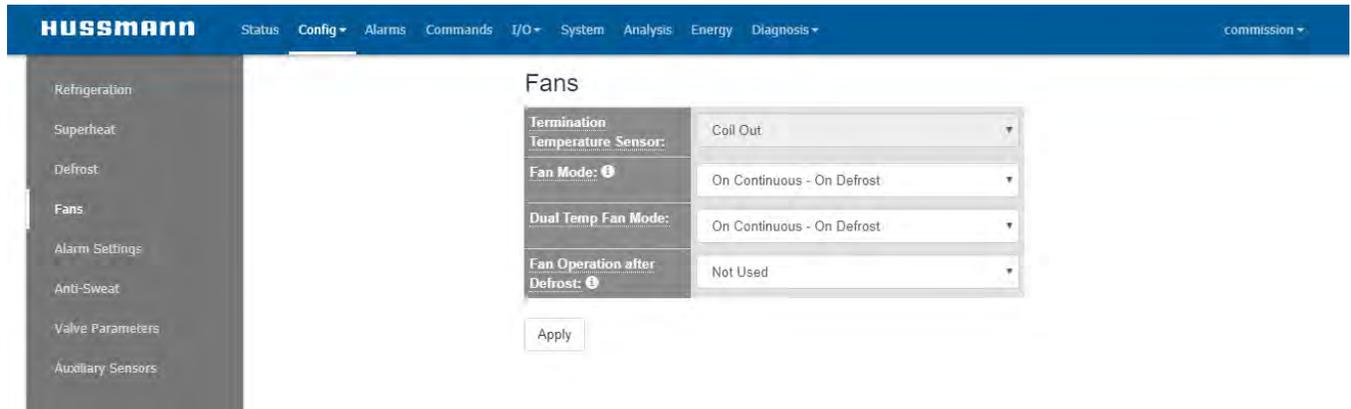
**MAX WAIT:**  
Refrigeration starts if in wait period and the end-wait input is active. If no supervisory controller is available (offline), the application ignores the end-wait-input and will not use it for the start refrigeration logic. This mode is only available if BAS system is connected to the case controller.

### Dual Temperature Defrost Sequence

Dual Temp Defrost Delay:	0	(0 to 30) min
Dual Temp min Defrost Duration:	20	(1 to 360) min
Dual Temp Max Defrost Duration:	20	(1 to 360) min
Dual Temp Drip Time:	0	(0 to 30) min
Dual Temp Defrost Maximum Wait Time:	0	(0 to 60) min

**DUAL TEMP DEFROST SEQUENCE:**  
This defrost sequence applies when in Dual Temp Mode.

FANS



**FAN OPERATION MODES**

On Refrigeration – On Defrost:

Fans cycle with Refrigeration - On during defrost

Note: Fan operation after defrost does not apply in this mode.

On Refrigeration – Off Defrost:

Fans cycle with Refrigeration - Off during defrost

Note: Fan operation after defrost applies in this mode.

On Continuous - On Defrost: Fans [ON] Running at all times irrespective of system status.

Note: Fan operation after defrost does not apply in this mode

On Continuous – Off Defrost: Fans [OFF] during defrost.

Note: Fan operation after defrost applies in this mode.

**TERMINATION TEMPERATURE SENSOR:**

Important parameter information from Defrost Menu. Fans menu will use this selected temperature sensor for fan function.

**FAN MODE:**

4 selectable fan control modes

**FAN OPERATION AFTER DEFROST:**

By Temperature: In refrigeration mode if selected termination temperature sensor is above the fan setpoint, the fan output is OFF.

By Time: After defrost and switching into refrigeration mode, the fan starts the delay timer for a user-defined time before the output is active.

**FAN SETPOINT:**

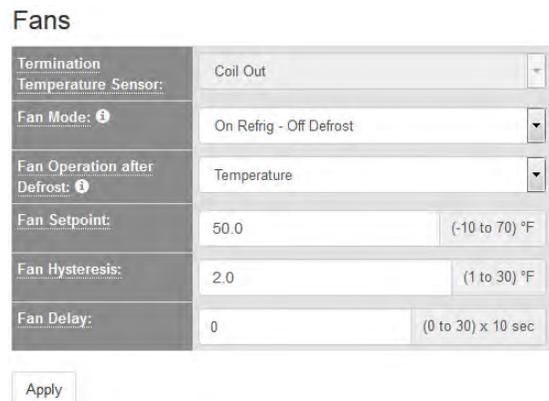
Temperature setpoint in which case fans will start.

**FAN HYSTERESIS:**

Temperature margin from the fan setpoint in which the fan will not be active.

**FAN DELAY:**

After defrost and switching into refrigeration mode, time before fans start (Time Mode)



## 5-12

### ALARM OPTION:

In an absolute alarm, the alarm parameter is the threshold for the alarm. In a relative alarm, the alarm setpoint is added to the parameters, and its sum becomes the alarm threshold.

#### Anti-Sweat Control ⓘ

Dew Setpoint:	45.0	(0 to 100) °F
Dew Proportional Band:	0.0	(0 to 20) °F
Max Output:	100	%
Min Output:	0	%

Apply

### ANTI-SWEAT CONTROL

The anti-sweat control operation maintains the door frame temperature above the dewpoint setpoint or dewpoint network value using a proportional calculation with user-adjustable minimum and maximum output. If the frame sensor is not available, the output is fixed to 100%.

- If no network dewpoint value is available, the frame temperature maintains a user-adjusted band above the dewpoint setpoint.
- If a network dewpoint value is available, the frame temperature maintains a user-adjusted band above the dewpoint value.

### DEW SETPOINT:

If no network dewpoint value is available, the frame temperature maintains a user-adjusted band above the dewpoint setpoint.

### Dew Proportional Band:

User defined range from which the temperature can drift from the Dew Setpoint.

### MAX OUTPUT:

Maximum anti-sweat power output.

### MIN OUTPUT:

Minimum anti-sweat power output.

### VALVE SELECTION

#### Valve Selection ⓘ

Valve Type 1:	PWM Valve
Valve Type 2:	
Valve Type 3:	

Apply

Valve Steps ⓘ

Range (0 to 50) x 10 steps

- PWM Valve
- Manual
- AlcoEX4-5-6
- AlcoEX7
- AlcoEX8-500st/s
- DanfETS-25/50
- DanfETS-100
- DanfETS-250/400
- SporSEI-5to11
- SporSER1-5to20
- SporSEI30
- SporSER(I)GJK
- SporSEI50
- SporSEH(I)100
- SporSEH(I)175
- SER A
- SER AA
- None/Mechanical TXV
- PWM Valve

Anytime a valve is selected from the list many of the valve parameters will hide. To display all valve parameters select “Manual”.

This will show all valve parameters that can be configured.

Range (0 to 10000) steps		
24hr Reset Steps 1:	250	steps
24hr Reset Steps 2:	250	steps
24hr Reset Steps 3:	250	steps

### VALVE TYPE:

The Corelink Case Controller comes pre-loaded with 13 different stepper valve types.

### VALVE SELECTION

When making a valve selection choice, select a value in the drop down menu, and then after applying the selected valves refresh the browser page to see updated valve information.

### 24 HOUR RESET STEPS:

The first defrost after midnight, the controller adds this many steps to compensate for lost steps throughout the day.

**VALVE PARAMETERS**

**Pull Down Settings**

Pull Down Valve Opening 1:	85	(0 to 100) %
Pull Down Valve Opening 2:	85	(0 to 100) %
Pull Down Valve Opening 3:	85	(0 to 100) %
Pull Down Max Duration:	10	(0 to 180) min
Soft Start Delay Timer:	122	(0 to 300) sec

Apply

**PULL DOWN VALVE OPENING:**

Percentage the valve opens after defrost. Run time will be when the case reaches setpoint or the duration counter expires.

Range (10 to 600) steps/sec		
Step Rate 1:	200	steps/sec
Step Rate 2:	200	steps/sec
Step Rate 3:	200	steps/sec

Apply

**STEP RATE:**

Speed of valve. Steps per second.

**Valve Steps**

Range (0 to 50) x 10 steps		
Min Steps 1:	0	x 10 steps
Min Steps 2:	0	x 10 steps
Min Steps 3:	0	x 10 steps
Range (0 to 800) x 10 steps		
Max Steps 1:	250	x 10 steps
Max Steps 2:	250	x 10 steps
Max Steps 3:	250	x 10 steps

Apply

**MIN STEPS:**

Below this number of steps, valve one has to be considered closed. In case of alarms or no consensus from the thermostat, the valve moves to this number of steps. This is the valve manufacturer recommended lower valve opening limit.

**MAX STEPS:**

Above this number of steps, valve one has to be considered open. This is the valve manufacturer recommended higher valve opening limit.

**VALVE STEPS**

Range (0 to 500) steps		
Extra Step 1:	100	steps
Extra Step 2:	100	steps
Extra Step 3:	100	steps
Range (0 to 500) steps		
Relax Step 1:	0	steps
Relax Step 2:	0	steps
Relax Step 3:	0	steps

Apply

**EXTRA STEP:**

When valve is at its min number of step (From Min Steps), the valve adds this many extra close steps to recover possible lost steps. Valve Overrun.

**RELAX STEPS:**

After any extra steps, if any, valve one is forced open for the number of steps specified here.

VALVE PARAMETERS

Current ⓘ

Range (0 to 100) x 10 mA		
Peak Current 1:	12	x 10 mA
Peak Current 2:	12	x 10 mA
Peak Current 3:	12	x 10 mA
Range (0 to 100) x 10 mA		
Hold Current 1:	5	x 10 mA
Hold Current 2:	5	x 10 mA
Hold Current 3:	5	x 10 mA

Apply

**PEAK CURRENT:**

Current in 10s of mA

(This means that if you write 20, the peak current is 200mA)

**HOLD CURRENT:**

Current in 10s of mA

(This means that if you write 20, the peak current is 200mA)

Filters ⓘ

Range (0 to 60) sec		
Interval Update 1:	0	sec
Interval Update 2:	0	sec
Interval Update 3:	0	sec
Range (0 to 100) sec		
Temp Filter 1:	1	sec
Temp Filter 2:	1	sec
Temp Filter 3:	1	sec

Apply

**INTERVAL UPDATE:**

At every n number of seconds, this value will act on valve. Value of zero means auto adaptive. Increasing the time slows down valve update.

**TEMP FILTER:**

This value is used to calculate the SH. If this value is 1, there is not any filter on the temperature. Increase time to reduce valve responses to large temperature system anomalies.

Range (0 to 100) sec		
Filter Pressure 1:	1	sec
Filter Pressure 2:	1	sec
Filter Pressure 3:	1	sec

Apply

**FILTER PRESSURE:**

In case of systems with a big fluctuation of the suction pressure, a filter may be useful. This value is used to calculate the SH. If this value is 1, there is not any filter on suction pressure. Increase time to reduce valve one responses to large suction pressure system anomalies.

**VALVE MOTOR TYPE:**

Select either Uni-Polar or Bi-Polar stepper valve.

Valve Motor Type

Solenoid Type (XEV20D_1 or XEV30K):	Bipolar
Solenoid Type (XEV20D_2):	Bipolar

Apply

**ELECTRONIC PULSE VALVE:**

CoreLink has the capability of controlling pulse width modulation valves (Pulse, PWM valve). This requires a solid state relay per valve and application version 2.6.0 or higher. A valve driver is not required to operate the valves. They are controlled by the analog outputs of the CoreLink controllers.

**Analog output wiring:**

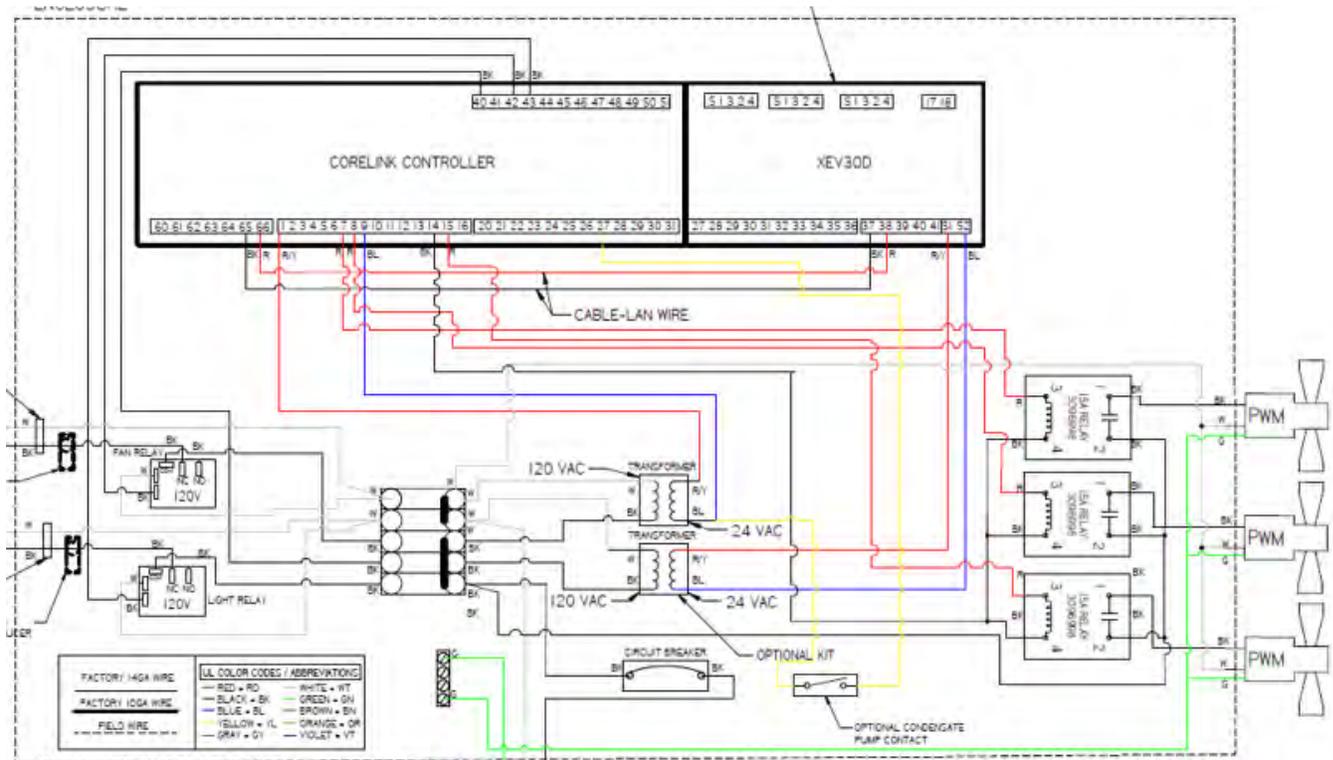
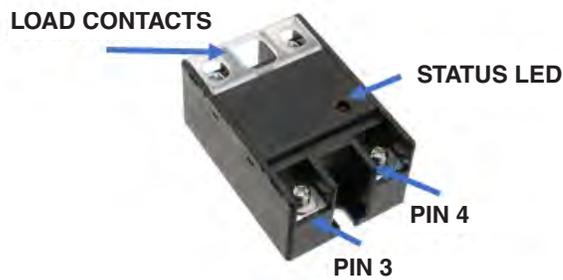
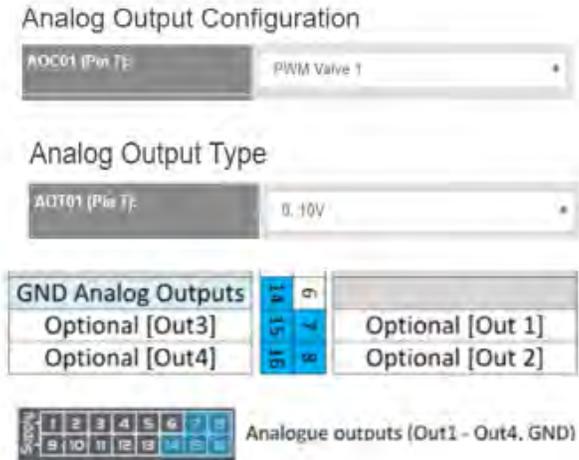
- CoreLink Pin 7, 8, 15 to Relay Pin 3 (+)
- CoreLink Pin 14 to Relay Pin 4 (-)

**Functionality:**

- Valves operate on a 6-second period
- Valve percentage equals the duty cycle
- 50% Valve position equals ON for 3 seconds  
OFF for 3 seconds
- Valve percentage 85% = 100%
- Valve percentage 15% = 0%

**WEB UI CONFIGURATION**

**ANALOG OUTPUT MENU CONFIGURATION:**



# 5-16

## DOOR ANTI SWEAT HEATER (DASH):

CoreLink has the capability of performing the Hussmann DASH controller functionality. This requires a temperature and relative humidity sensor, solid state relay and application version 3.0.0 or higher. The pulse heater is controlled by the analog outputs of the CoreLink controllers.

### Analog output wiring

- CoreLink Pin 7, 8, 15 to Relay Pin 3 (+)
- CoreLink Pin 14 to Relay Pin 4 (-)

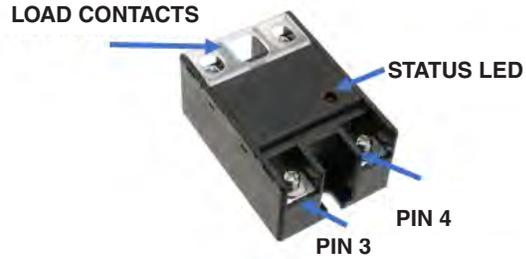
### DASH Functionality

- The heater operates on a 10-second period
- The heater output percent equals ON for 5 seconds Off for 5 seconds

Reference Dash Manual for more details

### STATUS SCREEN

Refrigerant	R404A	Saturation	11.2 °F
Dew Point	0.0 °F	Pressure 1	44.6 PSI
Dash Temperature	63.6 °F	Dash RH	65.8%
Anti-Sweat Heater	70 %		



### ANALOG OUTPUT MENU CONFIGURATION



#### Analog Output Configuration

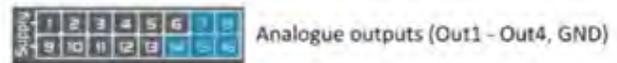
AOC01 (Pin 7): Heater 1

#### Analog Output Type

AOT01 (Pin 7): 0..10V

### ANALOG INPUT MENU CONFIGURATION

AIC01 (Pin 2):	Discharge Air 1 (Default)
AIC02 (Pin 3):	Dash Temp Sensor
AIC03 (Pin 4):	Current Transducer 1
AIC04 (Pin 10):	Defrost Terminate 1
AIC05 (Pin 11):	Return Air 1
AIC06 (Pin 12):	Dash RH Sensor



	40°F	45°F	50°F	55°F	60°F	65°F	70°F	75°F	80°F	85°F	90°F	95°F	100°F	105°F	110°F
<10% RH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25%	0	0	0	0	0	0	0	30	30	30	45	45	45	45	45
30%	20	20	30	30	30	30	35	35	35	50	50	50	50	50	50
35%	30	30	35	35	40	40	40	40	45	55	55	55	55	55	55
40%	35	35	40	40	45	45	45	45	45	60	60	60	60	60	60
45%	40	40	45	45	50	50	50	50	55	65	65	65	65	65	65
50%	45	45	50	50	55	55	55	55	60	75	75	75	75	75	75
55%	50	50	55	55	60	60	65	65	70	80	80	80	80	80	80
60%	55	55	60	60	65	65	75	75	75	90	90	90	90	90	90
65%	60	60	65	65	70	70	80	80	80	100	100	100	100	100	100
70%	70	70	75	75	80	80	90	90	90	100	100	100	100	100	100
75%	80	80	85	85	90	90	100	100	100	100	100	100	100	100	100
80%	85	85	90	90	95	95	100	100	100	100	100	100	100	100	100
85%	90	90	95	95	100	100	100	100	100	100	100	100	100	100	100
90%	95	95	100	100	100	100	100	100	100	100	100	100	100	100	100
>95%	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

**COMPONENT FAILURE DETECTION:**

CoreLink has the capability of determining a failed case component (fans and defrost heater). This requires a current transducer (CT) with the fan and heater loads wired through the core of the CT. Application version 3.0.0 or higher. The CT is wired to the CoreLink controller analog input.

**Analog input wiring**

CoreLink Pin 1, 3, 4, 10, 11, 12 to CT Pin ( - )  
 CoreLink Pin 5 to CT Pin ( + )

Reference Current Transducer manual for more details.

**CT FUNCTIONALITY**

**Fan Event:**

LOW Alarm Fan Event: For every 25 hour cycle check current last read value by switching ON fan for 30 Sec and Switching OFF fan, if the last read current value is below that Min Limit% of the baseline, then generates low current event.

High Alarm Fan Event: - For every 24 hrs. cycle check current last read value by switching ON fan for 30 Sec and Switching OFF fan, if the last read current value is above than Min Limit% of the baseline then generate low current event.

**Defrost Heater Event:**

Low Alarm Defrost Heater Event: - For every defrost cycle check current last read value at the end of defrost cycle, if the last read current value is below than Min Limit% of the baseline then generate low current event.

High Alarm Defrost Heater Event: - For every defrost cycle check current last read value at the end of defrost cycle, if the last read current value is above than Min Limit% of the baseline then generate low current event.

**ALARM GENERATION**

**EVAPORATOR FAN FAILURE ALARM GENERATION:-** If it is observed that there is low current event or high current event generated, then do the same sequence (switching ON fan for 30 Sec and Switching OFF fan) for 3 times, if the same event is generated 3 times, then raise an alarm. If same event is not generated, don't raise any alarm.

Evaporator fan failure is one generic alarm and it is flagged when High alarm event or low alarm event happens for 3 times. This is just to ensure that we are not creating nuisance alarms for one event trigger.

4/29/2020 21:17:20	N1491	Defrost 1 Output High Current	1	Active
4/29/2020 21:14:55	N1540	Evaporator Fan Output Low Current	N/A	Active
4/29/2020 21:13:1	N1491	Defrost 1 Output High Current	1	Active

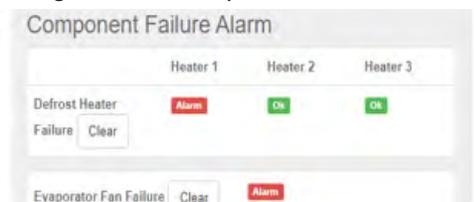
**Heater Component Alarm Generation:** - If it is observed that there is low current event or high current event generated during the end of defrost cycle, then wait for the next defrost cycle if the same event is generated at the end of next defrost cycle then raise an alarm, if same event is not generated don't raise any alarm.

Heater Component failure is one generic alarm and it is flagged when high alarm event or low alarm event happens for 2 defrost sequences. This is just to ensure that we are not creating nuisance alarms for one event trigger.

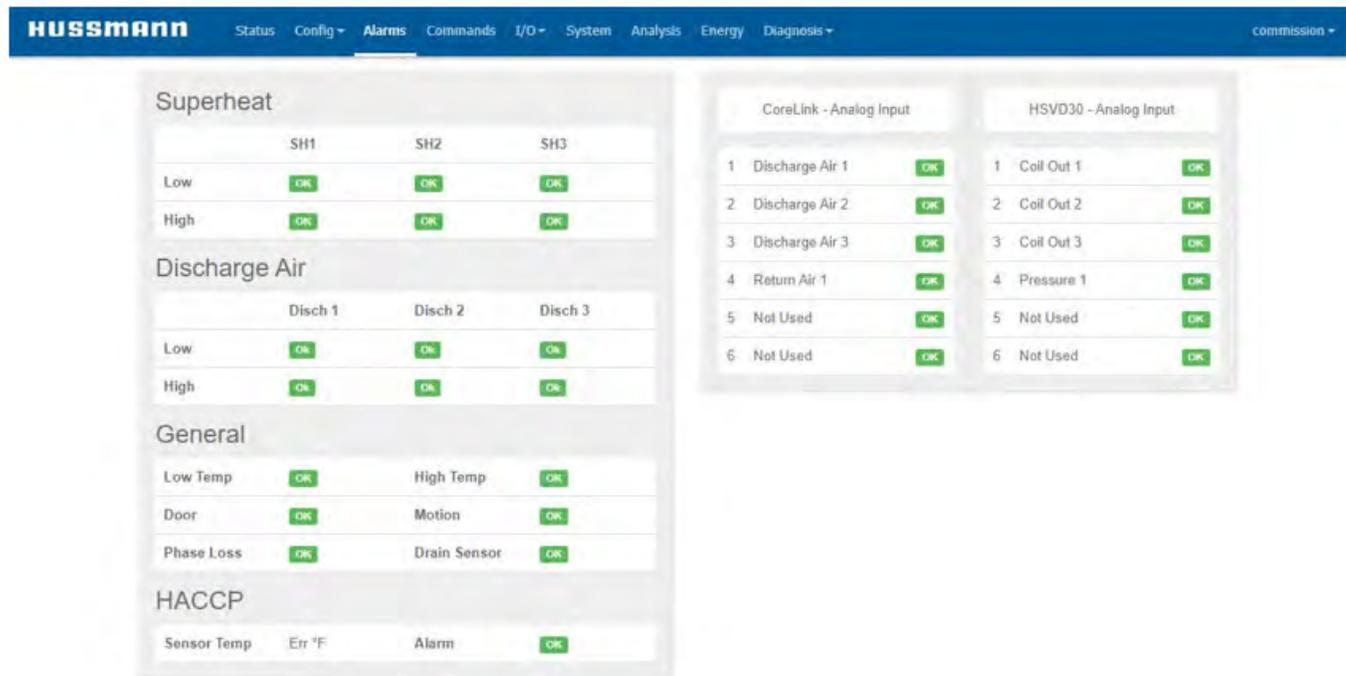
Alarm and Time	Fault Code	Fault Name	Count	Status
4/21/2020 21:17:20	F4031	Defrost Heater Failure	1	Active
4/21/2020 21:17:20	N1491	Defrost 1 Output High Current	1	Active
4/21/2020 21:14:55	N1540	Evaporator Fan Output Low Current	N/A	Active
4/21/2020 21:13:1	N1491	Defrost 1 Output High Current	1	Active

4/18/2020 02:45	F4021	Evaporator Fan Failure	N/A	Active
4/18/2020 02:22	N1540	Evaporator Fan Output Low Current	N/A	Active
4/18/2020 01:22	N1540	Evaporator Fan Output Low Current	N/A	Active
4/18/2020 01:22	N1540	Evaporator Fan Output Low Current	N/A	Active

**Clearing the alarms:-** Alarms can be cleared during reset or can be cleared using Web UI. Next alarms will be generated only once the alarms are cleared.



## ALARMS MENU



Case Alarm - Case temperature is either too high or too low

- Low Alarm
- High Alarm

Superheat - If coil is only a few degrees above saturation on the coil outlet, superheat is too low and could be dangerous for compressor operation. If coil temp is drastically above saturation temperature on the coil and missing target, superheat is too high for normal refrigeration performance.

- Low Alarm
- High Alarm
- Door Alarm - Door has been left open longer than expected.
- Motion Alarm
- Input Alarm - short or open @ the analog input
- Probe Error - high value translates to a probe error

The case controller can display numerous alarms.

- Superheat – High/Low
- Case Temp – High/Low
- Door – Open/Closed

The controller can also show various temperature probe failures.

Controller Enable:	Enable	Apply	Defrost Initiate:	Start
Evap Fan:	Automatic	Apply	Defrost Terminate:	Stop
Cond Fan:	Automatic	Apply	Valve 1 %:	101 Apply
Exhaust Fan:	Automatic	Apply	Valve 2 %:	101 Apply
Light:	Automatic	Apply	Valve 3 %:	101 Apply
Refrigeration 1:	Automatic	Apply	Refrig Analog %:	101 Apply
Refrigeration 2:	Automatic	Apply	Refrig %:	101 Apply
Refrigeration 3:	Automatic	Apply	Anti-Sweat %:	101 Apply
Alarm:	Automatic	Apply	Dim %:	101 Apply
Solenoid Valve:	Automatic	Apply		
Drain Pan Heater:	Automatic	Apply		
Night Curtain:	Open	Apply		

Level 2 and higher users can force various controller operations to help troubleshoot control problems or diagnose backroom issues.

### Digital Output Relay

Evap Fan:	On
Cond Fan:	On
Exhaust Fan:	Off
Lights:	On
Defrost 1:	Off
Defrost 2:	Off
Defrost 3:	Off
Refrigeration 1:	On
Refrigeration 2:	On
Refrigeration 3:	On
Auxiliary 1:	Off
Auxiliary 2:	Off
Auxiliary 3:	Off
Alarm:	OK
Night Curtain:	Open
Solenoid Valve:	Open
Drain Pan Heater:	Off

### Digital Input Switch

Controller Disabled:	No
Defrost Termination:	Off
Defrost Initiate:	Off
Door Switch:	Off
Clean Switch:	Off
Dual-Temp Mode:	Off
Compressor Safety Switch 1:	Off
Compressor Safety Switch 2:	Off
Compressor Safety Switch 3:	Off
Phase Loss:	Off
Power Loss:	Off
Refrigeration Shutoff:	Off
Drain Sensor:	Off

### Analog Output

Anti-Sweat:	On	Dimming:	Off
Anti-Sweat Percentage:	100 %	Dimming Percentage:	0 %

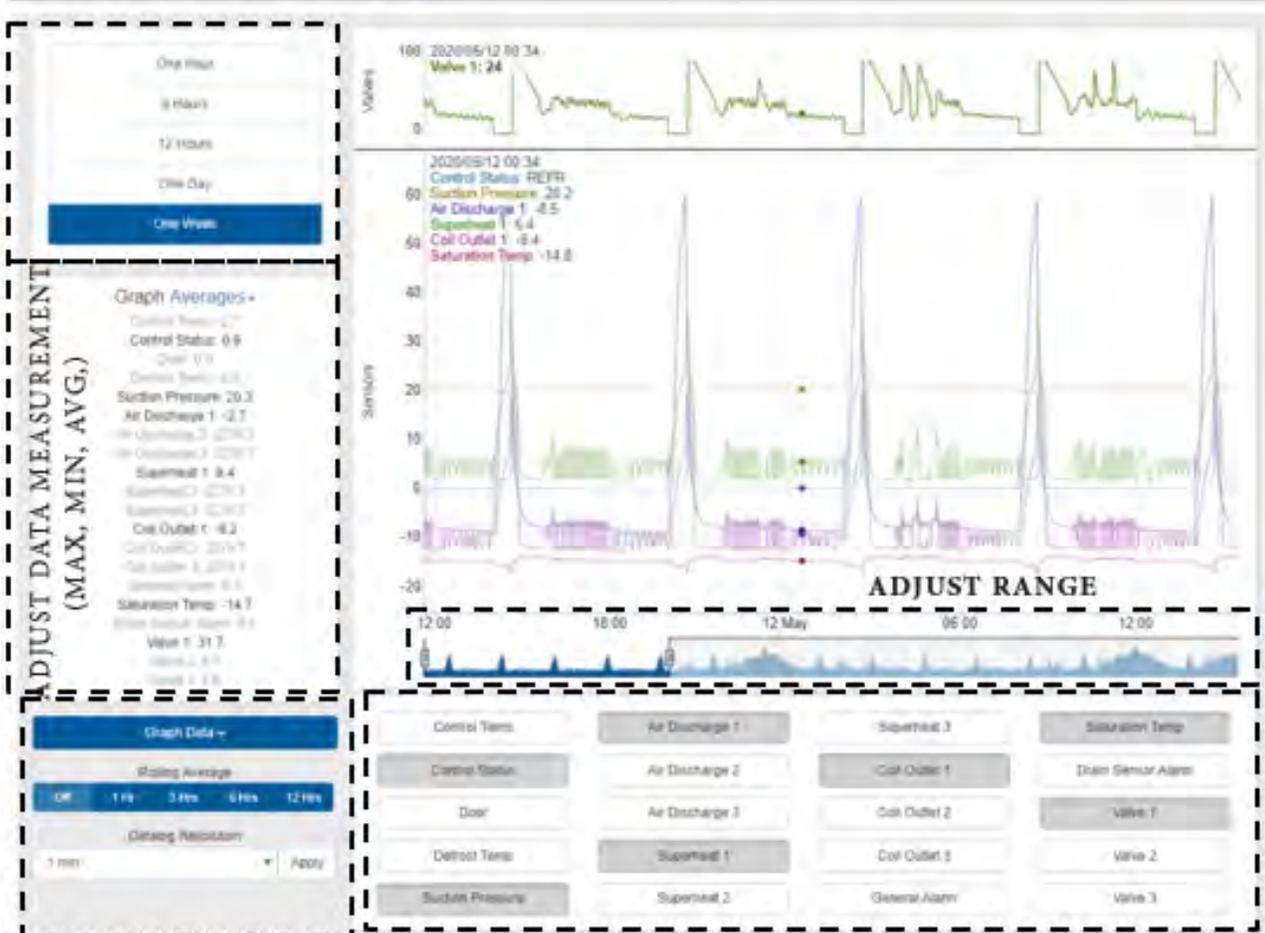
### Valve Position

Valve 1 Pos:	100 %
Valve 2 Pos:	100 %
Valve 3 Pos:	100 %

### Current Transducer

Current Transducer 1:	Err A
Current Transducer 2:	Err A
Current Transducer 3:	Err A

ADJUST DATA LOG TIME BASE



- UPLOAD, DOWNLOAD OR DELETE DATA LOG
- ADJUST DATA LOG RESOLUTION

CHOOSE GRAPH DATA POINTS

## CORELINK SMALL DISPLAY

**CORELINK DISPLAY:**

CoreLink has a small display option. This requires the display module and application version 2.6.0 or higher. The display can perform multiple functions (real-time controller, sensors, and superheat status; override commands; modifying setpoints, defrost sequence and Modbus/BACnet settings).

## CoreLink/Display wiring

CoreLink Pin 61 to Display Pin ( + )

CoreLink Pin 62 to Display Pin ( - )

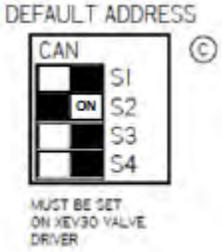
Reference Current Display manual for more details.

## PARAMETERS

CoreLink Case Controller IO			General Application Format Note: Application could vary		
Input No.	Type of Input	Description	Low Temp	Med Temp	Cooler
1	Supply	<b>Reference “-“/GND power (24Vac or 24Vdc)</b>			
2	Pb1	Configurable analogue input 1 (NTC, 0 - 5V)	Discharge 1	Discharge 1	Discharge 1
3	Pb2	Configurable analogue input 2 (NTC, 0 - 5V)		Discharge 2	Discharge 2
4	Pb3	Configurable analogue input 3 (NTC, 0 - 5V)		Discharge 3	Discharge 3
5	+12V	Additional power +12Vdc			
6	+5V	Additional power +5Vdc			
7	Out1	Analogue output 1 0 - 10V, 4 - 20mA, Relay			
8	Out2	Analogue output 2 0 - 10V, 4 - 20mA, Relay			
9	Supply	<b>Reference “+“ power supply (24Vac or 24Vdc)</b>			
10	Pb4	Configurable analogue input 4 (NTC, 0 - 5V)			
11	Pb5	Configurable analogue input 5 (NTC, 0 - 5V)			
12	Pb6	Configurable analogue input 6 (NTC, 0 - 5V)			
13	PbC	Common analogue inputs (NTC, PTC, DI)			
14	GND(-)	Additional power reference 5Vdc and 12Vdc, analogue inputs (0 - 20mA, 4 -			
15	Out3	Analogue output 3 0 - 10V, 4 - 20mA, Relay			
16	Out4	Analogue output 4 0 - 10V, 4 - 20mA, Relay			
20	DI1	Digital input 1 24Vac/dc		Enabled	
21	DI2	Digital input 2 24Vac/dc		Defrost Initialize	
22	DI3	Digital input 3 24Vac/dc		Defrost Terminate	
23	DI4	Digital input 4 24Vac/dc		Motion	
24	DI5	Digital input 5 24Vac/dc		Clean	
25	DI6	Digital input 6 24Vac/dc		Door	
26	DI7	Digital input 7 24Vac/dc		Dual Temp	
27	DI8	Digital input 8 24Vac/dc			
28	DI9	Digital input 9 24Vac/dc			
29	DI10	Digital input 10 24Vac/dc			
30	DI11	Digital input 11 24Vac/dc			
31	GND(-)	<b>Reference “-“ for digital inputs from 1 to 11 (if version with dry contacts, this input has to be used only as common for the digital inputs)</b>			
40	C	Common relays 1, 2, 3 and 4 (MAX 10A)	115v Common Input for Relays (RL1, RL2, RL3, RL4)		
41	C	Common relays 1, 2, 3 and 4 (MAX 10A)			
42	RL1	Relay 1 normally open contact	Fans		
43	RL2	Relay 2 normally open contact	Lights		
44	RL3	Relay 3 normally open contact	Defrost		
45	RL4	Relay 4 normally open contact	Refrig		
46	RL5	Relay 5 normally open contact	Alarm		
47	C	Common relays 5, 6, 7 and 8 (MAX 10A)	115v Common Input for Relays (RL5, RL6, RL7, RL8)		
48	C	Common relays 5, 6, 7 and 8 (MAX 10A)			
49	RL6	Relay 6 normally open contact	Aux 1		
50	RL7	Relay 7 normally open contact	Aux 2		
51	RL8	Relay 8 normally open contact	Aux 3		
60	Remote Display	Connection for VISOGRAPH remote terminal (Vnr)	External Display		
61	Remote Display	Connection for VISOGRAPH remote terminal (+)			
62	Remote Display	Connection for VISOGRAPH remote terminal (-)			
63	RS485 Slave	RS485 Secondary connection (-)	Modbus RS485		
64	RS485 Slave	RS485 Secondary connection (+)			
65	LAN	LAN Connection (-)	Valve Driver Conneciton		
66	LAN	LAN Connection (+)			

# TROUBLESHOOTING

Follow steps on the next 2 pages below before attempting to change hardware.

ISSUE	Troubleshooting Steps
CoreLink case controller/HSVD has no power	Verify Line voltage to high-side power of transformer
	Verify 24V to controller/valve driver
Web UI does not update	Clear cash for WebUI as follows:
	Open Internet Browser (Mozilla Firefox, Google Chrome, Safari, Microsoft Edge) Note: Internet Explorer not recommended.
	Select drop down menu from the tool bar
	Select the "History" icon
	Select "Clear Recent History"
	Select "Clear Now"
Cannot connect (login) to CoreLink	Verify your computer has an IP address that is on the same domain as the CoreLink controller.
	See the section entitled Adjusting Network settings of the CoreLink's user manual.
	Verify you enter the correct user and password.
	Verify connection to HSM_CORELINK_AP wireless access point
	Reference CoreLink USB Wireless Connection Instructions document.
	Bizarre user credentials screen? User account settings not correct inside case controller. Contact Hussmann rep for more information.
Communication Errors with System Manager	Verify wiring of daisy chain loop back to system manager. Confirm termination resistor on last CoreLink in communication loop. 120 ohms resistor across pin 63,64
	Verify the correct Modbus address of CoreLink controller. Reboot controller, a reboot is required when modifying controller Modbus address.
	Verify the correct Baud rate of CoreLink and System Manager
	Verify slave/master configuration of CoreLinks
	Verify CoreLink IP addresses
Valve Driver Offline	Verify power to driver
	 <p style="text-align: center;">MUST BE SET ON XEVS0 VALVE DRIVER</p>
	Verify dip switch address is correct
	Verify LAN wiring. Positive to Positive, Negative to Negative
	Verify Web UI configuration in the system tab.

Discharge/Return/Defrost Termination Air temperature sensor error	Verify wiring of analog inputs of CoreLink controller
	Verify Web UI analog input configuration
	Verify wiring of analog inputs of CoreLink controller
	All sensors ERROR? Verify PbC common landed correct
Discharge/Return/Defrost Termination Air temperature sensor missing on Web UI	Verify Web UI analog input configuration
	Verify wiring of analog inputs of CoreLink controller
	Verify # of distributed zones in Web UI systems tab.
Coil Outlet Air sensor temperature error	Verify HSVD is online
	Verify Web UI HSVD30 analog input configuration
	Verify wiring of analog input of HSVD valve driver
Pressure Transducer error	Verify HSVD is online
	Verify connection between transducer connector and transducer
	Verify Web UI HSVD30 analog input configuration
	Verify wiring of analog input of HSVD valve driver
	Verify transducer part number
	Verify isolation valve OPEN
Pressure Transducer 'out of range' measurement	Verify Web UI HSVD30 analog input configuration
	Verify Web UI HSVD30 analog input scaling configuration
	Verify Web UI HSVD30 transducer scaling configuration
	Verify HSVD is ON
	Verify HSVD is online
	Verify HSVD and EEV wiring
	Verify refrigerant type
Valve issues	Verify Web UI valve configuration
	Verify connection between connector and valve
	Force command valves
	Power cycle CoreLink controller and HSVD valve driver
Performance issues	Verify temperature sensor location in case zones. Optional Methods: Spray sensor with canned air upside down or use heat gun on low setting. DO NOT burn case components.
Component Working Opposite	Verify relay connections. NC or NO
Controller does not power down with box circuit breaker	Verify internal box wiring. Circuit breaker should power down controller for servicing.
Data logging analysis not working	Delete data log in Web UI menu and recheck.
E2 missing information from Corelink Controller	Verify E2 master is set to YES on Web UI systems tab. Note: Only partial information will show up if master set to NO
Defrost sync not working	Verify slave controller IP address in MASTER
	Verify network router is powered ON
	Verify cable connection to router.

The Hussmann pressure transducer is constructed with a stainless steel housing and a 1/8 inch male national pipe thread (NPT) fitting.

The rugged design makes it compatible with all HFC/HCFC refrigerants and ammonia.

The sensor includes a 20-ft cable with a Packard connector to allow for ease of sensor replacement.

0-200 PSI P/N: 0554218  
 0-650 PSI P/N: 0529188

0-5V  
 Pressure Sensor

Volts	0-150 PSI	0-200 PSI	0-300 PSI	0-500 PSI	0-650 PSI
0	0	0	0	0	0
0.2	6	8	12	20	26
0.4	12	16	24	40	52
0.6	18	24	36	60	78
0.8	24	32	48	80	104
1	30	40	60	100	130
1.2	36	48	72	120	156
1.4	42	56	84	140	182
1.6	48	64	96	160	208
1.8	54	72	108	180	234
2	60	80	120	200	260
2.2	66	88	132	220	286
2.4	72	96	144	240	312
2.6	78	104	156	260	338
2.8	84	112	168	280	364
3	90	120	180	300	390
3.2	96	128	192	320	416
3.4	102	136	204	340	442
3.6	108	144	216	360	468
3.8	114	152	228	380	494
4	120	160	240	400	520
4.2	126	168	252	420	546
4.4	132	176	264	440	572
4.6	138	184	276	460	598
4.8	144	192	288	480	624
5	150	200	300	500	650

The temperature sensor has a 10K Ω thermistor.

The thermistor is enclosed in a nickel-plated brass shell with epoxy. The sensor has a green 20-ft pigtail. The wire is a 22 AWG CL3X cord with 2 conductors.

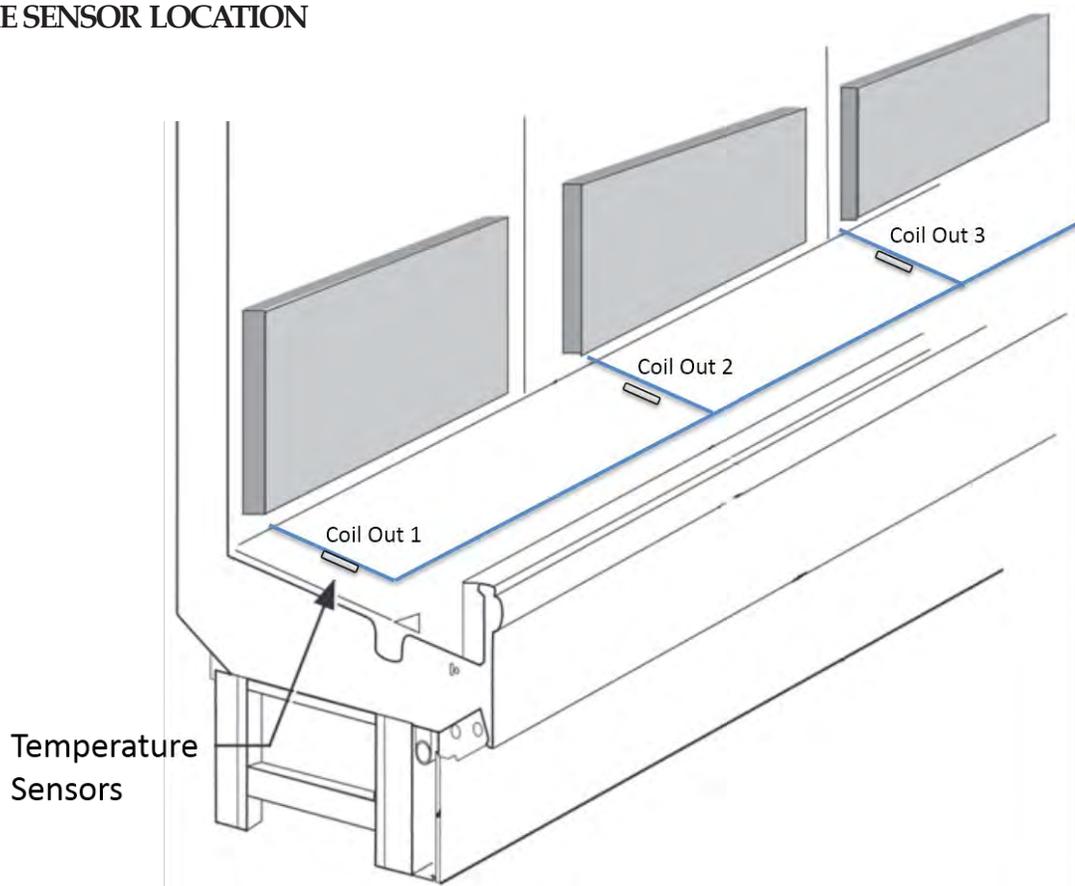
The cable is UL rated for 194°F (90°C). The sensor has been tested by Hussmann to maintain less than 0.72°F error between -40 and 248°F.

Green P/N: 0529189  
 Blue P/N: 0529190  
 Orange P/N: 0529191  
 Purple P/N: 0418813

NTC  
 10K Temperature Sensor

Temperature (°F)	Temperature (°C)	Resistance Ω
-40	-40	336,450
-30	-34	234,170
-20	-29	165,210
-10	-23	118,060
0	-18	85,399
10	-12	62,493
20	-7	46,235
30	-1	34,565
40	4	26,100
50	10	19,899
60	16	15,311
70	21	11,883
80	27	9,299
90	32	7,334
100	38	5,828
110	43	4,664
120	49	3,758
130	54	3,048
140	60	2,488
150	66	2,042
160	71	1,686
170	77	1,400
180	82	1,169
190	88	981
200	93	827

## TEMPERATURE SENSOR LOCATION



All temperature sensors are assigned from left to right looking towards the case.

Left #1      Center #2      Right #3

Please attach coil out sensors to coil suction outlet. These should be installed reasonable close to coils while still having good access.

### Sensor Position on Tube

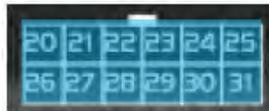


Incorrect position of sensor can result in reduced performance.

## DIGITAL INPUTS



Dual Temp	26	20	Enabled
Optional [Open]	27	21	Defrost Initialize
Optional [Open]	28	22	Defrost Terminate
Optional [Open]	29	23	Motion
Optional [Open]	30	24	Clean
Digital Common	31	25	Door



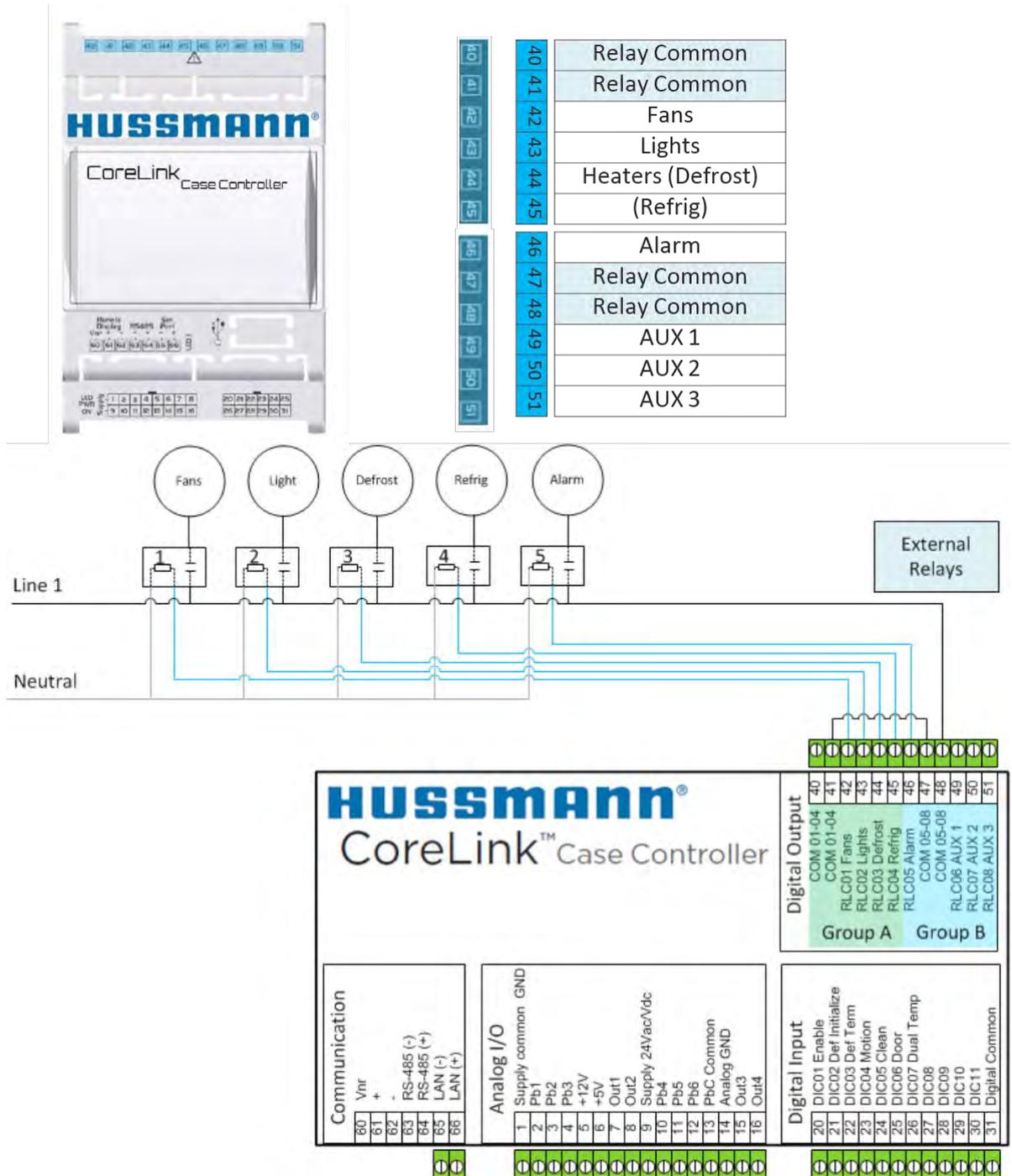
24Vac/dc digital inputs (DI1 - DI11, GND)

<b>Type:</b> (configurable via software parameter)	Opto-insulated live contact (24Vac/dc) External power 24Vac/dc ±20%
<b>Number of inputs:</b>	11
<b>Digital input status variation detection time:</b>	100ms (in any case it depends on the cycle time set by the user in the given application)
<b>Notes:</b> 	Use another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged.

## Digital Input

- **Not Used**- digital input disabled
- **Motion**- once activated, the lights digital output is enabled
- **Defrost Terminate**- terminates the defrost cycle anytime during the defrost sequence
- **Defrost Initialize**- initiates a defrost. The CoreLink will perform the entire configured defrost sequence
- **Door**- activates the Door alarm and performs configured Door Operation. The general alarm will activate after the configured Alarm Delay.
- **Clean**- activates the Clean mode and performs configured Clean Mode Operation. The Refrigeration outputs are disabled, and valves are driven to 0%
- **Dual Temp**- activates medium temp mode. The dual temp offset, fan control, defrost heater control and defrost sequence are applied. The control mode becomes Standard
- **Enable**- Enable/disables controller. All outputs are deactivated. Control Status display DISABLE DI. Default: Enable-Open
- **Refrigeration Shutoff**- once activated, all refrigeration outs are disabled. Control Status displays REFR DISABLE DI
- **Comp Dish 1 Safety Switch**- once activated, the digital output controlling Compressor 1 is disabled and the general alarm is enabled immediately
- **Comp Dish 2 Safety Switch**- once activated, the digital output controlling Compressor 2 is disabled and the general alarm is enabled immediately
- **Comp Dish 3 Safety Switch**- once activated, the digital output controlling Compressor 3 is disabled and the general alarm is enabled immediately
- **Phase Loss**- once activated, all refrigeration outs are disabled, and the general alarm is enabled immediately.
- **Power State- Phase A**- once activated, the lights and fans turn off and the night curtain will close. The case will generate a general alarm immediately
- **Power State- Phase B**- once activated, the lights and fans turn off and the night curtain will close. The case will generate a general alarm immediately
- **Power State- Phase C**- once activated, the lights and fans turn off and the night curtain will close. The case will generate a general alarm immediately
- **Drain Sensor**- once activated, the CoreLink displays a Drain Sensor alarm on the UI. The general alarm will activate after the configured Alarm Delay.
- **Comp Suction 1 Safety Switch**- once activated, the digital output controlling Compressor 1 is disabled and the general alarm is enabled immediately
- **Comp Suction 2 Safety Switch**- once activated, the digital output controlling Compressor 2 is disabled and the general alarm is enabled immediately
- **Comp Suction 3 Safety Switch**- once activated, the digital output controlling Compressor 3 is disabled and the general alarm is enabled immediately

DIGITAL OUTPUT



## DIGITAL OUTPUT

### Digital Output Polarity

- **Open-** When the digital output is active the relay contact is Open
- **Close-** When the digital output is active the relay contact is Closed

### Digital Outputs

- **Not Used-** digital output disabled
- **Light-** toggles On/Off the case lights
- **Evap Fan-** activates the evaporator fans per Evap Fan control configurations
- **Refrigeration 1-** always active in Continuous mode except for the defrost cycle. In standard mode, the refrigeration 1 output enables/disables per case setpoint and deadband.
- **Refrigeration 2-** while in Remote Distributed or Micro Distributed mode and in Standard control mode, the refrigeration 2 output enables/disables per case setpoint and deadband for zone 2
- **Refrigeration 3-** while in Remote Distributed or Micro Distributed mode and in Standard control mode, the refrigeration 2 output enables/disables per case setpoint and deadband for zone 3
- **Defrost 1-** while in Electric, Hot Gas or Electric Defrost- Individual Coils, this output is active during the defrost cycle and performs the configured defrost sequence
- **Defrost 2-** while in Electric Defrost- Individual Coils, this output is active during the defrost cycle and performs the configured defrost sequence for zone 2
- **Defrost 3-** while in Electric Defrost- Individual Coils, this output is active during the defrost cycle and performs the configured defrost sequence for zone 3
- **Alarm-** activates when the General Alarm is triggered
- **Night Curtain Open-** opens the night curtains once on command
- **Night Curtain Close-** closes the night curtains once on command
- **Cond Fan-** activates the Condenser fans per Condenser Fan control configurations
- **Exhaust Fan-** toggles On/Off exhaust fans
- **Solenoid Valve-** activates will the refrigeration outputs are enabled
- **Drain Pan Heater-** output is active during defrost cycle. Follows the same sequence as Defrost 1
- **Heater 1-** Locker dedicated output – When seasonal switch is Enabled to control temperature if it is below the cutoff Setpoint it will be turned ON - applicable to Zone 1
- **Heater 2 -** Locker dedicated output – When seasonal switch is Enabled to control temperature if it is below the cutoff Setpoint it will be turned ON - applicable to Zone 2
- **Heater 3 -** Locker dedicated output – When seasonal switch is Enabled to control temperature if it is below the cutoff Setpoint it will be turned ON - applicable to Zone 3

ANALOG INPUT



Optional Temp [Pb4]	1	
Optional Temp [Pb5]	2	(LH) Air Disc 1_[Pb1]
Optional Temp [Pb6]	3	(M) Air Disc 2_[Pb2]
Common [PbC]	4	(RH) Air Disc 3_[Pb3]
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
	13	
	14	
	15	
	16	



Analogue inputs (Pb1 - Pb6, PbC)

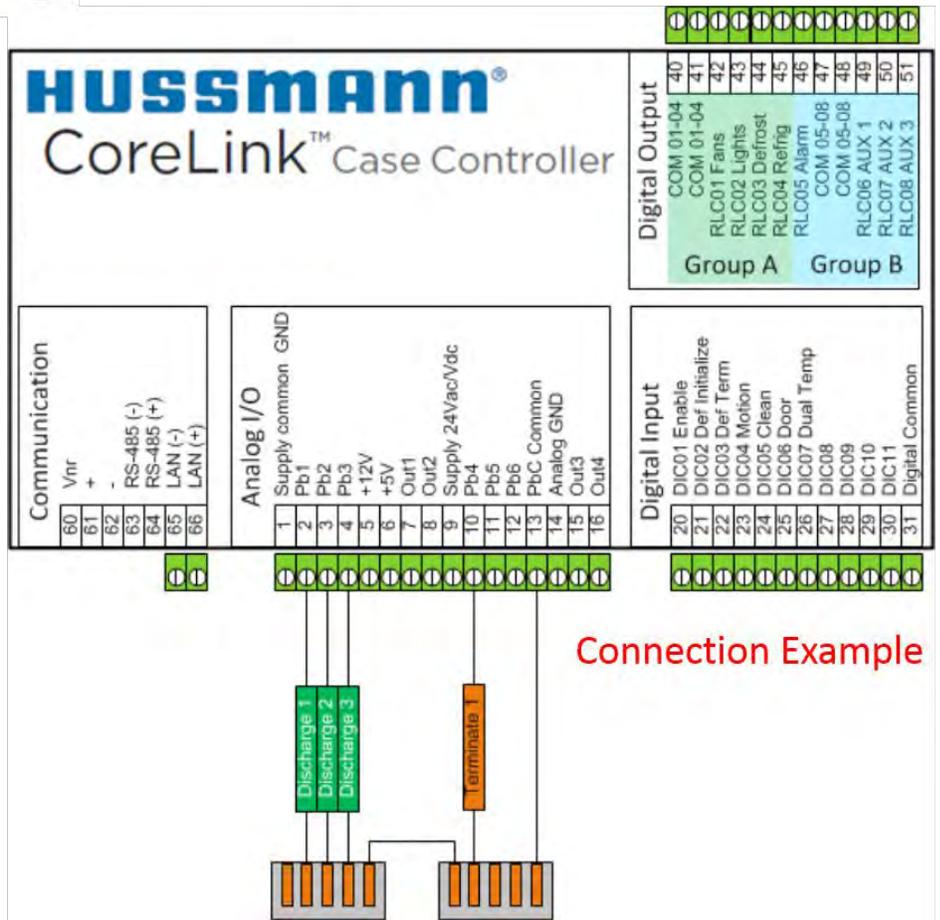
Available Analog Inputs:

Temp Sensors:

- Discharge AirTemp 1-3
- Defrost Terminate Temp 1-3
- Return AirTemp 1-3
- Coil OutTemp 1-3

Pressure Sensors:

- Pressure 1-3



Installers do not need to observe polarity when wiring temp sensors.

Connect one end to the desired port to analog input Pb 1-6 and all others to PbC common.

ANALOG OUTPUT



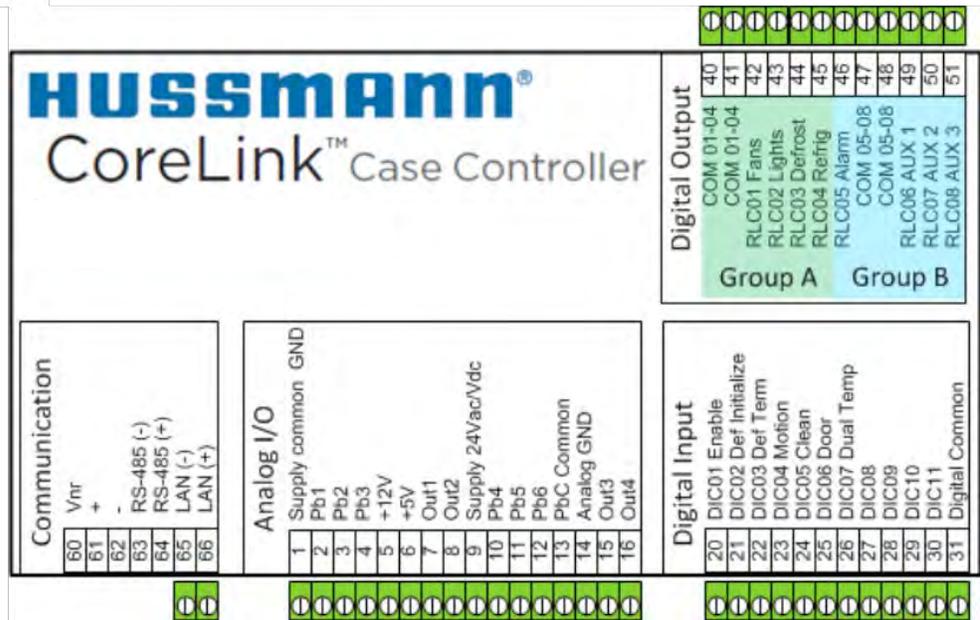
	9	1	
	10	2	
	11	3	
	12	4	
	13	5	
GND Analog Outputs	14	6	
Optional [Out3]	15	7	Optional [Out 1]
Optional [Out4]	16	8	Optional [Out 2]

Supply	1	2	3	4	5	6	7	8
	9	10	11	12	13	14	15	16

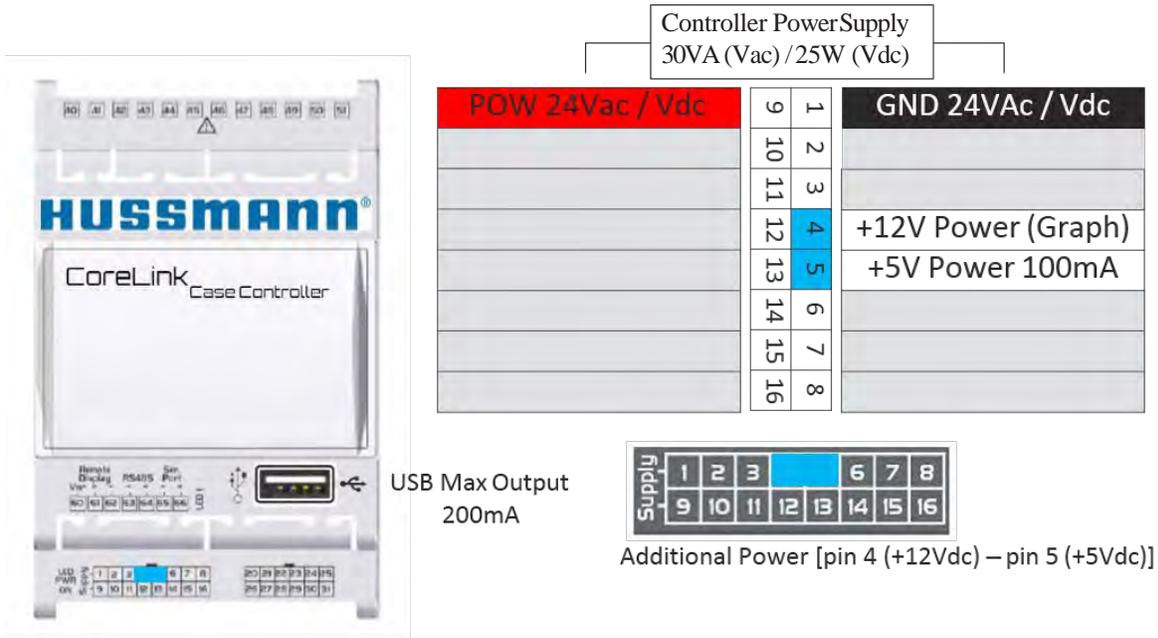
Analogue outputs (Out1 - Out4, GND)

Available Analog Outputs:

- PWM Valve 1-3
- Heater 1

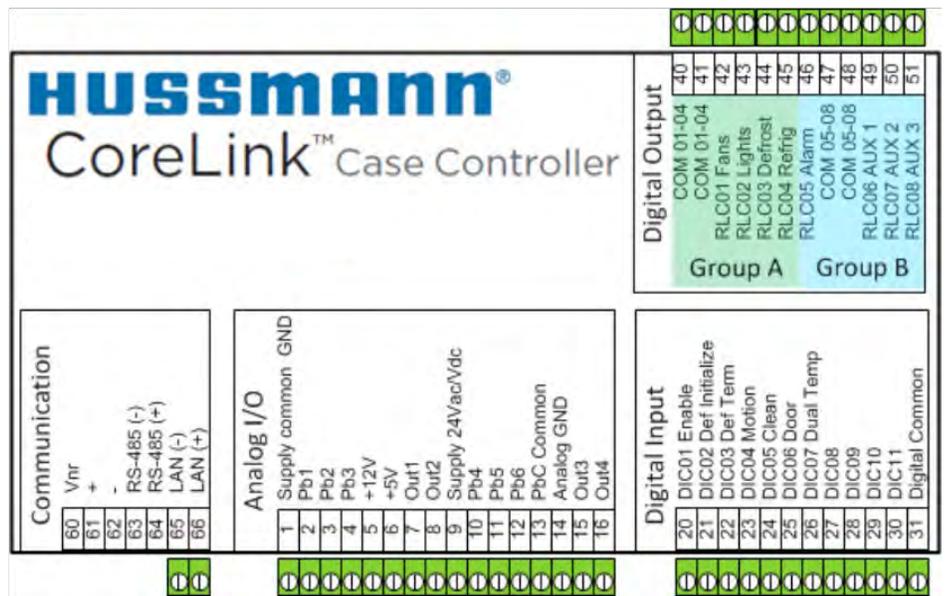


ADDITIONAL POWER



Available Power Outputs:

- +12Vdc
- +5Vdc



# HUSSMANN®

**To obtain warranty information  
or other support, contact your  
Hussmann representative.  
Please include the model and  
serial number of the product.**

*Hussmann Corporation, Corporate Headquarters: Bridgeton, Missouri, U.S.A. 63044-2483 01 October 2012*