

# Natural Refrigerant Training Summit

Building a Sustainable Workforce

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## Micro Thermo Alliance

Adam Hughes

Parker Hannifin – Sporlan Division,  
Micro Thermo Technologies



NORTH AMERICAN  
Sustainable  
Refrigeration  
Council

# Presenter



**Adam Hughes**

Project Manager – U.S. Integration

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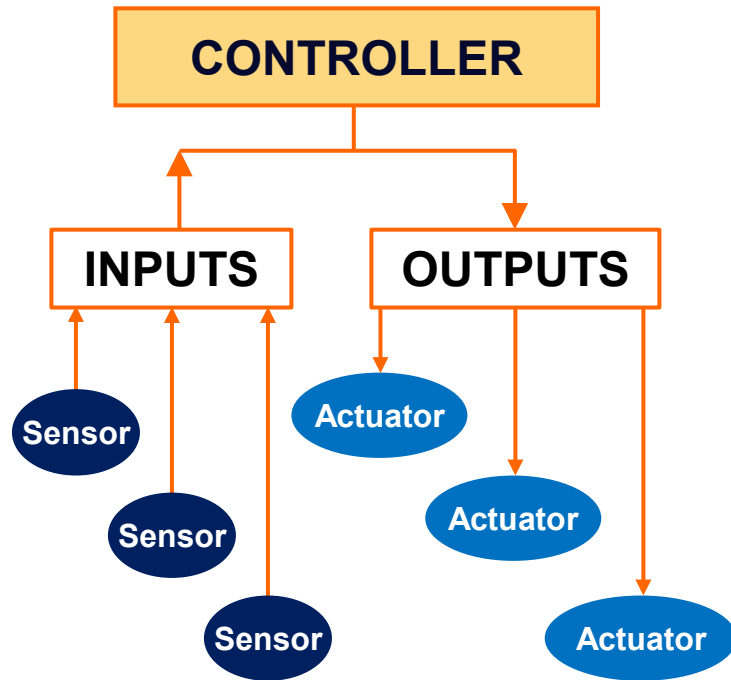
# What is Micro Thermo Alliance?

- State-of-the-art facility management software platform
- Control, monitoring, information, historical graphs and data
- More than just control or monitoring...a true management tool
- Windows<sup>®</sup> based graphical format

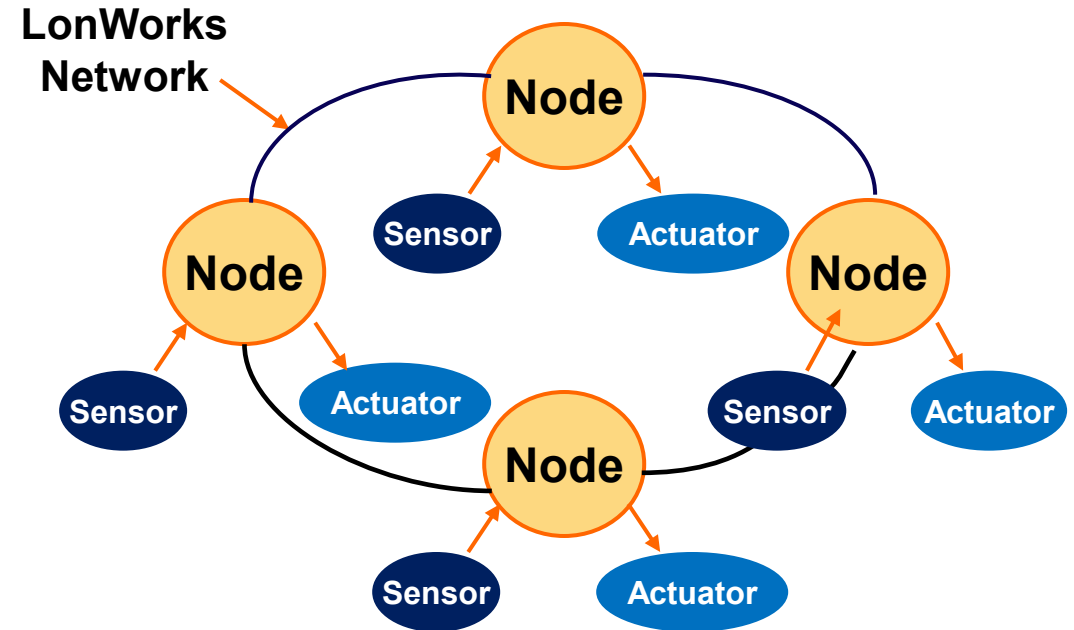


# Distributed Control

## CENTRALIZED CONTROL



## DISTRIBUTED INTELLIGENT CONTROL



# FACILITY Control

- Supermarkets
- 300+ CO<sub>2</sub> installations in North America
- Frozen and refrigerated warehouses
- Ice skating rinks
- Marine refrigeration
- Food processing and preparation facilities
- Ice cream processing and production
- Pharmaceutical process and storage



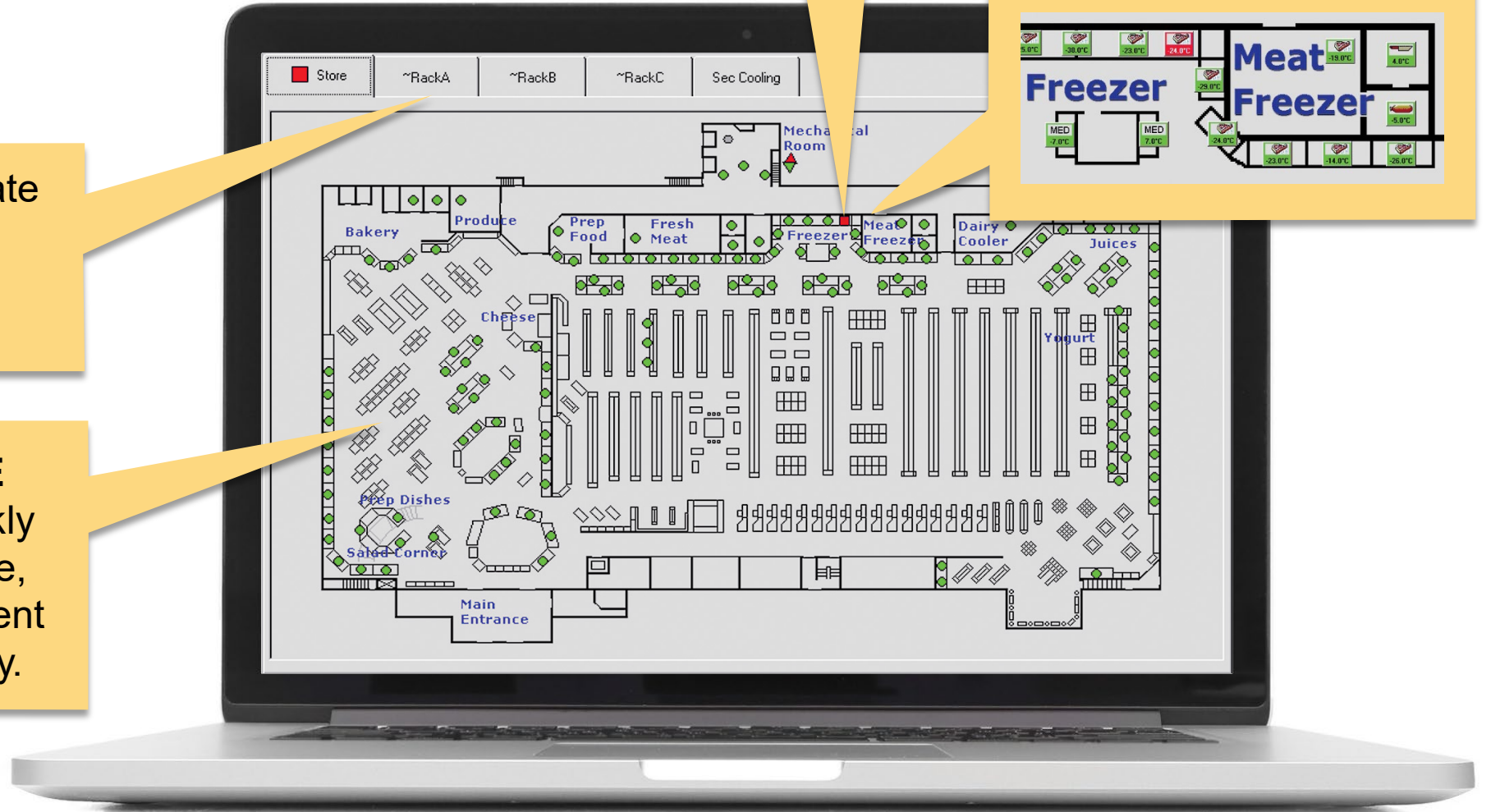
# It's All Connected

**MENU TABS** - Navigate to other screens to monitor your entire refrigeration system.

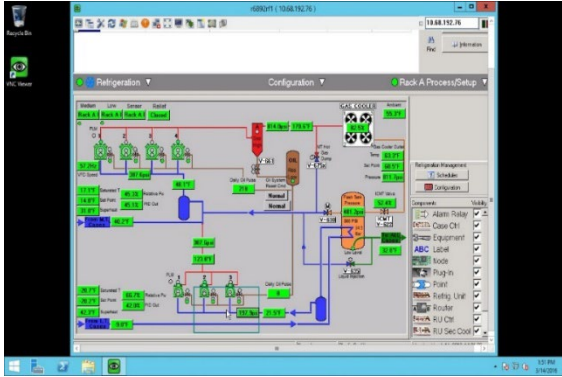
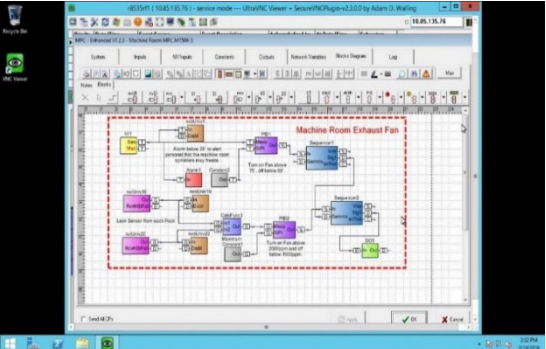
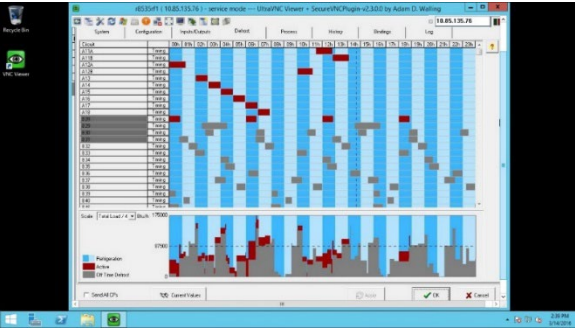
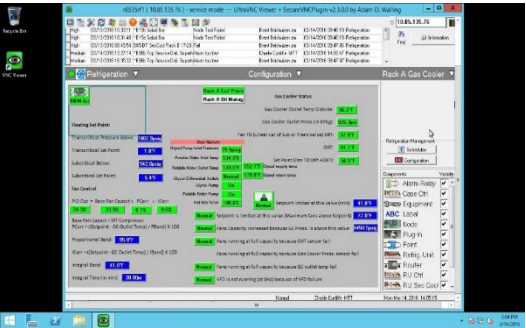
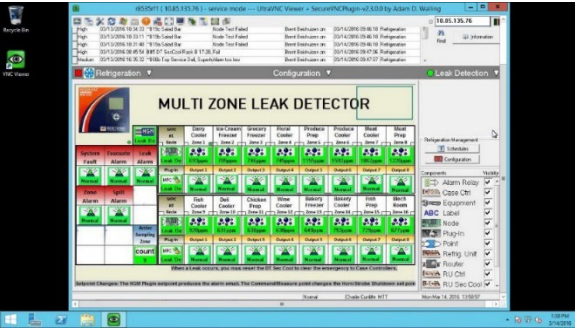
**COMPREHENSIVE OVERVIEW** - Quickly scan the entire store, see that all equipment is operating properly.

**COLOR-CODED INDICATORS** - Identifies alarm situations.

**ZOOM IN** - For detailed, real-time operating data.

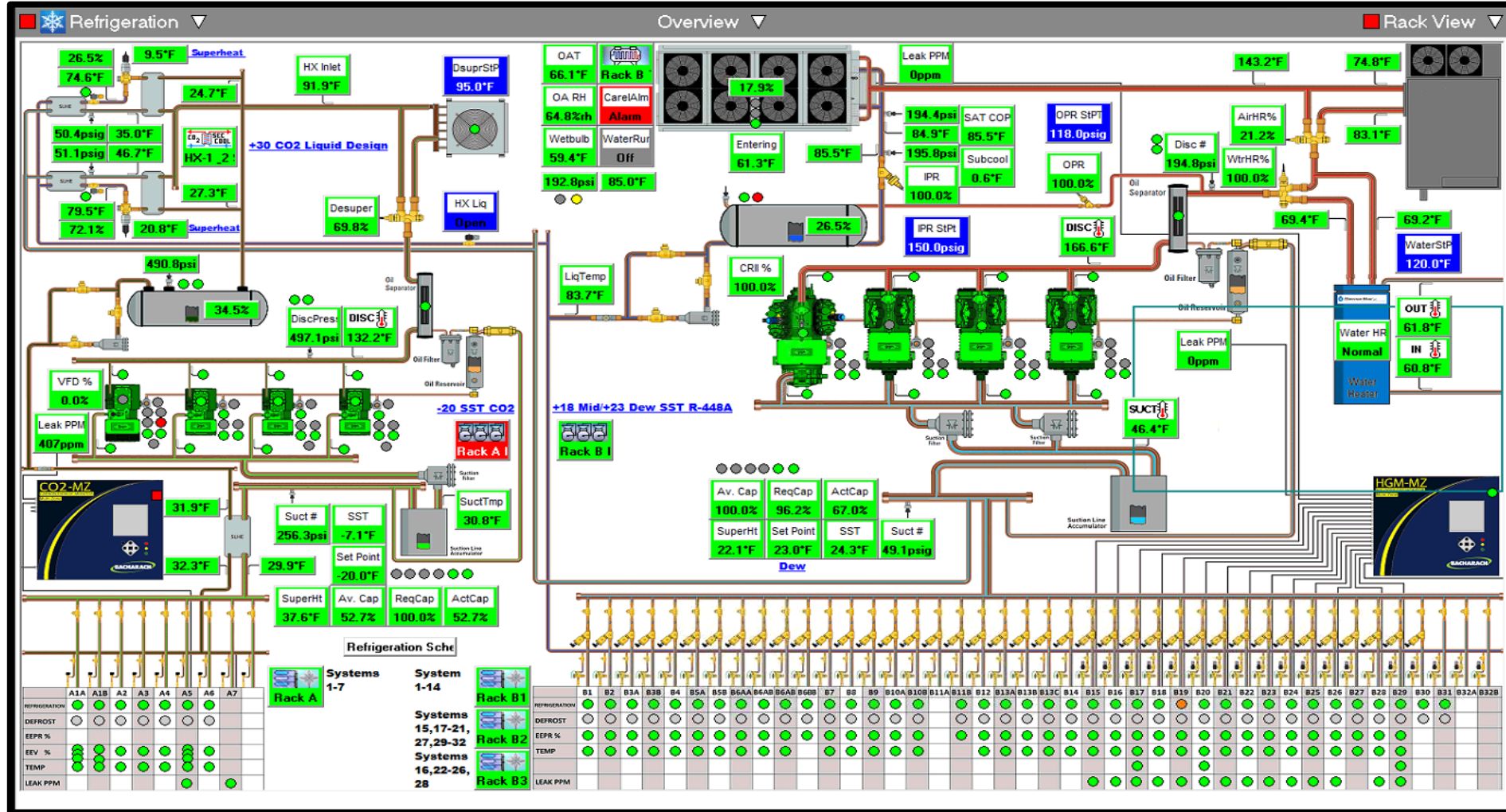


# MICRO THERMO ALLIANCE Subsystem Access



# Virtual/Interactive View of a Refrigeration System

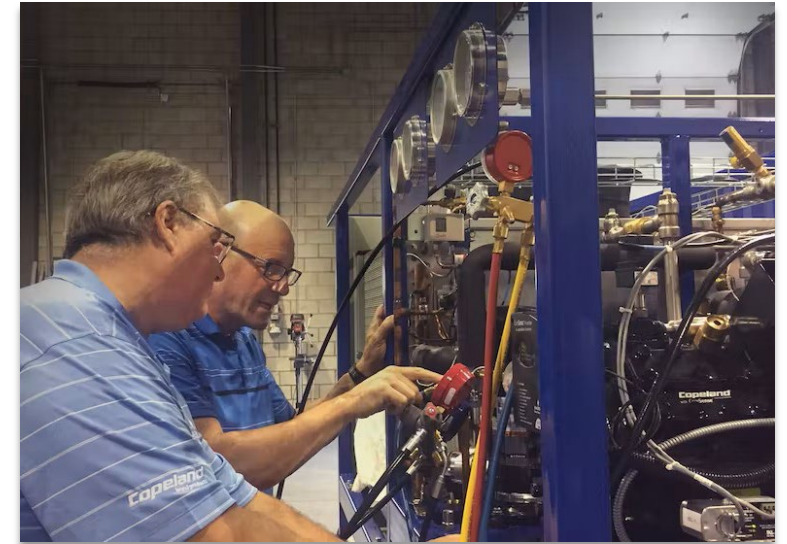
## Supermarket...Commercial...Industrial





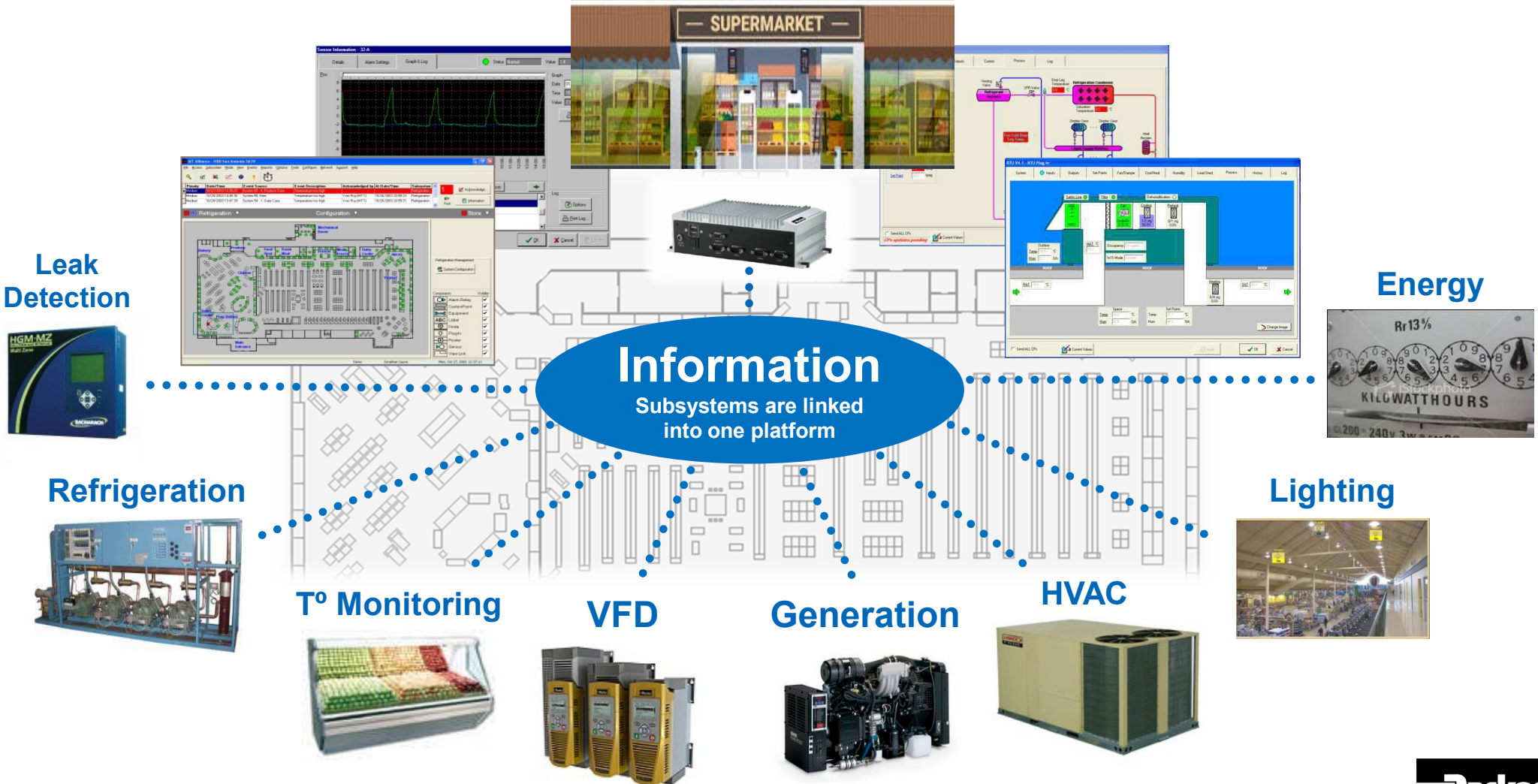
# CONTRACTOR Goals & Needs

- Real time smart alarm notification via text / email
- 5W's technician accountability
- Virtual / remote troubleshooting
- Remote graphing and analysis
  - 5+ year system history
- Remote system modification and set-point changes
  - Superheat / Suction Pressure / Defrost Schedule / Over-rides
- Electronic service log
- Alarm event triage report
- Reduce labor, service, and energy costs
- Reduce management costs
- Increase profitability

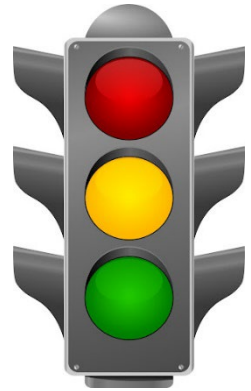


# MICRO THERMO ALLIANCE

# Graphical User Interface Front End



# MICRO THERMO ALLIANCE Menus



Tool/Icon Bar

Menu Bar

Events & Alarm List

MT Alliance V7.0 2011-05-17A226 , IGA Grenville

File Access Subsystem Mode View Events Reports Options Tools Configure Network Support Language Help

Priority	Date/Time	Event Source	Event Description	Acknowledged by	At Date/Time	Subsystem
Medium	09/27/2011 20:17:14	~RackCO\SGr1\Cmp1, Safety L	Alarm	(Klimfax) Francis Jalbert	09/27/2011 20:17:58	Refrigeration
Medium	09/27/2011 19:31:15	~RackCO\SGr1\Cmp1, Safety L	Alarm	(Klimfax) Francis Jalbert	09/27/2011 19:52:06	Refrigeration

Buttons: Acknowledge, Find, Information

Subsystems

Permission Modes

Store Views

From the main window, every function of Alliance is just a few clicks away!

Refrigeration Configuration Main

Support Technique  
Micro Thermo  
1-888-664-1406  
poste # 106

Doina

Refrigeration Management  
Schedules Configuration

Components	Visibility
Alarm Relay	✓
Equipment	✓
Label	✓
Node	✓
Plug-In	✓
Point	✓
Refrig. Unit	✓
Router	✓
RU Ctrl	✓
RU Sec Cool	✓
Sensor	✓



# Color Codes

- **RED SQUARE**

**TAKE ACTION**

- Active Alarm

- **YELLOW DIAMOND**

**CAUTION**

- Alarm in Recall

- **GREEN CIRCLE**

**All Systems GO**

- Temps and Nodes OK

- **ORANGE**

Fixture or Circuit in **DEFROST**

- **TEAL**

Fixture, Fan, Valve,  
Compressor in **OVERRIDE**

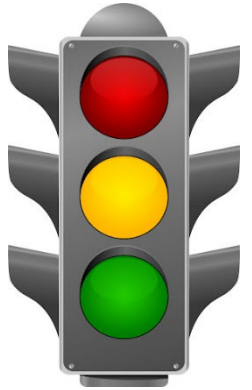
- **WHITE**

**UNCONFIGURED**

- Not commissioned

- **BLACK**

Node **OFFLINE**



# The Power of Information

- ✓ **Intelligent Distributed Control**
- ✓ **Intuitive Windows<sup>®</sup> based graphical user interface**
- ✓ **History retains system data up to 5 years**
- ✓ **CO2 control, both Transcritical & Subcritical; 300+ North America installations in last 8 years**
- ✓ **Integrated subsystems managed through an integrated front-end**
- ✓ **Colorful visual indicators enable facility management at-a-glance**
- ✓ **Customizable icons and templates make set-up and commissioning easy**



# **ALLIANCE**

# **Installation and Set-Up**

# MICRO THERMO ALLIANCE Industrial Computer



# MICRO THERMO ALLIANCE

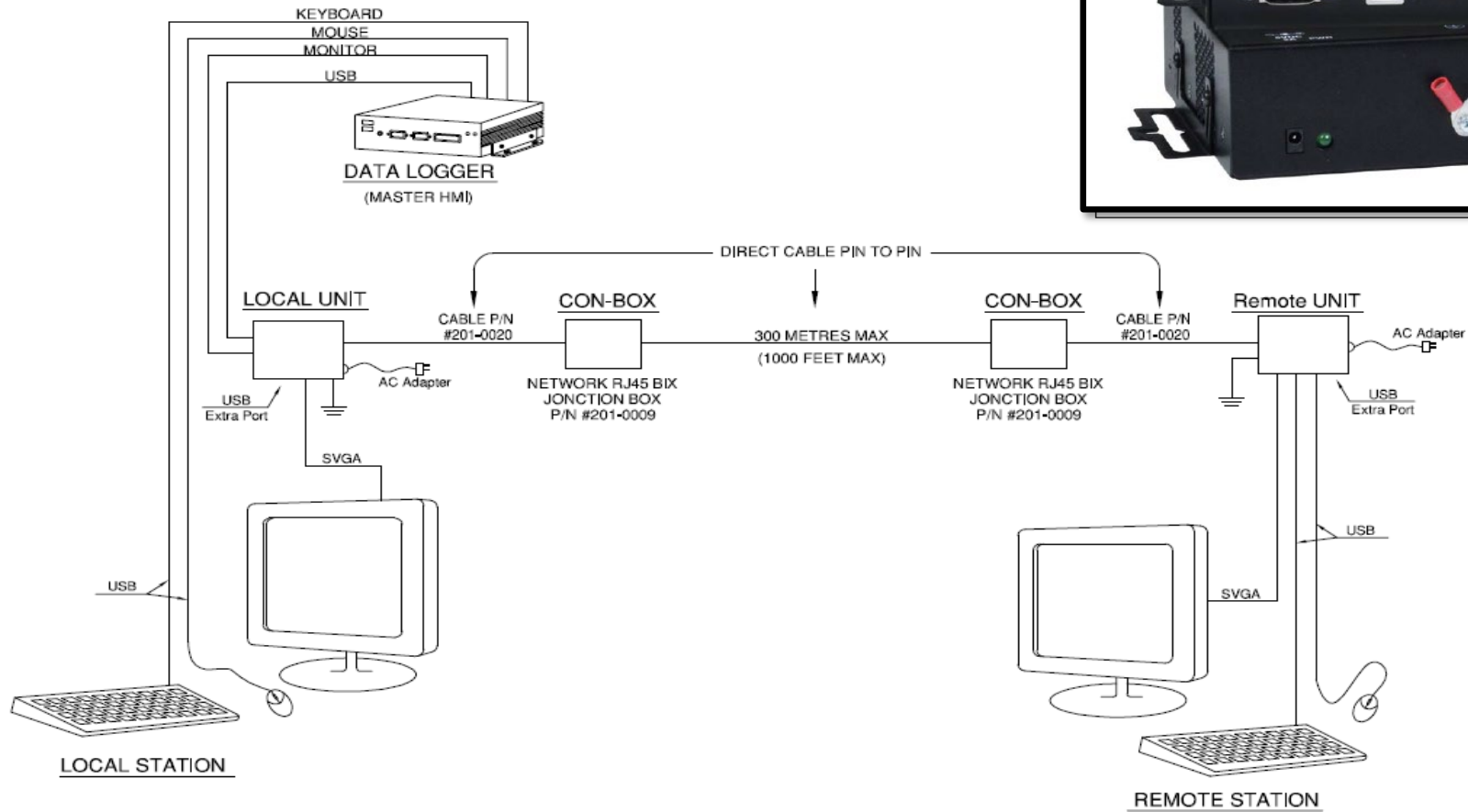




MICRO THERMO ALLIANCE

# Industrial Computer with KVM

*up to 8 remote workstations*



# Literature Resources

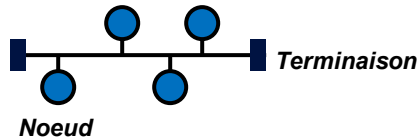
- <https://discover.parker.com/MicroThermoLiterature>

## 70-PHW-1003-R1.1 Micro Thermo Standard Wiring Guide

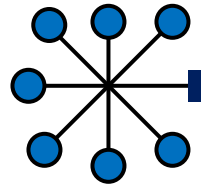
	<b>Belden: 8461</b>	<b>Belden: 8471</b>
Description	1 twisted pair, unshielded	1 twisted pair, unshielded
Conductor size	AWG #18	AWG #16
Stranding	AWG #26 x7	AWG #29 x19
Conductor material	Tinned copper	Tinned copper
Lay length (twists /ft)	2 inches (6)	2 inches (6)
Inductance	N.A.	0.19 uH /ft
Capacitance	22 pF /ft	33 pF /ft
DC resistance	5.86 ohms /1000ft	4.49 ohms /1000ft
Nominal outside diameter	.234 inch	.274 inch
Acceptable alternate suppliers	General Cable (Carol): C2830A	General Cable (Carol): C2405A
	-	Windy City Wire: 104500
	West Penn Wire: 224	West Penn Wire: 225
	Daburn: 3029	Daburn: 3030

# Network Topologies & Transceivers

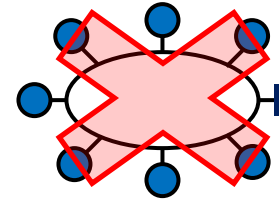
Bus



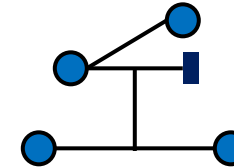
Star



Loop



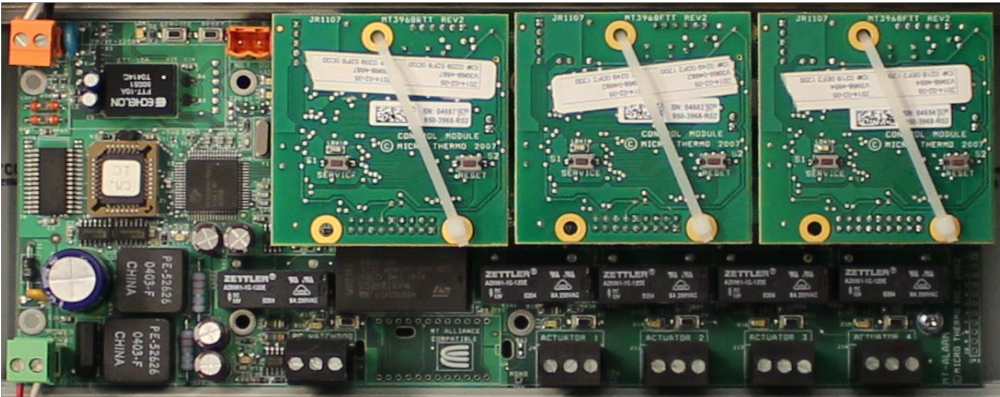
Free



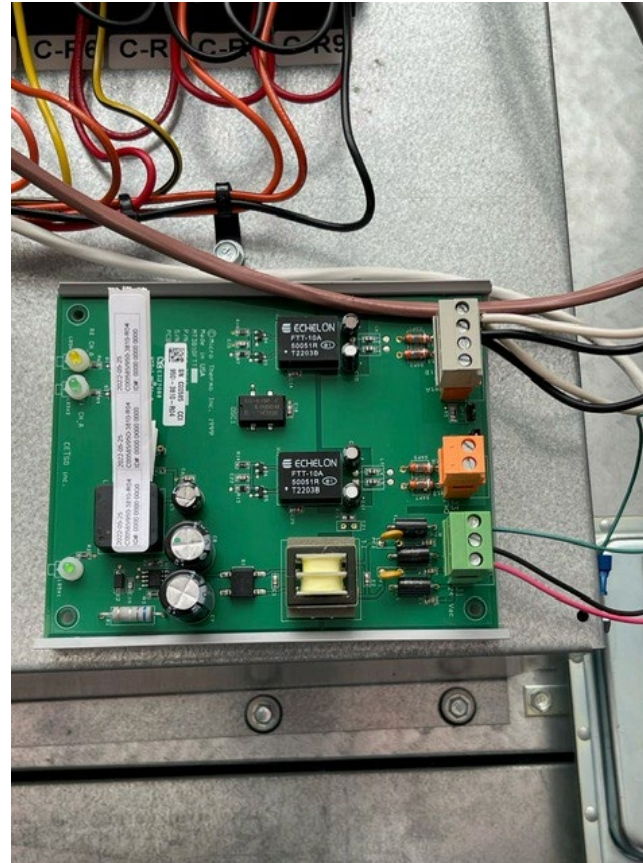
Types	Speed	Topology	Nodes	Distance
TPT/XF1250	1.25 Mbps	Bus	64	500 Meters
FTT-10	78 Kbps	Bus	64	2200 Meters
FTT-10	78 Kbps	Free & Star	64	500 Meters
Radio	19.5Kbps	RF		50 Meters
PLT-21	5 Kbps			

# MICRO THERMO ALLIANCE

## Backbone Components



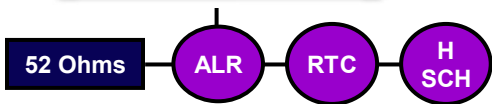
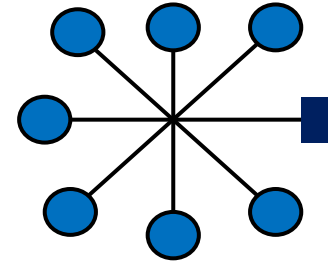
# Routers & Repeaters



Routers create new network channels and are used to increase the quantity of nodes on the network as well as clean up network traffic. A router is a smart device with its' own neuron ID's.

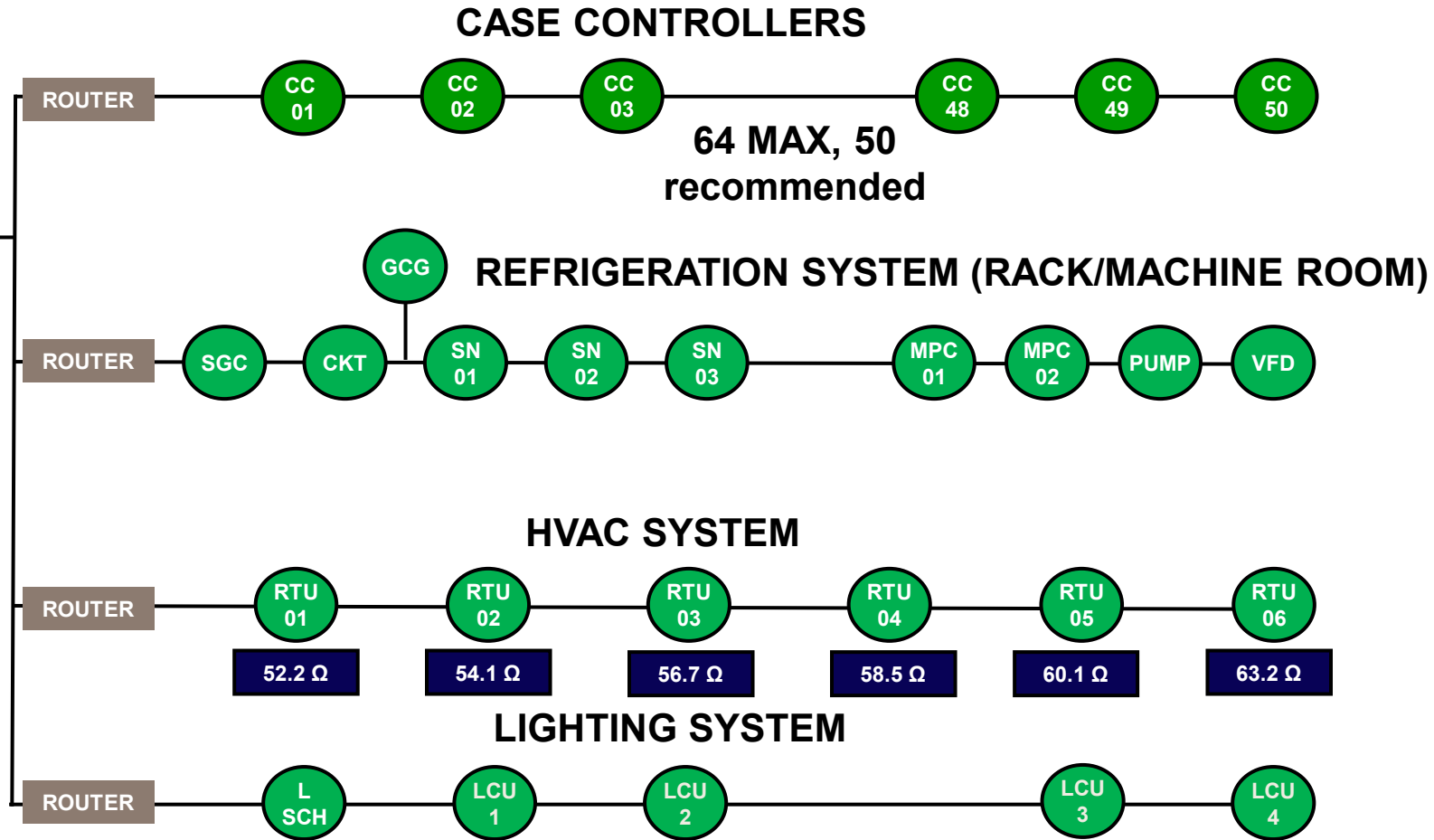
Repeaters increase the distance between nodes or the total run length of a segment. Repeaters do not have a neuron ID and are not a smart device.

# LARGE SUPERMARKETS Network – Backbone and Channels

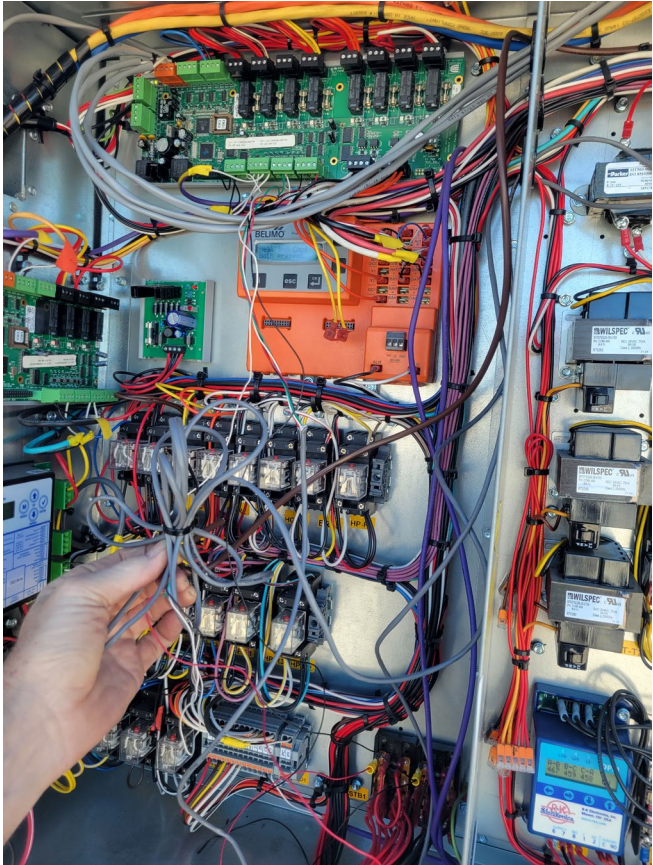


## Special Echelon Network Requirement

- Each network channel will begin with router/repeater
- Each channel will have termination resistor mounted on the router for shipping
- Check resistance at router
- Check resistance at end of each channel
- Resistance must be 52 – 58 ohms
- If high resistance is measured at the end of channel....move termination resistor to best location to balance network resistance



# What Not To Do





# Micro Thermo Boards



## MICRO THERMO ALLIANCE

# MT-500 Configurable Smart Nodes

## MANY USES: HVAC, Refrigeration, Lighting, Energy

- Powered by 24 VAC center-tap transformer
- Micro Thermo Smart Nodes are self-operating
- 8 - UI can be configured to support a broad range of sensors
- Hardware low pass filter on all inputs
- LonWorks Controller Section
  - Neuron
  - Transceiver
  - Memory
  - Logic

❖ MT-504	4DO	8UI	4AO*	
❖ MT-508	8DO	8UI	4AO*	4DI
❖ MT-512	12DO	8UI	4AO*	8DI

\*CONFIGURABLE: 4 – 20ma 0-10V 0 – 5V 2 – 10V 1 – 5V

*MT-504*



*MT-508*



*MT-512*



# MICRO THERMO

## NEW MT-700 Smart Nodes

Customizable... adaptable ...intelligent

- Each Smart-Train starts with MT-722F Brain
- Connect up to TEN additional Smart Nodes
- MT-708V: 8 steppers
- MT-708R: 8 relays
- MT-784A: 8 inputs, 4 relays
- MT-766A: 6 inputs, 2 AO & 4 relays
- MT-716U: 16 inputs
- MT-742V: 4 inputs, 2 steppers



MICRO THERMO

# Case Controller – MT-700 Series

- Easily configurable from a Windows® based front end
- Optimized for CO2 Control
- Smart Fan Control
- True P/T Superheat Control
- Temperature Control with Superheat limit
- Superheat Control with temperature limit
- Superheat Control priority
- Temperature Control priority



**MICRO THERMO**

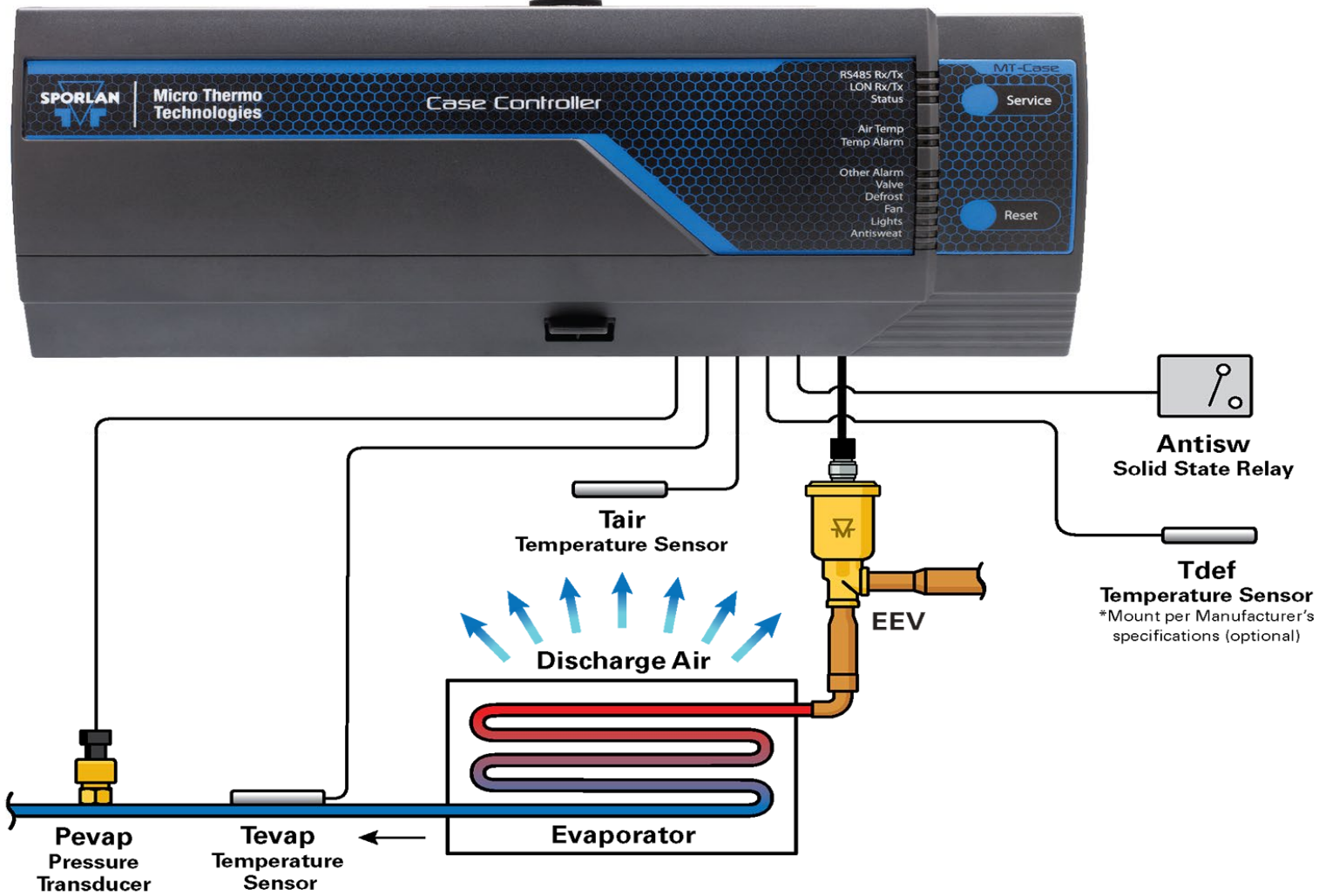
# **EEV Case Control**

- ✓ **Optimized for Fixture**
- ✓ **Optimized by Valve Type**
- ✓ **Base Value Correction**
- ✓ **Maximum % OPEN**
- ✓ **Pulldown Correction**
- ✓ **Delayed Opening After Defrost**
- ✓ **Liquid Temperature Correction**
- ✓ **Pressure Drop Correction**
- ✓ **Flow Direction Correction.....axial...radial**
- ✓ **Ambient Correction**



# MICRO THERMO CASE CONTROLLER

## System Schematic - Example



MICRO THERMO

# Case Controller

- **3 sets of temperature alarms**
  - Cumulative Alarm for improved food safety and reduced product shrinkage
  - Trend Graphing
- **Smart process model used with custom PID and intelligent algorithm**
  - Controls valve position based on evaporative load and predictive load along with smart fan control

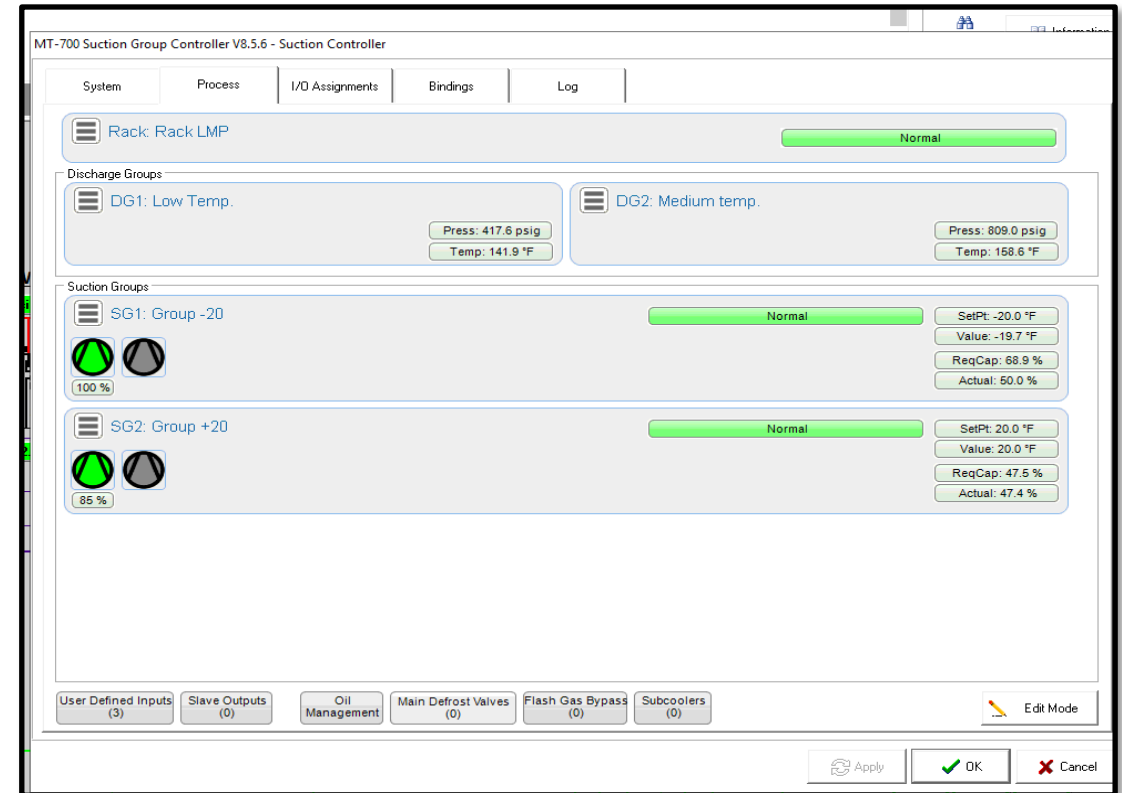


MICRO THERMO

# MT-700 Suction Group Controller Train



- 4 Suction Groups
- 16 Compressors per Suction Group
- Compressor Digital Inputs:
  - Safety Line Alarm
  - Low Oil Level
  - Proof of Running
  - Oil Injection
  - Digital
    - 1 Alarm
  - VFD
    - 1 Alarm
  - 1 out each: Bypass / Reset / Enable



MICRO THERMO

# MT-700 Suction Group Controller Train



- 4 Discharge Groups
- Digital Inputs:
  - 1 discharge pressure/group
  - 1 discharge temperature/group
  - 1 High Pressure switch/group
  - 1 High Pressure re-set/group
  - 2 Sub Cool
    - 2 DO with 3 stages
    - 1 sub-cool inlet temperature
    - 1 sub-cool outlet temperature
  - Main Defrost Valve
  - Oil Control

MT-700 Suction Group Controller V8.5.6 - Suction Controller

System Process I/O Assignments Bindings Log

Rack Normal

Discharge Groups

DG1: Low Temp. Press: 417.6 psig Temp: 141.9 °F

DG2: Medium temp. Press: 809.0 psig Temp: 158.6 °F

Suction Groups

SG1: Group -20 Normal SetPt: -20.0 °F Value: -19.7 °F ReqCap: 68.9 % Actual: 50.0 %

SG2: Group +20 Normal SetPt: 20.0 °F Value: 20.0 °F ReqCap: 47.5 % Actual: 47.4 %

User Defined Inputs (3) Slave Outputs (0) Oil Management Main Defrost Valves (0) Flash Gas Bypass (0) Subcoolers (0) Edit Mode

Apply OK Cancel



# Intelligent Refrigeration Controls

## Suction Group Control

- PID control for suction pressure
- Floating suction pressure
- Optimized algorithms for reducing compressor cycling
- Disregards faulty compressors in refrigeration control strategies



## Compressor Control

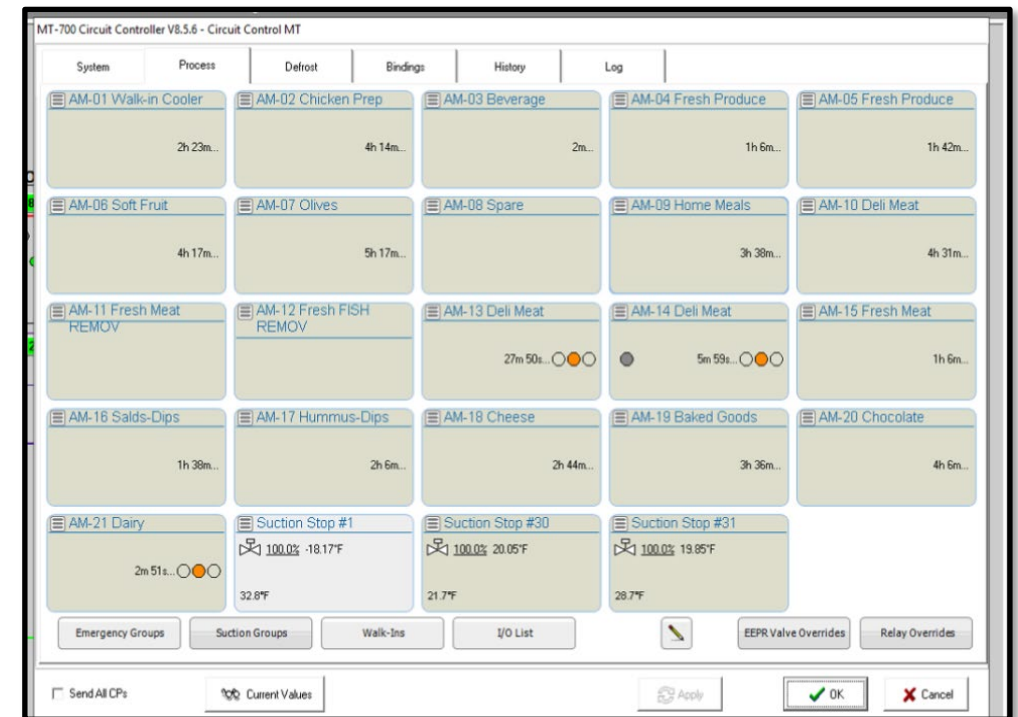
- Fail-safe switch back
- Equalized Run Time
- Supports 2 un-loaders per compressor
- Supports VFD
- Digital Discus & Digital Scroll
- Inputs
  - Safety Line Monitoring
  - Proof-of-running
  - Xproof-of-running



MICRO THERMO

# MT-700 Circuit Controller Train

- Configurable I/O
- Regulate up to 24 Circuits
- Control up to 80 relays
- Support for TEV or Case Controllers
- Dual-Temp EEPs
- Circuit pressure regulation based on local or remote pressure, or based on case temperatures
- Floating circuit pressure and suction pressure set points
- Alarming on circuit superheats



MICRO THERMO

# MT-700 Condenser / Gas Cooler Controller Train



- Up to 8 Sections / 16 Fans
- Split: Main Valve – Fan Power Output – Vent Valve Output
- Fan Control: OAT / COT / COP / DLP / DP
  - Entering Air
  - Ambient RH
  - Water Relay (Adiabatic)
- Receiver / Flash Tank
  - FGB Valve Digital Output
  - Holdback / HPV
  - Pressure Regulation
  - Receiver Pressure / Receiver Empty
  - Liquid Level
- Heat Reclaim – up to 8 HR subsystems
- Up to 8 HR subsystems

MICRO THERMO

# MT-700 Condenser / Gas Cooler Controller Train



- **3 Plug-In Tabs**

- Global
- Configuration
- Inputs

- **4 Configuration Sub-Tabs**

- **Control**

- **PID**

- **Staging**

- **Pressure Limits**

The screenshot displays the configuration software interface for the MT-700 controller. The 'Inputs' tab is selected, and the 'Regulation Strategies' section is expanded. The interface includes a left-hand navigation menu with options: Control, PID, Staging, and Pressure Limits. The 'Regulation Strategies' section contains the following settings:

- Control from Outside Air Temperature (OAT) only
- Variable to regulate: CGC Outlet Temperature
- Set Point Calculation: Floating
- Set Point section:
  - Approach Temperature Set Point: 10.0 °F
  - Min / Max Outlet Temp Set Point value: 46.0 °F / 80.1 °F
  - Calculated Outlet Temperature Set Point: 52.5 °F
  - Fixed Set Point (when OAT is invalid): 60.0 °F
- Alternative regulation Set Point section:
  - Fixed Set Point (when COT is invalid): 65.0 °F

At the bottom of the window, there are 'OK' and 'Cancel' buttons, and a help icon (question mark) is visible in the bottom right corner of the configuration area.

# Intelligent Controllers

## Condenser/Gas Cooler Control

- PID or Sequential Control
- Air Cooled or Evaporative
- Fixed or Variable Speed Fans
- VFD application
- Split Logic on Outdoor Temp, Heat Reclaim or both
- Automatic fail-safe
- Floating Head strategies adaptable



## Circuit Control

- Controls refrigeration, defrost, off-time and drip cycle
- Integrated scheduler for each refrigeration circuits
- Defrost types supported : Hot Gas, Electric, Off Cycle, Pulse, Warm Fluid
- Defrost termination on time or temperature



MICRO THERMO

# MT-700 2 Valve Controller

- GC and FGB control
- Main Defrost Valve Control
- Electronic Replacement of A8 and A9 Valves
- CDS Valve Control
- Heat Reclaim Control



# MICRO THERMO ALLIANCE

## Anti-Sweat Control

- Modulation of anti-sweat heaters based on store Dew-point T° or RH%
- Built-in Load Shed functions

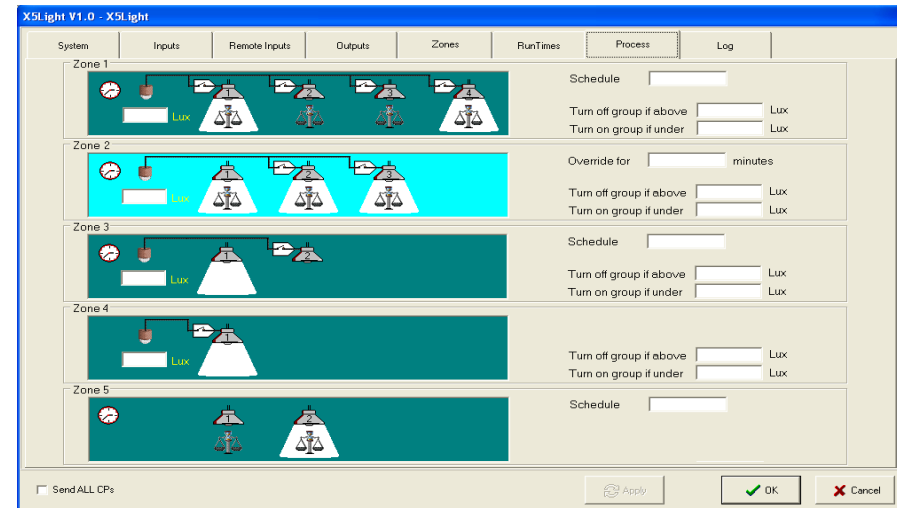


# MICRO THERMO ALLIANCE

## Intelligent Controllers

### Lighting

- **Controls a wide variety of applications**
  - Dimmable lighting
  - Daylight harvesting
  - Multiple zone controls
- **Corporate scheduling capabilities**
- **Built-in Load Shed functions**
- **Astronomical clock**



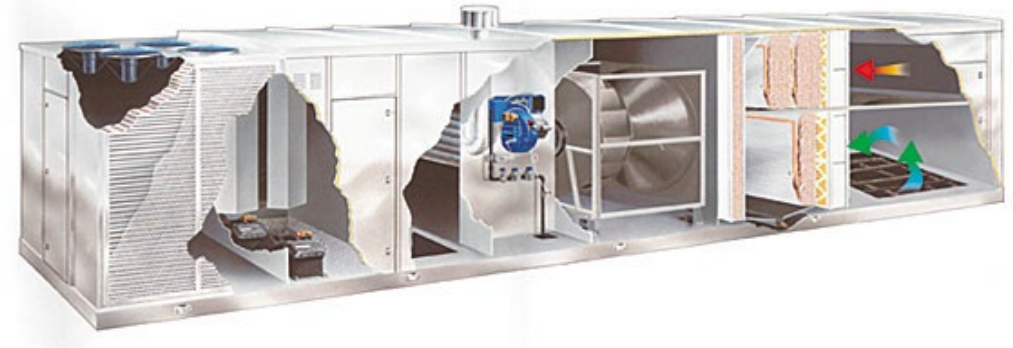


# MICRO THERMO ALLIANCE

# Intelligent Controllers

## HVAC – RTU700

- **Supply Fan Control**
  - Variable or discrete speeds based on operation mode
  - MAU air balance feature
- **Humidity Control**
  - %RH or Dew Point Control
  - Hot Gas Reheat – on/off or modulating
- **Built-in Load Shed functions**
- **Heat Reclaim**
  - CO2 Refrigeration Reclaim
  - Water Heating
- **Differential Enthalpy Economizer Control**
- **Digital Scroll and Variable Speed Compressor Control**
  - Suction Pressure Control
  - Supply Air Temp Control
  - Setpoint reset curve





# Alarms & Monitoring

# Temperature Monitoring

- Case T° Monitoring with alarm capabilities
- Multiple sets of alarms from **one temperature input point**

## SET 1 PRIMARY ALARM – Basic

- High and low set points
- User defined priority

## SET 2 SECONDARY ALARM – Efficiency & Food Quality

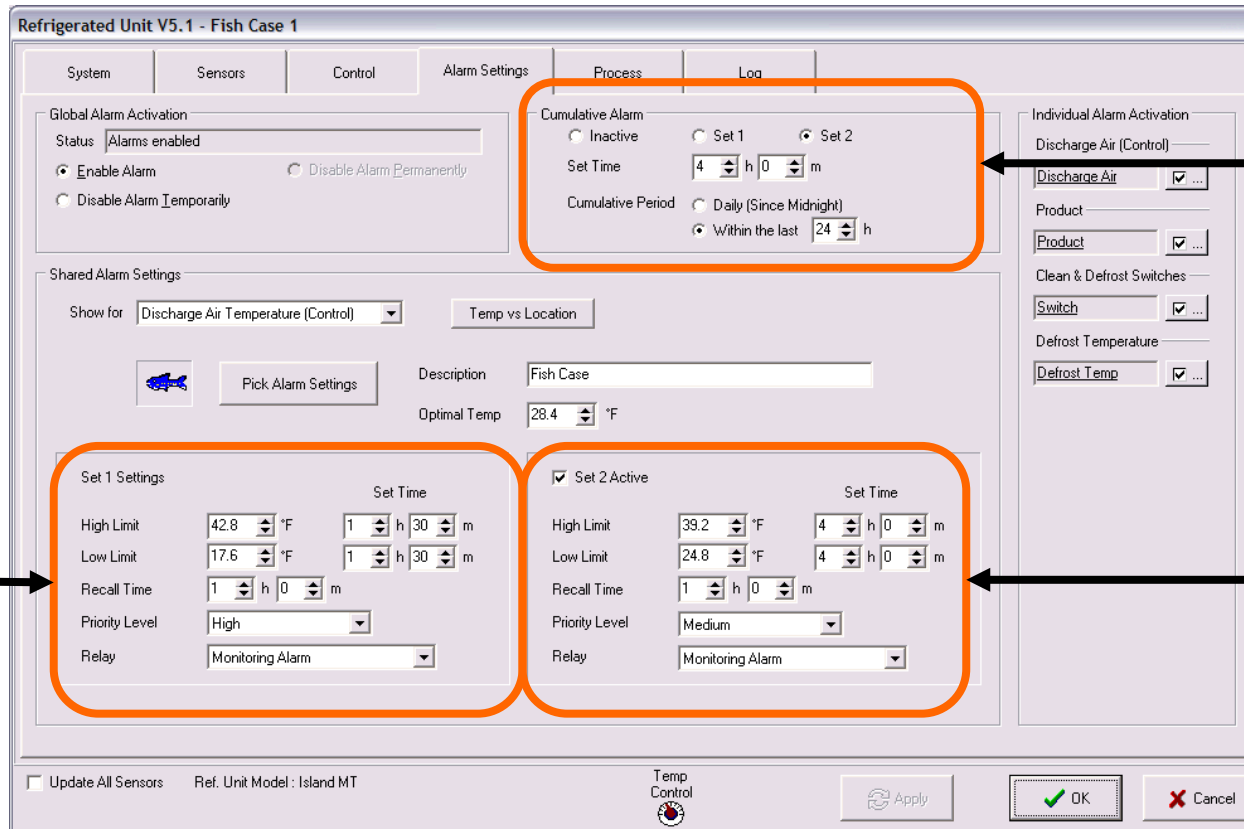
- High and low set points
- User defined priority

## SET 3 CUMULATIVE ALARM – Food Safety

- User defined alarm priority



# Food Safety, Food Quality, and Monitoring



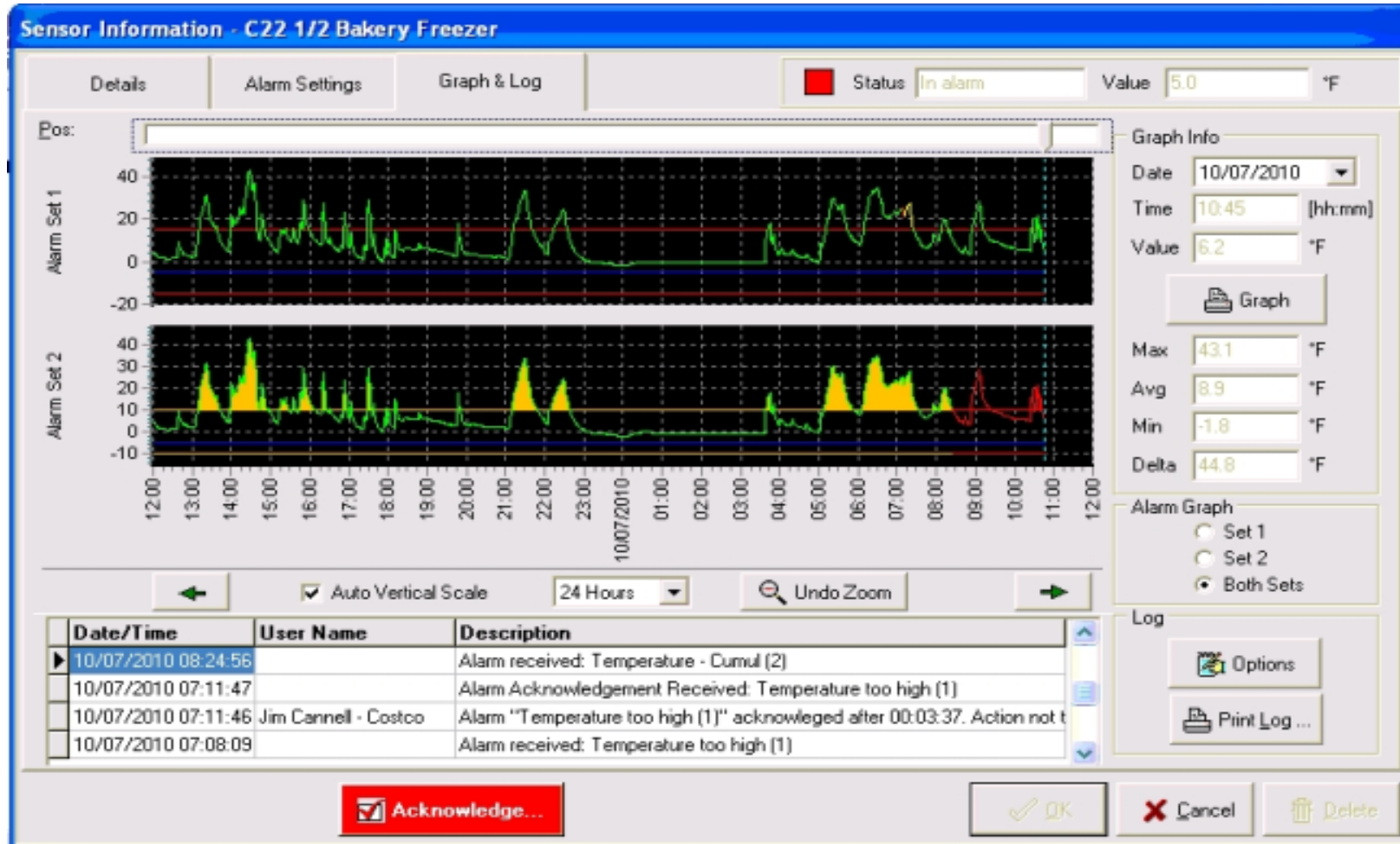
Basic alarming and monitoring capabilities...

Food Safety with Cumulative Alarm function...

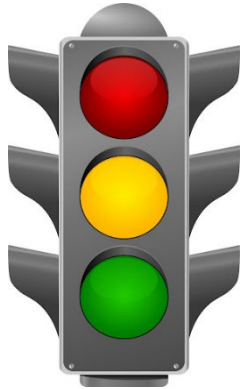
Food Quality and process efficiency with second set of alarm function...

# MICRO THERMO ALLIANCE

## Food Safety



# Alarm Acknowledgement and Resolution



The screenshot displays the Micro Thermo Alliance software interface. At the top, there is a menu bar with options: File, Access, Subsystem, Mode, View, Events, Reports, Options, Tools, Configure, Network, Support, Language, Help. Below the menu is a toolbar with various icons. The main area is divided into several sections:

- Event Log Table:** A table with columns: Priority, Date/Time, Event Source, Event Description, Acknowledged by, At Date/Time, and Subsystem. It shows two high-priority events related to temperature being too high in a fish case.
- Navigation and Status:** Buttons for 'Acknowledge', 'Find', and 'Information'. A status bar shows 'Refrigeration', 'Configuration', and 'MT Demo Store'.
- Floor Plan:** A detailed layout of a store with various zones labeled: Mechanical Room, freezer, Fresh Meat, Fish and Sea Food, MVC, Beer and Wine, Food Court, and Fresh Produce. Green dots represent sensor locations.
- Control Panel:** A 'Monitor' section with buttons for 'MT LOG', 'Rack A', 'Leak an', and 'HVAC AI'. Below it are 'Refrigeration Management' options for 'Schedules' and 'Configuration'. A 'Components' list on the right includes Alarm Relay, Equipment, Label, Node, Plug-In, Point, Refrig. Unit, Router, RU Ctrl, RU Sec Cool, and Sensor, each with a visibility toggle.

MICRO THERMO ALLIANCE

# Accountability · Traceability · Security



The screenshot displays the MT Alliance software interface. At the top, it shows a remote control window for 'MT Alliance - LA 00640 Kauai, HI'. Below this is an event log table with the following data:

Priority	Date/Time	Event Source	Event Description	Acknowledged by	At Date/Time	Subsystem
High	10/07/2010 02:08:03	A12 Meat Prep, Meat Prep	Temperature too low			Refrigeration
Medium	10/06/2010 07:54:05	~RackA\SGR1, Refrigerant Level	Level too low			Refrigeration
Medium	10/05/2010 22:07:26	~RackB\SGR1\CKC1, Circuit 4	EEPFR Failed to Defrost			Refrigeration
Medium	10/05/2010 19:07:14	~RackB\SGR1\CKC1, Circuit 3	EEPFR Failed to Defrost			Refrigeration
Medium	10/05/2010 18:08:13	~RackB\SGR1\CKC1, Circuit 2	EEPFR Failed to Defrost			Refrigeration

Below the event log is a refrigeration management dashboard. It features a floor plan with various temperature sensors and status indicators. The dashboard includes a 'Refrigeration' section with a 'Main' dropdown, a 'Zoom Out' button, and a 'Schedules...' button. The status bar at the bottom indicates 'Normal', 'Frederick D - MTT', and the date/time 'Thu Oct 07, 2010 04:37:28'.

# MICROTHERMO ALLIANCE

## ***Alarm Acknowledgement***



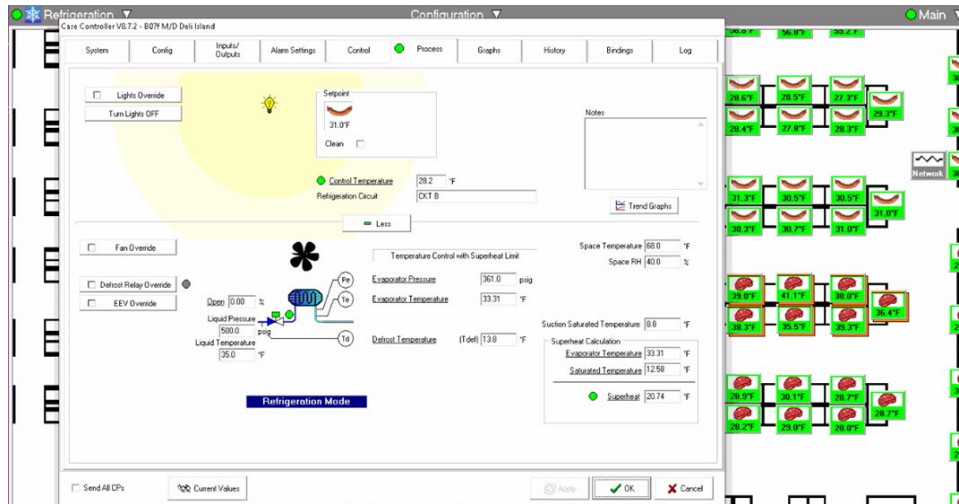


# How-To's & Other Neat Stuff

# Plug-Ins & Nodes

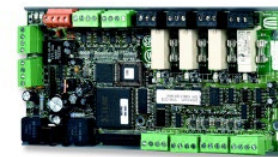
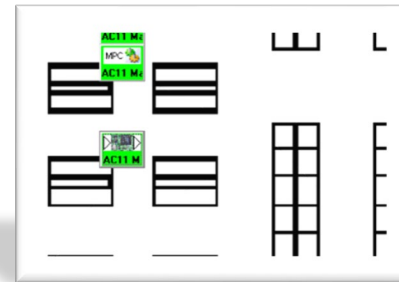
## Plug-In

On-screen button that opens the graphical interface that is used to interact with the node



## Node

On-screen representation of the physical board



How many nodes?

# Install (or replace) a Node

500 Series (individual)

700 Series (embedded)

The image illustrates the process of installing or replacing a node in a control system. On the left, a rack layout shows several units, with one unit labeled 'AC11 M' circled in red. On the right, a software interface displays a 'Nodes' list with a '500 Node' circled in red. A red arrow points from the circled 'AC11 M' unit to the 'Install' button in the software. Another red arrow points from the '500 Node' to the 'Install Node \*xn1\*' dialog box. A yellow circle highlights the 'Replace' button in the software, with a yellow arrow pointing to the 'Install Node \*xn1\*' dialog box. The dialog box shows 'Board Models: MT 500 Family' and 'Identification Method: Service Button'. A board model preview image is also visible.

# Start An Emergency Defrost – 700 Series

1. Find the circuit controller (usually on rack screen)
2. Click the hamburger button of the circuit you want to defrost, select “Actions”
3. Click “Start Emergency Defrost”

The screenshot displays the configuration interface for the AT-700 Circuit Controller V8.7.3 - Rack A. The interface is divided into several sections: 'RACK INFO', a table of circuit controllers, and a detailed view of a selected circuit controller.

**RACK INFO**  
AT-700 Circuit Controller V8.7.3 - Rack A Circuit Controller

System	Process	Defrost	Bindings	I/O Assignments	History	Log
A01 1/4 POS Freezer #1	100.0% -2.0°F 1h 30m...	100.0% -1.9°F 2h 30m...				
A02 1/4 POS Freezer #1						
A03 Spare						
A05 1/4 POS Freezer #2	100.0% -5.3°F 3h 30m...	100.0% -4.7°F 4h 30m...				
A06 1/4 POS Freezer #2						
A07 1/2 Bakery Freezer	100.0% 7.3°F 5h 30m...					
A08 1/2 Meat Cooler	23.7% 28.6°F 23.0°F 30m...					
A09 D/T End Cap	100.0% -12.7°F 8h 0m...					

The detailed view for A06 1/4 POS Freezer #2 shows the following actions:

- Power OFF
- Initialize
- Start Emergency Defrost (highlighted with a red circle)
- Reset Integral Errors
- Learning
- Restart Circuit
- Reset Leak Emergency

Red annotations in the image highlight the 'Rack A' dropdown menu, the hamburger menu of the selected circuit controller, the 'Actions' button, and the 'Start Emergency Defrost' button in the detailed view.

# Set Point – 700 Series EEPR Temp Control

1. Find the circuit controller (usually on rack screen)
2. Click the hamburger button of the circuit you want to defrost, select “Config”
3. Go to the “Air Temperature” tab
4. Change set point

The screenshot displays the configuration interface for a 700 Series EEPR Temp Control. The top panel, titled 'RACK INFO', shows the 'Rack A' configuration with a table of circuit controllers. The bottom panel shows the 'Air Temperature Configuration' window for 'A02 1/4 POS Freezer #1', with the 'Air Temperature' tab selected and the 'Optimal' set point highlighted at 33.8°F.

System	Process	Defrost	Bindings	I/O Assignments	History	Log
A01 1/4 POS Freezer #1	100.0%	-2.0°F				
A02 1/4 POS Freezer #1	100.0%	-1.9°F				
A03 Spare	8.3%					
A05 1/4 POS Freezer #2	100.0%	2.4°F				
A06 1/4 POS Freezer #2	100.0%	2.7°F				
A07 1/2 Bakery Freezer	100.0%	7.3°F				
A08 1/2 Meat Cooler	23.7%	28.6°F				
A09 D/T End Cap	100.0%	-12.7°F				

The 'Air Temperature Configuration' window for 'A02 1/4 POS Freezer #1' shows the following details:

- General: EEPR Valve, Circuit Relays, Lock, Defrost, Walk-ins
- Air Temperature Configuration: Temperature, Floating
- Air Temperature Control: Temperature, Floating
- Optimal: 33.8°F
- Measured: 11.6°F
- Nothing to Configure
- Show Control:
- Buttons: OK, Cancel

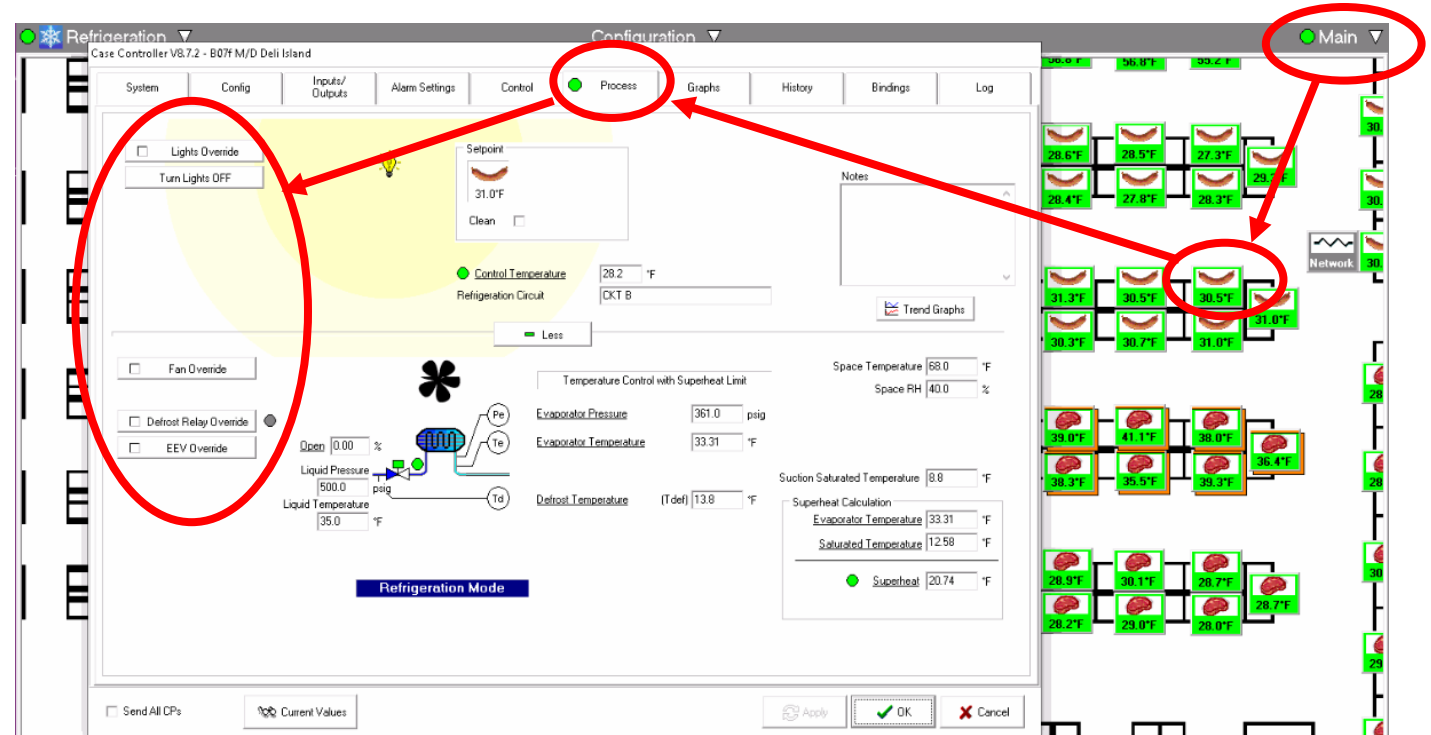
# Set Point – Case Controller Temp Control

1. Find the case controller (usually on Main view)
2. Go to “Alarm Settings” tab
3. Change “Optimal Temp”

The screenshot displays the 'Refrigeration' software interface for 'Case Controller V8.7.2 - B07F M/D Deli Island'. The 'Configuration' menu is open, and the 'Alarm Settings' tab is selected. The 'Control Temperature Alarm' section shows 'Status Alarms enabled' and 'Optimal Temp' set to 31.0°F. The 'Set 1 Settings' section includes fields for High Limit (40.0°F), Low Limit (20.0°F), Recall Time (1 h 0 m), and Priority Level (High). The 'Set 2 Active' section includes fields for High Limit (35.0°F), Low Limit (27.0°F), Recall Time (24 h 0 m), and Priority Level (Notice (No Relay)). A yellow banner at the bottom states 'Optimal Temp is used as the Temperature Set Point'. The background shows a network diagram with various temperature sensors and a 'Main' view indicator circled in red.

# Various Overrides – Case Controller

1. Find the case controller (usually on Main view)
2. Go to “Process” tab
3. Overrides available for:
  1. Lights
  2. Fans
  3. Defrost Relay
  4. EEV



# Override a Compressor – 700 Series

1. Find the suction group controller (usually on rack screen)
2. Click the compressor you want to override, select “configuration”
3. Apply the override

MT-700 Suction Group Controller V8.7.3 - Rack A Suction Controller

System Process I/O Assignments Bindings Log

Rack Rack A Normal

Discharge Groups

DG1: Rack A Press: 158.8 psig Temp: 195.6 °F

Suction Groups

SG1: Rack A-28

Configuration

History

Actions

Duplicate

Delete

General

Identification

Rack A SG1 Comp 2

Model Number 6HE-28Y

Serial Number

Settings

Compressor Type Variable Speed (0-10 V)

Discharge Group DG1: Rack A

Capacity 95500.0 Btu/h

Maximum Frequency 60 Hz @ 10.00 V

Minimum Frequency 0 Hz @ 0.00 V

Initial Frequency 0 Hz @ 0.00 V

Drive Fault Retries 5

Drive Reset Duration 00:10 mm:ss

Minimum On Time 00:05:00 hh:mm:ss

Minimum Off Time 00:02:30 hh:mm:ss

Compressor Relay On Delay 00:05 mm:ss

Drive Enable On Delay 00:05 mm:ss

Override

Dedicated to Hot Gas Defrost

Override Command No Override On Off

Rack A

Nodes

Rack A Suction Controller

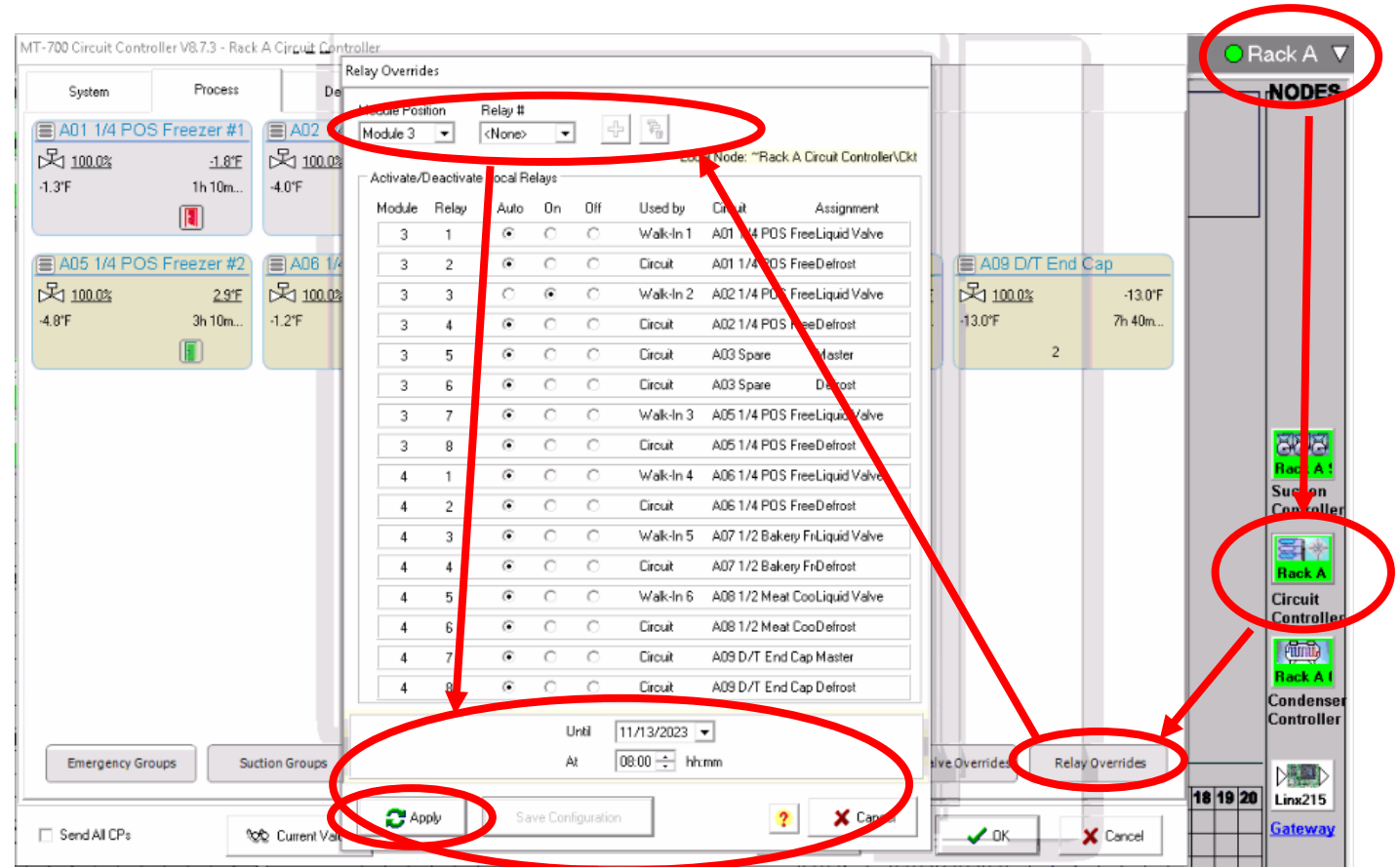
Rack A Circuit Controller

Rack A Condenser Controller



# Override a Circuit Relay – 700 Series

1. Find the circuit controller (usually on rack screen)
2. Click “Relay Overrides”
3. Populate the List
4. Apply the Override(s)



# Override an EEPR – 700 Series

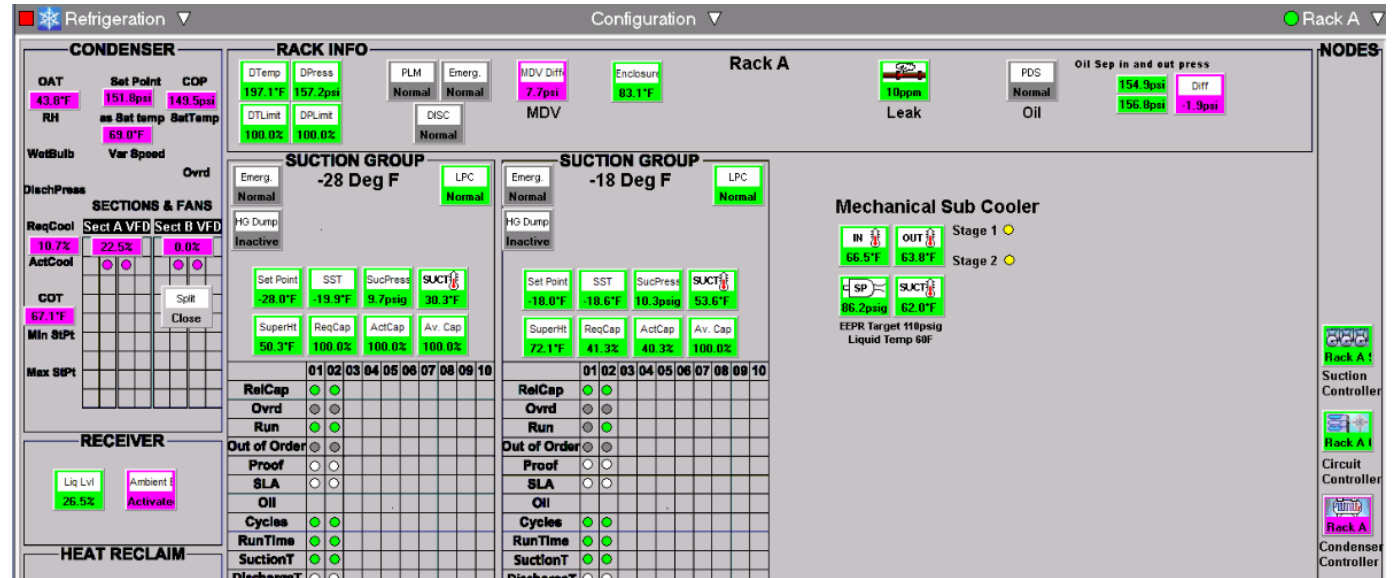
1. Find the circuit controller (usually on rack screen)
2. Click “EEPR Valve Overrides”
3. Populate the List
4. Apply the Override(s)

The screenshot shows the MT-700 Circuit Controller software interface. The 'EEPR Valve Overrides' dialog box is open, displaying a table of circuit controllers. The 'Circuit' dropdown menu is set to '<None>'. The 'Apply' button is highlighted with a red circle. The 'Rack A' dropdown menu in the top right corner is also highlighted with a red circle. The 'EEPR Valve Overrides' button is highlighted with a red circle. The 'Apply' button is highlighted with a red circle. The 'Circuit' dropdown menu is highlighted with a red circle. The table below shows the list of circuit controllers:

Circuit	Module	Drive	Target [%]	Value [%]
A01 1/4 POS Freezer #1	2	1	100.00	100.0%
A02 1/4 POS Freezer #1	2	2	100.00	100.0%
A03 Spare	2	3	100.00	8.3%
A05 1/4 POS Freezer #2	2	4	100.00	100.0%
A06 1/4 POS Freezer #2	2	5	100.00	100.0%
A07 1/2 Bakery Freezer	2	6	100.00	100.0%
A08 1/2 Meat Cooler	2	7	100.00	17.1%
A09 D/T End Cap	2	8	100.00	100.0%

# The Purple Button

1. Right click on any node, point, sensor, etc.
2. Select “highlight connections”
3. All connections turn purple.
4. Right click again and select “cancel highlight” to clear the purple color.



# FACILITY MANAGEMENT

# System Log (Operating System)

The screenshot shows the 'System Log V7.5.1' window from the MT Alliance V7.5.1.621 software. The window title bar includes the application name and standard window controls. The main area contains a table of system events with columns for Date, Time, Severity, Message, and Application. The table lists various login and logout events for users like Heidi Meher-Aldi Shitt, Joe Dudar, and ABC Tech, along with an unknown user login attempt. A filter panel on the right allows for filtering by From-To date, Severity Level, and Application. The status bar at the bottom shows 'Normal', 'Charles J Cunliffe - MTT', and 'Fri Jun 01, 2018 12:22:45'.

Date	Time	Severity	Message	Application
05/31/2018	10:44:55	Information	User "Amber Marriott Aldi Shitt" logged in for 15 minutes.	Alliance
05/29/2018	08:19:27	Information	User "Heidi Meher-Aldi Shitt" logged out automatically.	Alliance
05/29/2018	08:04:27	Information	User "Heidi Meher-Aldi Shitt" logged in for 15 minutes.	Alliance
05/28/2018	12:21:50	Information	User "Joe Dudar - Aldi's" logged out automatically.	Alliance
05/28/2018	12:06:50	Information	User "Joe Dudar - Aldi's" logged in for 15 minutes.	Alliance
05/28/2018	09:35:14	Information	User "Joe Dudar - Aldi's" logged out automatically.	Alliance
05/28/2018	09:20:14	Information	User "Joe Dudar - Aldi's" logged in for 15 minutes.	Alliance
05/27/2018	11:14:39	Information	User "Heidi Meher-Aldi Shitt" logged out automatically.	Alliance
05/27/2018	10:59:39	Information	User "Heidi Meher-Aldi Shitt" logged in for 15 minutes.	Alliance
05/26/2018	09:45:30	Information	User "Heidi Meher-Aldi Shitt" logged out automatically.	Alliance
05/26/2018	09:30:30	Information	User "Heidi Meher-Aldi Shitt" logged in for 15 minutes.	Alliance
05/26/2018	09:16:58	Information	User "Heidi Meher-Aldi Shitt" logged out automatically.	Alliance
05/26/2018	09:01:58	Information	User "Heidi Meher-Aldi Shitt" logged in for 15 minutes.	Alliance
05/26/2018	08:08:21	Information	User "Heidi Meher-Aldi Shitt" logged out automatically.	Alliance
05/26/2018	07:53:21	Information	User "Heidi Meher-Aldi Shitt" logged in for 15 minutes.	Alliance
05/25/2018	16:21:14	Information	User "Heidi Meher-Aldi Shitt" logged out automatically.	Alliance
05/25/2018	16:06:14	Information	User "Heidi Meher-Aldi Shitt" logged in for 15 minutes.	Alliance
05/25/2018	13:47:37	Information	User "Heidi Meher-Aldi Shitt" logged out automatically.	Alliance
05/25/2018	13:32:37	Information	User "Heidi Meher-Aldi Shitt" logged in for 15 minutes.	Alliance
05/25/2018	13:32:27	Information	An unknown user tried to log on with account "dj37" while user "David Jackson" was logged on.	Alliance
05/25/2018	12:29:25	Information	User "David Jackson" logged out automatically.	Alliance
05/25/2018	12:14:25	Information	User "David Jackson" logged in for 15 minutes.	Alliance
05/25/2018	12:14:19	Information	An unknown user tried to log on with account "37dj" while user "ABC Tech" was logged on.	Alliance
05/24/2018	16:45:09	Information	User "ABC Tech" logged out automatically.	Alliance
05/24/2018	16:30:09	Information	User "ABC Tech" logged in for 15 minutes.	Alliance
05/24/2018	16:30:04	Information	User "ABC Tech" logged out automatically.	Alliance
05/24/2018	16:15:04	Information	User "ABC Tech" logged in for 15 minutes.	Alliance
05/24/2018	16:11:06	Information	User "ABC Tech" logged out.	Alliance
05/24/2018	15:36:30	Information	User "ABC Tech" logged in for 4 hours.	Alliance
05/24/2018	15:36:23	Information	User "ABC Tech" logged out automatically.	Alliance
05/24/2018	15:21:23	Information	User "ABC Tech" logged in for 15 minutes.	Alliance
05/24/2018	15:21:14	Information	User "ABC Tech" logged out automatically.	Alliance
05/24/2018	15:06:14	Information	User "ABC Tech" logged in for 15 minutes.	Alliance
05/24/2018	15:03:10	Information	User "Heidi Meher-Aldi Shitt" logged out automatically.	Alliance
05/24/2018	14:48:10	Information	User "Heidi Meher-Aldi Shitt" logged in for 15 minutes.	Alliance



# FACILITY MANAGEMENT

# Changes Made by Users



MT Alliance V7.5.1.621 , Aldi's Amsterdam

File Access Subsystem Mode View Events Reports Options Tools Configure Network Support Language Help

### Changes Made By Users V7.5.1

Move the columns and/or click on their headers to change the sorting.

Date and Time	User name	Identification	Component	Description
05/24/2018 16:31:...	ABC Tech	Log Book	Equipment	changed A04 to meat cooler set point of 32 degrees as per manager
05/24/2018 16:27:...	ABC Tech	A04 Meat Cooler	Plug-in	Set 1 Alarm High Set Time changed from 2h 0m to 1h 30m for all Case Ctrls of the lineup
05/24/2018 16:27:...	ABC Tech	A04 Meat Cooler	Plug-in	Set 1 Alarm Low Set Time changed from 2h 0m to 1h 30m for all Case Ctrls of the lineup
05/24/2018 16:26:...	ABC Tech	A04 Meat Cooler	Plug-in	Evaporator Pressure - Send On Delta (Fast) changed from 2.6psi to 2.7psi for all Case Ctrls of the lineup
05/24/2018 16:26:...	ABC Tech	A04 Meat Cooler	Plug-in	Set 1 Alarm High Set Time changed from 1h 30m to 2h 0m for all Case Ctrls of the lineup
05/24/2018 16:26:...	ABC Tech	A04 Meat Cooler	Plug-in	Set 1 Alarm Low Set Time changed from 1h 30m to 2h 0m for all Case Ctrls of the lineup
05/24/2018 16:26:...	ABC Tech	A04 Meat Cooler	Plug-in	Set 1 Description changed from "" to "Fresh Meat Cooler" for all Case Ctrls of the lineup
05/24/2018 16:26:...	ABC Tech	A04 Meat Cooler	Plug-in	Set 1 High Limit changed from 38.0°F to 42.8°F for all Case Ctrls of the lineup
05/24/2018 16:26:...	ABC Tech	A04 Meat Cooler	Plug-in	Set 1 Low Limit changed from 24.0°F to 17.6°F for all Case Ctrls of the lineup
05/24/2018 16:26:...	ABC Tech	A04 Meat Cooler	Plug-in	Set 1 Setpoint changed from 28.0°F to 32.0°F for all Case Ctrls of the lineup
05/21/2018 14:08:...	Evan Aschow - MTT	LT-TC Rack (MT5...	Plug-in	Floating Suction Pressure-Float Limit changed from 2.0°F to 3.0°F
05/17/2018 09:28:...	Ray McWayne - ABC ...	Log Book	Equipment	Oil level alarm 04:00, attributed to low-load condition, no fill cycles from separator. Added one gallon oi...
05/14/2018 15:27:...	ABC Tech	A05a Dairy Cooler	Plug-in	Cleaning Until set to 05/14/2018 16:26:59
05/14/2018 15:25:...	ABC Tech	A05b Dairy Cooler	Plug-in	Cleaning Until set to 05/14/2018 16:25:54
05/13/2018 17:27:...	Evan Aschow - MTT	B#1 Defrost 722F	Plug-in	Circuit 1-Maximum active Defrost duration changed from 45m to 56m
05/13/2018 17:27:...	Evan Aschow - MTT	B#1 Defrost 722F	Plug-in	Circuit 1-Minimum active Defrost duration changed from 44m to 55m
05/13/2018 13:26:...	Evan Aschow - MTT	B#1 Defrost 722F	Plug-in	Start Circuit 1 Defrost
05/13/2018 13:26:...	Evan Aschow - MTT	B#1 Defrost 722F	Plug-in	Start Circuit 1 Defrost
05/13/2018 13:08:...	Evan Aschow - MTT	LT-TC Rack (MT5...	Plug-in	Capacity-Suction Temp Integral Band Time Constant changed from 20m to 8m
05/13/2018 13:08:...	Evan Aschow - MTT	LT-TC Rack (MT5...	Plug-in	Floating Suction Pressure-Float Interval changed from 10m 0s to 5m 0s
05/13/2018 13:08:...	Evan Aschow - MTT	LT-TC Rack (MT5...	Plug-in	Suction Saturated Temp Alarm-Low Limit changed from -35.0°F to -39.9°F
05/13/2018 02:58:...	Evan Aschow - MTT	A01b Grocery Free...	Plug-in	Superheat - Band changed from 4.0°F to 7.0°F for all Case Ctrls of the lineup
05/13/2018 02:52:...	Evan Aschow - MTT	A01a Grocery Free...	Plug-in	Superheat - Band changed from 4.0°F to 7.0°F for all Case Ctrls of the lineup
05/13/2018 02:12:...	Evan Aschow - MTT	B#1 Defrost 722F	Plug-in	Start Circuit 1 Defrost
05/13/2018 02:09:...	Evan Aschow - MTT	A09b 24' Deli	Plug-in	Defrost - Drip Time After End Defrost changed from "03:00" to "00:00" for all Case Ctrls of the lineup
05/13/2018 02:09:...	Evan Aschow - MTT	A09a 24' Deli	Plug-in	Defrost - Contributes changed from "False" to "True" for all Case Ctrls of the lineup
05/13/2018 02:09:...	Evan Aschow - MTT	A09a 24' Deli	Plug-in	Defrost - Drip Time After End Defrost changed from "03:00" to "00:00" for all Case Ctrls of the lineup
05/13/2018 02:09:...	Evan Aschow - MTT	A09a 24' Deli	Plug-in	Defrost - End Defrost Temperature changed from 621.81°F to 52.00°F for all Case Ctrls of the lineup

Found 67 changes

Filters

From-To Day

From 05/01/2018 To 06/01/2018

User name All user names

Component All components

Where Description contains

Changes Maintenance Both

Print Apply OK

Normal Charles J Cunliffe - MTT Fri Jun 01, 2018 12:13:24

# FACILITY MANAGEMENT

# Acknowledged Events

The screenshot displays a software window titled "Acknowledged Events" under the "Refrigeration" configuration. The window shows a list of events with the following columns: Priority, Date/Time, Event Source, Event Description, Acknowledged by, At Date/Time, After, and Subsystem. The events are sorted by date, with the most recent at the top. The interface also includes a search bar, a "Find" button, and a "Main" dropdown menu. The status bar at the bottom indicates the user is "Charlie Cunliffe MTT" and the date is "Mon Mar 14, 2016 14:08:42".

Priority	Date/Time	Event Source	Event Description	Acknowledged by	At Date/Time	After	Subsystem
Medium	03/14/2016 13:27:14	~B06b Top Service Deli, Su	Alarm too low	Charlie Cunliffe MTT	03/14/2016 14:00:47	00:33:33	Refrigeration
Medium	03/13/2016 16:35:32	~B06b Top Service Deli, Su	Alarm too low	Brent Beishuizen zm	03/14/2016 09:47:07	17:11:35	Refrigeration
High	03/13/2016 10:34:33	~B19c Salad Bar	Node Test Failed	Brent Beishuizen zm	03/14/2016 09:46:18	23:11:44	Refrigeration
High	03/13/2016 10:33:11	~B19b Salad Bar	Node Test Failed	Brent Beishuizen zm	03/14/2016 09:46:18	23:13:07	Refrigeration
High	03/13/2016 10:31:48	~B19a Salad Bar	Node Test Failed	Brent Beishuizen zm	03/14/2016 09:46:18	23:14:30	Refrigeration
High	03/13/2016 08:45:54	B#5 DT SecCool Rack B 17	Fail	Brent Beishuizen zm	03/14/2016 09:47:06	> 24:00:00	Refrigeration
High	03/13/2016 07:17:02	B#5 DT SecCool Rack B 17	Fail	Brock Lichty	03/13/2016 07:45:55	00:28:53	Refrigeration
Medium	03/12/2016 21:42:42	~B06b Top Service Deli, Su	Alarm too low	Brock Lichty	03/13/2016 07:46:15	10:03:33	Refrigeration
Medium	03/12/2016 15:16:02	~B06b Top Service Deli, Su	Alarm too low	Brent Beishuizen zm	03/12/2016 18:01:02	02:45:00	Refrigeration
High	03/12/2016 10:29:40	~A05 Ice Cream Freezer\Co	Temperature too high	John Aloia	03/12/2016 10:43:46	00:14:06	Refrigeration
Medium	03/10/2016 23:09:07	~B06b Top Service Deli, Su	Alarm too low	John Aloia	03/12/2016 10:44:32	> 24:00:00	Refrigeration
High	03/08/2016 16:43:53	B#3 Oil Management Rack	Oil Level High	Scott Moore	03/08/2016 17:09:48	00:25:55	Refrigeration
High	03/08/2016 16:38:25	B#3 Oil Management Rack	Oil Failure	Scott Moore	03/08/2016 17:10:06	00:31:41	Refrigeration
High	03/08/2016 13:06:56	B#3 Oil Management Rack	Oil Level Low	John Aloia	03/08/2016 13:12:38	00:05:42	Refrigeration
High	03/07/2016 04:26:20	~B19c Salad Bar\Control Te	Temperature too high	williams Sluis	03/07/2016 04:30:15	00:03:55	Refrigeration
Medium	03/06/2016 05:50:00	~AA12Ab DT Coffin, SuperH	Alarm too low	williams Sluis	03/07/2016 04:30:34	22:40:34	Refrigeration
High	03/04/2016 22:44:06	Leak Detector 1, Zone 3	Refrigerant leak (set 1)	williams Sluis	03/04/2016 22:45:16	00:01:10	Refrigeration
High	02/24/2016 13:37:19	~A04b Grocery Freezer\Cor	Temperature too high	Brent Beishuizen zm	02/24/2016 13:53:39	00:16:20	Refrigeration
High	02/24/2016 13:37:18	~A04a Grocery Freezer\Cor	Temperature too high	Brent Beishuizen zm	02/24/2016 13:40:34	00:03:16	Refrigeration
High	02/24/2016 12:31:12	~A04b Grocery Freezer\Cor	Temperature too high	John Aloia	02/24/2016 12:37:19	00:06:07	Refrigeration
High	02/24/2016 12:30:57	~A04a Grocery Freezer\Cor	Temperature too high	John Aloia	02/24/2016 12:37:17	00:06:20	Refrigeration
High	02/24/2016 11:36:14	Leak Detector 1, Zone 3	Refrigerant leak (set 1)	John Aloia	02/24/2016 11:38:06	00:01:52	Refrigeration
High	02/24/2016 10:55:42	Leak Detector 1, Zone 3	Critical refrigerant leak (set 2)	John Aloia	02/24/2016 11:38:05	00:42:23	Refrigeration



# Acknowledged Events Statistics

**ACKNOWLEDGED EVENTS STATISTICS**  
 FROM 04/02/2018 TO 06/01/2018 FOR REFRIGERATION

Alliance  
Version 7.5

Firm:  
 Address: 4888 State Hwy 30 Amsterdam, NY 12010  
 Owner:  
 Chain: Aldi's

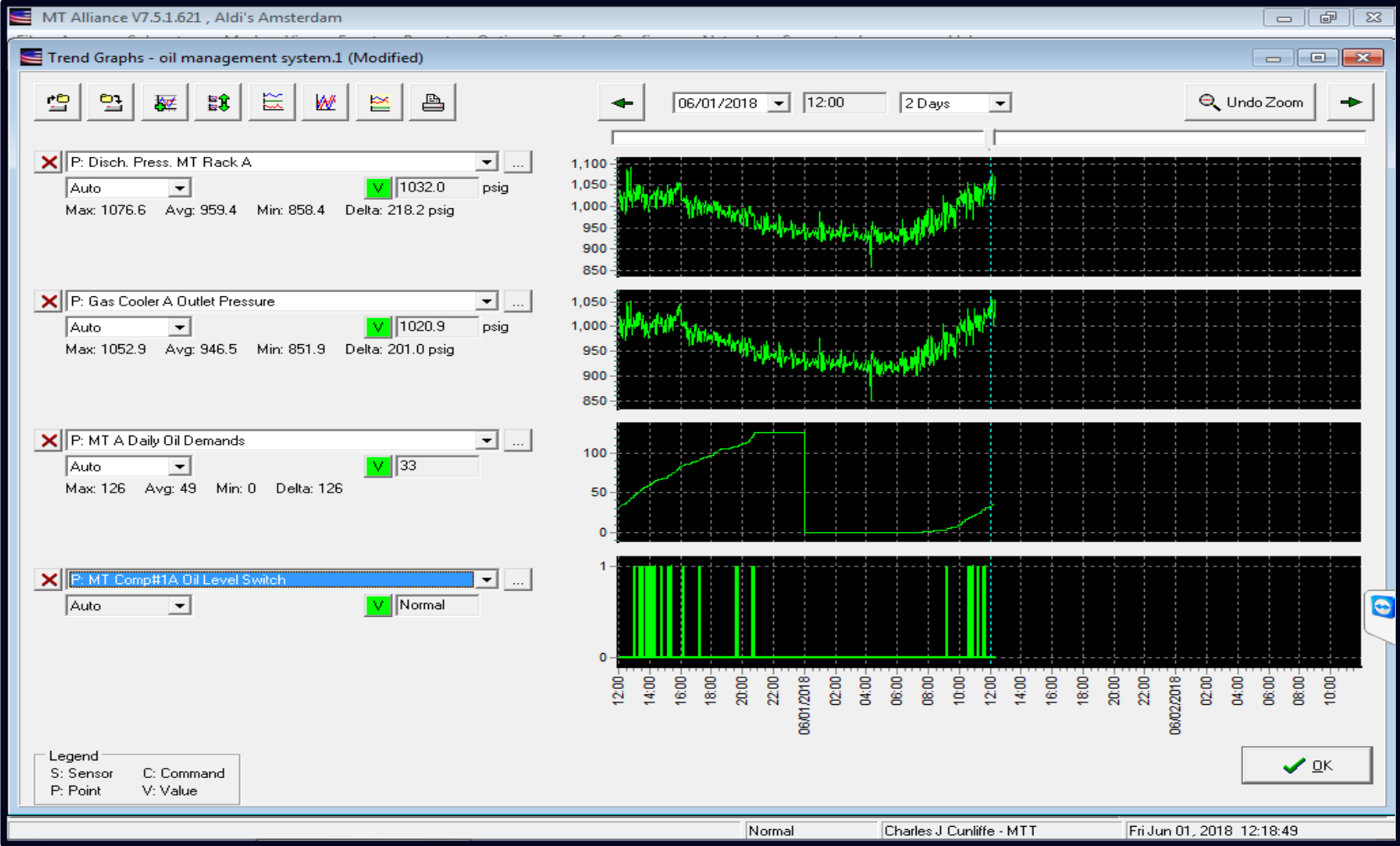
View	Source	Events	Recalls	Hours
<b>Sensor Alarms</b>				
Main	~A01a Grocery Freezer/Control Temp	2	0	0.26
Main	~A01b Grocery Freezer/Control Temp	2	0	0.22
RackA Co2	Leak Detector Rack A	1	0	0.20
<b>Total</b>		<b>5</b>	<b>0</b>	<b>0.69</b>
<b>Object Alarms - Custom Nodes</b>				
Main	~A01a Grocery Freezer, Door Ajar	59	0	57.09
Main	~A04 Meat Cooler, Door Ajar	7	0	3.82
Main	~A05a Dairy Cooler, Door Ajar	47	0	46.31
Main	~A05b Dairy Cooler, Superheat	2	0	3.98
RackA Co2	LT-TC Rack (MT504) Rack A, Emergency shut off	1	0	0.05
RackA Co2	LT-TC Rack (MT504) Rack A, Saturated Suction Temp	1	0	0.04
RackA Co2	LT-TC Rack (MT504) Rack A, Superheat	1	0	0.20
RackA Co2	MT-TC Rack (MT504) Rack A, Emergency shut off	1	0	0.06
RackA Oil	B#3 Oil Management (MT504), Reservoir 1	1	0	3.21
RackA Oil	B#3 Oil Management (MT504), Separator 1	1	0	0.20
<b>Total</b>		<b>121</b>	<b>0</b>	<b>114.96</b>
<b>Grand Total</b>		<b>126</b>	<b>0</b>	<b>115.64</b>

--- End of Report ---



# FACILITY MANAGEMENT

# Trend Graphs



Max.  
7 graphs  
per  
screen



# Drop Labels

Mechanical Sub Cooler

IN 55.4°F OUT 37.5°F Stage 1 ●  
SP 71.1°F SUCT 53.9°F Stage 2 ●

Pick Label

Caption

Re-enable compressor 2 unloader 2 on -18 group after it is replaced!

Visibility

Always visible  
 Maintenance and Configuration  
 Configuration only

From now on, "Shift - Click" or "Right - Click" on the label to edit the text.

Refrigeration Management

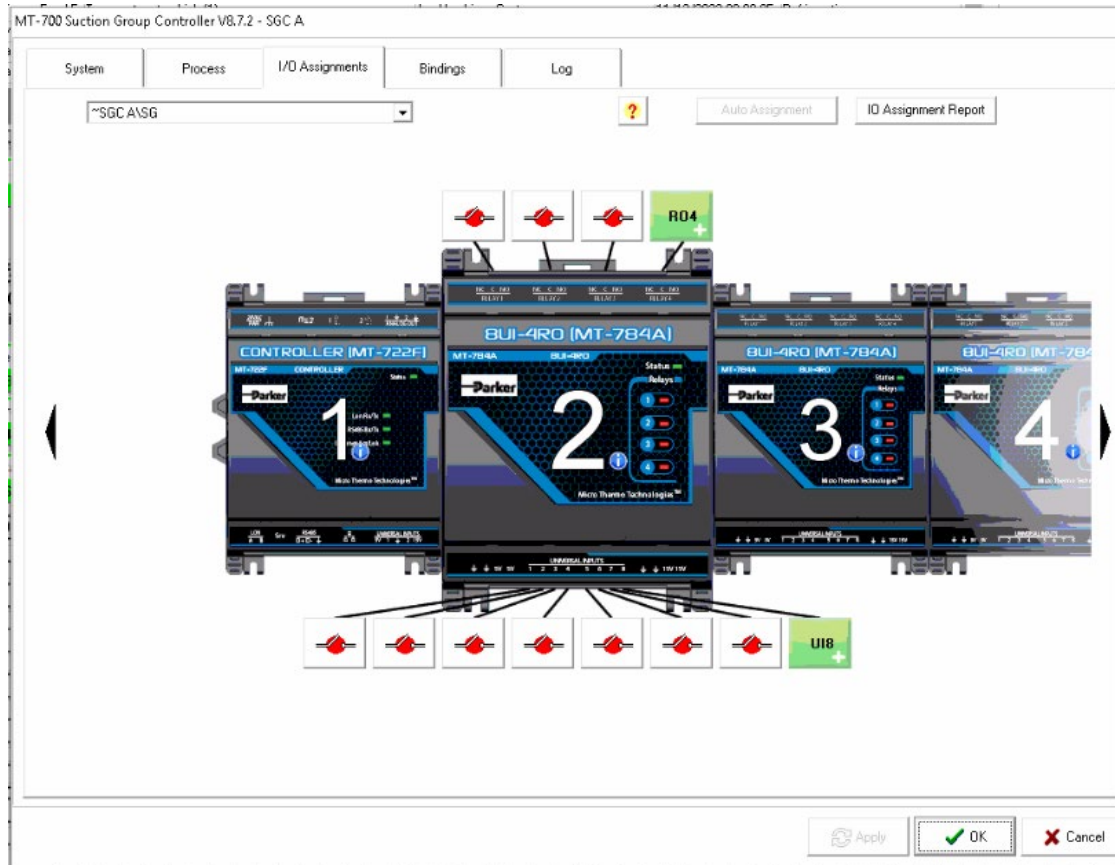
Schedules Configuration

Components Visibility

Alarm Relay	<input checked="" type="checkbox"/>
CASE Case PWM	<input checked="" type="checkbox"/>
CASE Case Stepper	<input checked="" type="checkbox"/>
Equipment	<input checked="" type="checkbox"/>
ABC Label	<input checked="" type="checkbox"/>
Node	<input checked="" type="checkbox"/>
Plug-In	<input checked="" type="checkbox"/>
Point	<input checked="" type="checkbox"/>

Use as reminders, warnings, or instructions

# I/O Assignments



# Share Your Feedback!



**To receive an electronic training certificate:**

1. Scan or visit [nasrc.org/session-surveys](https://nasrc.org/session-surveys)
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***Please Note:*** You will not receive a certificate unless you share your name on the survey form.

## Micro Thermo Alliance

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