

Natural Refrigerant Training Summit

Building a Sustainable Workforce

Micro Thermo[®] Alliance Application, Navigation, and On-board Tools

Charlie Cunliffe - MicroThermo
Parker Hannifin, Sporlan Division



NORTH AMERICAN
Sustainable
Refrigeration
Council

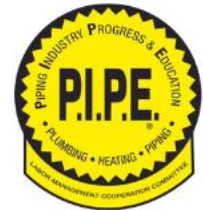


NORTH AMERICAN
Sustainable
Refrigeration
Council

Natural Refrigerant Training Summit

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Basic Sponsors



North American Sustainable Refrigeration Council (NASRC)

Mission Create sustainable future for supermarket refrigeration by removing barriers to natural refrigerant adoption

➤ **501c3**
Non-Profit Organization

➤ **150+**
Members

➤ **51,000+**
Food Retail Locations

Goals

- **Build sustainable workforce**
- Increase funding options
- Increase education & awareness

Natural Refrigerants

Carbon Dioxide
R744

Propane
R290

Ammonia
R717

Need help? Look for NASRC staff!



Danielle Wright
Executive Director



Morgan Smith
Program & Communications Director



Jeanne Ackerman
Membership & Communications
Coordinator



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Visit us at [sce.com/classes](https://www.sce.com/classes) or scan the QR code.



Before we get started...

- Please make sure you sign in by the door
- To receive an electronic certificate for this training:
 - Complete the survey at the end of the session
 - Share your name and email at the end of the survey



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[®] based graphical format



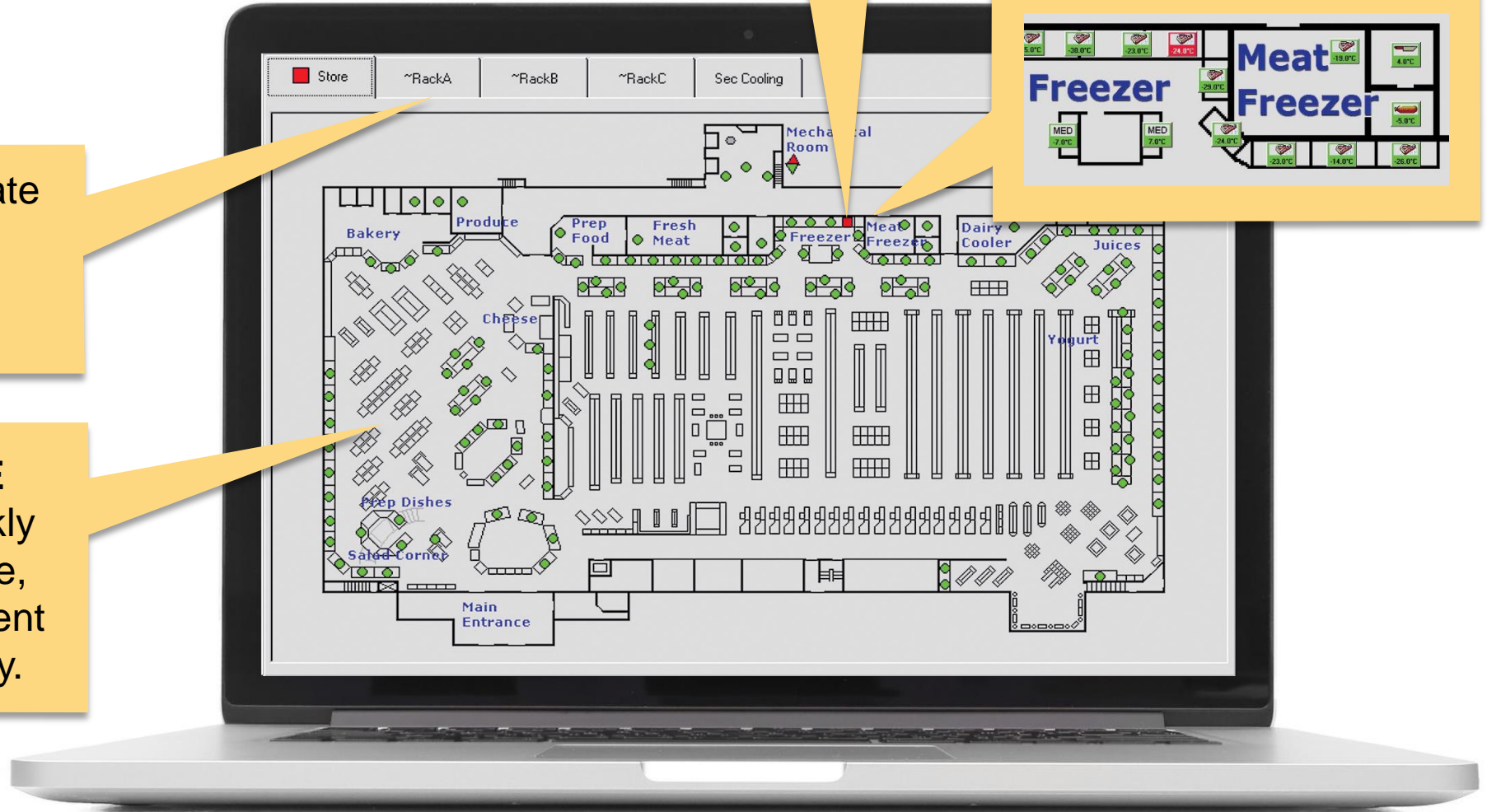
It's All Connected

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

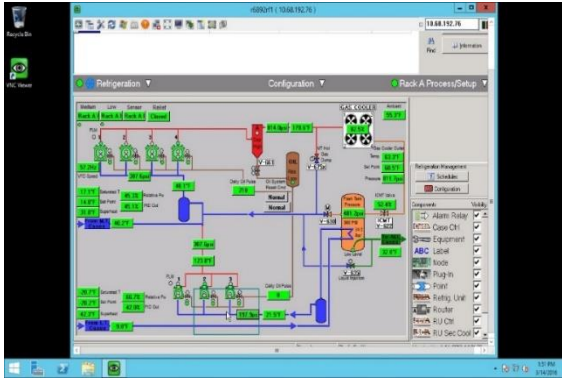
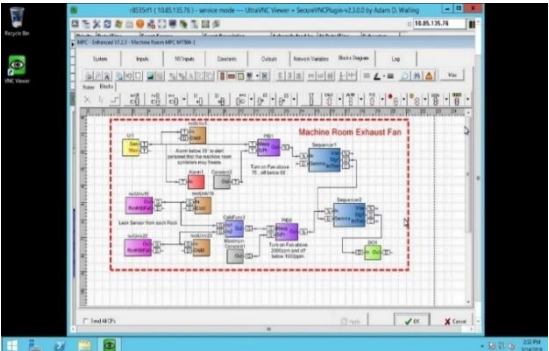
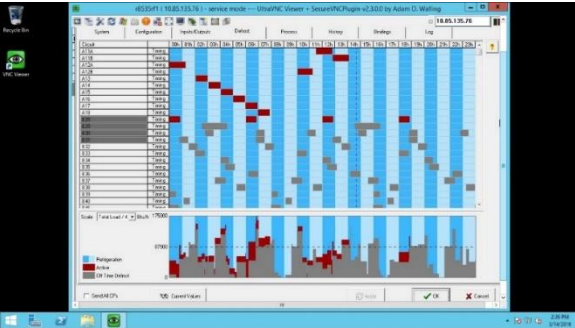
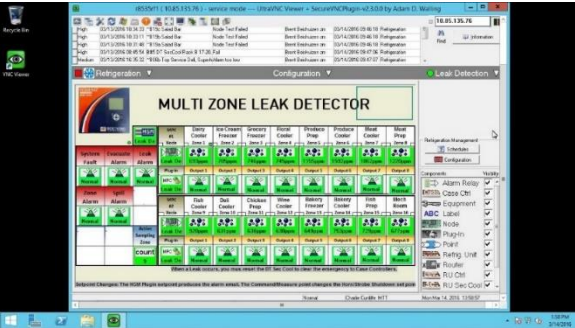
COMPREHENSIVE OVERVIEW - Quickly scan the entire store, see that all equipment is operating properly.

COLOR-CODED INDICATORS - Identifies alarm situations.

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

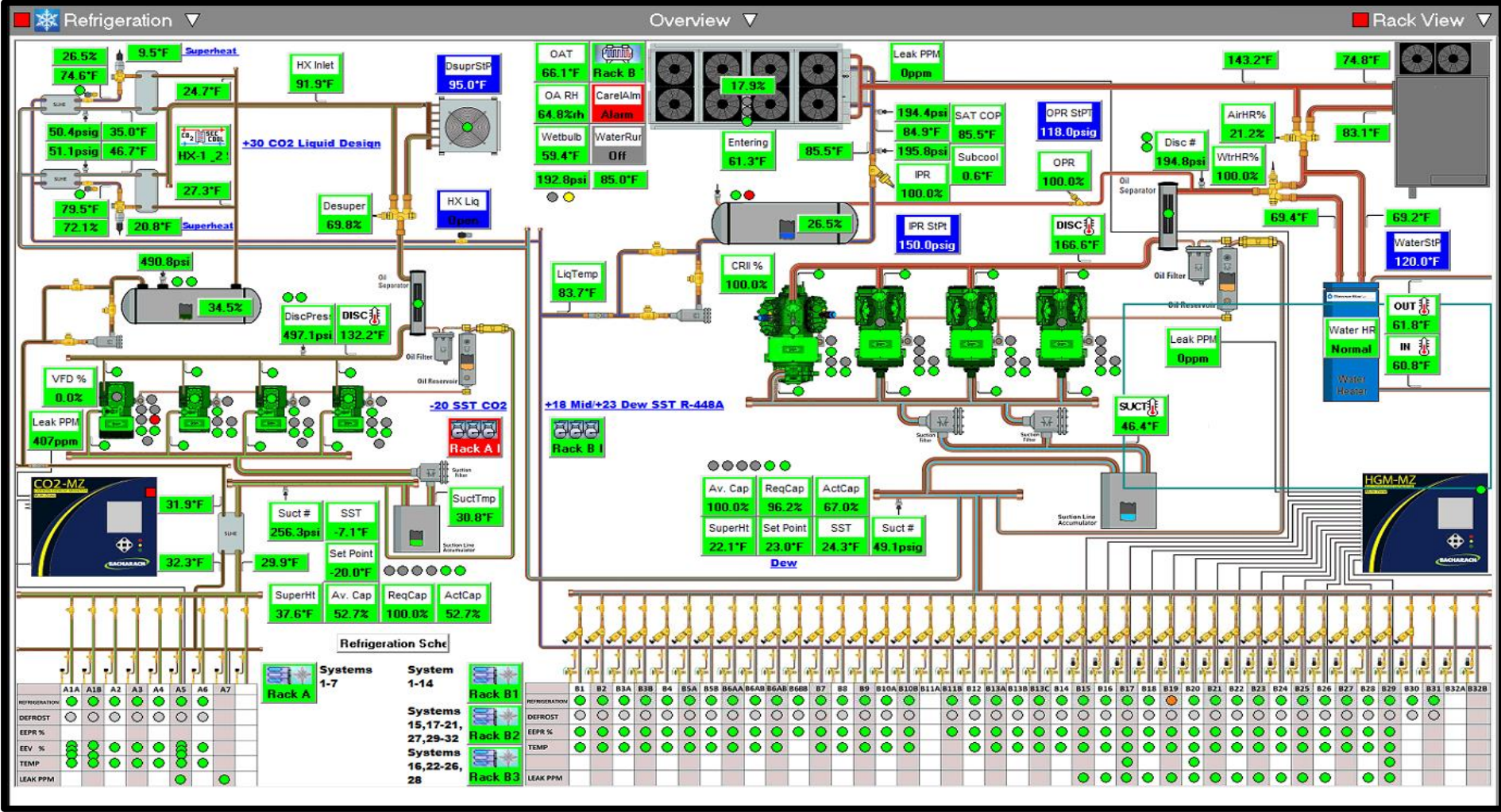


MICRO THERMO ALLIANCE Subsystem Access



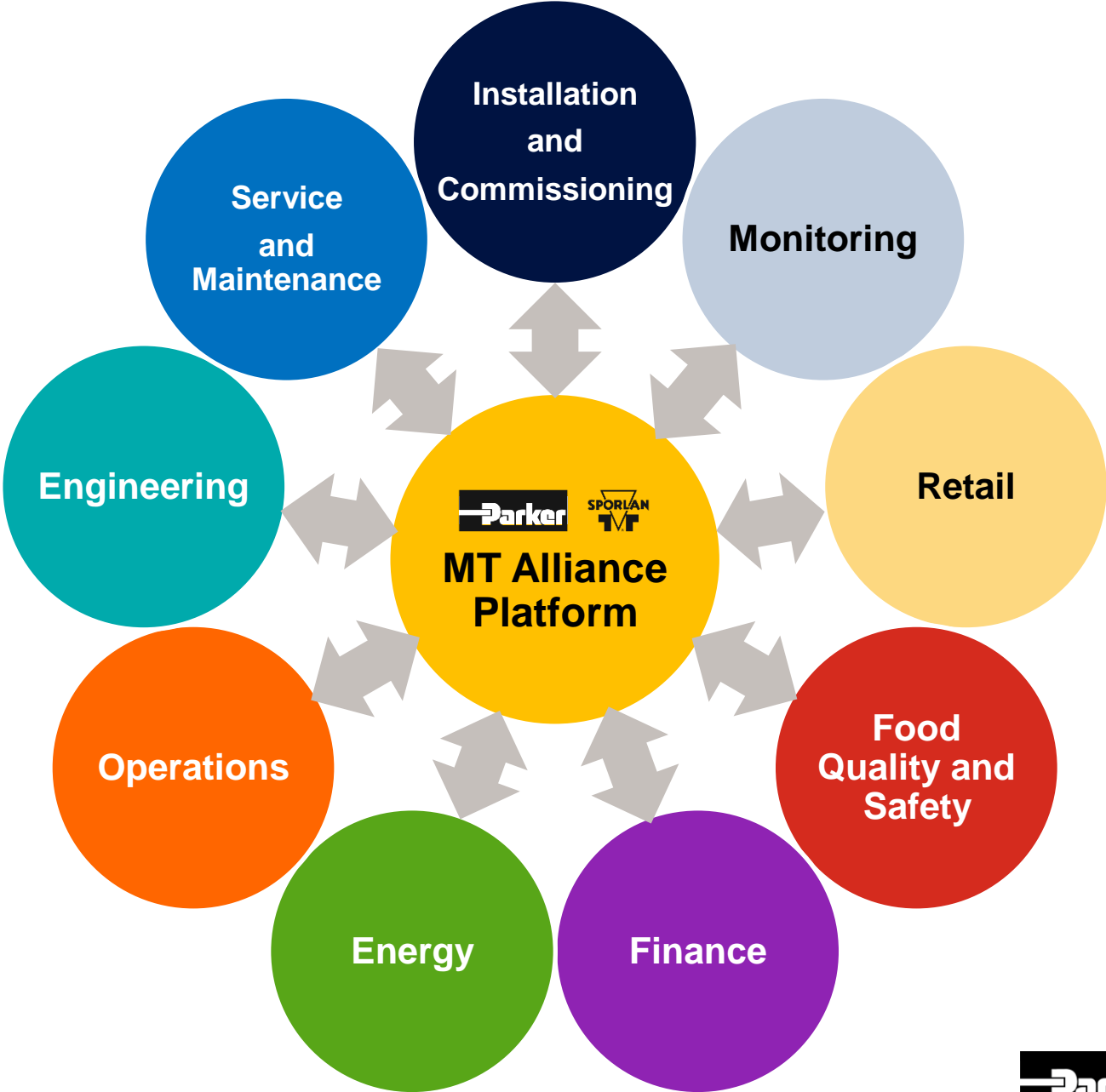
Virtual/Interactive View of a Refrigeration System

Supermarket...Commercial...Industrial



Micro Thermo Alliance

The power of information!



FACILITY Control

- Supermarkets
- 300+ CO₂ 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



FACILITY Goals & Needs

- Reduce food loss and improving food quality
- Extend product shelf life
- Optimize temperature control
 - Product and environment
- Reduce service costs
- Reduce energy costs
- Reduce management costs
- Reduce facility costs
- Increase profitability



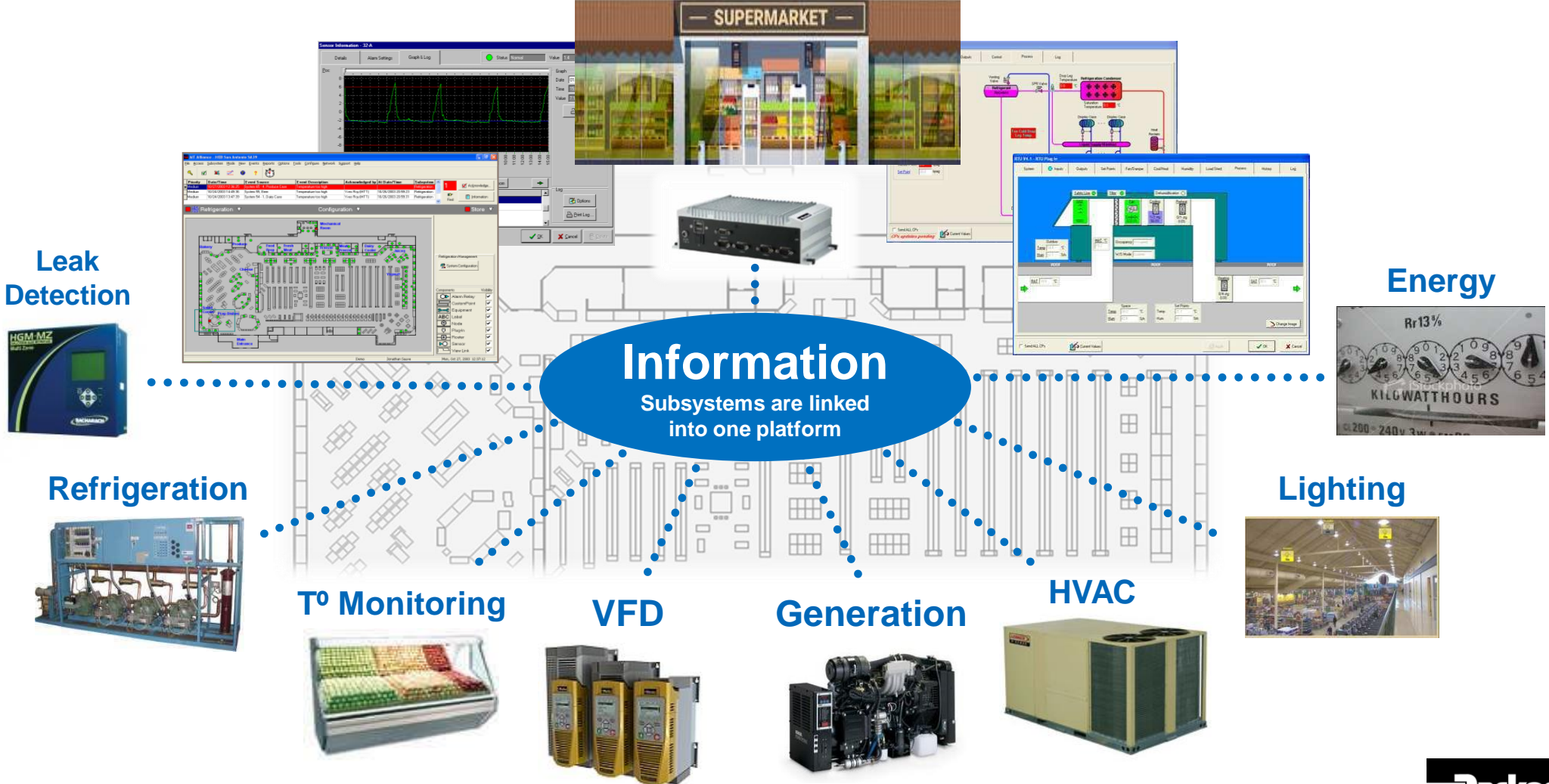
CONTRACTOR Goals & Needs

- 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



Menu Bar

Events & Alarm List

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

Subsystems

Permission Modes

Store Views

Refrigeration Configuration Main

Refrigeration Management
Schedules Configuration

Components Visibility

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

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

Doina

Tool/Icon Bar

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

MICRO THERMO ALLIANCE

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**



Alarm Acknowledgement and Resolution



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

- Event Log:** A table showing recent events. The top event is highlighted in red.
- Configuration:** A dropdown menu showing 'Refrigeration' and 'MT Demo Store'.
- Floor Plan:** A detailed layout of a store with various sections labeled: Fresh Produce, Freezer, Fresh Meat, Fish and Sea Food, Mechanical Room, Beer and Wine, and Food Court. A red dot on the 'Fish Case' sensor indicates an active alarm.
- Right Panel:** Contains a 'Monitor' button, a list of components (Rack A, Leak an, HVAC AI), and a 'Refrigeration Management' section with 'Schedules' and 'Configuration' options. Below this is a 'Components' list with checkboxes for visibility: Alarm Relay, Equipment, Label (ABC), Node, Plug-In, Point, Refrig. Unit, Router (A/B), RU Ctrl, RU Sec Cool, and Sensor.

Priority	Date/Time	Event Source	Event Description	Acknowledged by	At Date/Time	Subsystem
High	1/25/2012 23:41:03	SN5 Sensor 3, Fish Case	Temperature too high [1]			Refrigeration
High	1/23/2012 17:38:03	SN3 Sensor 3, Fresh Meat Cools	Temperature too high [1]	demo	1/23/2012 17:38:42	Refrigeration

MICRO THERMO ALLIANCE

Accountability - Traceability - Security



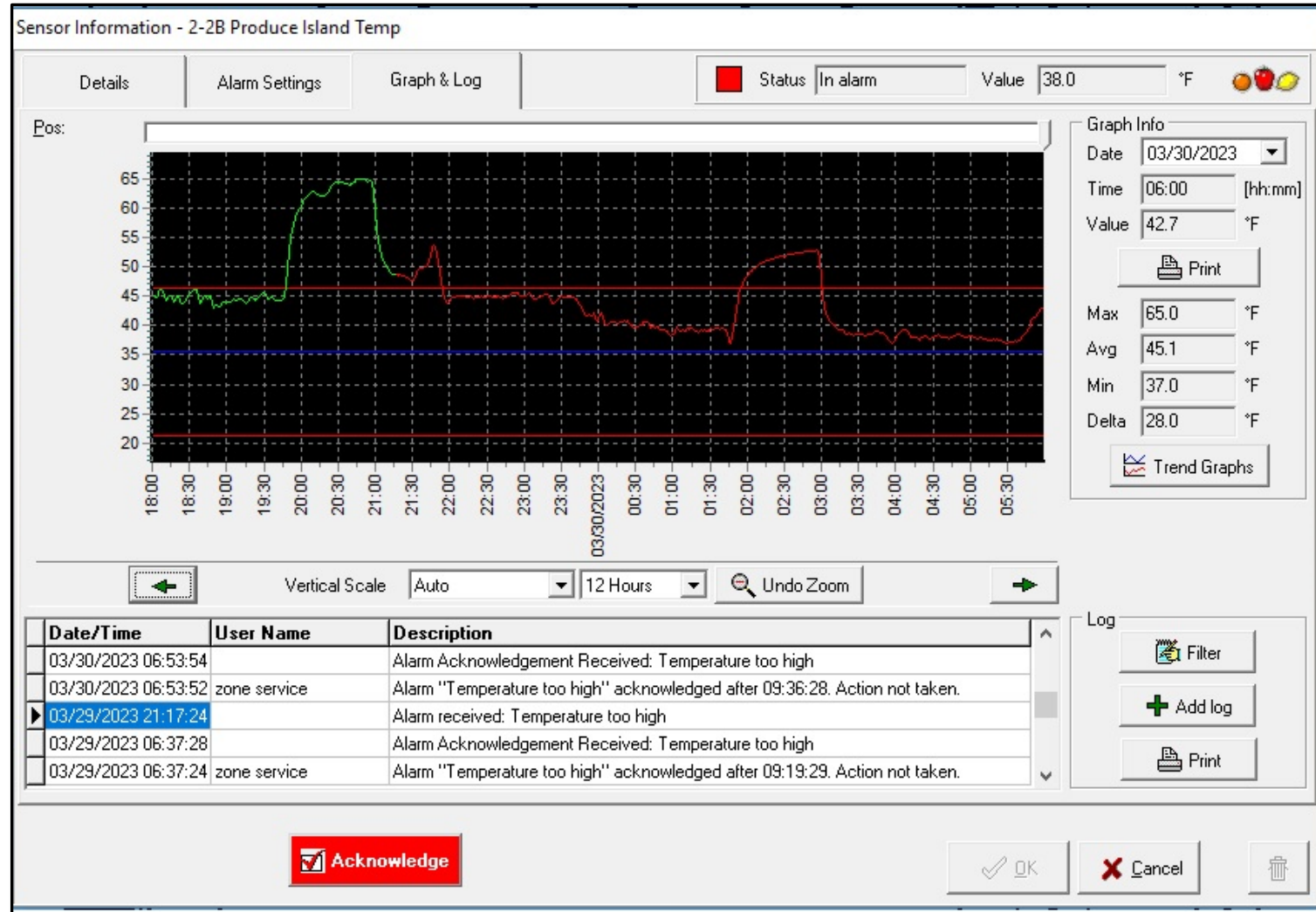
The screenshot displays the 'Remote Control' window for 'MT Alliance - LA 00640 Kauai, HI'. The interface includes a menu bar (File, Access, Subsystem, Mode, View, Events, Reports, Options, Tools, Configure, Network, Support, Help) and a toolbar with various icons. A table lists recent events:

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\SG1, Refrigerant Level	Level too low			Refrigeration
Medium	10/05/2010 22:07:26	~RackB\SG1\CKC1, Circuit 4	EEPR Failed to Defrost			Refrigeration
Medium	10/05/2010 19:07:14	~RackB\SG1\CKC1, Circuit 3	EEPR Failed to Defrost			Refrigeration
Medium	10/05/2010 18:08:13	~RackB\SG1\CKC1, Circuit 2	EEPR Failed to Defrost			Refrigeration

Below the table is a 'Refrigeration' overview section with a floor plan diagram. The diagram shows various temperature points with status indicators (Normal, MED, LOW) and numerical values in Fahrenheit. A 'Refrigeration Management' sidebar on the right includes a 'Zoom Out' button and a 'Schedules...' button. The bottom status bar shows 'Normal', 'Frederick D - MTT', and 'Thu Oct 07, 2010 04:37:28'.

MICRO THERMO ALLIANCE

Graph and Log View



The Power of Information

- ✓ **Intelligent Distributed Control**
- ✓ **Intuitive Windows[®] 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**

Distributed Control System...with HMI

MICRO THERMO DISTRIBUTED NETWORK

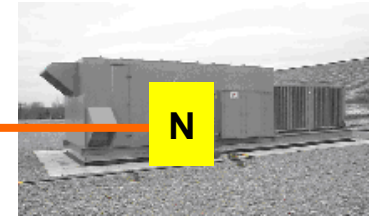
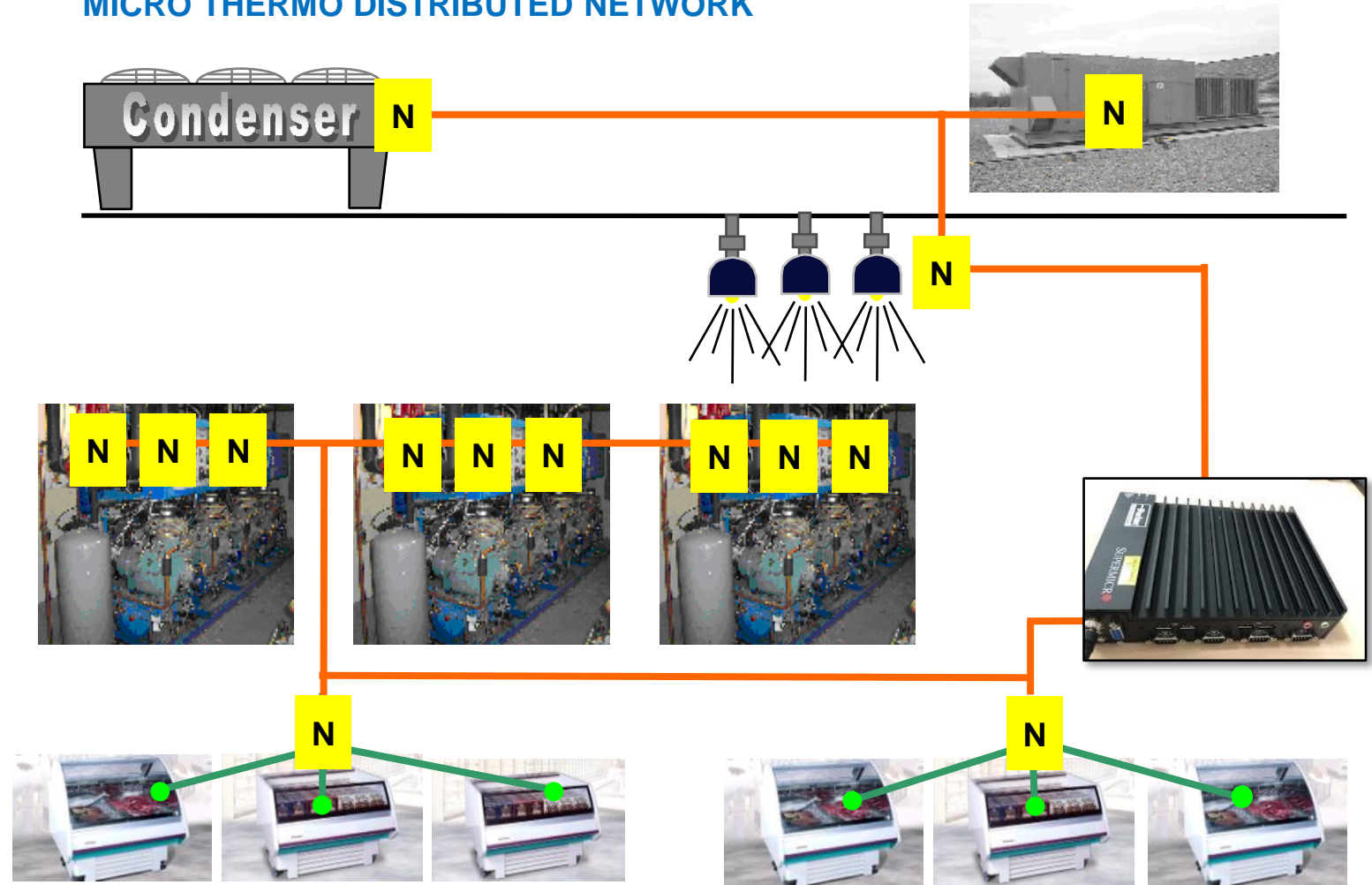
➤ *Intelligent LonWorks Smart Nodes*

➤ *Open Echelon network*

➤ *Simplified wiring*

➤ *Simplified system integration*

➤ *Simplified 3rd Party Integration*



Facility Management

- If you do not **SEE IT**
- If you do not **MEASURE IT**
- If you do not **ANALYZE IT...**
- **YOU CAN NOT MANAGE IT!**





ALLIANCE

On-Board Tools & Reports

FACILITY MANAGEMENT

System Log (Operating System)

MT Alliance V7.5.1.621 , Aldi's Amsterdam

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

System Log V7.5.1

Date	Time	Severity	Message	Application
05/31/2018	10:44:55	Information	User "Amber Marriott Aldi Shift" logged in for 15 minutes.	Alliance
05/29/2018	08:19:27	Information	User "Heidi Meher-Aldi Shift" logged out automatically.	Alliance
05/29/2018	08:04:27	Information	User "Heidi Meher-Aldi Shift" 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 Shift" logged out automatically.	Alliance
05/27/2018	10:59:39	Information	User "Heidi Meher-Aldi Shift" logged in for 15 minutes.	Alliance
05/26/2018	09:45:30	Information	User "Heidi Meher-Aldi Shift" logged out automatically.	Alliance
05/26/2018	09:30:30	Information	User "Heidi Meher-Aldi Shift" logged in for 15 minutes.	Alliance
05/26/2018	09:16:58	Information	User "Heidi Meher-Aldi Shift" logged out automatically.	Alliance
05/26/2018	09:01:58	Information	User "Heidi Meher-Aldi Shift" logged in for 15 minutes.	Alliance
05/26/2018	08:08:21	Information	User "Heidi Meher-Aldi Shift" logged out automatically.	Alliance
05/26/2018	07:53:21	Information	User "Heidi Meher-Aldi Shift" logged in for 15 minutes.	Alliance
05/25/2018	16:21:14	Information	User "Heidi Meher-Aldi Shift" logged out automatically.	Alliance
05/25/2018	16:06:14	Information	User "Heidi Meher-Aldi Shift" logged in for 15 minutes.	Alliance
05/25/2018	13:47:37	Information	User "Heidi Meher-Aldi Shift" logged out automatically.	Alliance
05/25/2018	13:32:37	Information	User "Heidi Meher-Aldi Shift" 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 Shift" logged out automatically.	Alliance
05/24/2018	14:48:10	Information	User "Heidi Meher-Aldi Shift" logged in for 15 minutes.	Alliance

Filters

From-To Day

From day: 06/02/2013

To day: 06/01/2018

Severity Level: All

Application: All

Print Log... Add... Clear Log... Refresh

OK

Normal Charles J Cunliffe - MTT Fri Jun 01, 2018 12:22:45

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 degress 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 interface for facility management, specifically focusing on refrigeration events. The main window is titled 'Refrigeration' and contains a sub-tab labeled 'Acknowledged Events', which is highlighted by an orange arrow. The interface includes a top navigation bar with 'Configuration' and 'Main' options, and a right-hand sidebar with search and information tools. The central area is dominated by a table listing various events.

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

At the bottom of the window, the status bar shows 'Normal', 'Charlie Cunliffe MTT', and the date/time 'Mon Mar 14, 2016 14:08:42'. The right sidebar includes a 'Period' selector (From-To/Day), date range inputs (From: 02/15/2016, To: 03/14/2016), and buttons for 'Refresh', 'Information', 'Export to XML', 'Print', and 'OK'.

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

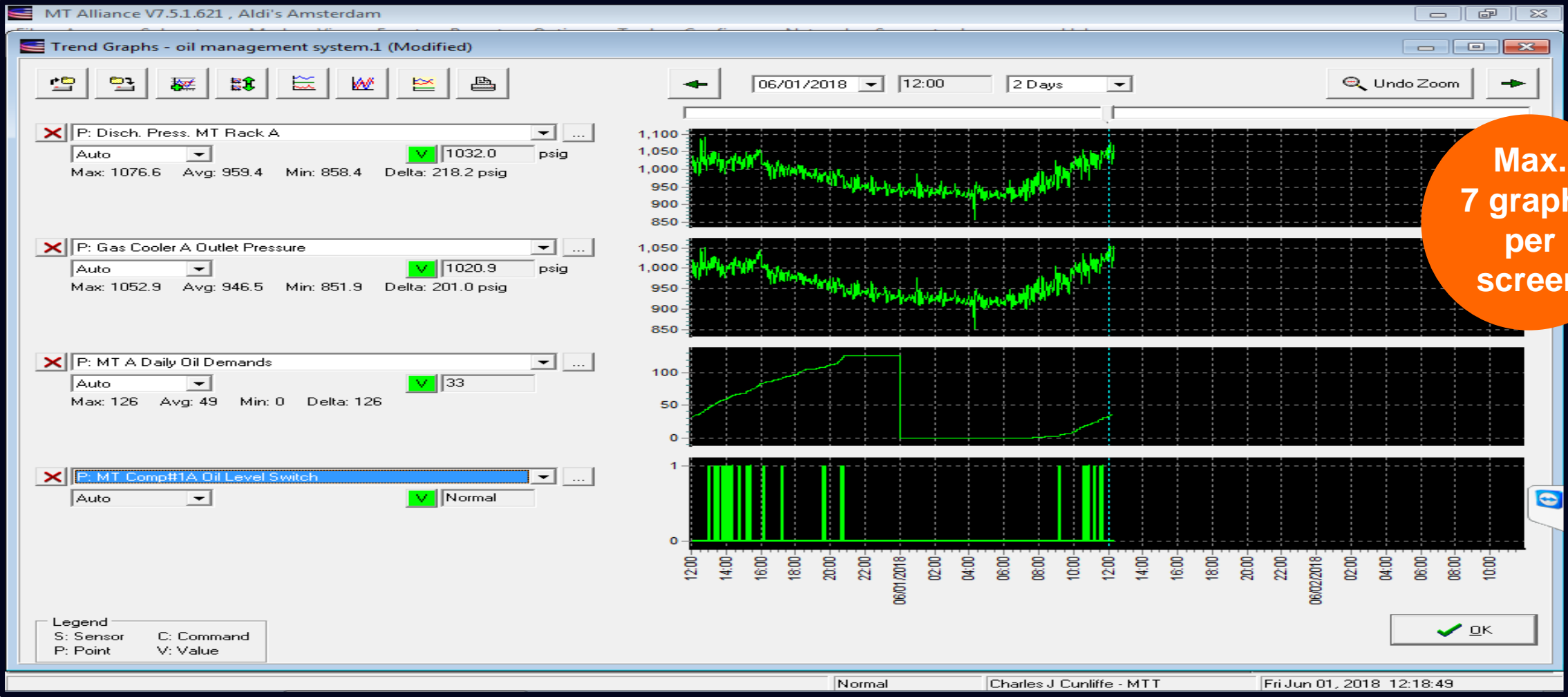
View	Source	Events	Recalls	Hours
Sensor Alarms				
Main	~A01a Grocery Freezer/Control Temp	2	0	0.26
Main	~A01b Grocery Freezer/Control Temp	2	0	0.22
RackA Co2	Leak Detector Rack A	1	0	0.20
		Total	5	0.69
Object Alarms - Custom Nodes				
Main	~A01a Grocery Freezer, Door Ajar	59	0	57.09
Main	~A04 Meat 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
		Total	121	114.96
		Grand Total	126	115.64

--- End of Report ---



FACILITY MANAGEMENT

Trend Graphs





ALLIANCE

Echelon Network

- *Network Quality...bad installation = slow speed poor performance*
- *NOISE...stay away from high voltage*
- *Cable: Belden 8471 16 AWG No Shield 6 twist per foot*

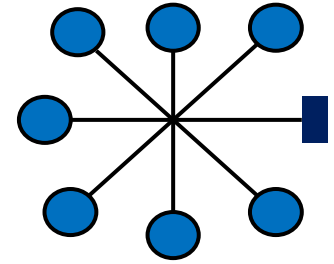
MICRO THERMO ALLIANCE

Echelon Communication Cable

2 Wire Twisted Pair, NO Shield

- **BELDEN - #16 8471**
 - *Use for main Echelon communication drop for each channel home run to Data Logger*
- **BELDEN - #16 8471**
 - *Use for Node to Node Communication within each Echelon Channel*

LARGE SUPERMARKETS Network – Backbone and Channels

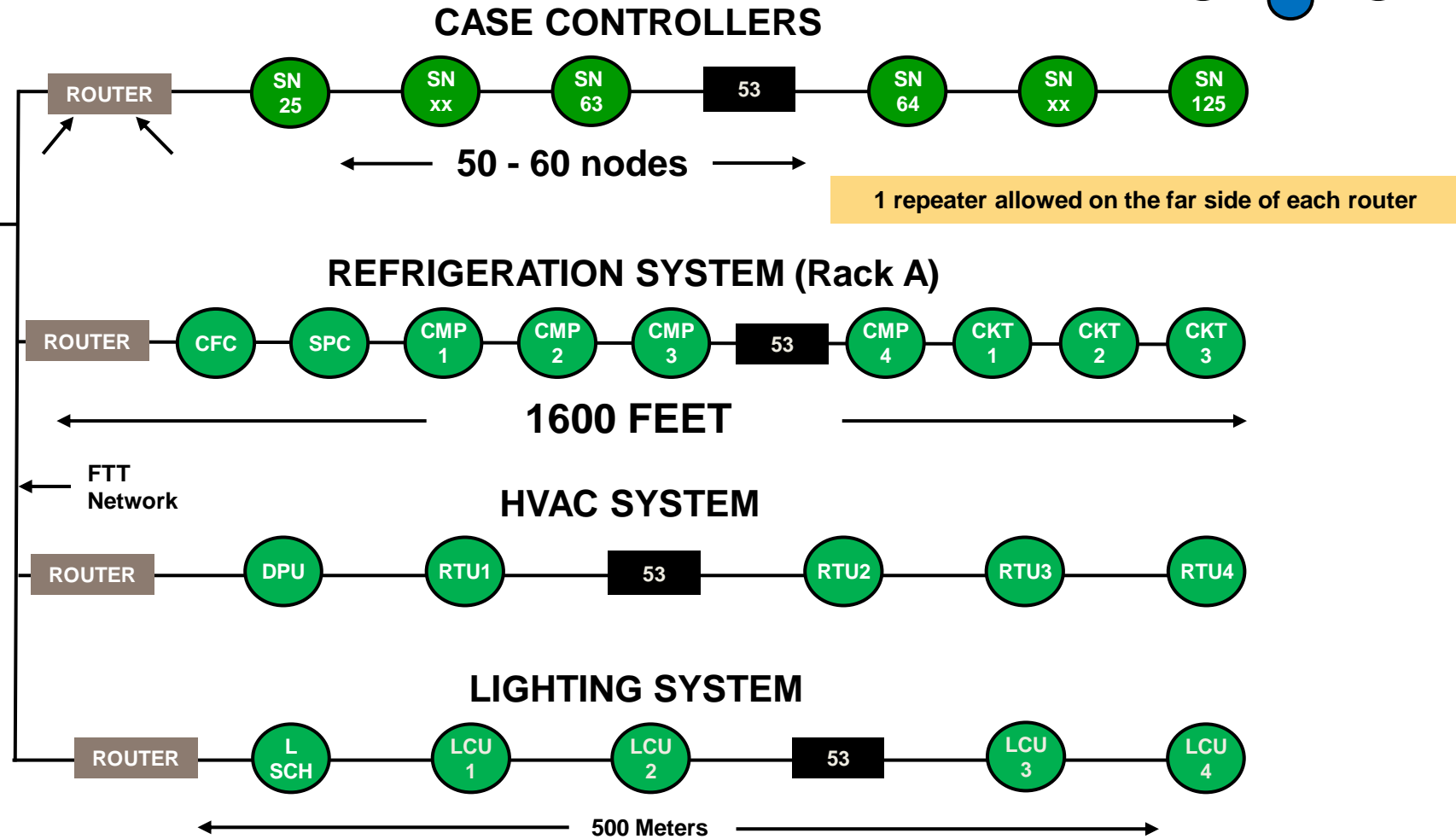


Total 315 Nodes
(Inc. PC & RTC)
2.5 Kilometers



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 53 – 58 ohms
- If high resistance is measured at the end of channel....move termination resistor to best location to balance network resistance



MICRO THERMO ALLIANCE



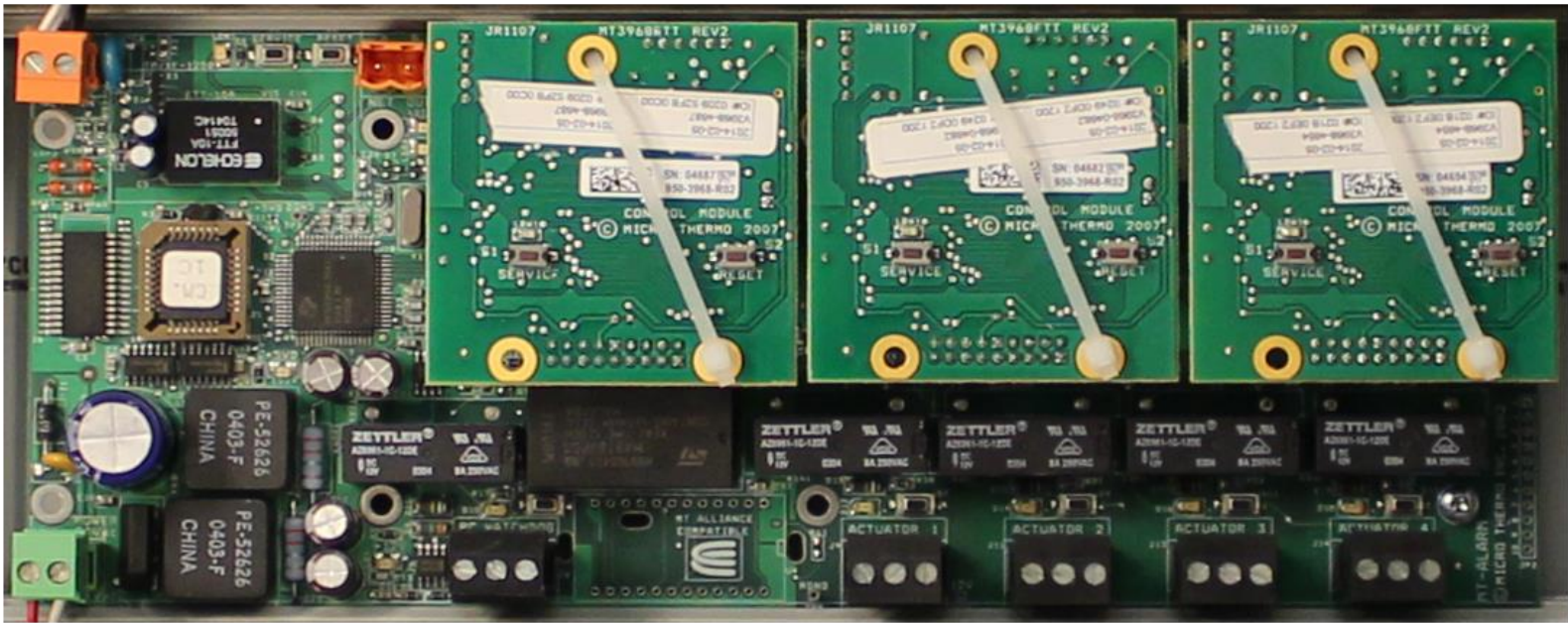
MICRO THERMO ALLIANCE

Industrial Computer



MICRO THERMO ALLIANCE

Backbone Components



MICRO THERMO ALLIANCE

Alarm Node Integration

Alarm Relay Node Information - Alarm Board

Details | Outputs | **Commands/Status** | Log | ● Status On Line

Testing Commands

- Wink
- Test
- Details
- Object Status

Maintenance Commands

- Reset
- Send Config
- Replace
- Move
- Offline

Installation

Neuron ID: 0255 9580 3600

Install (circled in orange)

Commission

LonWorks

- Network Variables
- LonMark
- Configuration
- HNCIP Terminal

Board Calibration

Date: N/A
Status: Not Available

Calibration

Versions

Board Revision: N/A

Load Node Software

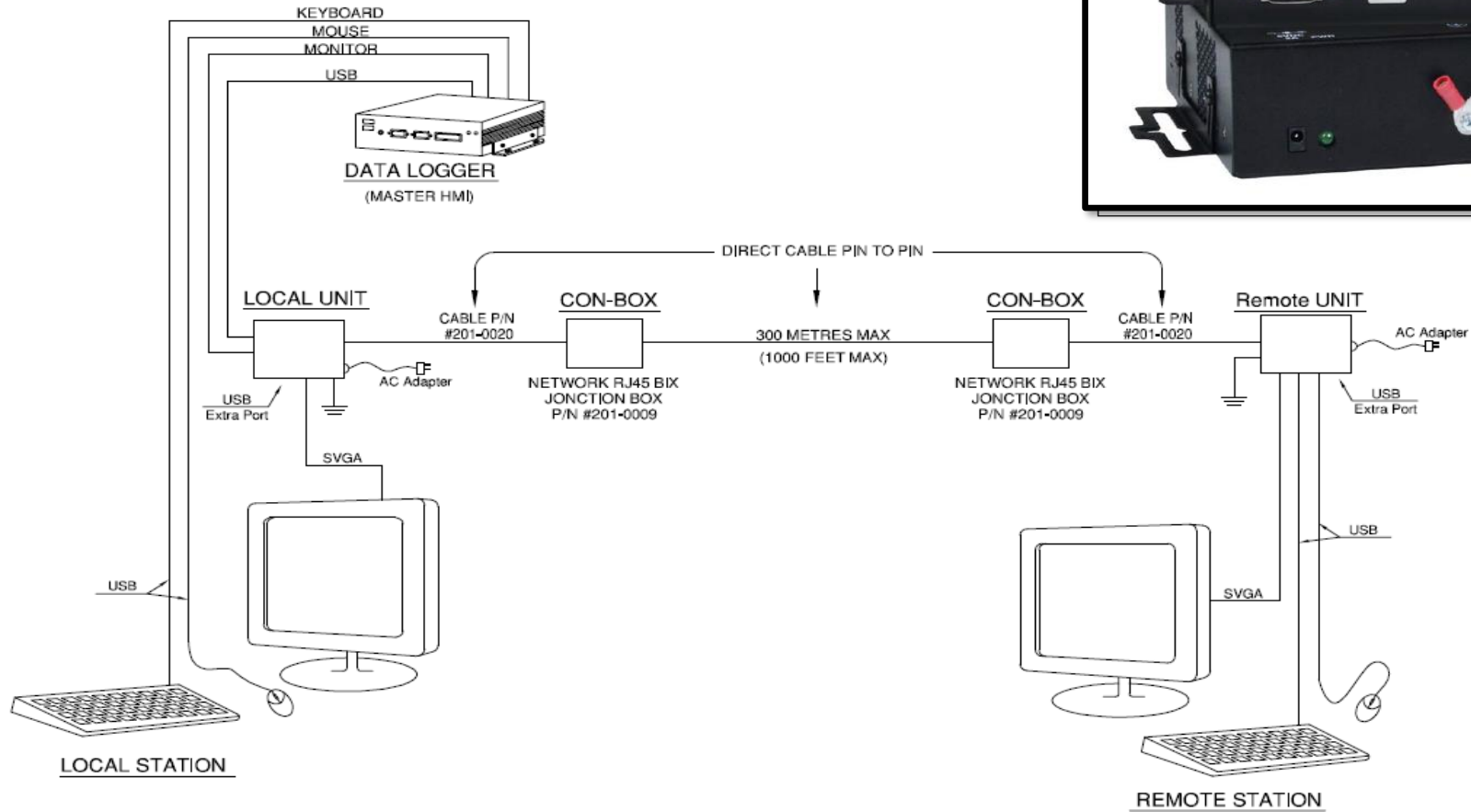
External Interface: V6.0
Application Software: V6.0

OK Cancel

MICRO THERMO ALLIANCE

Industrial Computer with KVM

up to 8 remote workstations





Application of **ALLIANCE**

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



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

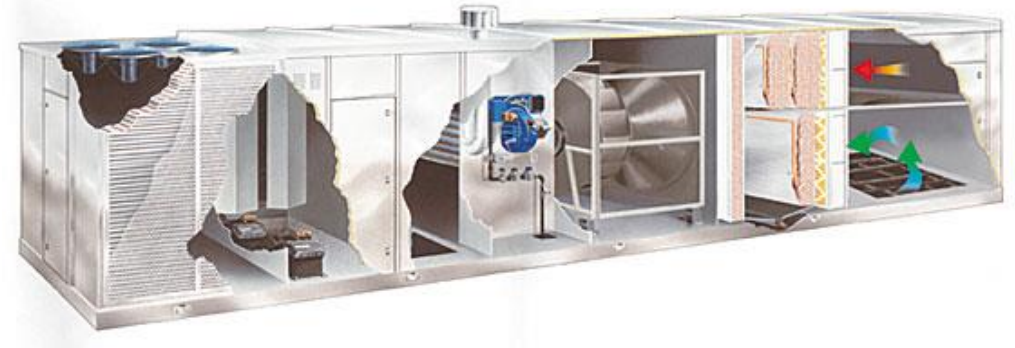


MICRO THERMO ALLIANCE

Intelligent Controllers

HVAC

- **Controls a wide variety of HVAC units**
RTU's, AHU's, DPU's, Make-up air, VAV's,
Custom applications, connectivity to 3rd Party
LON Devices
- **Humidity or Dew Point control**
- **Built-in Load Shed functions**
- **Heat Reclaim**
 - Reheat – Space Heat – Hot water
 - Monitored to prove application



MICRO THERMO ALLIANCE

Anti-Sweat Control

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

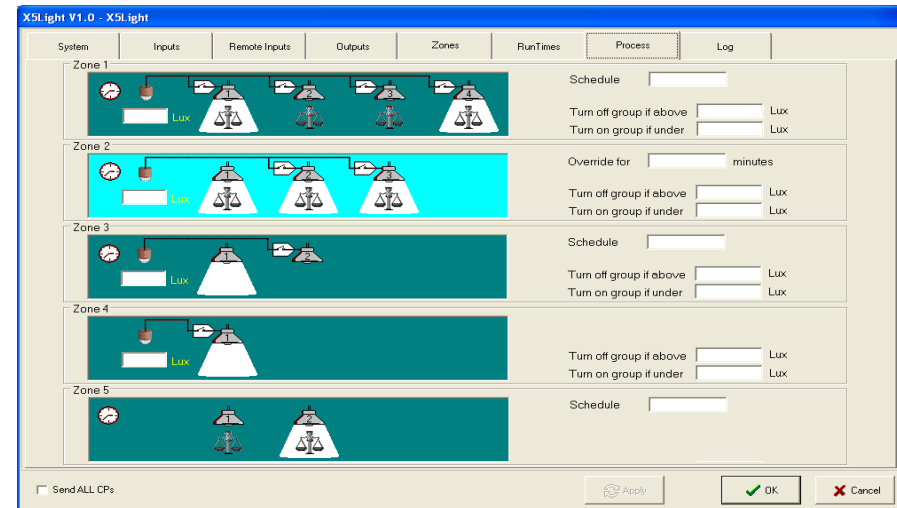


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Intelligent Controllers

Lighting

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



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

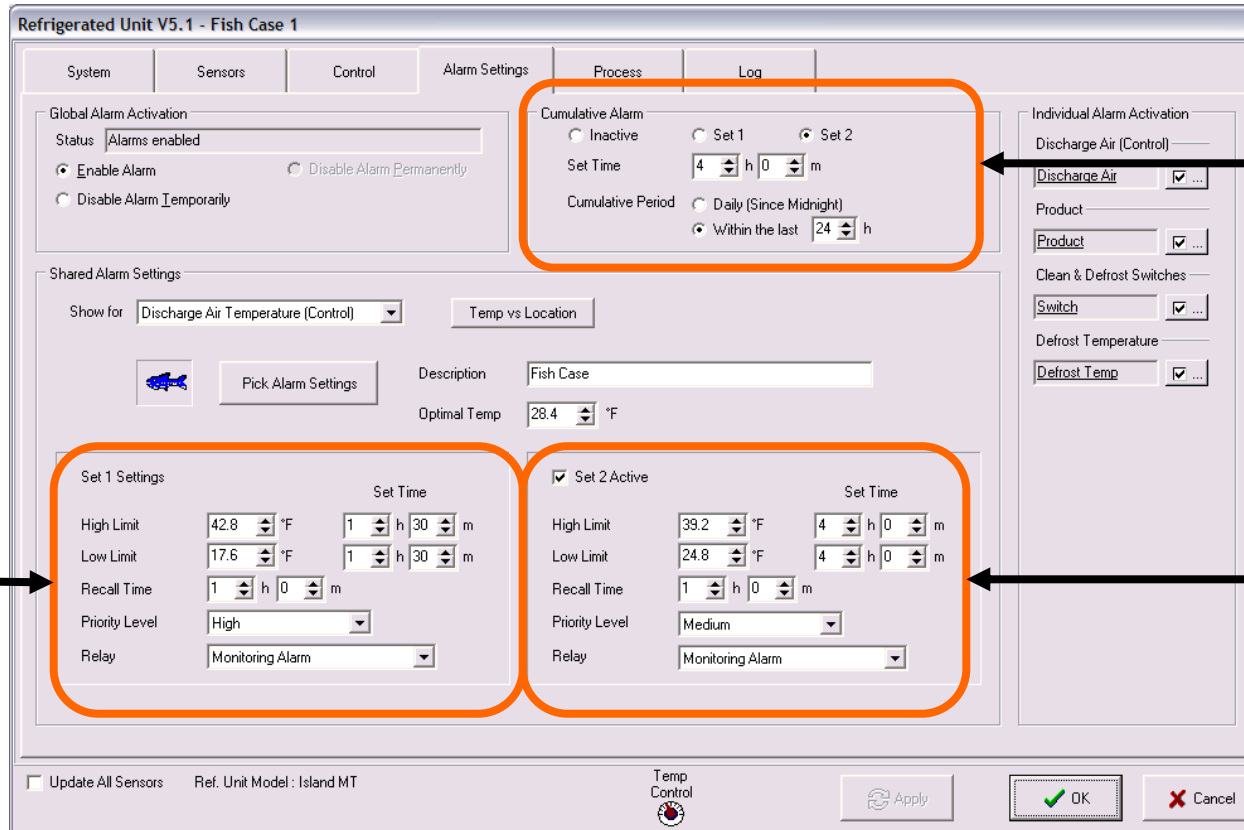
- High and low set points
- User defined priority

SET 3 CUMULATIVE ALARM – Food Safety

- User defined alarm priority



Food Safety, Food Quality, and Monitoring



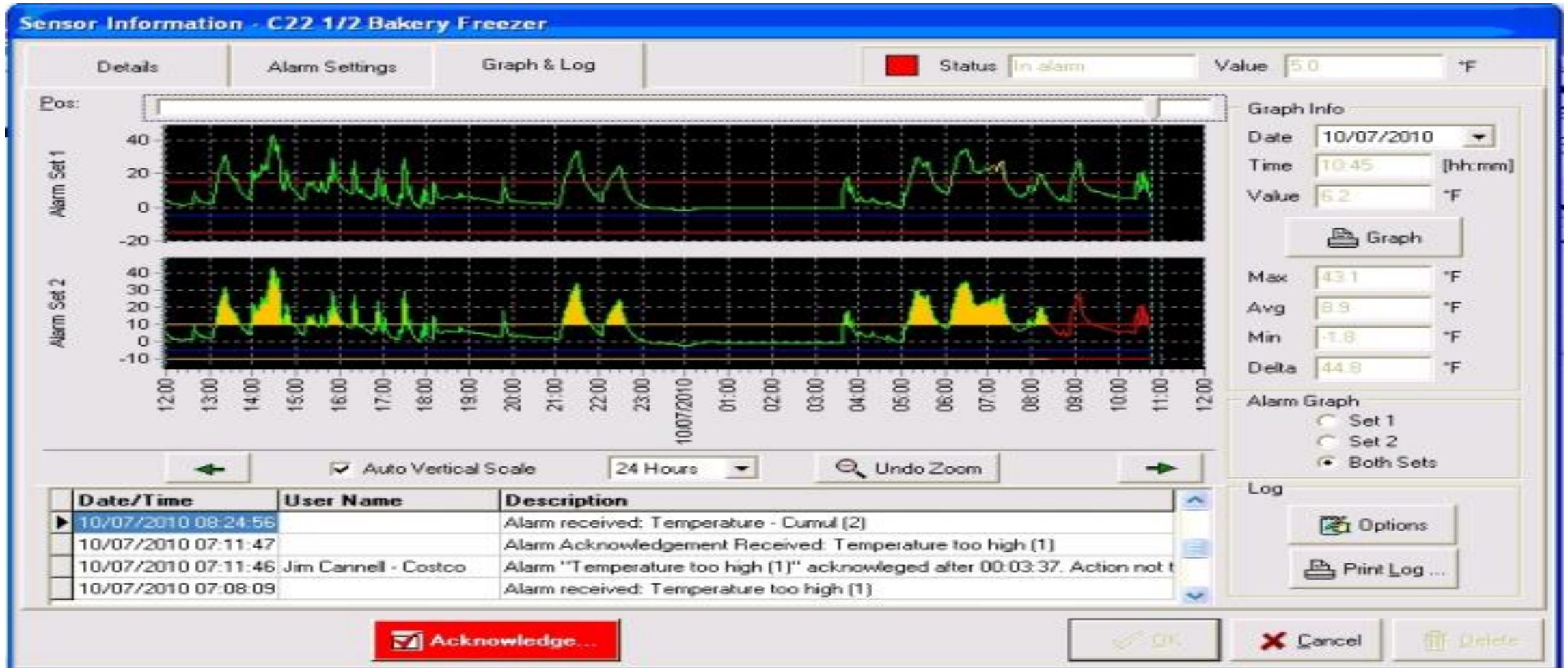
Basic alarming and monitoring capabilities...

Food Safety with Cumulative Alarm function...

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

MICRO THERMO ALLIANCE

Food Safety



MICRO THERMO ALLIANCE

ALLIANCE

Smart Nodes – MT-500

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 ALLIANCE

ALLIANCE

Smart Nodes – MT-700

MICRO THERMO

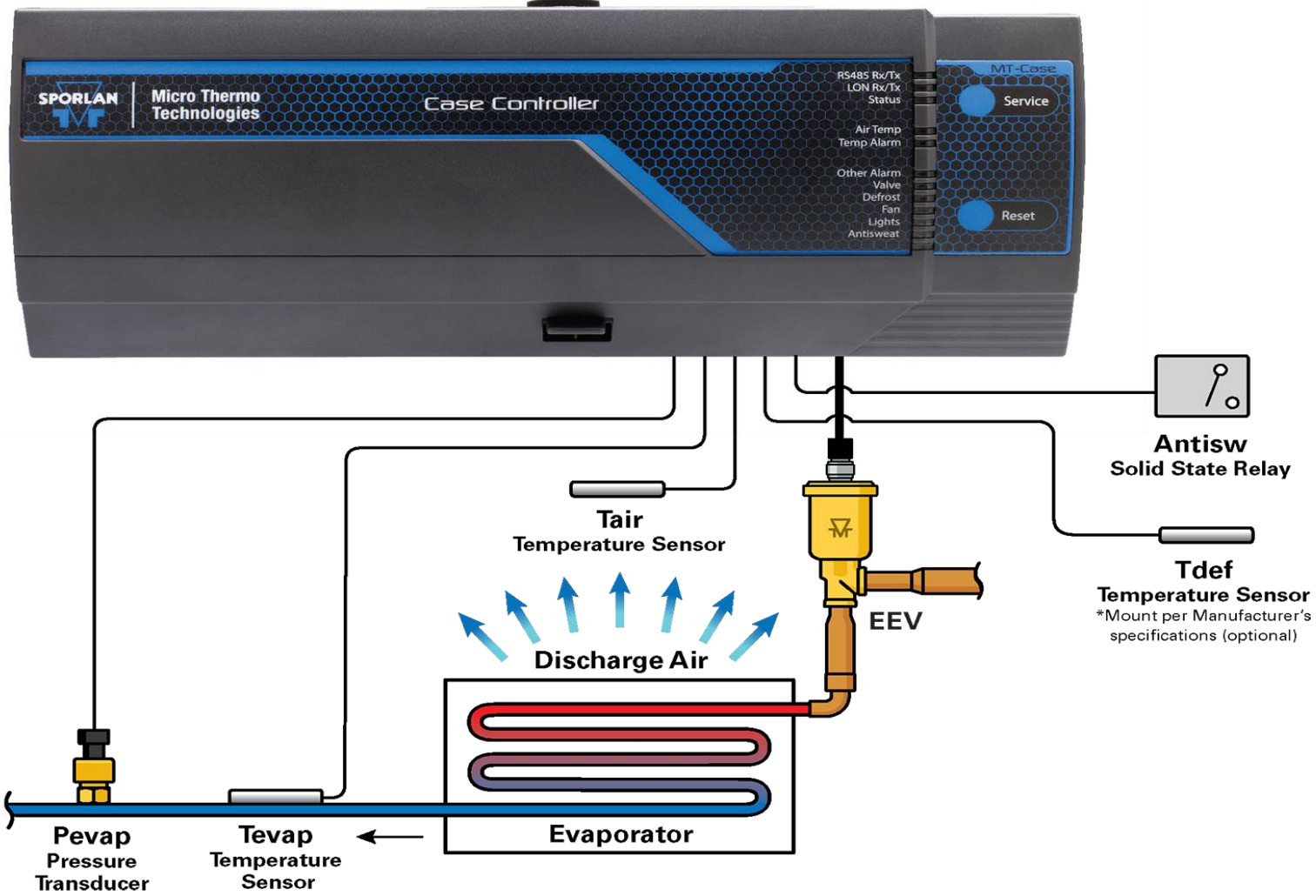
Case Controller – MT-700 Series

- 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 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 CASE CONTROLLER

Integration Tabs

- 10 Integration Tabs
- Customize
- Fine-Tune
- Self-Learning

The screenshot displays the 'Case Ctrl V7.0 - CCtrl1' control interface. The top navigation bar includes tabs for System, Config, Inputs/Outputs, Alarm Settings, Control, Process (active), Graphs, History, Bindings, and Log. The main control area features a central diagram of a refrigeration system with a compressor, condenser, evaporator, and expansion valve. Key parameters and controls are visible:

- Setpoint:** 10.0°F (Case) and 35.0°F (Case). Clean checkbox is unchecked.
- Control Temperature:** 8.3 °F. Refrigeration Circuit: N/A.
- Door:** Open (indicated by a green dot).
- Temperature Control with Superheat Limit:** Evaporator Pressure: 11.0 psig, Evaporator Temperature: -4.0 °F.
- Superheat Calculation:** Evaporator Temperature: -4.0 °F, Saturated Temperature: -27.9 °F, Superheat: 23.9 °F.
- Other Parameters:** Space RH: Invalid %, Auxiliary Temperature: 41.5 °F, Dew Point: Invalid °F, Anti Sweat: 50.0 %.
- Overrides:** Lights Override (unchecked), Fan Override (unchecked), Anti Sweat Override (unchecked), EEV Override (unchecked).
- Buttons:** Turn Lights OFF, Less, Trend Graphs, Send All CPs, Current Values, Apply, OK, Cancel.

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

Process Tab

Case Ctrl V7.0 - CCtrl1

System | Config | Inputs/Outputs | Alarm Settings | Control | **Process** | Graphs | History | Bindings | Log

Lights Override
Turn Lights OFF

Setpoint
Case 10.0°F **Case** 35.0°F
Clean

Control Temperature 8.3 °F
Refrigeration Circuit N/A

Door Open

Fan Override
 Anti Sweat Override
 EEV Override

Open 35.23 %

Temperature Control with Superheat Limit

Evaporator Pressure 11.0 psig
Evaporator Temperature -4.0 °F

Space RH Invalid %
Auxiliary Temperature 41.5 °F

Superheat Calculation


Evaporator Temperature -4.0 °F
Saturated Temperature -27.9 °F
 Superheat 23.9 °F

Dew Point Invalid °F
Anti Sweat 50.0 %

Notes

Liquid Temperature Invalid °F

Refrigeration Mode

Send All CPs Local DUS 

MICRO THERMO CASE CONTROLLER

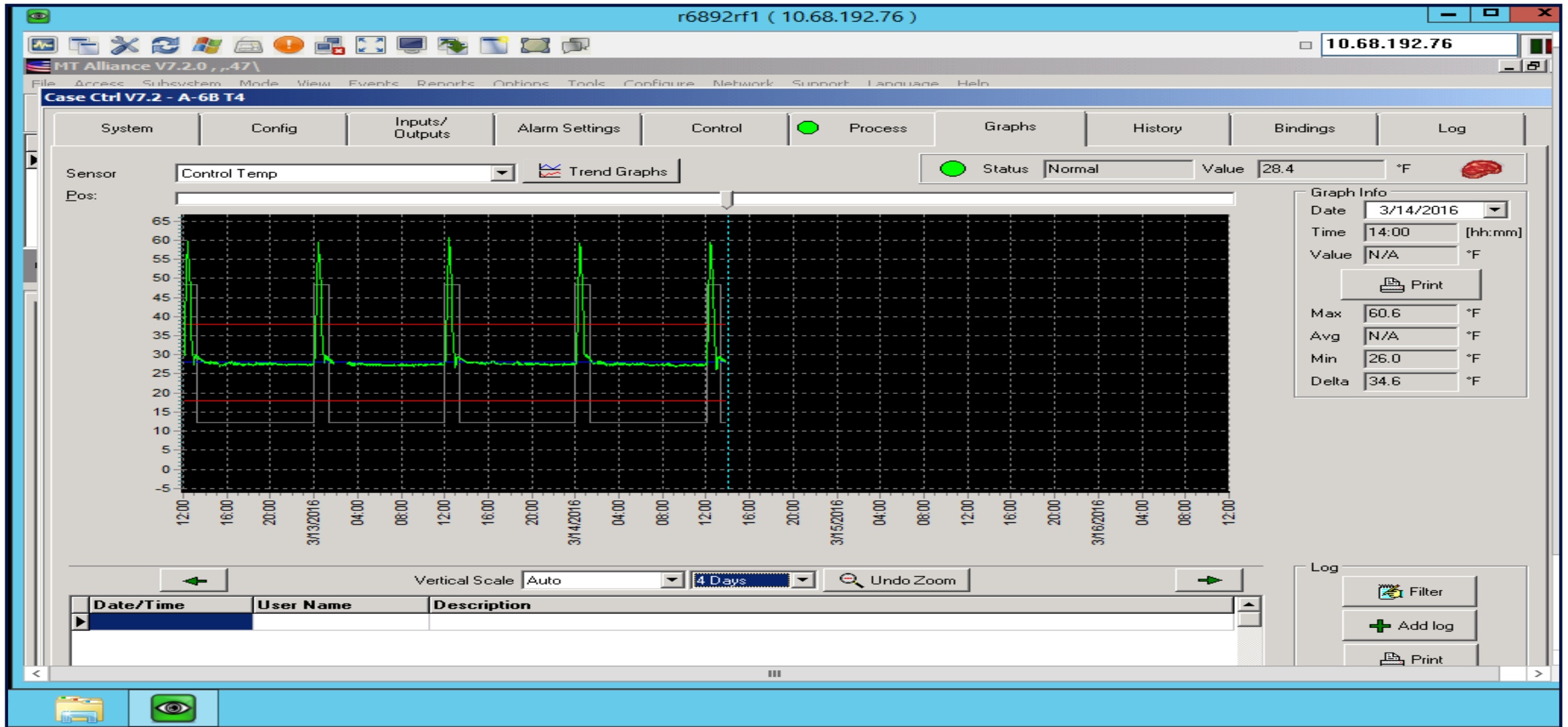
Control Tab

The screenshot shows the 'Control' tab of the Case Ctrl V7.0 - CCtrl1-2 interface. The interface includes a top navigation bar with tabs for System, Config, Inputs/Outputs, Alarm Settings, Control, Process, Graphs, History, Bindings, and Log. The 'Control' tab is active, and the 'Basic View' button is selected. On the left, a vertical menu lists various control options: Valve, Superheat, Pulldown, Temperature Control, Environmental Corrections, Defrost, Door Ajar, Fans, Lighting, Anti Sweat, and Emergency. The 'Valve' option is expanded, showing a 'Settings' dialog box with the following values: Base %Open (40.0 %), Corrected (N/A %), and Max %Open (1.80 x, N/A % =, N/A %). At the bottom of the interface, there is a status bar with a checked 'Send All CPs' checkbox, a 'Current Values' button, a yellow 'Vacuum Mode' indicator, and 'Apply', 'OK', and 'Cancel' buttons. A red text message 'CP updates pending' is visible in the bottom left corner.



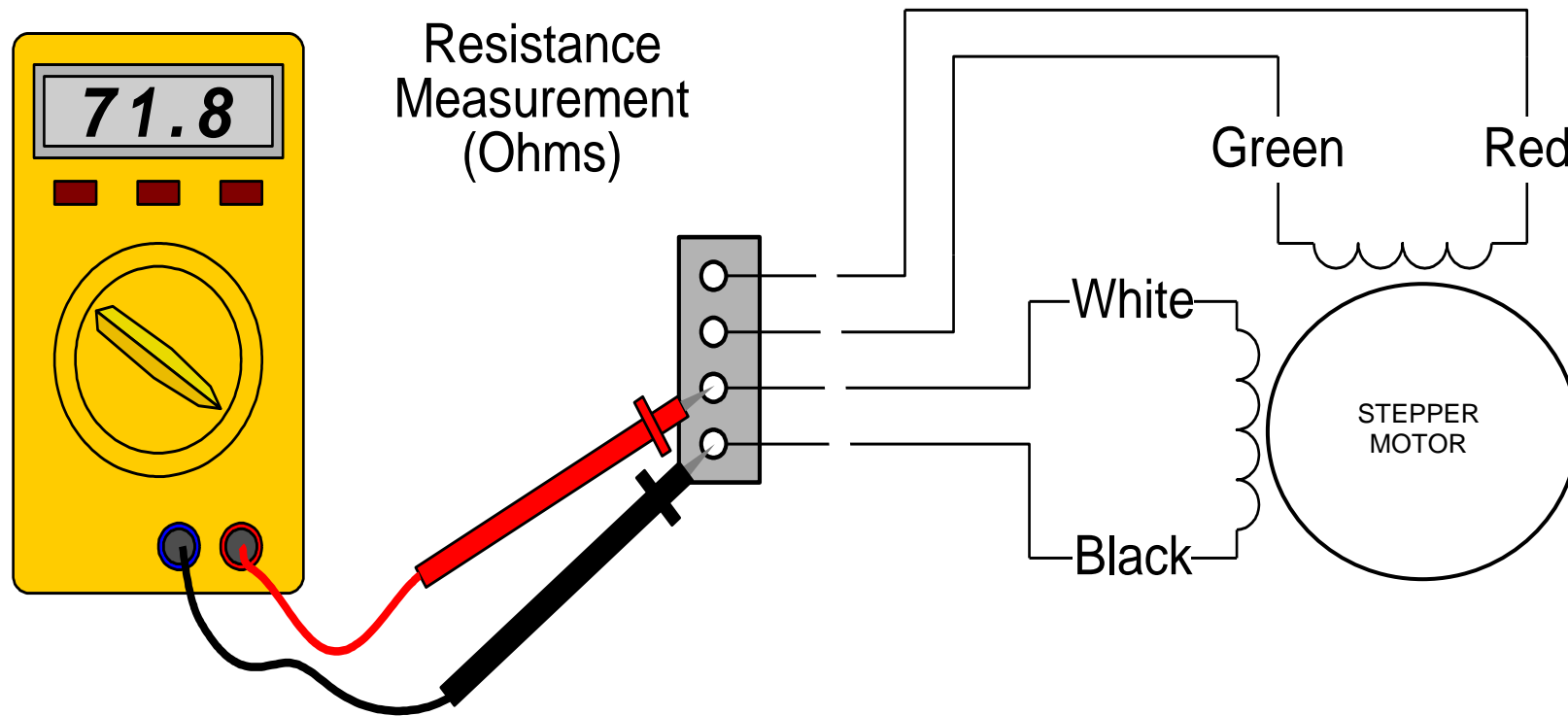
MICRO THERMO CASE CONTROLLER

Graphs Tab



MICRO THERMO

Checking an Electric Valve



Sporlan (SEI – SER – SEHI) : 75 or 100Ω nominal

MICRO THERMO

NEW MT-700 Smart Nodes

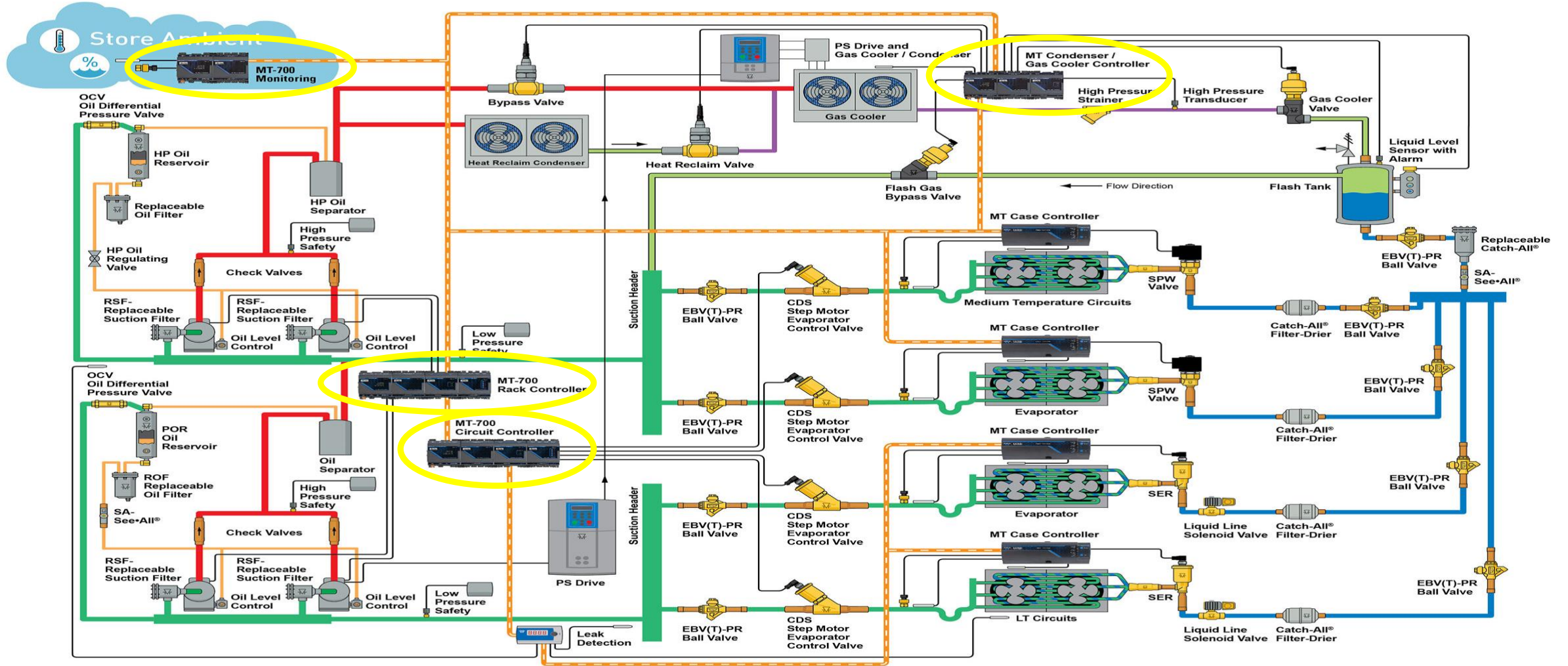
Customizable... adaptable ...intelligent

- Each Smart-Train starts with MT-722F Brain
- Connect up to TEN additional Smart Nodes
- MT-784V
- MT-708R
- MT-748A
- MT-766A
- MT-716UI



MICRO THERMO

NEW Suction Group and Circuit Controller

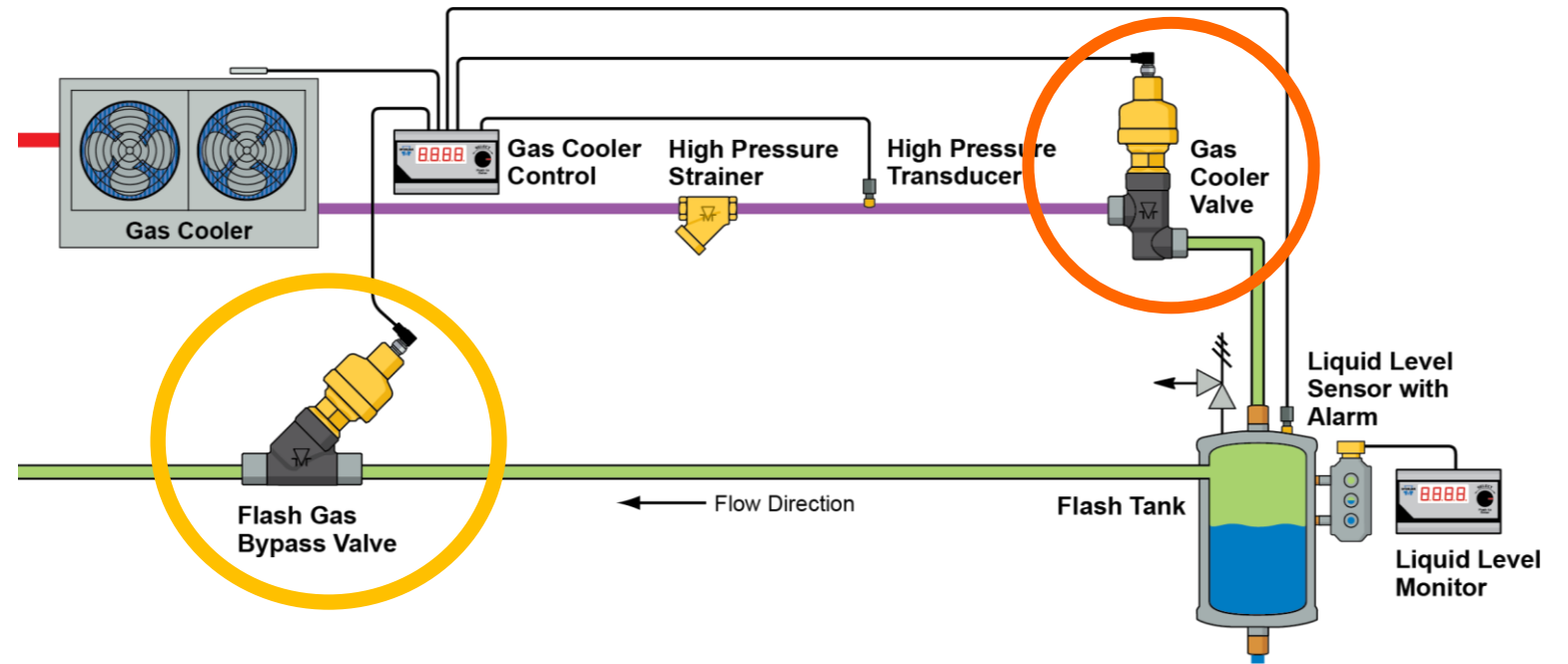


MICRO THERMO

Transcritical CO₂ Flow Controls

GAS COOLER & FGB Valves

- Located on the high-pressure side
- Regulates pressure in the condenser / gas cooler
- CO₂ through the valve port drops in pressure ...CO₂ below Critical point
- FGB Valve maintains flash tank/receiver at an intermediate pressure



SPORLAN

Transcritical CO₂ Flow Controls

GC

GAS COOLER VALVE

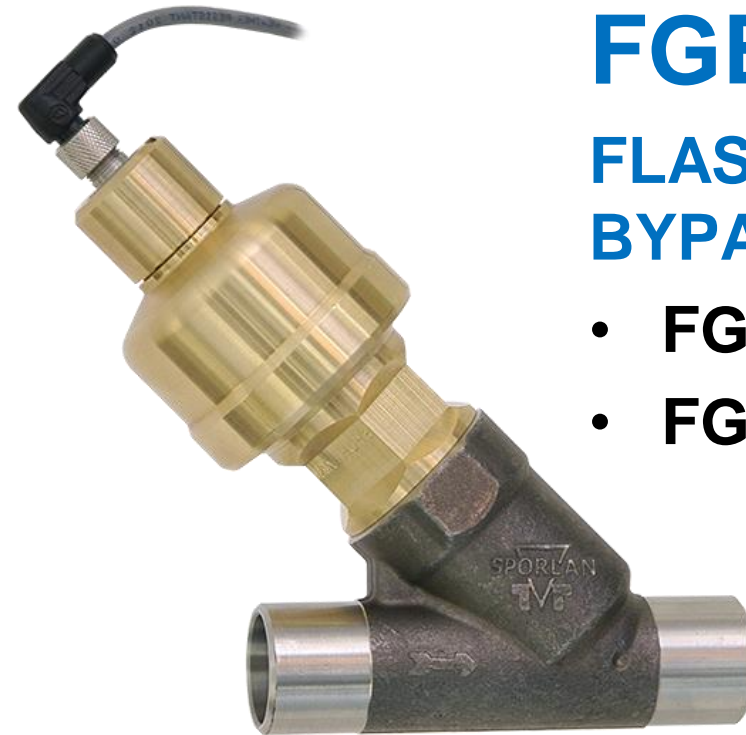
- GC-10
- GC-20
- GC-30
- GC-40
- GC-50



FGB

FLASH GAS BYPASS VALVE

- FGB-60
- FGB-70



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 interface for the MT-700 controller. The 'Inputs' tab is selected, and the 'Regulation Strategies' section is expanded. The interface includes a sidebar with tabs for 'Global', 'Config', and 'Inputs'. The 'Control' sub-tab is active, showing a list of sub-tabs: '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 configuration window, there are 'OK' and 'Cancel' buttons. A note at the bottom right states: 'Keeping a minimum cooling capacity until the Discharge Pressure falls below threshold'.

MICRO THERMO

MT-700 2 Valve Controller

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



MICRO THERMO ALLIANCE

Graphical User Interface

Leak Detection



Refrigeration



T° Monitoring



VFD



Generation



HVAC



Lighting



Energy



Micro Thermo
Manages your entire chain,
right from your desktop, laptop,
tablet, or smartphone!

Share Your Feedback!



To receive an electronic training certificate:

1. Scan or visit nasrc.org/session-surveys
2. Provide your name and email at the end of the survey

***Please Note:** You will not receive a certificate unless you share your name on the survey form.*

Micro Thermo Alliance Application, Navigation, and On-board Tools

Charlie Cunliffe

Parker Hannifin, Sporlan Division