MICRO THERMO TECHNOLOGIES

MT Alliance Refrigeration Technician's Manual

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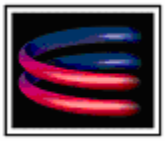

MICRO THERMO TECHNOLOGIES

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Chapter 1

Overview

Overview

The Refrigeration Configuration Tool helps you rapidly configure all refrigeration equipment in the store.

The Refrigeration Configuration Tool helps you configure your refrigeration equipment easily and rapidly. You can define racks, suction groups, compressors and circuits. You can select control strategies and completely commission the site.

The Refrigeration Configuration Tool is user-friendly because it displays all the site refrigeration equipment in one single view. Red () indicates that some items needs to be configured or validated. Yellow () means that some optional configuration items have to be reviewed. Green () means that you have reviewed all the items. By simply pointing and clicking, you completely configure all refrigeration equipment.

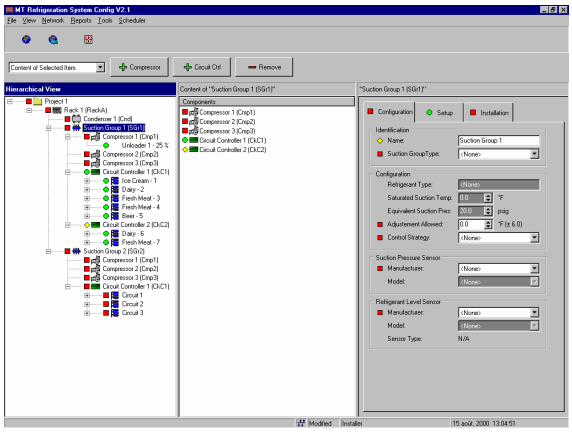
The Refrigeration Configuration Tool is safe because access is allowed only if you have the refrigeration maintenance or configuration permission. The tool can be started from within the MT Alliance or it can be started externally. The latter requires the refrigeration configuration permission and allows changes to the hardware configuration (you can add or delete compressors for example).

Some features are only accessible when the Refrigeration Configuration Tool is started externally. This symbol means that the feature is not accessible from within the MT Alliance.

Some fields (e.g.: drop-down lists) can be customized by adding or removing items. To add an item to one of those lists, simply click the choice <manage items> in the list.

Chapter 2

General Use of the Tool



General Use of the Tool

Starting the Tool

The Refrigeration Configuration Tool can be started using the shortcut on the Windows Desktop. If the shortcut is not present, open the Windows explorer and locate the Alliance directory. Double click on the directory and you will see the files within the directory on the right side of the screen. Locate the file named "RefSysConfig.exe", and double-click on it to start the tool.

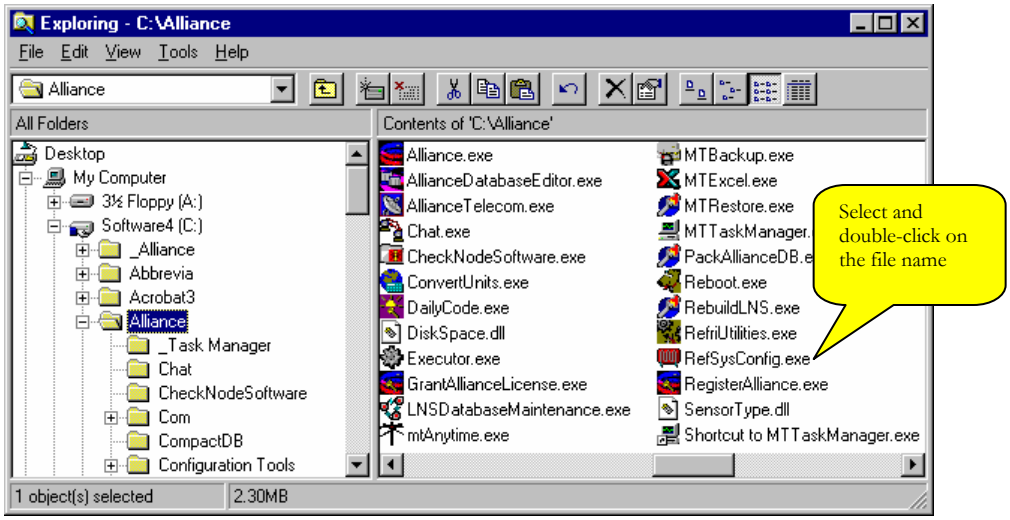


Figure 1 Explorer

Create a shortcut on the Windows Desktop if it is not present.

Configuring a New Site

When the tool is opened for the first time, you will see the following screen:

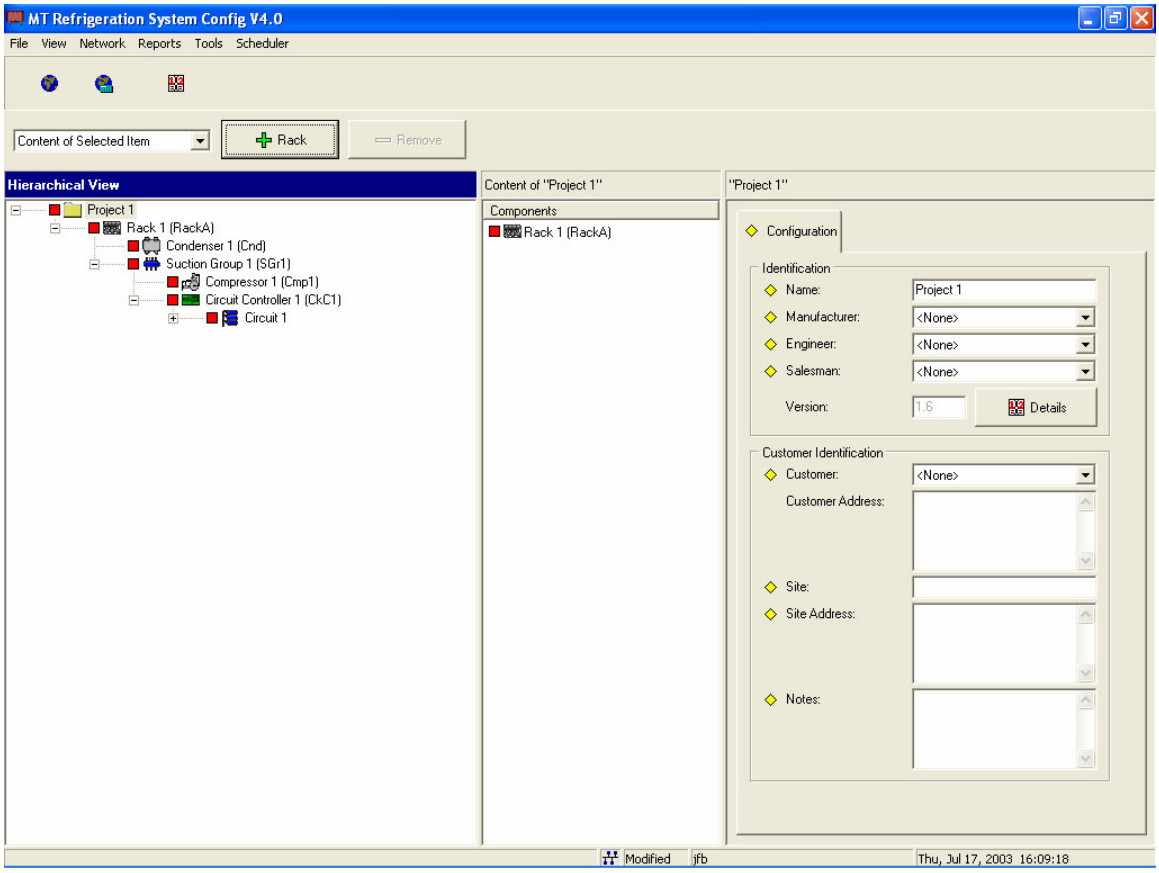


Figure 2 New Project

Follow these steps to configure a new site:

To add a rack, select the "project" item at the top of the tree and click on the "Add Rack" button. (Rack)

To add a suction group to a rack, select the "Rack" item in the tree and click on the "Add Suction Group" button.

To add a compressor to a suction group, select the "Suction Group" item in the tree and click on the "Add Compressor" button.

To add a circuit to a rack, select the "Circuit Controller" item in the tree and click on the "Add Circuit" button. There is a maximum of 5 circuits per circuit controller. To add more circuits, you first have to add a circuit controller by selecting the "Suction Group" item in the tree and by clicking on the "Add Circuit Controller" button.

You can also delete racks, suction groups, compressors, circuit controllers and circuits. The configuration procedure consists of selecting each item in the tree one by one and filling the information required on the right hand side (property window) until all items in the tree appear with a green circle ( ). It's that simple!

The main window looks like this:

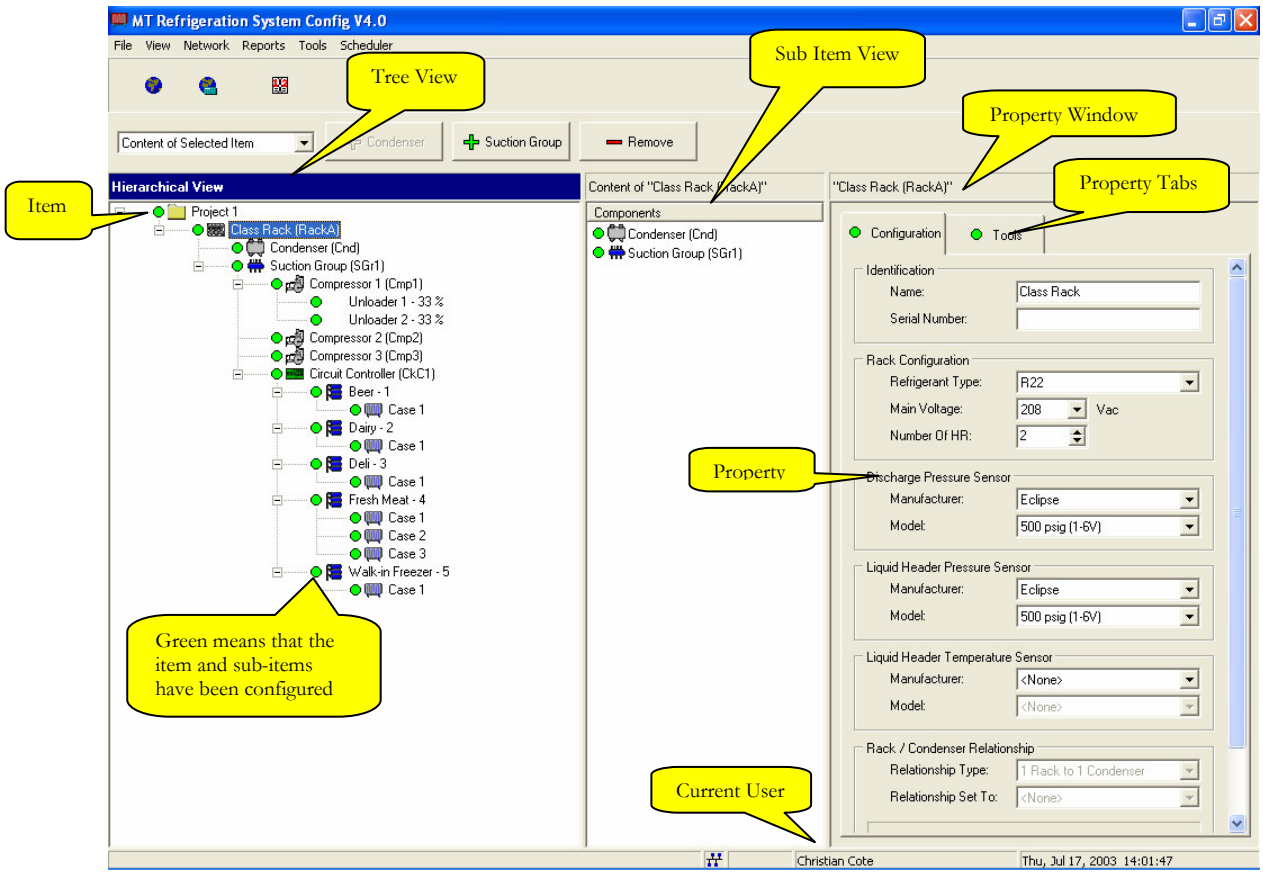


Figure 3 Main Window

Color Codes for Items and Tabs

There is a hierarchical order of colors displayed in the tree view

Red

The item or one of its sub-items needs to be configured or validated.

Yellow

The item or one of its sub-items has some optional properties to be configured or validated. These properties are used to provide additional information only. They are not critical to the operation of the system.

Green

The item and all sub-items have been configured.

The Toolbar

The toolbar allows the user fast access to some commonly used features:

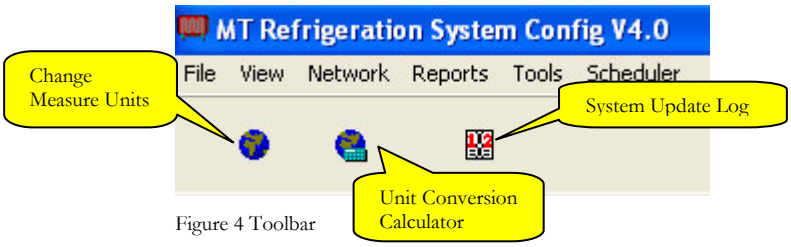
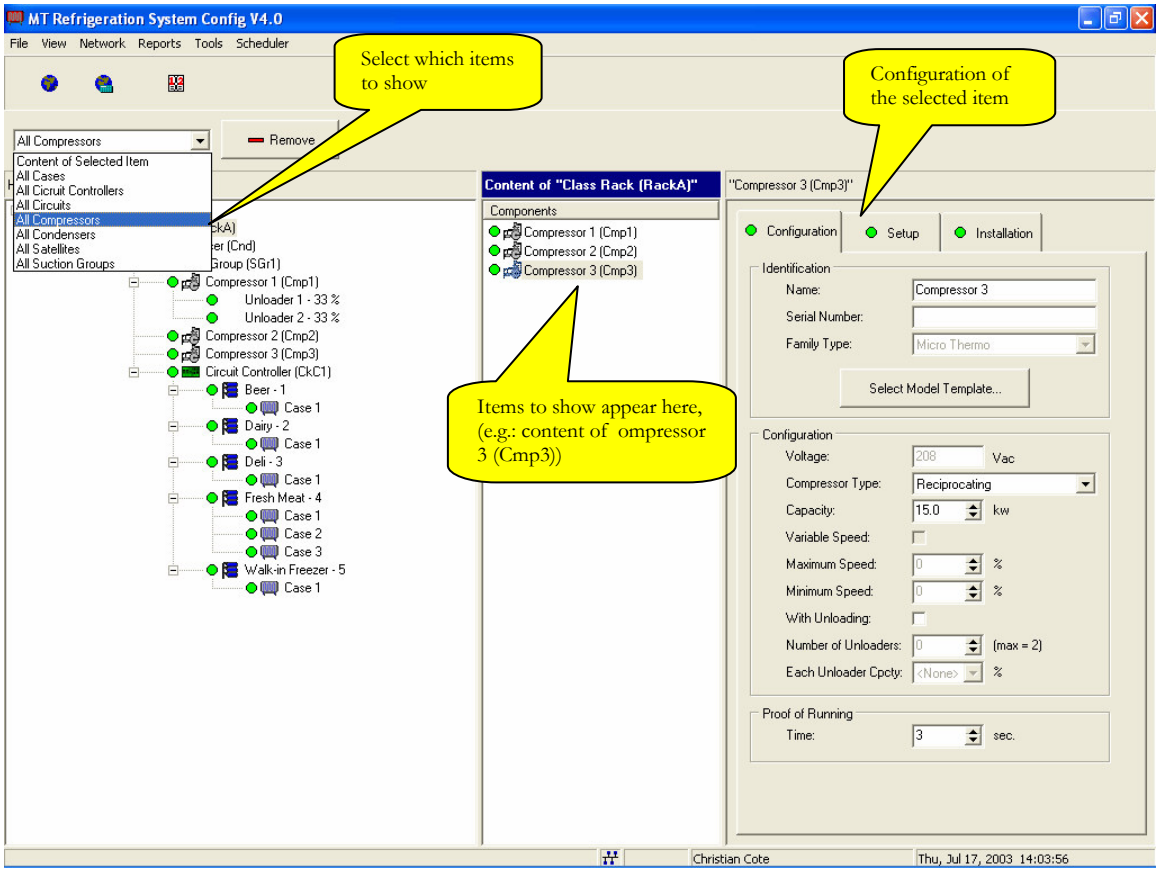


Figure 4 Toolbar

The toolbar can be removed via the "View – Toolbar" menu item.

The combo box above the tree view allows you to select the content of the sub-item view. For example you can select to see all circuits on the project. You can then use the sub-item view to review the property window of all circuits.

The Main Window



Configuration Limits

The following limitations apply to this tool. There can be a maximum of:

- three (3) suction groups per rack
- ten (10) compressors per suction group
- eight (8) circuit controllers per rack
- five (5) circuits per circuit controller
- forty (40) circuits per rack
- one (1) condenser per rack
- The maximum number of racks depends on the number of global views in the MT Alliance. The number of racks is limited to "8 – (number of global views)". (e.g.: 5 racks if 3 global views are used in MT Alliance)

The "ADD…" button will be grayed (disabled) automatically if such a limitation is attained.

Menu Items

File Menu:

Exit: To exit the Refrigeration Configuration Tool. Exiting the tool takes a while since each property changed needs to be sent to the corresponding node. Furthermore, the MT Alliance user interface (rack views) must be refreshed. So it is better if you complete as much work as possible before exiting the tool.

View Menu:

Toolbar: Show or hide the toolbar

Large Icons - Small Icons - List - Details: Change the way objects are displayed in the sub-item view.

Network Menu:

Send All CPs: The Configuration Properties (CPs) are automatically sent when you exit the Refrigeration Configuration Tool. But you can use this menu item to send the CPs to the nodes without leaving the tool.

Update All Connections: The Connections between refrigeration nodes are automatically updated when you exit the Refrigeration Configuration Tool. But you can use this menu item to update them without leaving the tool.

Reports Menu:

Configuration Report: You can preview the configuration report of a specified rack and print it if needed. The report looks like this:

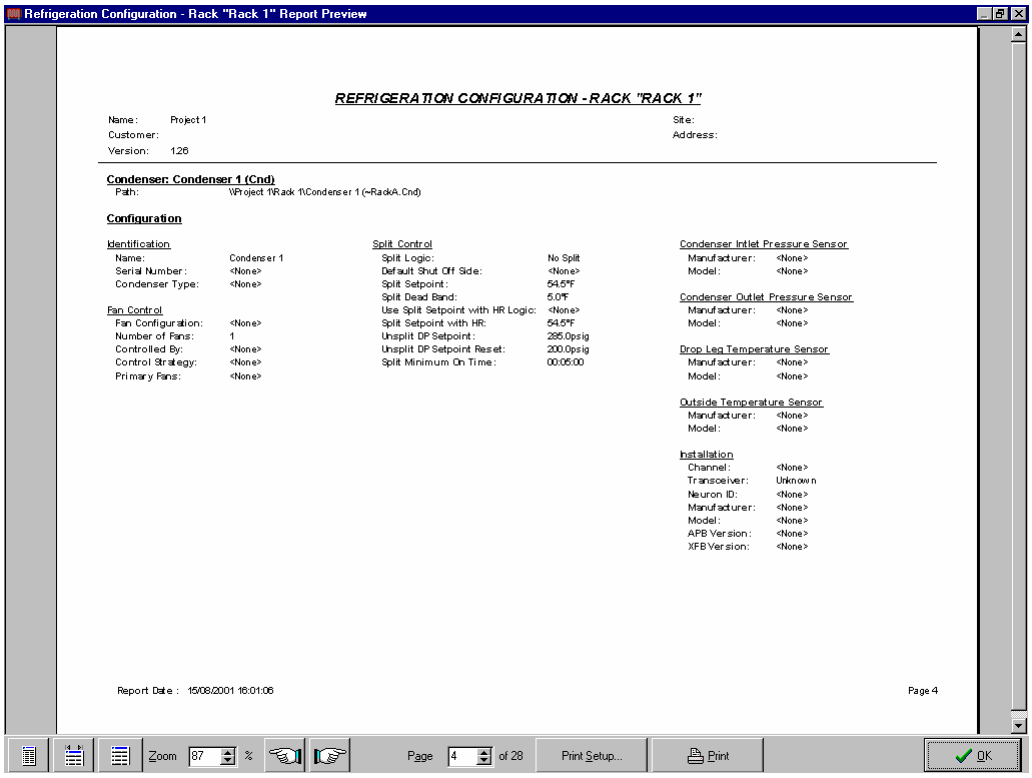


Figure 6a Refrigeration Configuration Report

Refrigeration remaining work / Validity checks: At any point during the configuration you can preview the list of remaining work and print it if needed. The report looks like this:

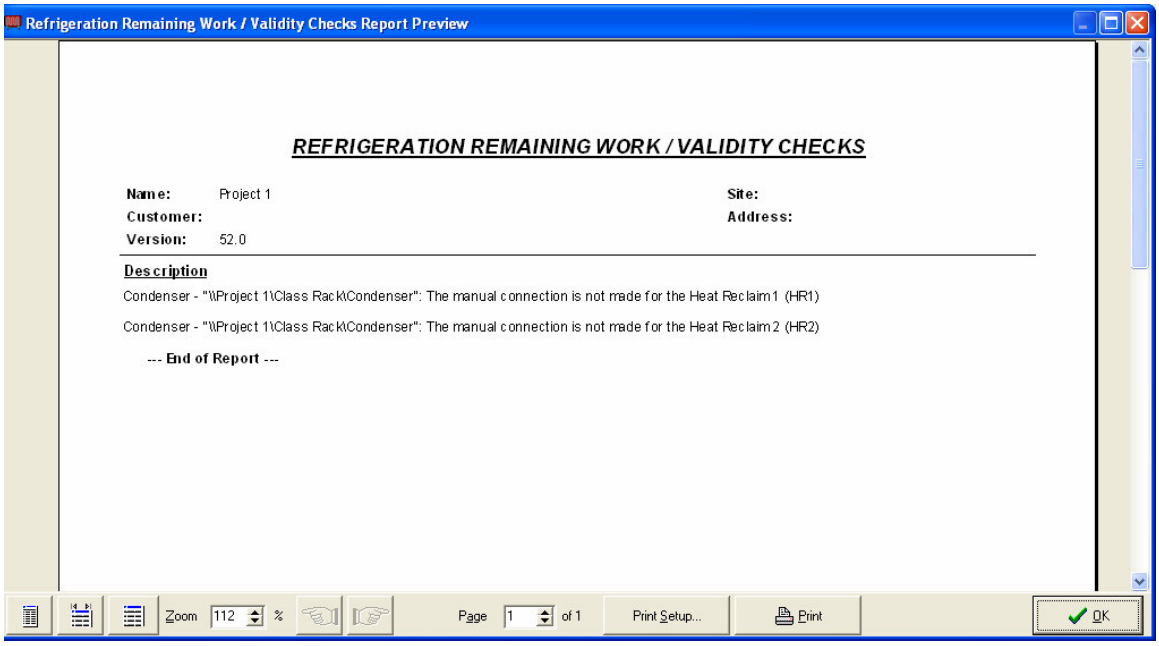


Figure 6b Refrigeration remaining work / Validity check report

System Updates: You can preview all changes made by all refrigeration technicians on this site. This feature is also available via a toolbar button.

This report will show you all the modifications that were made in the Refrigeration Configuration Tool (when, who, what). There is a major and minor version number. Each time you modify a property and you move to another item, the minor version is incremented.

Each time the Tool is restarted and you make a change, the major version is incremented and the minor version is set to 0.

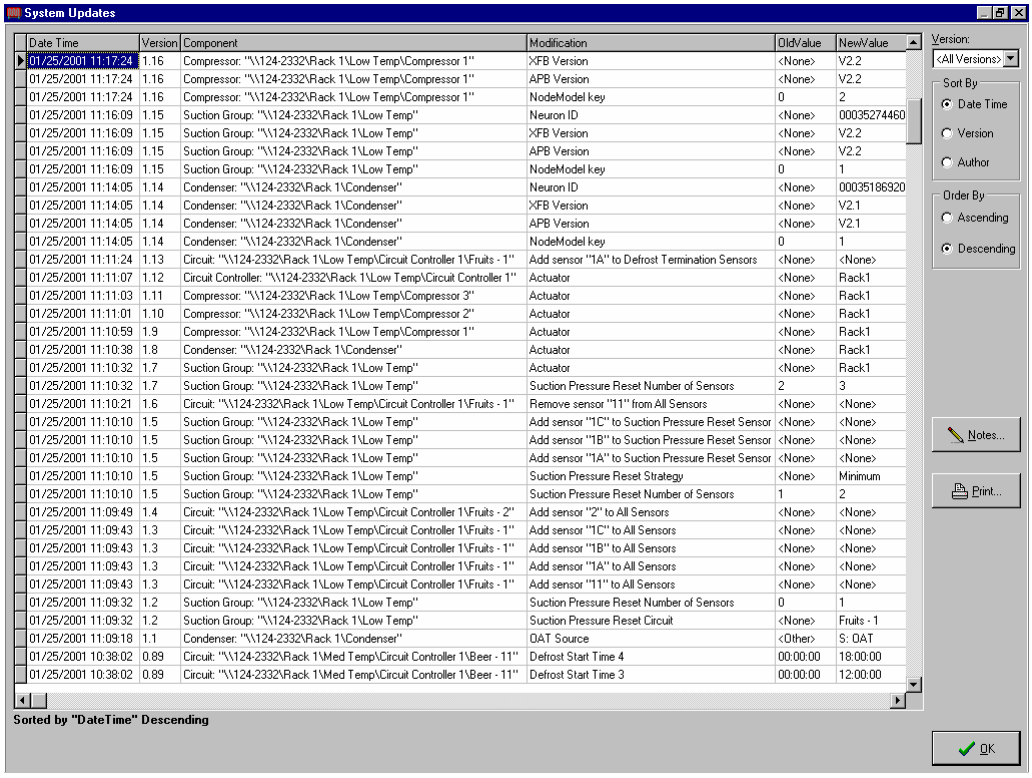


Figure 7 System Updates Report

Tools Menu:

Change Measure Units: You can change the units in which measures are displayed (metric, imperial, etc). Also available through a toolbar button.

Convert Units: This tool is a specialized calculator, which enables you to convert units (imperial to metric, etc.). Also available through a toolbar button.

System Log: This is the MT Alliance Platform System Log.

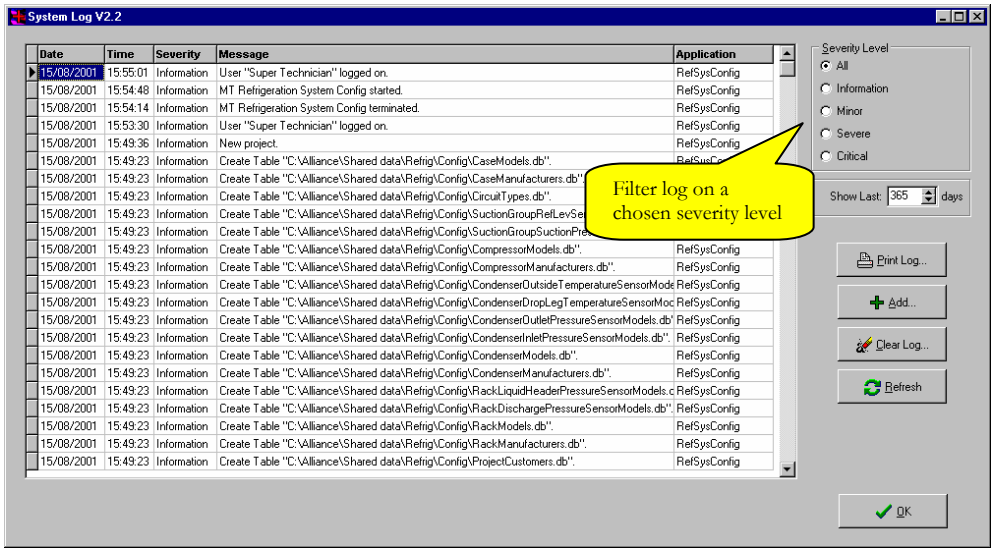


Figure 8 System Log

Scheduler Menu:

Rack N: The defrost scheduler allows you to set the defrost start times for all circuits on a rack. Another way to start the scheduler is to select the rack in the left part of the window and click on the *Scheduler* button in the *Tools*.

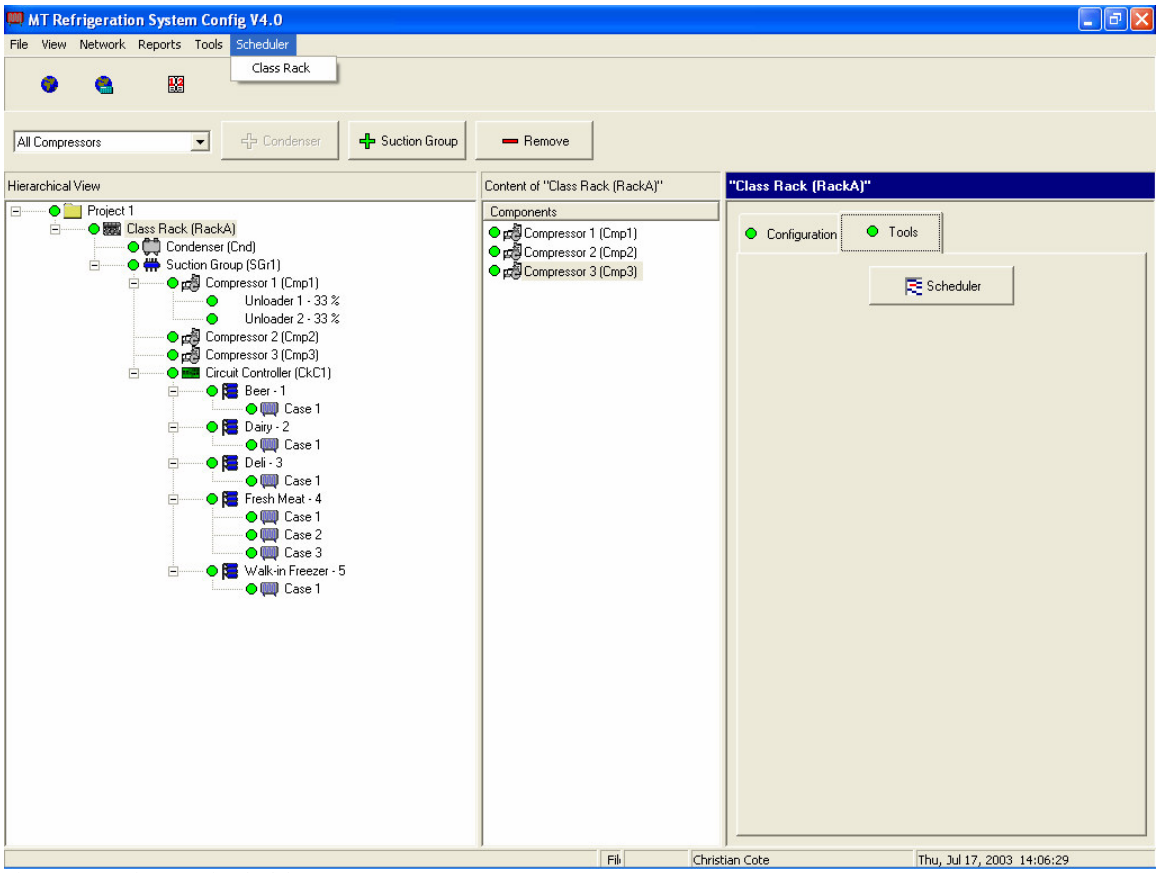


Figure 9 Accessing a Rack Schedule

The rack schedule allows you to set the defrost times of each circuit. The other defrost properties such as cycle duration, number of cycles/day, defrost type, circuit load and the like are set in the configuration tab of each circuit.

The circuit defrost properties must be configured **before** configuring the overall rack schedule

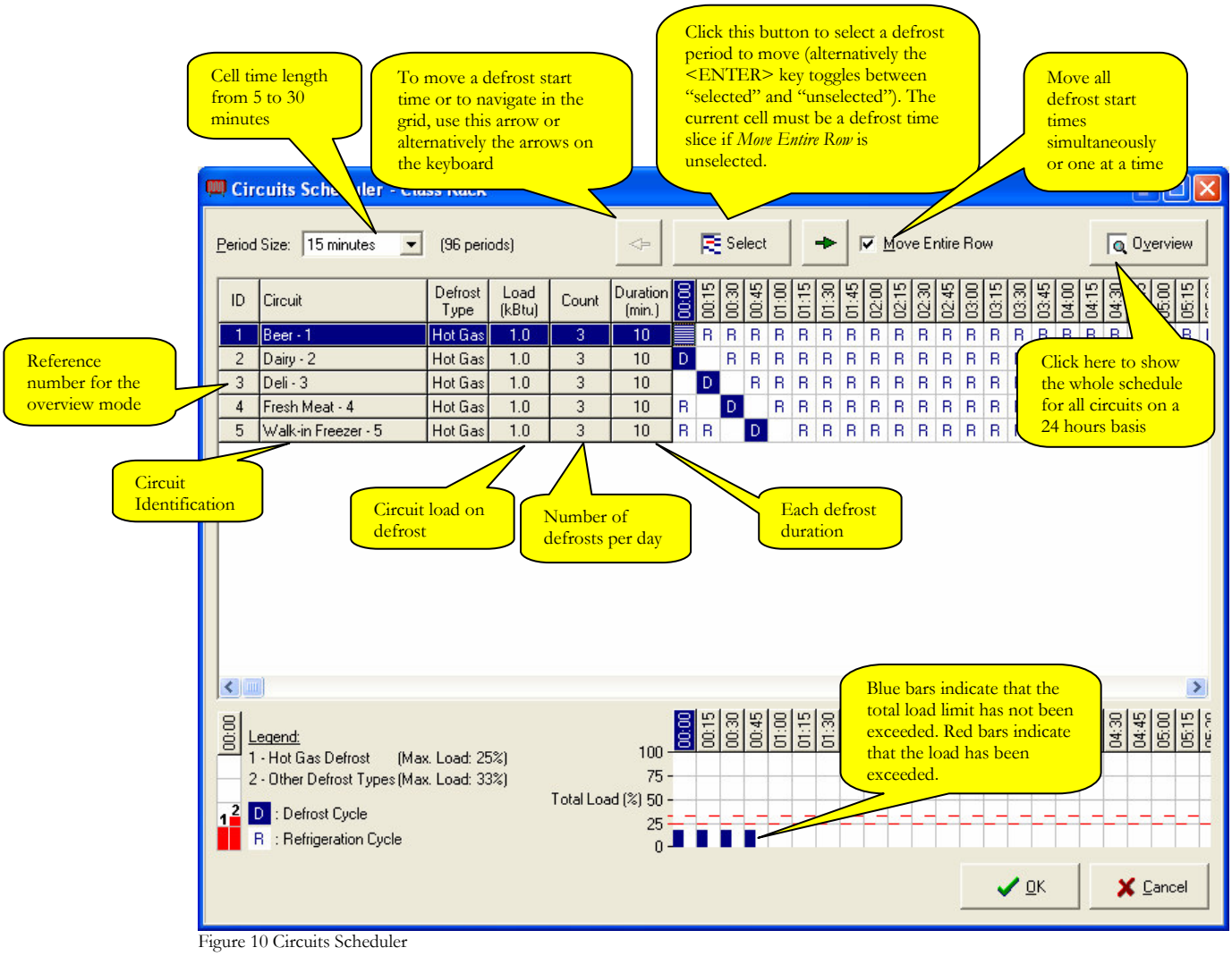


Figure 10 Circuits Scheduler

Managing items in drop-down lists

To add an item to a drop-down list marked with the symbol  (e.g.: the circuit types), simply click on <Manage Circuit Types> item in the list. The following window appears:

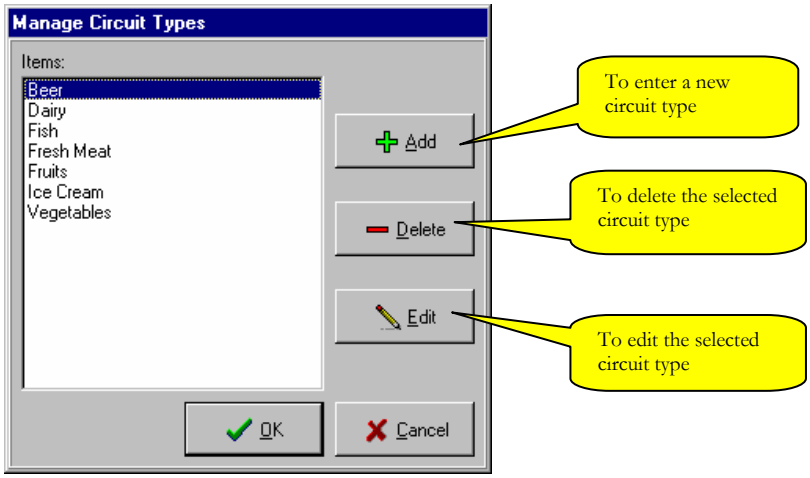
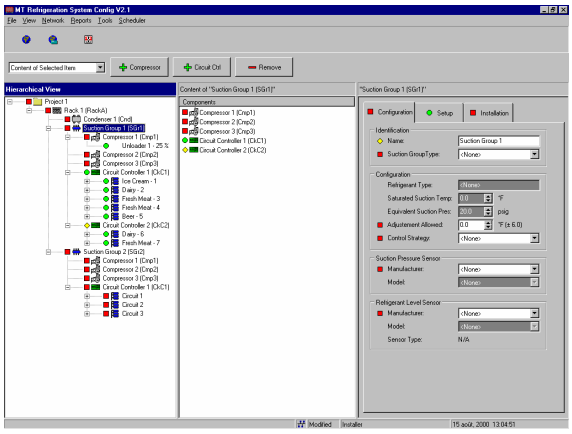


Figure 11 Managing Circuit Types

Proceed the same way with all other editable drop-down lists.

Chapter 3

Configuration Procedure



Configuration Procedure

Project Configuration

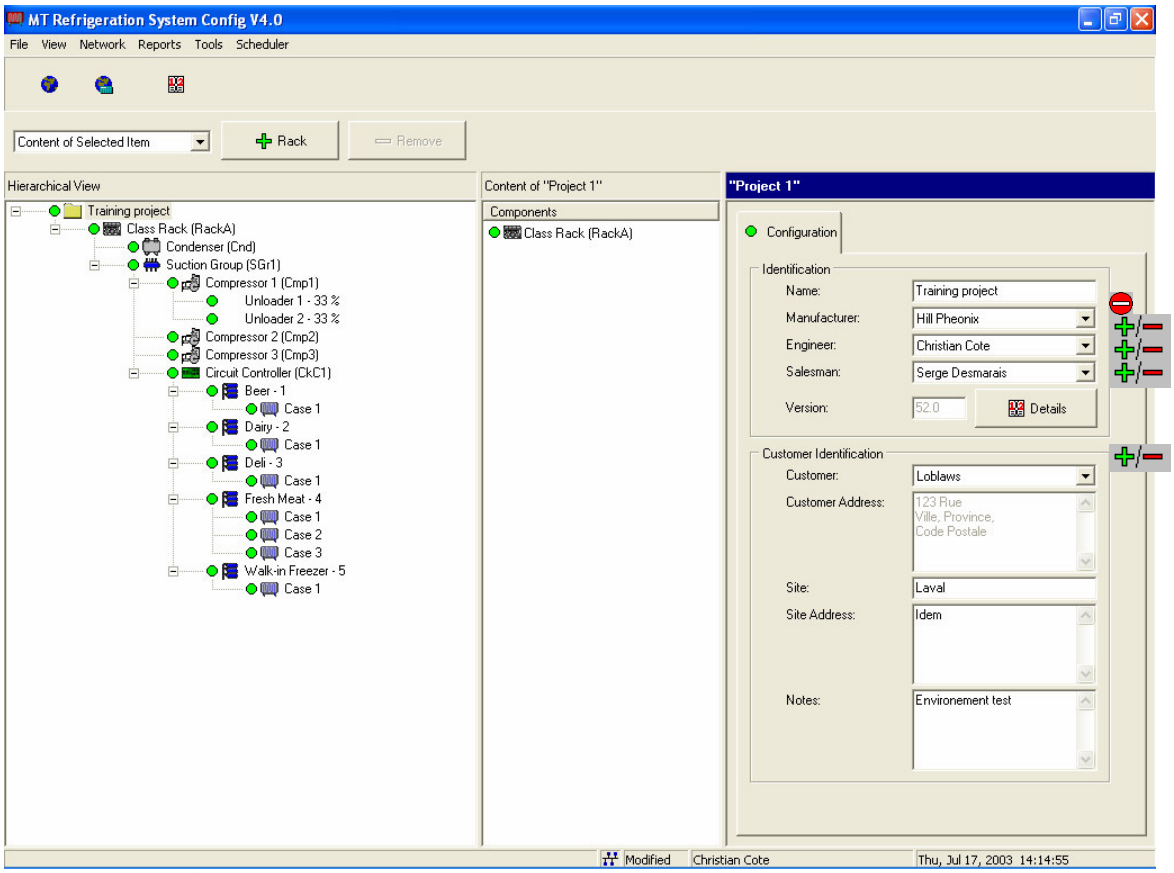


Figure 12 Project Configuration

Configuration:

Identification:

Name: Identify the project name.

Manufacturer: Rack manufacturer

Engineer: The engineer in charge of the rack design

Salesman: The person who sold the job

Costumer Identification:

Customer: Name of Owner or chain

Site: Site Name

Notes: Any other information that can be relevant

Rack Configuration

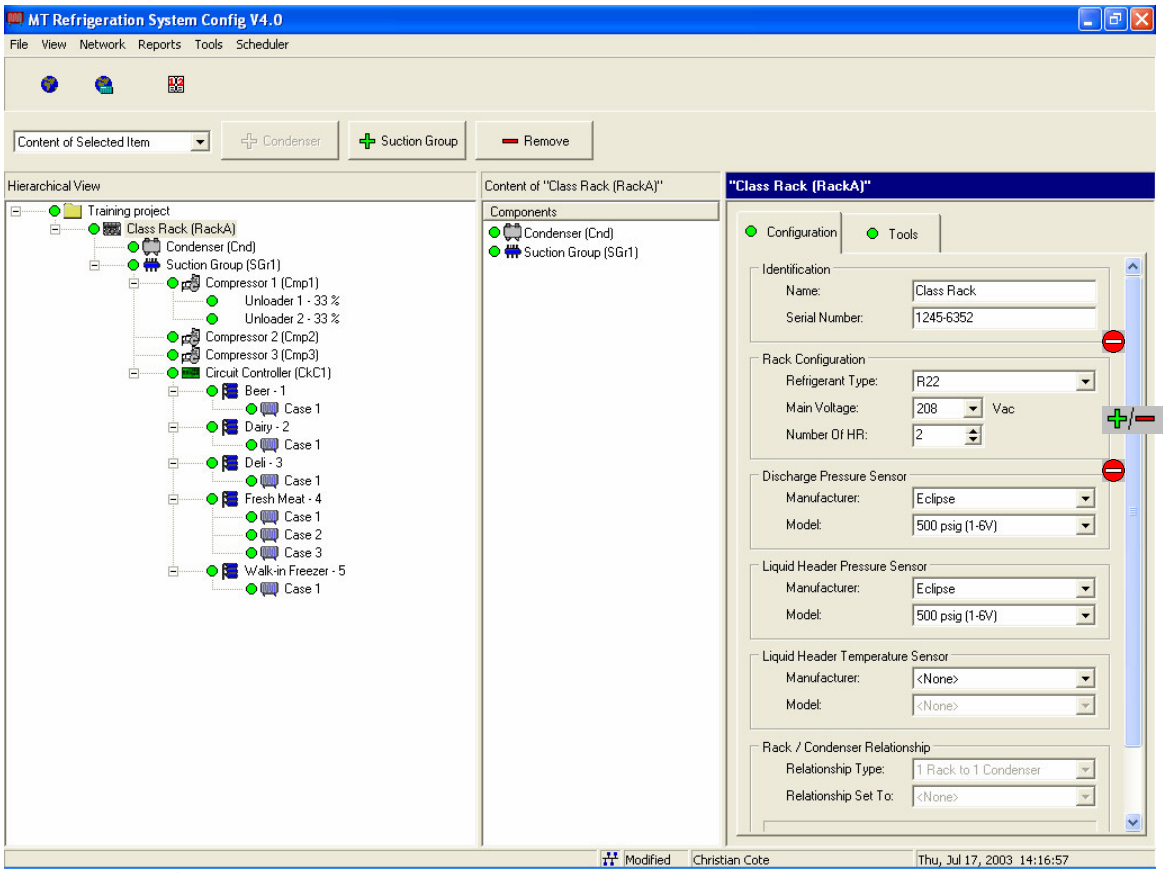


Figure 13 Rack Configuration

Configuration

Identification

Name: Identifies the rack name (e.g.: Low Temp).

Serial Number: Put in the rack serial number

Rack Configuration

Refrigerant Type: Refrigerant type used by the rack; the refrigerant type's physical characteristics can be imported from different sources, like a Microsoft Excel spreadsheet filled with pressure/temperature values.

Main Voltage: Rack voltage determines the type of compressor that can be used.

Number Of HR: Number of Heat Reclaims, maximum 2 per rack.

Discharge Pressure Sensor

It can be physically located on the condenser or on the suction group. Select proper sensor manufacturer and model for the rack.

Liquid Header Temperature Sensor

It can be physically located on the condenser or on the suction group. Select proper sensor manufacturer and model for the rack.

Liquid Header Pressure Sensor

It can be physically located on the condenser or on the suction group. Select proper sensor manufacturer and model for the rack.

Rack / Condenser Relationship

The only available relationship is one condenser per rack. One condenser being shared by 2 racks is not currently available.

Tools

See Scheduler Menu section.

Condenser Configuration

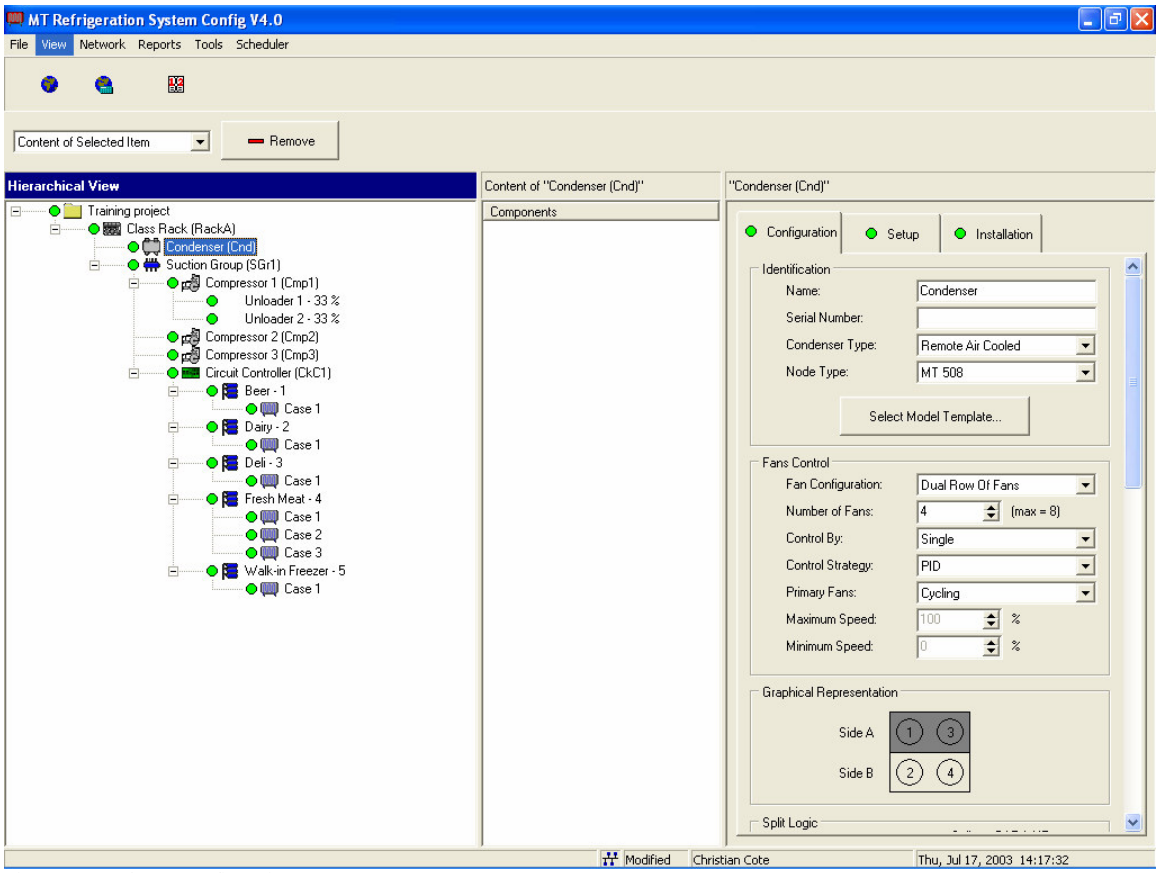


Figure 14 Condenser configuration

Configuration

Identification:

Name: Identify the Condenser

Condenser Type: Select the appropriate condenser physical type.

Select Model Template: Use this feature to apply default values to help you configure faster.

Node Type: use this feature to select the appropriate condenser type.

Fans Control:

Fan Configuration: Specify the mechanical configuration used on the condenser. Select "Single row of fans" or "Dual row of fans".

Number of Fans: Specify the total number of fans on the condenser.

Control By: Specify if each fan is controlled individually or by pairs in the case of a dual row of fans.

Control Strategy: Specify if the fans are controlled by a PID loop or sequentially (not yet available).

Primary Fans: Specify if the first fan has a fixed speed or a variable speed.

Maximum and minimum speed: Specify the variable speed fan maximum and minimum speed in percentage.

Your selections above are reflected in the graphical representation below (in the example below there is a dual row of fans controlled by pairs).

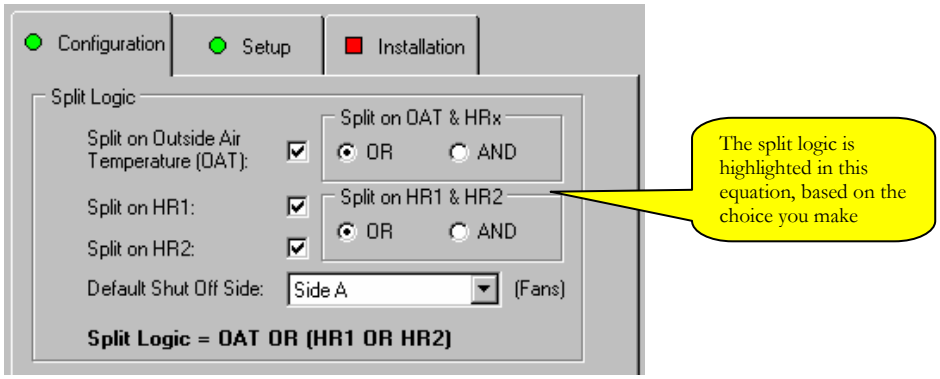


Figure 15 Condenser Split Logic

Specify how the condenser should split the fans. You can split on outside air temperature only, on heat reclaim 1 only, on heat reclaim 2 only or on a combination of these. You can specify which side will shut off when the condenser splits. Your selections are reflected on the Split Logic equation in bold.

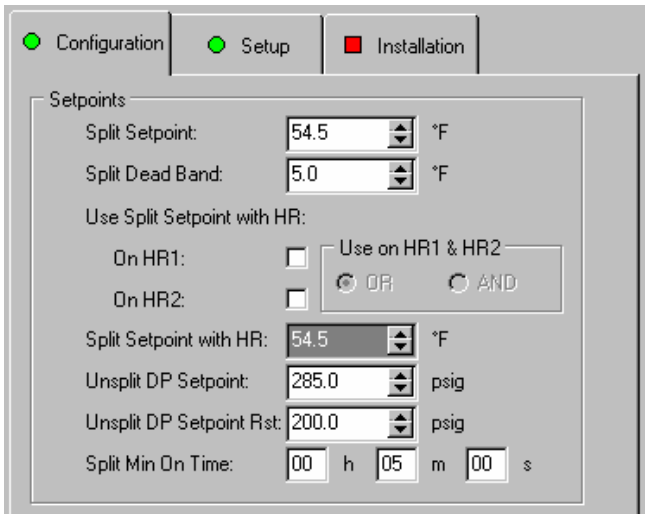


Figure 16 Condenser Setpoints

This section helps you determine the temperature and pressure setpoints that control the split logic.

Split Logic:

Split Setpoint: Represents the outside temperature at which the split should happen, depending on the other conditions.

Split Dead Band: Identifies a deadband (setpoint ± ½ deadband) to reduce the start/stop cycles.

Use Split Setpoint with HR: Specify if the condenser should use the Split Setpoint with Heat Reclaim for the outside temperature.

Split Setpoint with HR: Specify the outside temperature setpoint if you use a split setpoint with heat reclaim.

Unsplit DP Setpoint: Specify the discharge pressure setpoint which will unsplit the condenser.

Unsplit DP Setpoint Reset: Pressure at which the system will return the split in normal mode.

Split Min On Time: Specify the minimum time duration that the condenser will split if the temperature exceeds the setpoint.

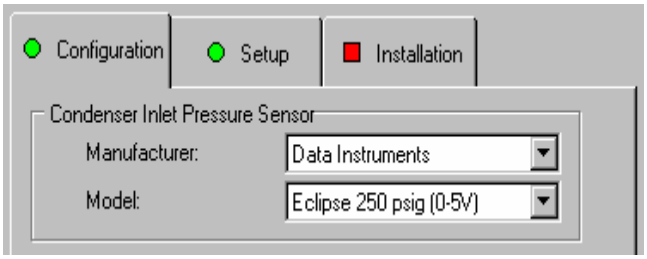


Figure 17 Condenser Sensors

Select the sensor manufacturer and the sensor model. Do the same thing with the Condenser Outlet Pressure, the Drop Leg Temperature Sensor, the Outside Temperature Sensor and the Variable Speed Analog Output.

Setup

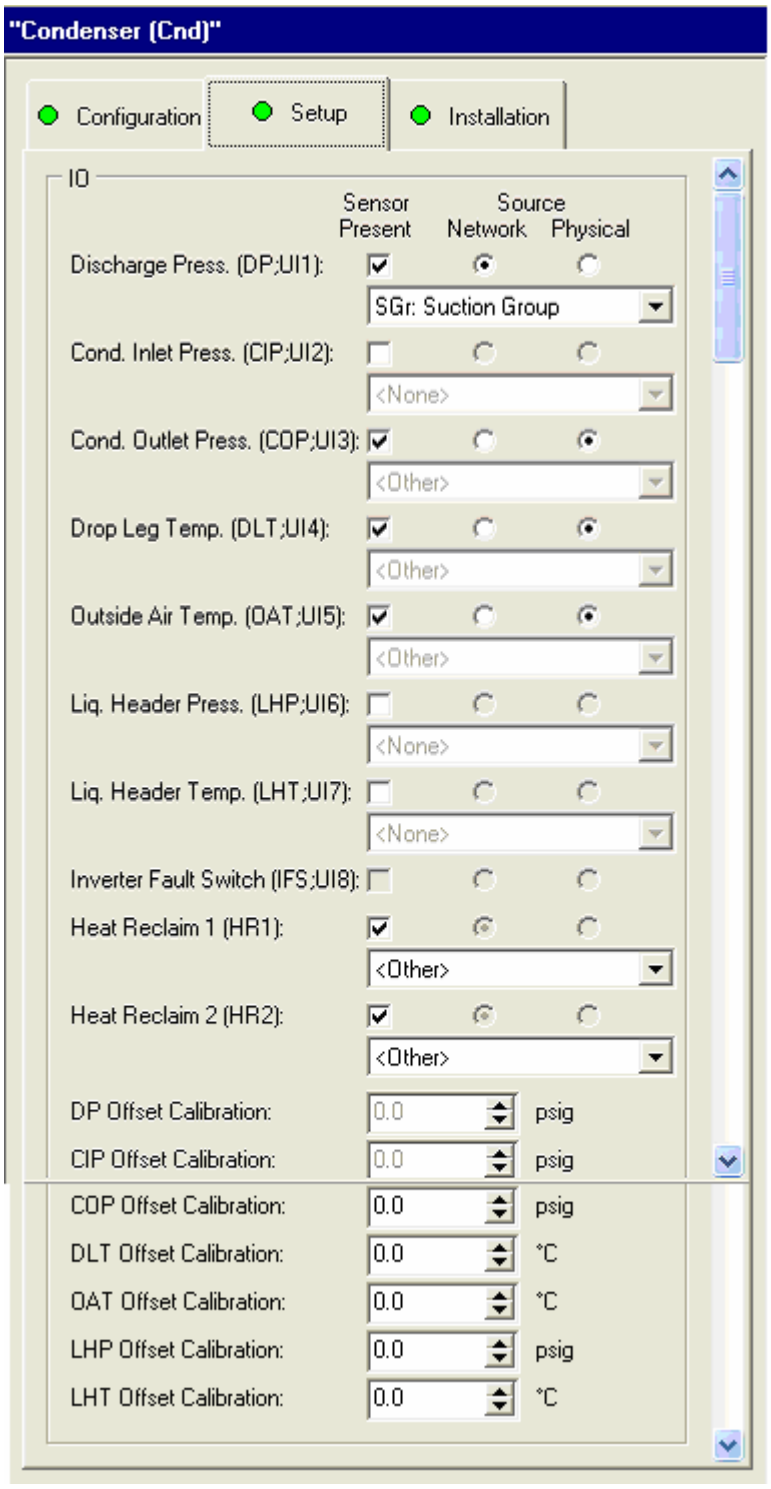


Figure 18 Condenser I/O

Specify if sensors are physically wired on the condenser or if they come from another node (another network source). A sensor can be present or absent (not used). If it is present, it can be either locally wired (physical) or come from another node (network). If you select a network source, the sensor can be on another node of the same rack or on an alarm sensor node dropped in the refrigeration subsystem. It can also come from any node but in this case the connection must be done manually.

Offsets: These allow you to calibrate each sensor that is physically wired to the condenser.

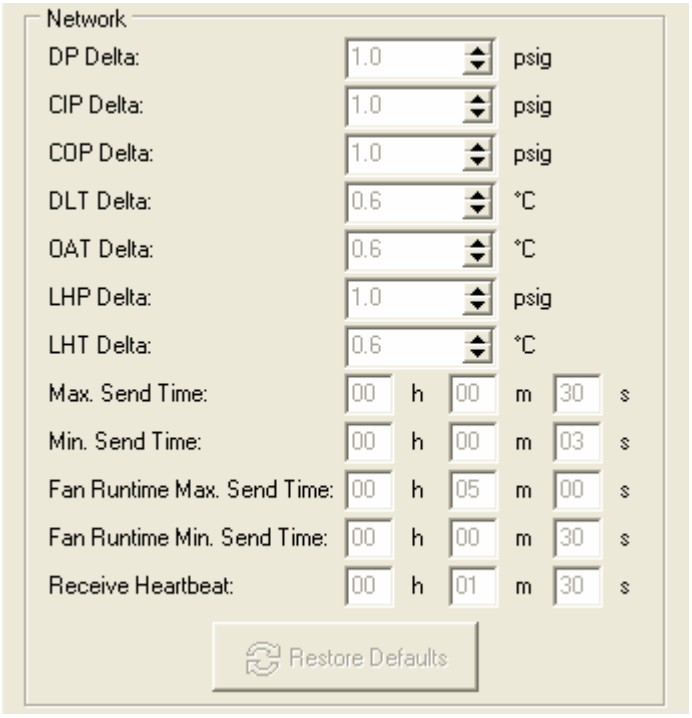


Figure 19 Condenser Network Parameters

This section allows you to control the network bandwidth by deciding when network variables should be propagated. The default values should do under most circumstances. You have to be logged in as a Super Technician to change these properties. Reducing the deltas, the min send time and the max send times is not recommended. A noisy sensor will create a lot of unnecessary network variable transmissions. Increasing these values can compensate for a noisy sensor.

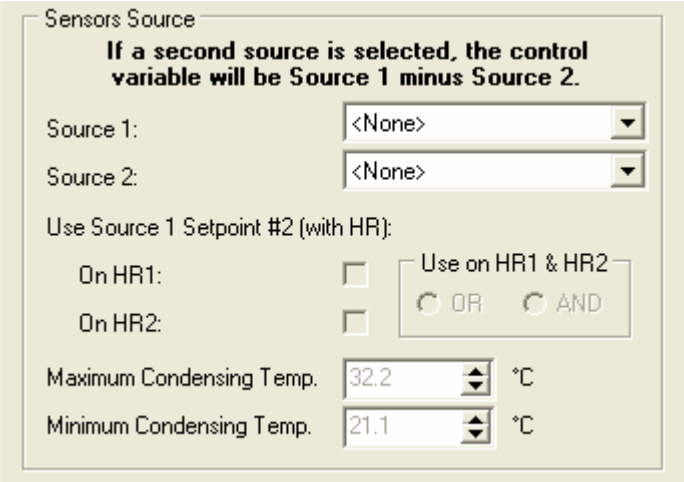


Figure 20 Condenser Sensors Source

This section is used to indicate how many control sources will be used to control the condenser. For example you can select DP (discharge pressure) if you use only one source. Another example would be to use the drop leg temperature for source 1 and outside temperature for source 2.

Figure 20A Condenser Inverter Fault

Reset Retry: Select the number time you want the inverter fault to try to start.

Retry Time: Time between each retry of the inverter fault.

Figure 21 Condenser Alarm Relay

Alarm Relay: Select the alarm relay to activate when a condenser alarm occurs. Only global alarm relays or refrigeration alarm relays are available for selection.

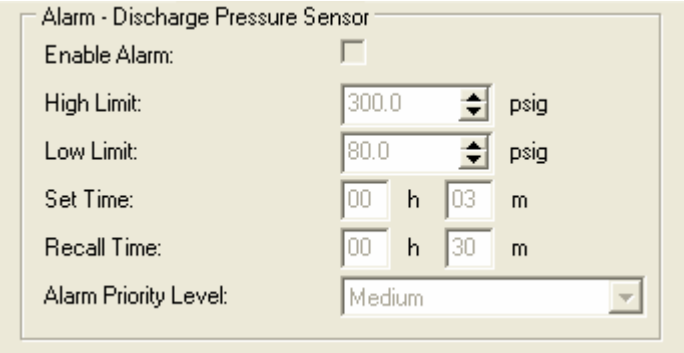


Figure 22 Condenser Alarm – Discharge Pressure Sensor

Enable Alarm: Check this box to enable alarm monitoring for this sensor. Note that you can not disable alarms related to sensor failures. Sensor failure alarms are automatically enabled when a sensor is declared physically present.

Low Limit, High Limit, Set Time and Recall Time: Refer to Volume 1, "MT Alliance Platform, Information and Control System" and read the "Alarm Concepts" chapter for a complete explanation of the set time and recall time.

Program Priority Level: Can be High, Medium, Low or Notice. The alarm relay will not be activated if you select a Notice level.

Proceed the same way with the Condenser Inlet Pressure Sensor, the Condenser Outlet Pressure Sensor, the Drop Leg Temperature Sensor the Outside Temperature Sensor, the Liquid Header pressure Sensor, the Liquid Header Temperature Sensor and the Inverter Fault Switch Sensor..

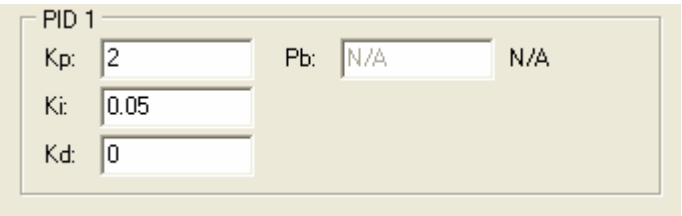


Figure 23 Condenser PID Gains

Use these to adjust how much and how fast the condenser strategy will react to differences between the measured value and the setpoint value. Kp is the proportional gain. Ki is the integral gain. Kd is the derivative gain. Pb is the proportional band. The simplest PID setup procedure is to leave Kd at 0. Start with Ki at 0. Increase Kp until the strategy starts to over-react. Reduce Kp by 20%. Increase Ki until the strategy starts to over-react. Finally reduce Ki by 20%.

Installation

See Hardware Installation Chapter.

Suction Group Configuration

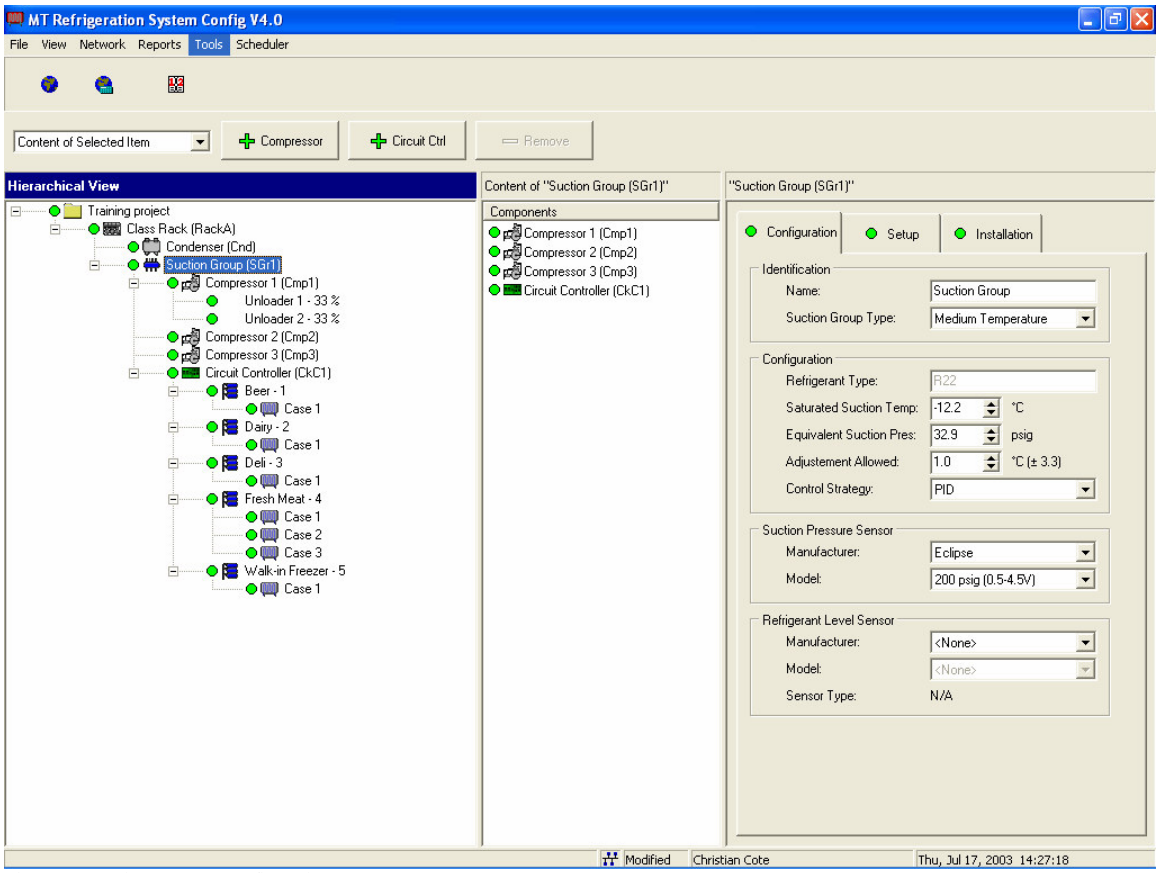


Figure 24 Suction Group Configuration

Configuration

Identification:

Name: Identify the suction group

Suction Group Type: This determines some default configuration properties.

Configuration:

Refrigerant Type: Pre-selected in the rack configuration.

Saturated Suction Temperature: The value depends on the suction group type and the refrigerant type.

Equivalent suction pressure: The value depends on the suction group type and the refrigerant type.

Adjustment allowed: For future use

Control Strategy: *PID* implemented but *fixed step* not currently supported.

Suction Pressure Sensor:

Specify the sensor used on the suction group.

Refrigeration Level Sensor:

Specify the sensor used on the suction group. The model and manufacturer determines whether the sensor is analog or digital.

Setup

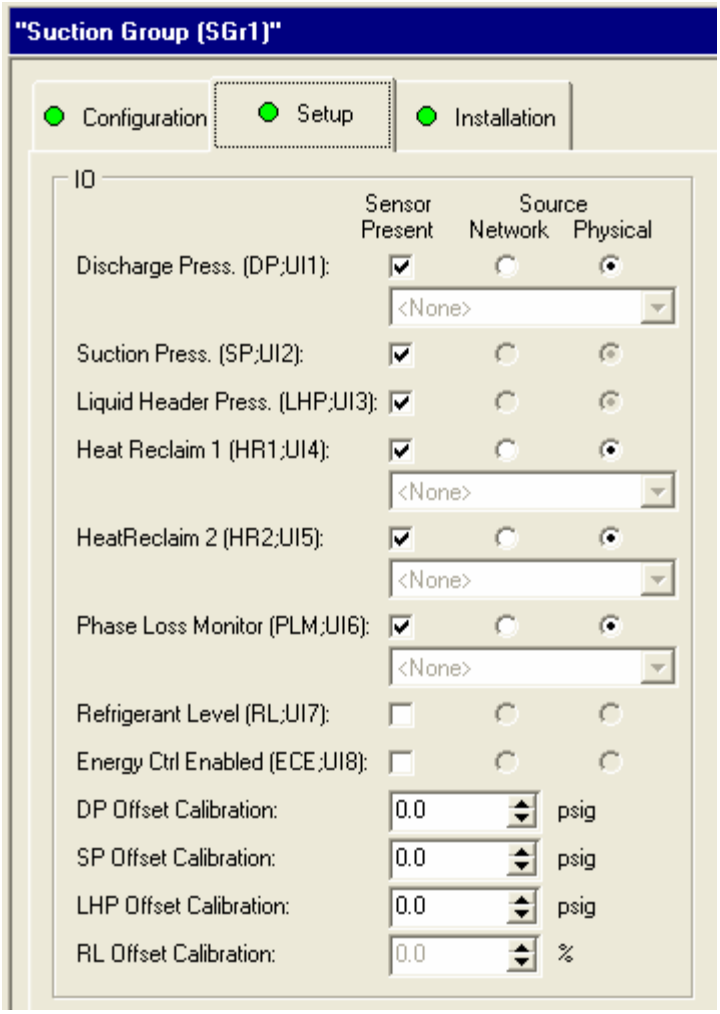


Figure 25 Suction Group I/O

Specify if sensors are physically wired on the suction group node or if they come from another node (another network source). A sensor can be present or absent (not used). If it is present, it can be either locally wired (physical) or come from another node (network). If you select a network source, the sensor can be on another node of the same rack or on an alarm sensor node dropped in the refrigeration subsystem. It can also be on any other node but in this case the connection must be done manually. Note that SP, LHP, RL and ECE sensors can not come from the network, they have to be physically connected to the suction group node.

Offsets: They allow you to calibrate each sensor physically connected to the suction group node.

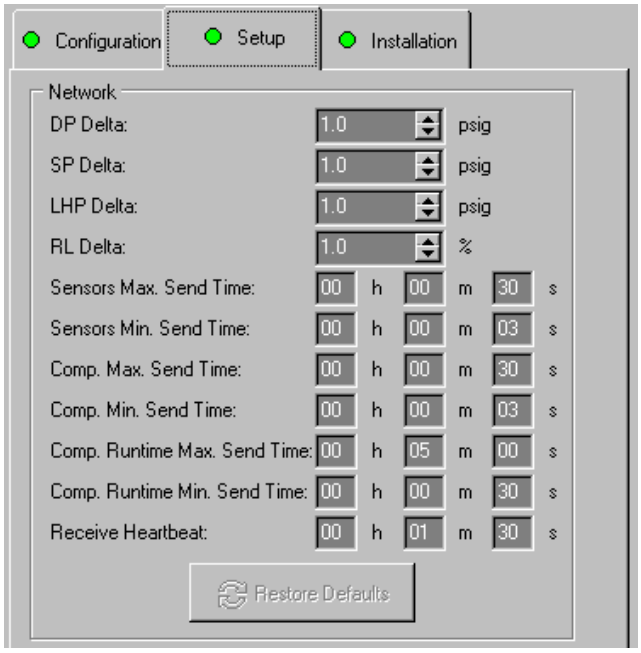


Figure 26 Suction Group Network Properties

This section allows you to control the network bandwidth by deciding when network variables should be propagated. The default values should do under most circumstances. You have to be logged in as a Super Technician to change these properties. Reducing the deltas, the min send time and the max send times is not recommended. A noisy sensor will create a lot of unnecessary network variable transmissions. Increasing these values can compensate for a noisy sensor.

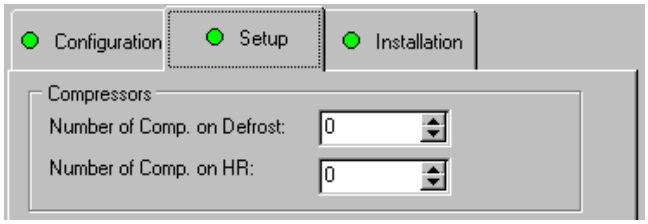


Figure 27 Suction Group Compressor properties

Number of Compressors on defrost: The X first compressors will be forced on when a circuit is in defrost on the suction group.

Number of Compressors on HR: The X first compressors will be forced on when a heat reclaim is activated on the rack.

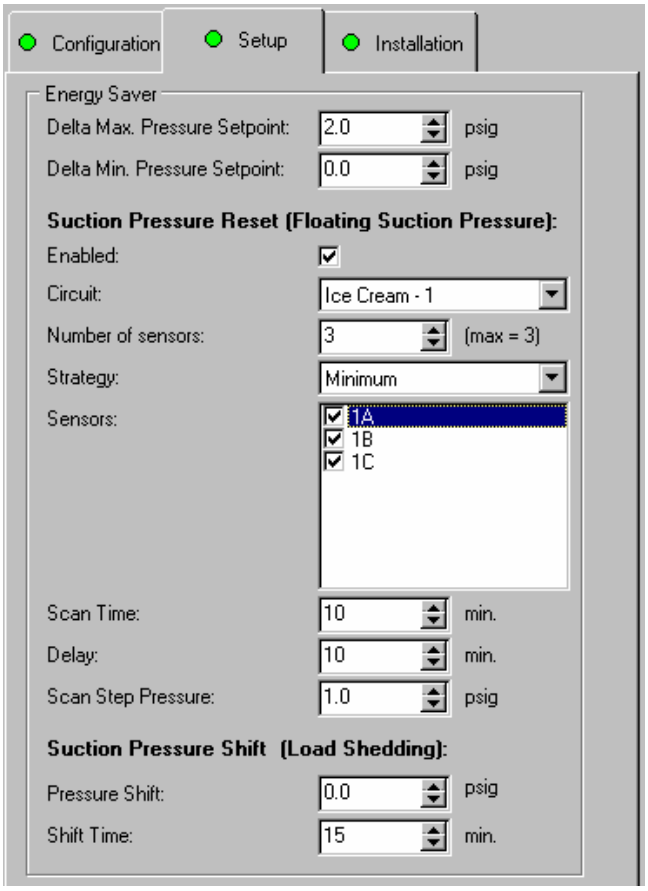


Figure 28 Suction Group Energy Saver

Delta Maximum Pressure: Set the pressure difference that will be added to the suction pressure setpoint to yield the maximum pressure.

Delta Minimum Pressure: Set the pressure difference that will be subtracted from the suction pressure setpoint to yield the minimum pressure.

Enabled: Specify if the Suction Pressure Reset option will be used to re-adjust the suction pressure setpoint.

Circuit: Specify which circuit is the coldest. The related case temperature sensors will be used by the Suction Pressure Reset option.

Number of sensors: Specify how many sensors on the coldest circuit should be used in the strategy.

Strategy: Select how the sensors readings will be used. You can select the minimum, maximum or average value of the selected case temperature sensors.

Sensors: Select which case temperature sensors to use in the strategy.

Scan Time: Set the time duration during which if circuit case temperatures are stable, we will get an increase or decrease of the suction pressure setpoint.

Delay: Set the delay after the circuits defrost before the Suction Pressure Reset can be activated again (to let the case temperatures recover their normal values).

Scan Step Pressure: Set the pressure increment to add to the setpoint or remove from the setpoint if the calculated circuit temperature is stable during each scan time. The setpoint will be increased if the case temperature is lower than the setpoint (set via the nviSprTpStPt).

Pressure Shift: Set how much the suction pressure setpoint must increase if the load shedding option is activated.

Shift Time: Set the duration of the load shedding after receiving a load shed request from an energy management node. The suction pressure setpoint will be increased for the Shift Time period than it will go back to normal.

Figure 29 Suction Group Alarm Relay

Alarm Relay: Select the Alarm Relay to activate when a suction group alarm occurs. Only global Alarm Relay or Refrigeration Alarm are available for selection.

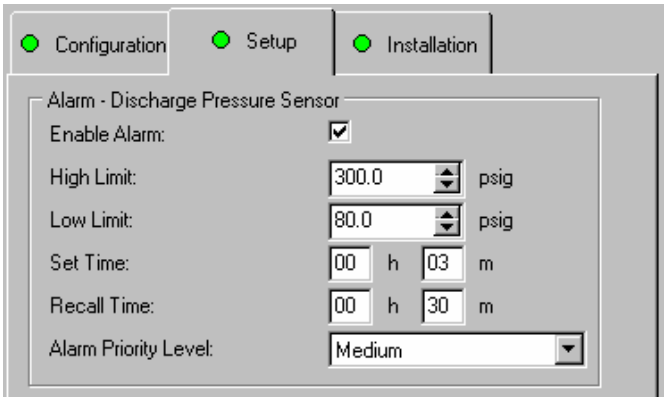


Figure 30 Suction Group Alarms

Enable Alarm: Check this box to enable alarm monitoring for this sensor. Note that you can not disable alarms related to sensor failures. Sensor failure alarms are automatically enabled when a sensor is declared physically present.

Low Limit, High Limit, Set Time and Recall Time: Refer to Volume 1, "MT Alliance Platform, Information and Control System" and read the "Alarm Concepts" chapter for a complete explanation of the set time and recall time.

Program Priority Level: Can be High, Medium, Low or Notice. The alarm relay will not be activated if you select a Notice level.

Proceed the same way with the Suction Pressure Sensor, the Liquid Header Pressure Sensor, Phase Loss Monitor Sensor and Refrigerant Level Sensor. The Phase Loss Alarm does not have a high and low limit. The Refrigerant Level Alarm uses a State instead of a High and Low Limit if the sensor is digital.

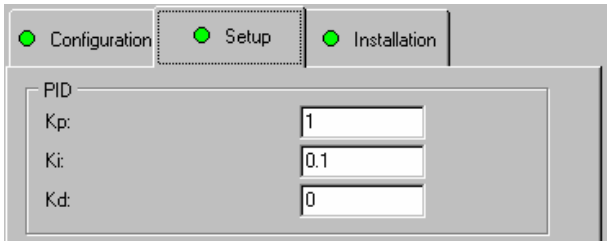


Figure 31 Suction Group PID gains

Use these to adjust how much and how fast the suction group strategy will react to differences between the measured value and the setpoint value. Kp is the proportional gain. Ki is the integral gain. Kd is the derivative gain. The simplest PID setup procedure is to leave Kd at 0. Start with Ki at 0. Increase Kp until the strategy starts to over-react. Reduce Kp by 20%. Increase Ki until the strategy starts to over-react. Reduce Ki by 20%.

Installation

See Hardware Installation Chapter.

Compressor Configuration

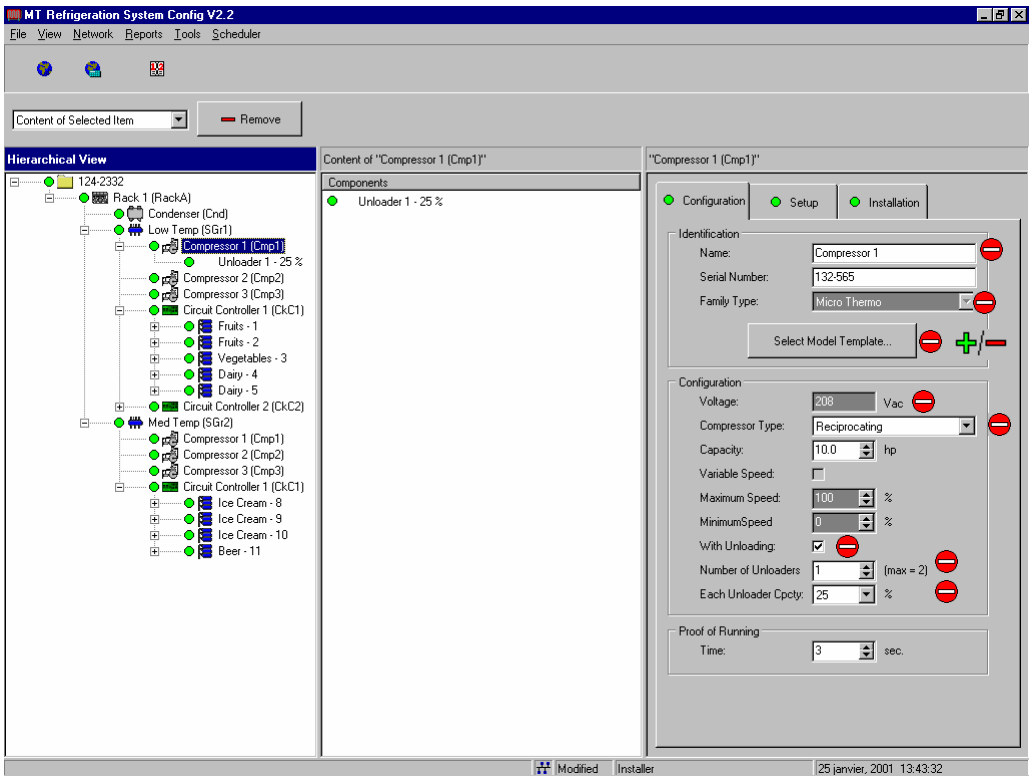


Figure 32 Compressor Configuration

Configuration

Identification:

Name and Serial Number: Identify the compressor

Family Type: Specify the rack node hardware that you are using (MT or HP family).

Select Model Template: Use this feature to apply default values to help you configure faster. Compressor models depend on the specified rack voltage.

Configuration:

Voltage: Comes from the rack configuration

Compressor Type : Select the proper type (e.g: reciprocating, scroll, etc.)

Capacity: Specify the compressor power

Variable Speed: Indicate if this is a variable speed compressor (i.e: enable the variable speed strategy)

Maximum Speed: Set the maximum speed command to the compressor (in %).

Minimum Speed: Set the minimum speed command to the compressor (in %).

With Unloading: Specify if there is at least one unloader on this compressor. Note that for the MT Family, you must insert the unloader plug-in module on the compressor node for this feature to work. With the HP family, the unloaders are built-in.

Number of Unloaders: Specify 1 or 2

Each Unloader Capacity: Specify the unloader power

Proof of running

Time: Set the time to wait before checking for a proof of running after a run command is issued.

Setup

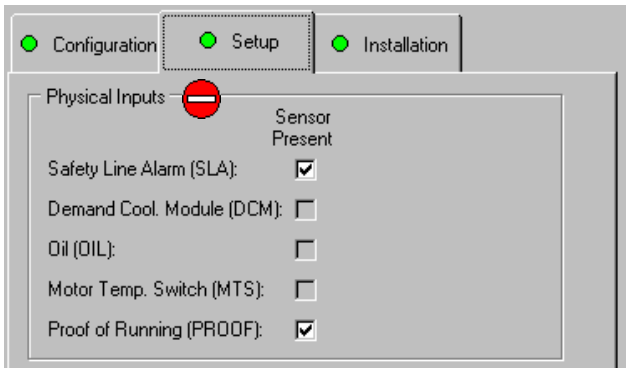


Figure 33 Compressor Physical Inputs

Specify which physical inputs are physically present.

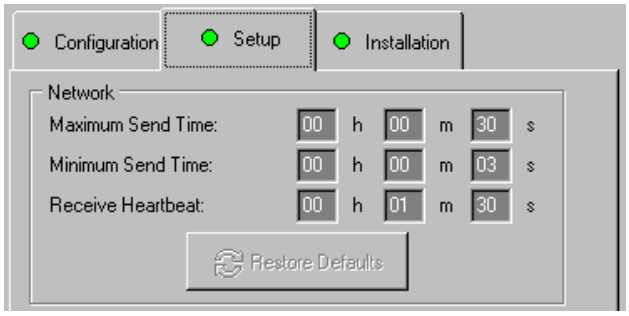


Figure 34 Compressor Network Properties

This section allows you to control the network bandwidth by deciding when network variables should be propagated. The default values should do under most circumstances. You have to be logged in as a Super Technician to change these properties. Reducing the min send time and the max send times is not recommended.

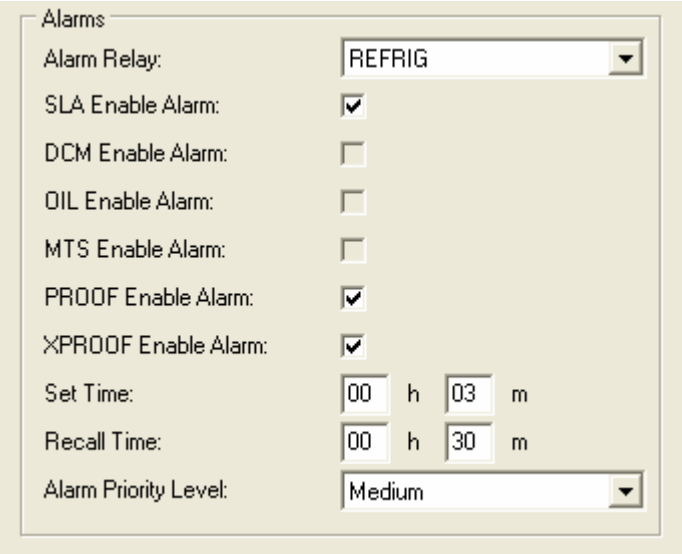


Figure 35 Compressor Alarm

Alarm Relay: Select alarm relays either among refrigeration alarms or site alarms relay dropped in Alliance.

Various Enable Alarm: Check this box to enable alarm monitoring for this sensor. Note that you can not disable alarms related to sensor failures. Sensor failure alarms are automatically enabled when a sensor is declared physically present.

Set Time and Recall Time: Refer to Volume 1, "MT Alliance Platform, Information and Control System" and read the "Alarm Concepts" chapter for a complete explanation of the set time and recall time.

Alarm Priority Level: Can be High, Medium, Low or Notice. The alarm relay will not be activated if you select a Notice level.

Installation

See Hardware Installation Chapter.

Circuit Controller Configuration

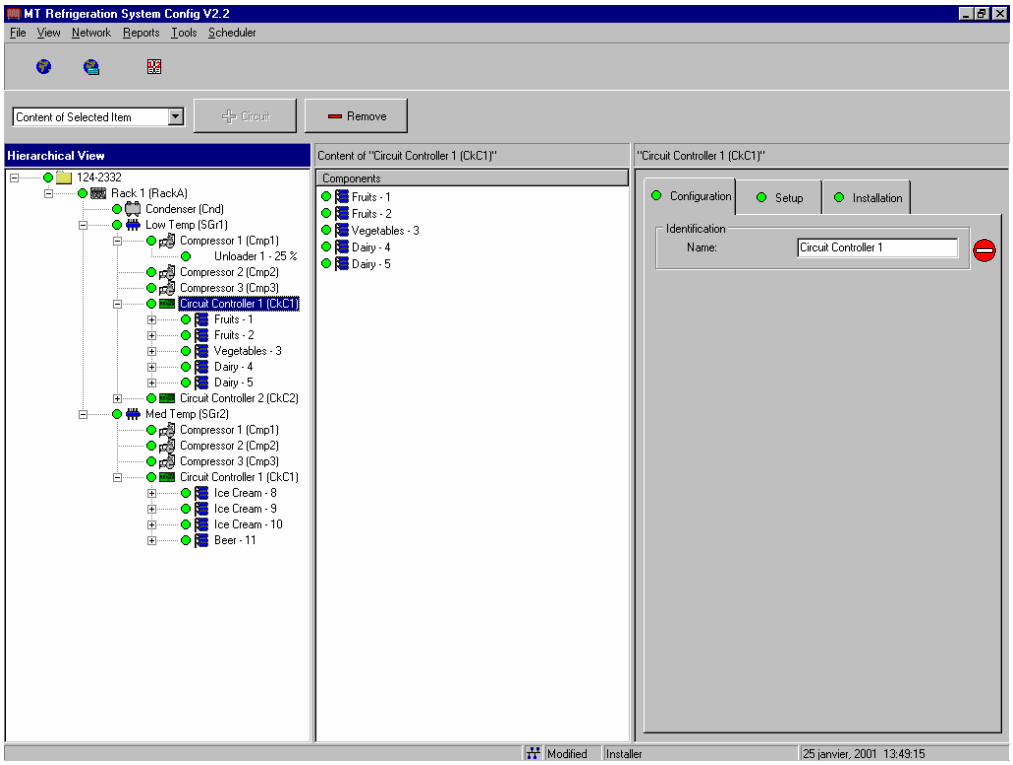


Figure 36 Circuit Controller Configuration

Configuration

Identification:

Name: Identify the circuit controller.

Setup

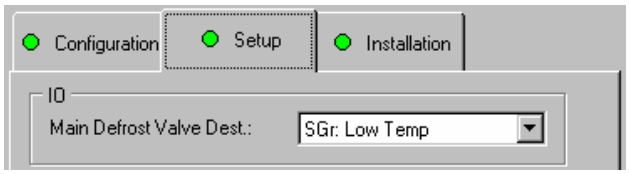


Figure 37 Circuit Controller I/O

Main Defrost Valve Dest.: Indicates which suction group will receive the Main Defrost Valve Status.

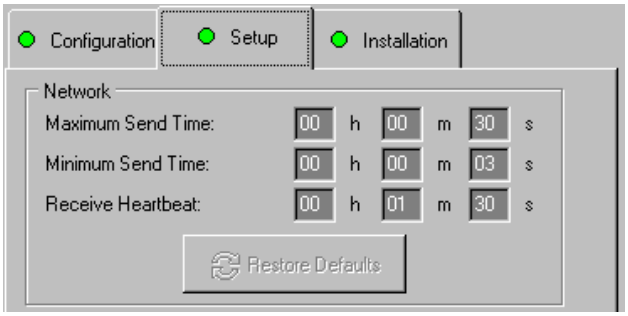


Figure 38 Circuit Controller Network Properties

This section allows you to control the network bandwidth by deciding when network variables should be propagated. The default values should do under most circumstances. You have to be logged in as a Super Technician to change these properties. Reducing the min send time and the max send times is not recommended.

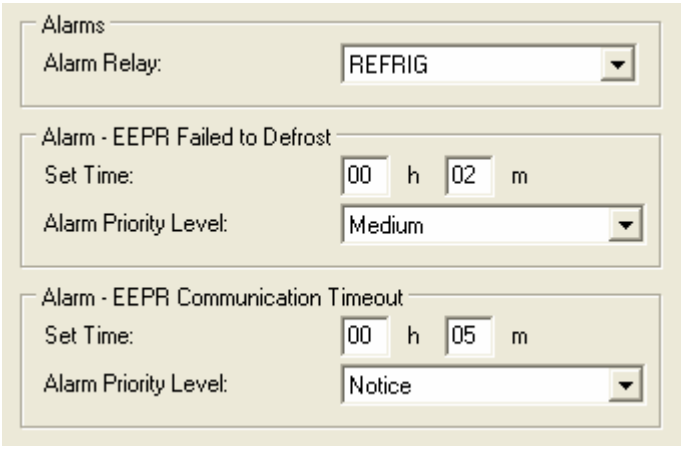


Figure 39 Circuit Controller Alarm Relay

Alarm Relay: Select alarm relays either among refrigeration alarms or site alarms relays dropped in Alliance.

EEPR Failed to Defrost: Set time for EEPR valve alarm if it failed to initiate defrost.

EEPR Communication Timeout: Set time EEPR valve to communicate communication timeout to system.

Installation

See Hardware Installation Chapter.

Circuit Configuration

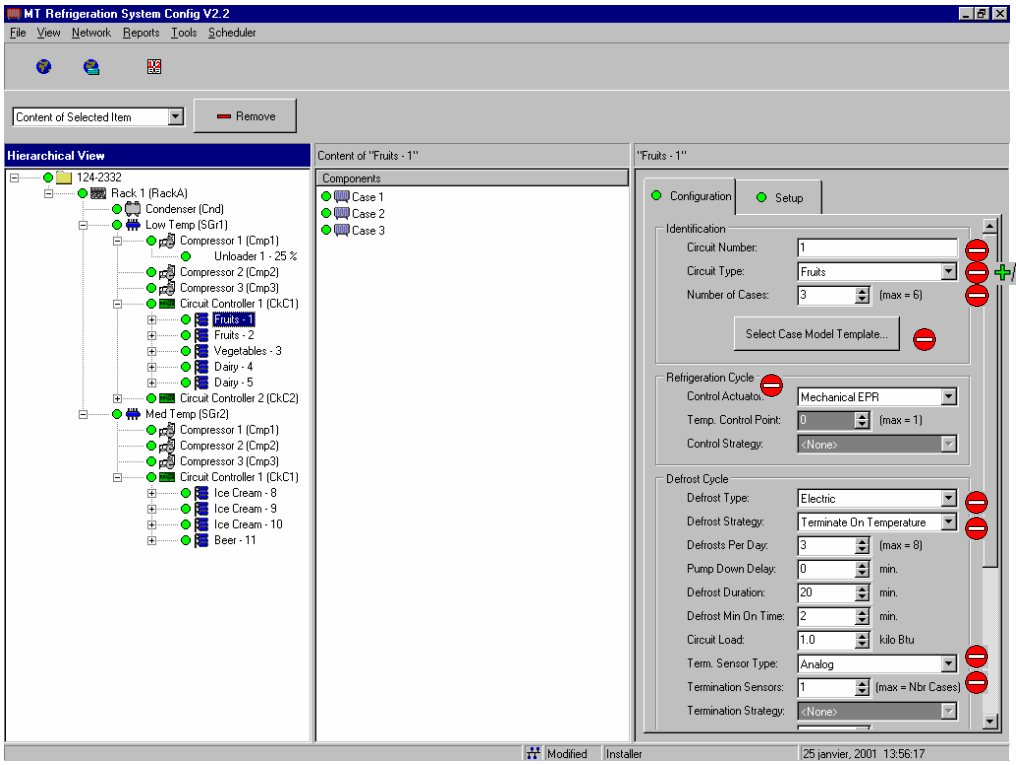


Figure 40 Circuit Configuration

Configuration

Identification:

Circuit Number: Identify uniquely the circuit on its rack (3 alphanumerical characters are allowed, e.g.: 15A)

Circuit Type: Identifies the circuit by providing a textual description. Choose meaningful names like "beer", "ice cream", etc.

Number of Cases: Number of cases present on the circuit (Max. 6). This is the maximum number of sensors that can be selected for control strategies based on case temperatures.

Select Case Model Template: Use this feature to apply default values to help you configure faster.

Refrigeration Cycle:

Specify how the refrigeration is controlled on this circuit. Only one temperature control point is allowed.

Control Actuator: type of refrigeration control used for that circuit. Choose between *mech. epr.*, *electronic epr.* (not yet supported) or *ref. solenoid mode.*

Temp Control Point: Number of case temperatures to use for the refrigeration control. This value is currently limited to one (1). You can use another node to collect multiple case temperatures and send a single refrigeration temperature to the circuit.

Control Strategy: Indicate how to calculate the temperature from the case temperatures. Not currently used because it is currently limited to one sensor.

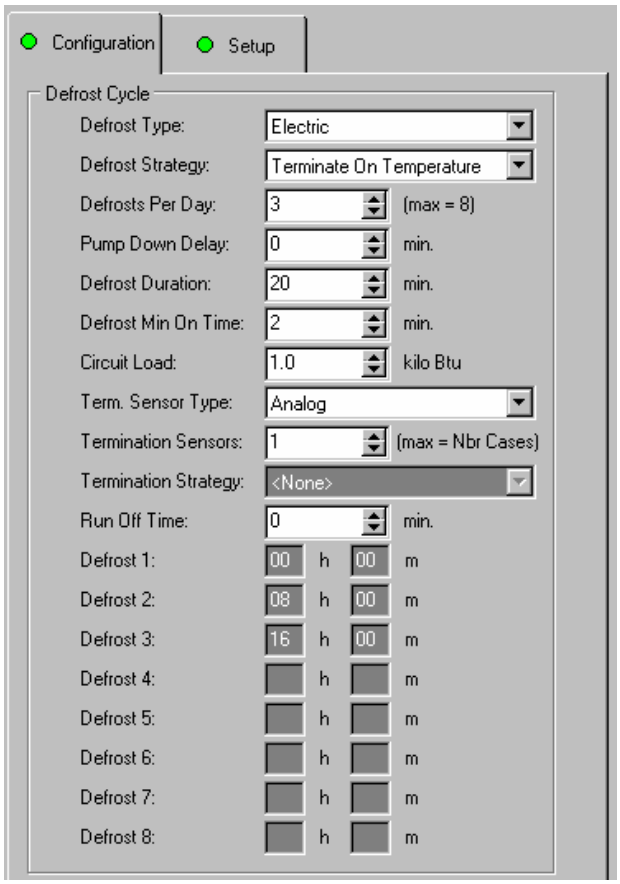


Figure 41 Circuit Defrost Cycle Properties

Defrost cycle:

Specify how the defrost control works on this circuit.

- Maximum 8 defrosts/day
- *Term Sensors depends* on the *Number of Cases*

Defrost Type: Specify how defrost is mechanically done (e.g.: hot gas, electric, off cycle, reverse air)

Defrost Strategy: Select a strategy to terminate defrost. It can be terminated by a temperature setpoint, it can be terminated after a fixed time or it can be terminated on pulse (for a fixed time with the defrost valve modulated around a setpoint).

Defrosts Per Day: Changing it will reset the defrost start times. Defrosts are, by default, equally distant in time. To modify them, go in the rack scheduler.

Pump Down Delay: Specify the delay between the end of the refrigeration cycle and the beginning of the defrost cycle.

Defrost Duration: Set the duration of the defrost cycle. If the defrost is set to terminate on temperature, this represents the maximum defrost duration.

Defrost Min On Time: Set the minimum defrost duration if the defrost is set to terminate on temperature.

Circuit Load: Specify the circuit load on the system when the circuit is in defrost (sum of all case loads for this circuit). This value is used to control the peak load while scheduling defrosts.

Term Sensor Type: Indicate if the defrost termination sensor is analog or digital (klixon) in the case where defrost terminates on temperature.

Termination Sensors: Number of case temperatures that should be used to determine if the circuit has reach the defrost termination setpoint when defrost is set to terminate on temperature or on pulse.

Termination Strategy: Indicate how to calculate the current circuit temperature based on the case temperatures. The minimum, maximum or average values are available.

Run Off Time: Specify the time delay between the end of the defrost cycle and the beginning of the refrigeration cycle.

Setup

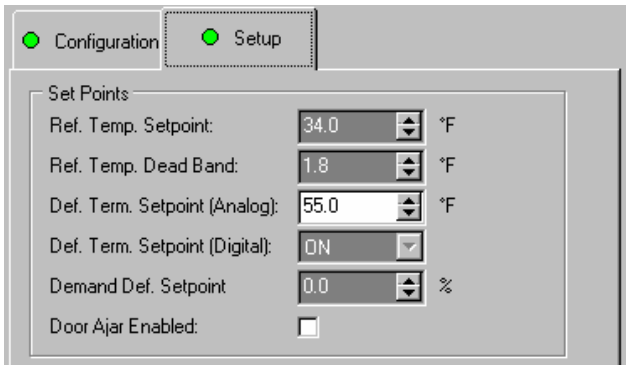


Figure 42 Circuit Setpoints

Ref. Temp. Setpoint: Represents the setpoint for refrigeration control, the ideal temperature for the case or cold room.

Ref. Temp. Dead Band: The dead band is located half below, half above the setpoint. It represents an acceptable variation around the setpoint in order to reduce the start and stop cycles of refrigeration control.

Def. Term. Setpoint (Analog): This is the temperature at which the defrost will be terminated (valid if *Terminate on Temperature* or *Pulse* is selected in the defrost strategy)

Def. Term. Setpoint (Digital): This is the status of the Klixon at which the defrost will be terminated (valid if *Terminate on Temperature* or *Pulse* is selected in the defrost strategy)

Demand Def. Setpoint: Not Implemented

Door Ajar Enabled: Specify this option to temporarily stop refrigeration when the door is left open.

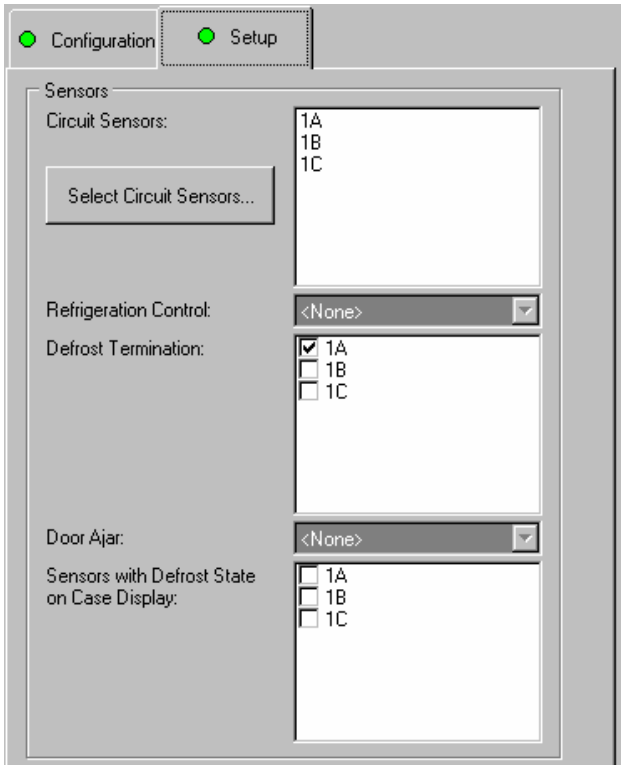


Figure 43 Circuit Sensors

Circuit Sensors: All Sensors specified on this circuit. A sensor can only be associated to one circuit. The *Select Circuit Sensors* button enables you to add or remove sensors on the circuit. Sensors are physically connected on Alarm Sensor Nodes. Sensors are physically located in the refrigeration case air discharge or elsewhere in the case. The window to select Circuit Sensors looks like the one on the next page:

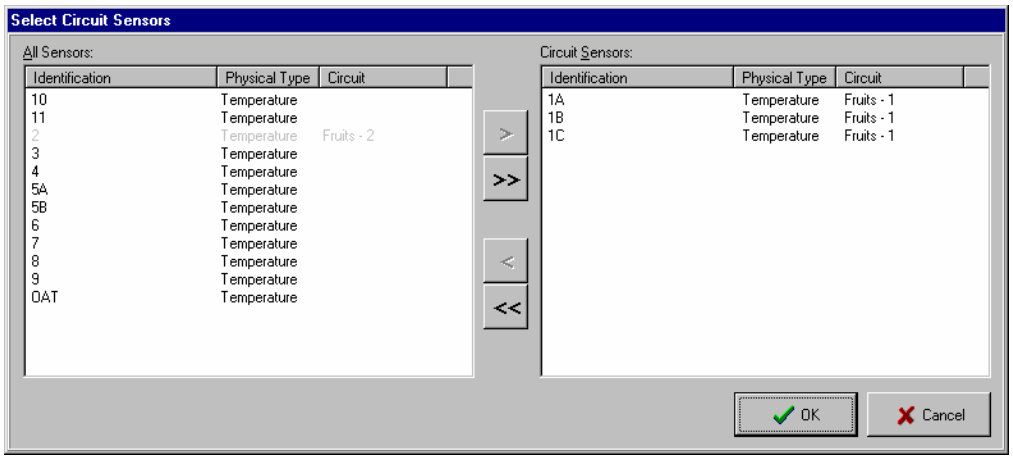


Figure 44 select the sensors that belong to a particular circuit among all refrigeration sensors

Refrigeration Control: Specify the sensor to use for refrigeration control.

Defrost Termination: Specify among all sensors on this circuit, which ones are used by the defrost termination. Select the same number of sensors as you specified in the number of Termination Sensors.

Door Ajar: Select the door ajar sensor (if *Door Ajar Enabled* was selected)

Sensors with Defrost state on case display: Specify which sensors have a case display installed so that the defrost state can be shown. The Alarm Sensor Nodes require a plug-in module to support the case displays.

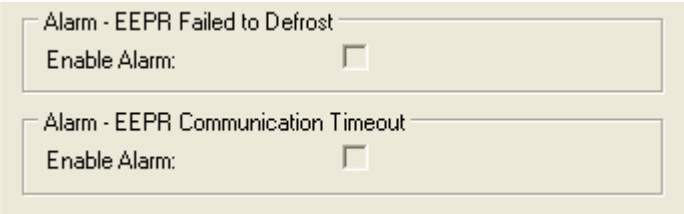
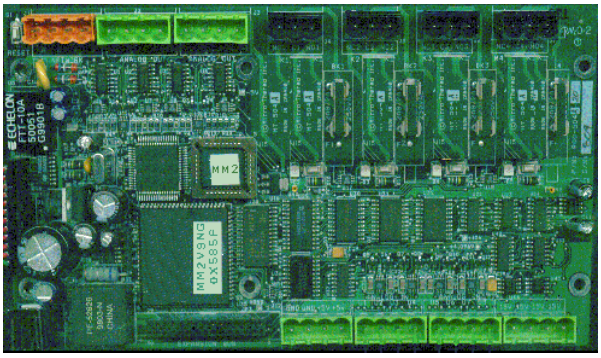


Figure 44b EEPR Alarm setup

When EEPR control valve are available you have the ability to enable or not the Alarm Relay for both; Failed to defrost and Communication timeout Alarm.

Chapter 4

Hardware Installation



Hardware installation

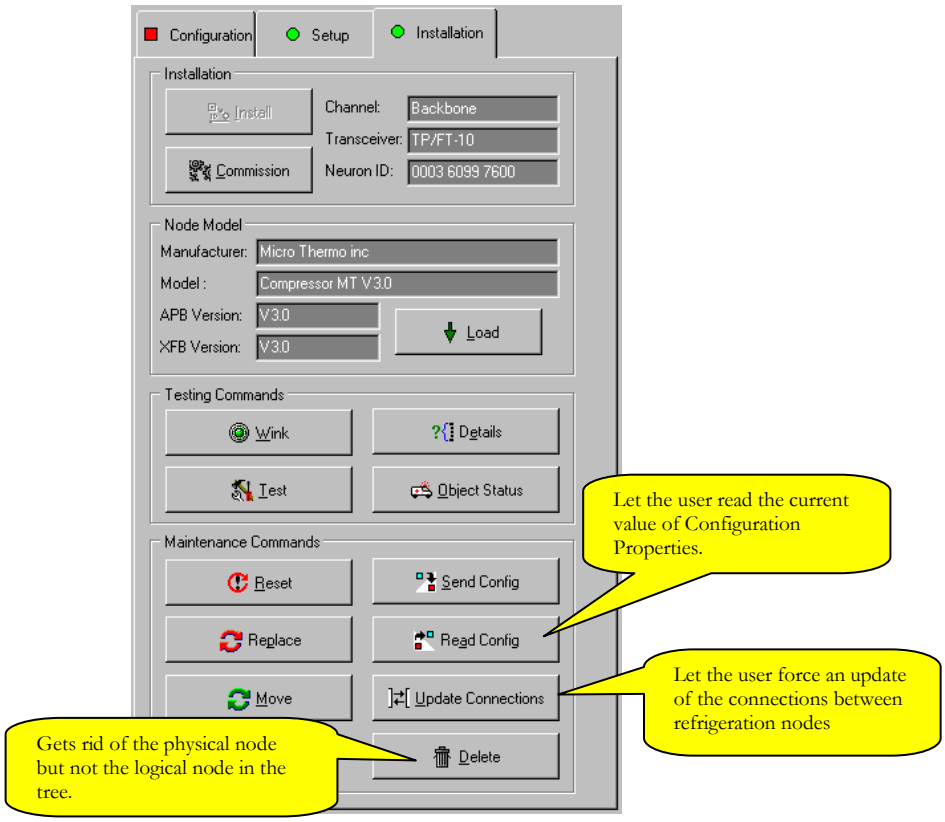


Figure 45 Installation

Proceed with the Node Installation by clicking on the "Install" Button. You will be asked to press a service pin or manually enter the Neuron ID.

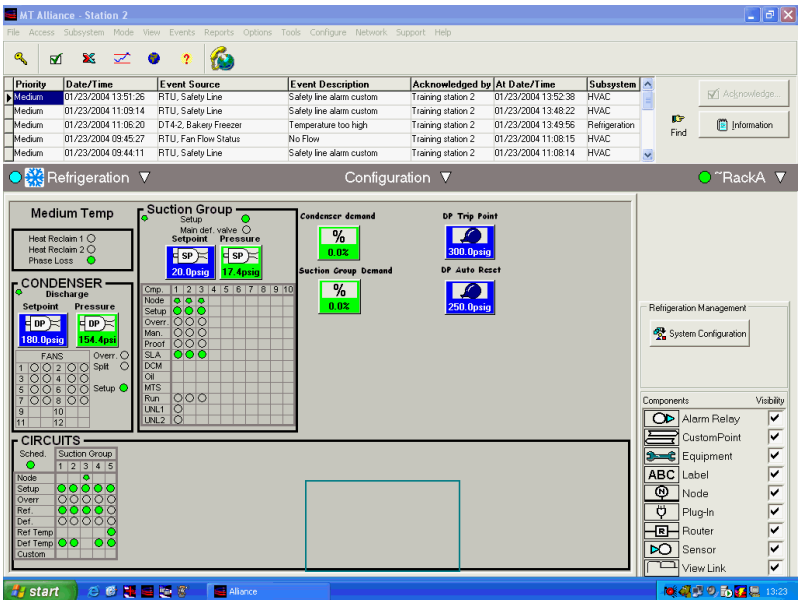
For more information on the other commands and when they are used, refer to the "Technician's Manual: Node Installation" (Volume 2).

In the Refrigeration Configuration Tool, the "Delete" button only removes the association between the physical node and the logical node in the tree. For example, if you delete a compressor node, the node is unconfigured but the compressor is not removed from the tree and does not loose any of its properties.

The "Read Config" button allows you to see the values of each CP in the "LonWorks" language.

Chapter 5

Servicing (from MT Alliance)



Servicing (from MT Alliance)

Rack View

When you exit the Refrigeration Configuration Tool and start the MT Alliance Platform, the changes you have made (e.g.: adding a compressor) will be reflected in the MT Alliance User Interface. A Rack View looks like this:

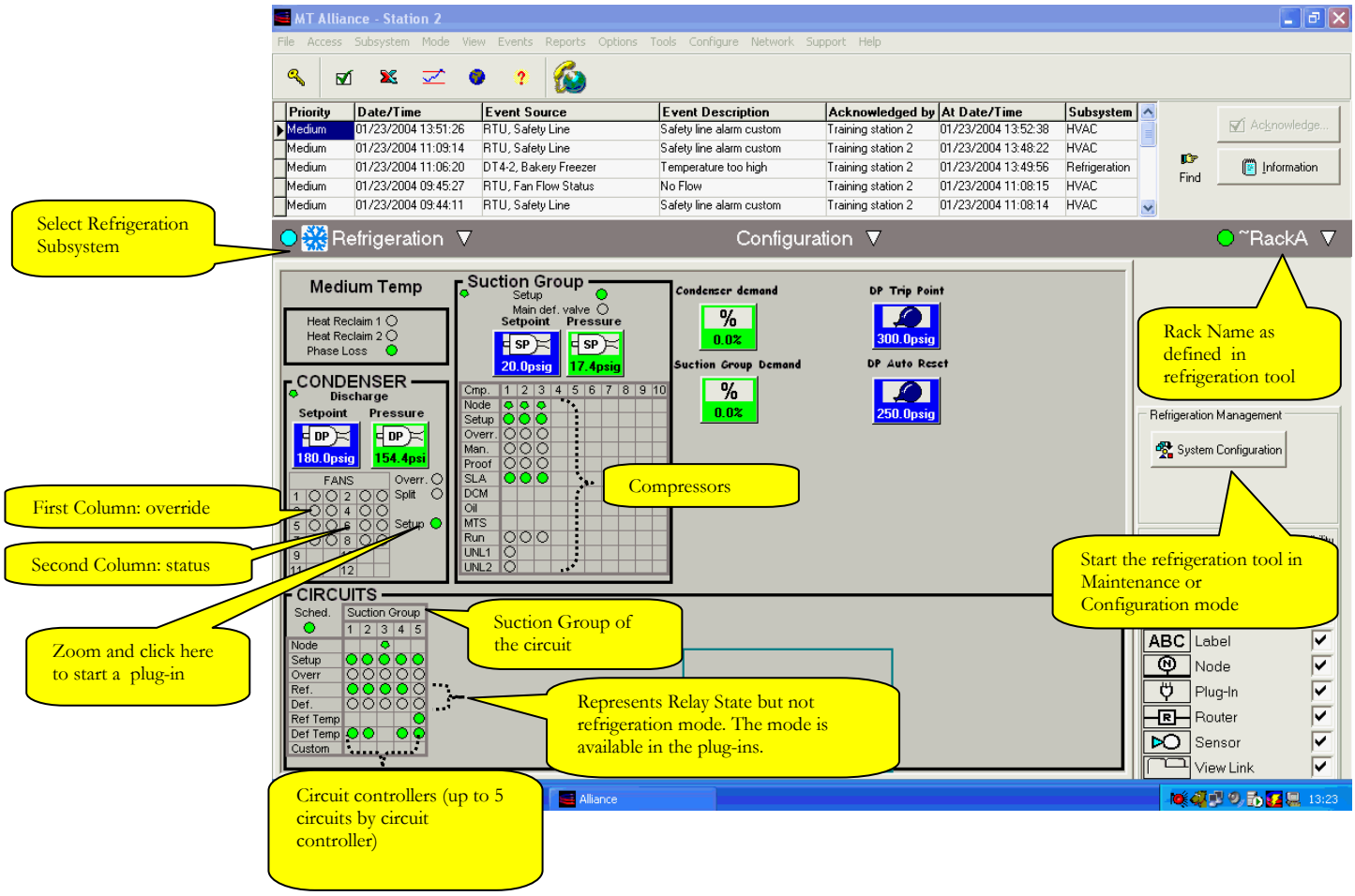


Figure 46 Rack View

Condenser Plug-In

Settings

You have to enter the Maintenance or Configuration Mode before entering the plug-in to be able to perform overrides and other functions.

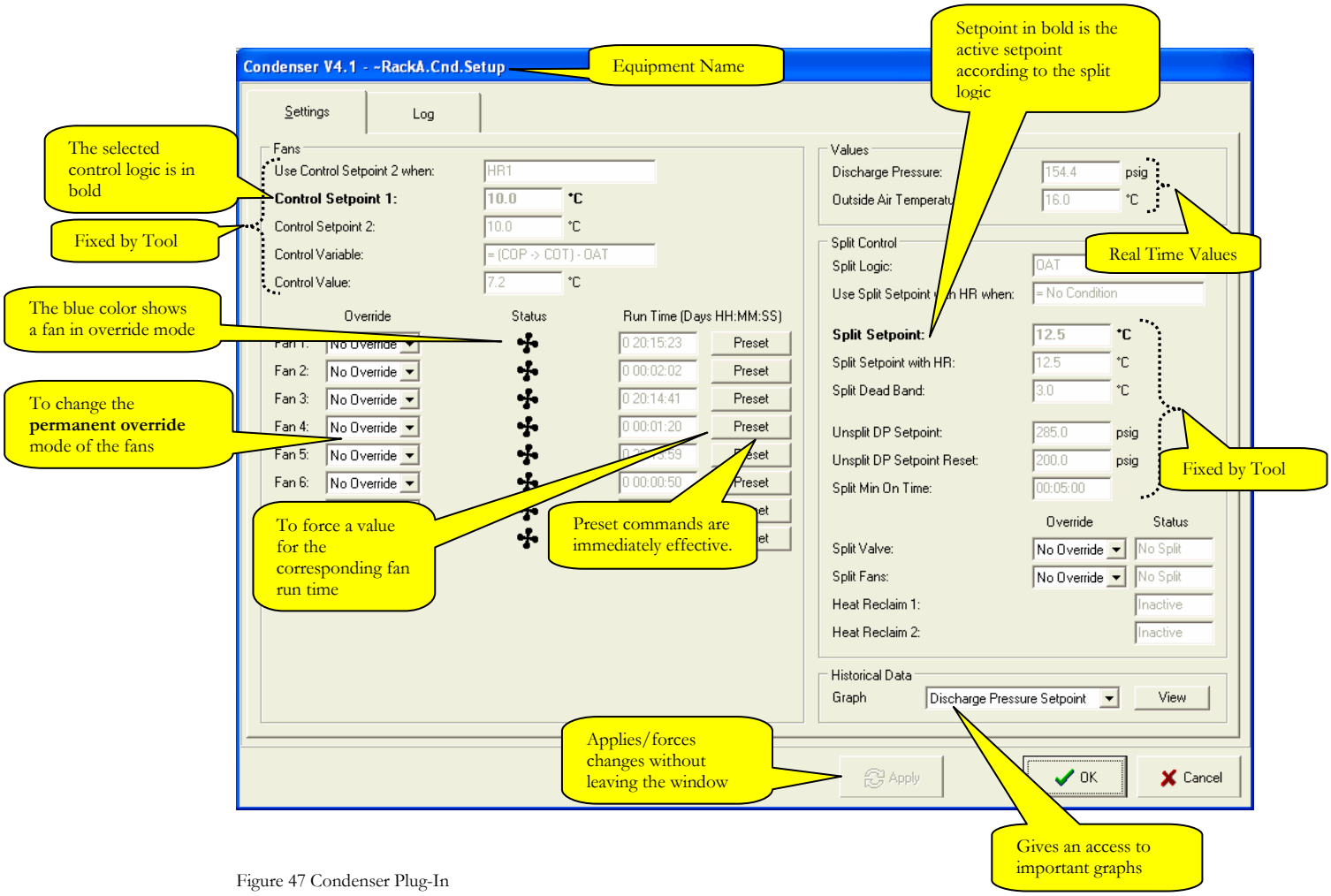


Figure 47 Condenser Plug-In

Log

The log tab exists for all plug-ins. All changes made by users and all events related to the plug-in are logged.

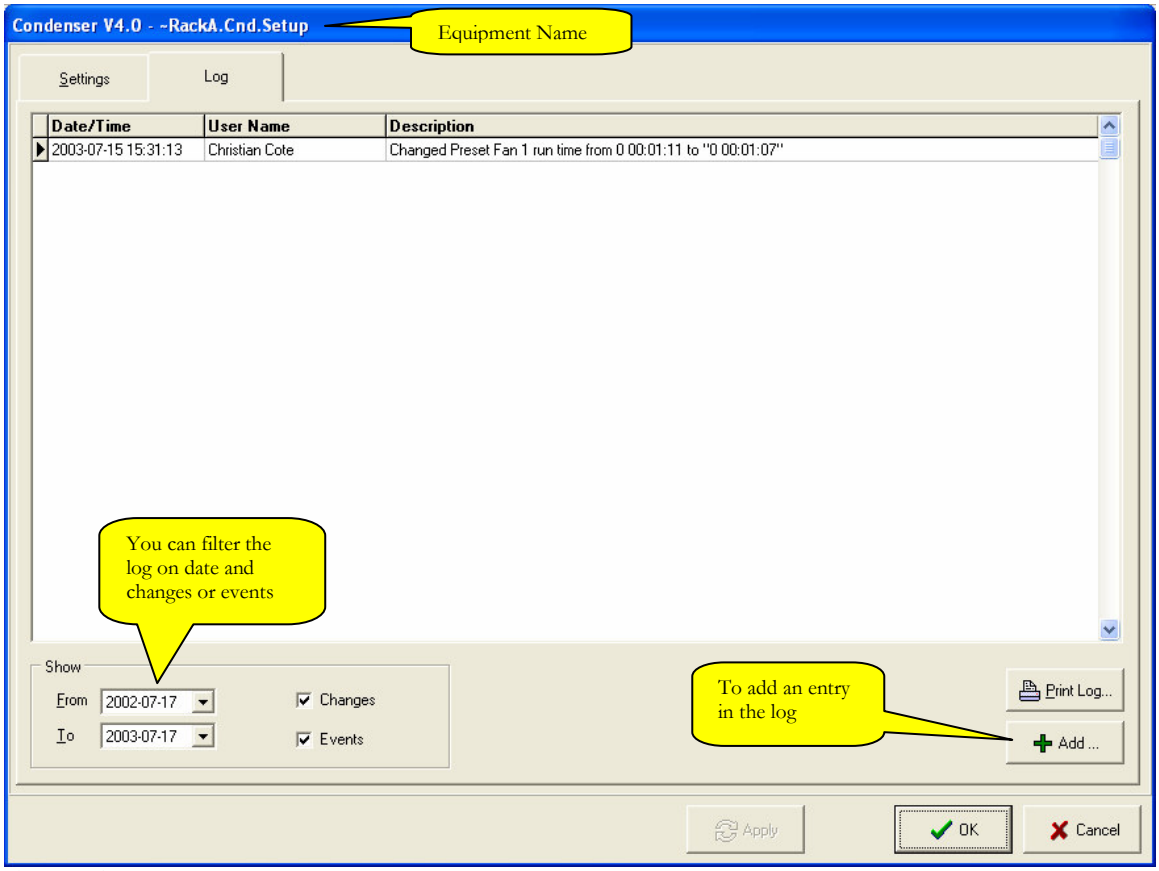


Figure 48 Plug-In Log

Suction Group Plug-In

Settings

You have to enter the Maintenance or Configuration Mode before entering the plug-in to be able to perform overrides and other functions.

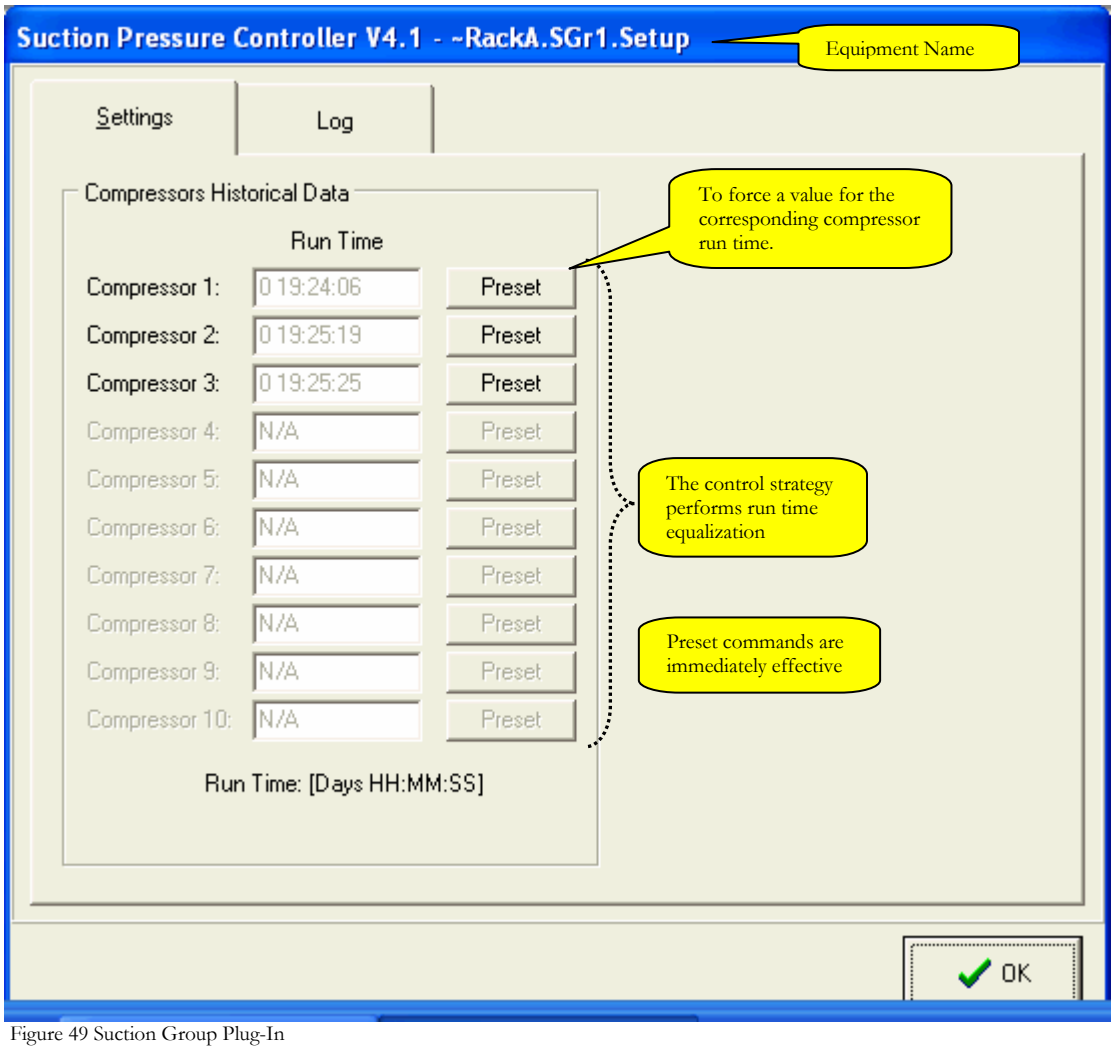


Figure 49 Suction Group Plug-In

Log

The log tab exists for all plug-ins. Refer to the condenser plug-in section.

Compressor Plug-In

Settings

You have to enter the Maintenance or Configuration Mode before entering the plug-in to be able to perform overrides and other functions. There is a compressor plug-in for MT compressor nodes and for MT-HP compressor nodes.

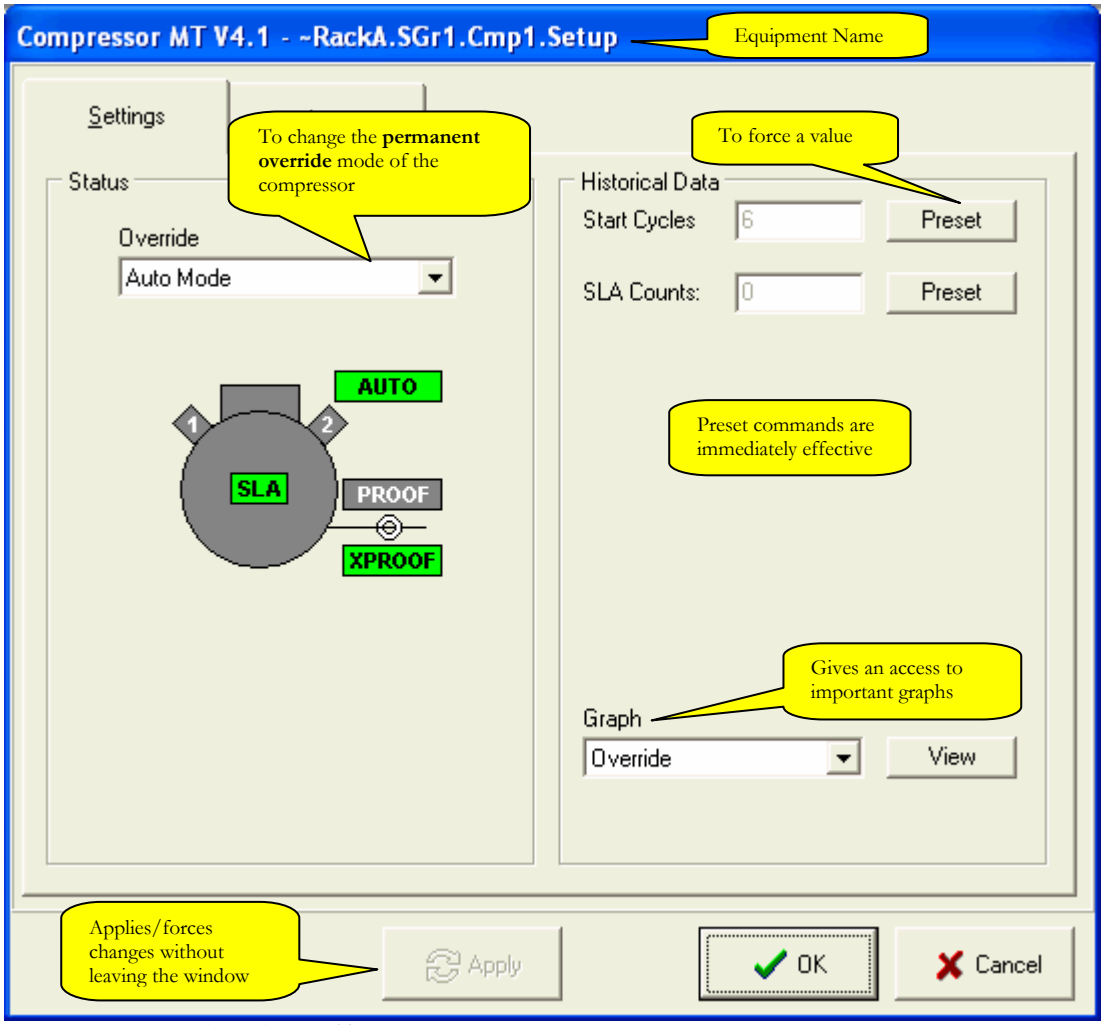


Figure 50 Compressor plug-in for the MT Family

Settings (Micro Thermo – HP Family)

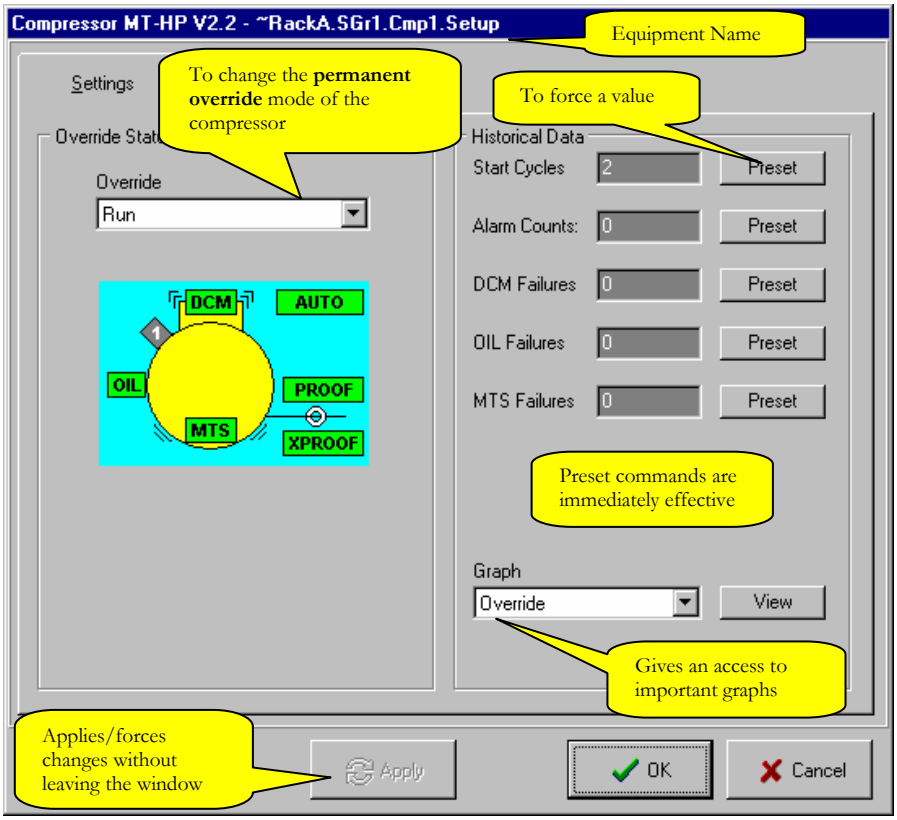


Figure 51 Compressor plug-in for MT-HP Familly

Log

The log tab exists for all plug-ins. Refer to the condenser plug-in section.

Circuit Plug-In

Settings

You have to enter the Maintenance or Configuration Mode before entering the plug-in to be able to perform overrides and other functions.

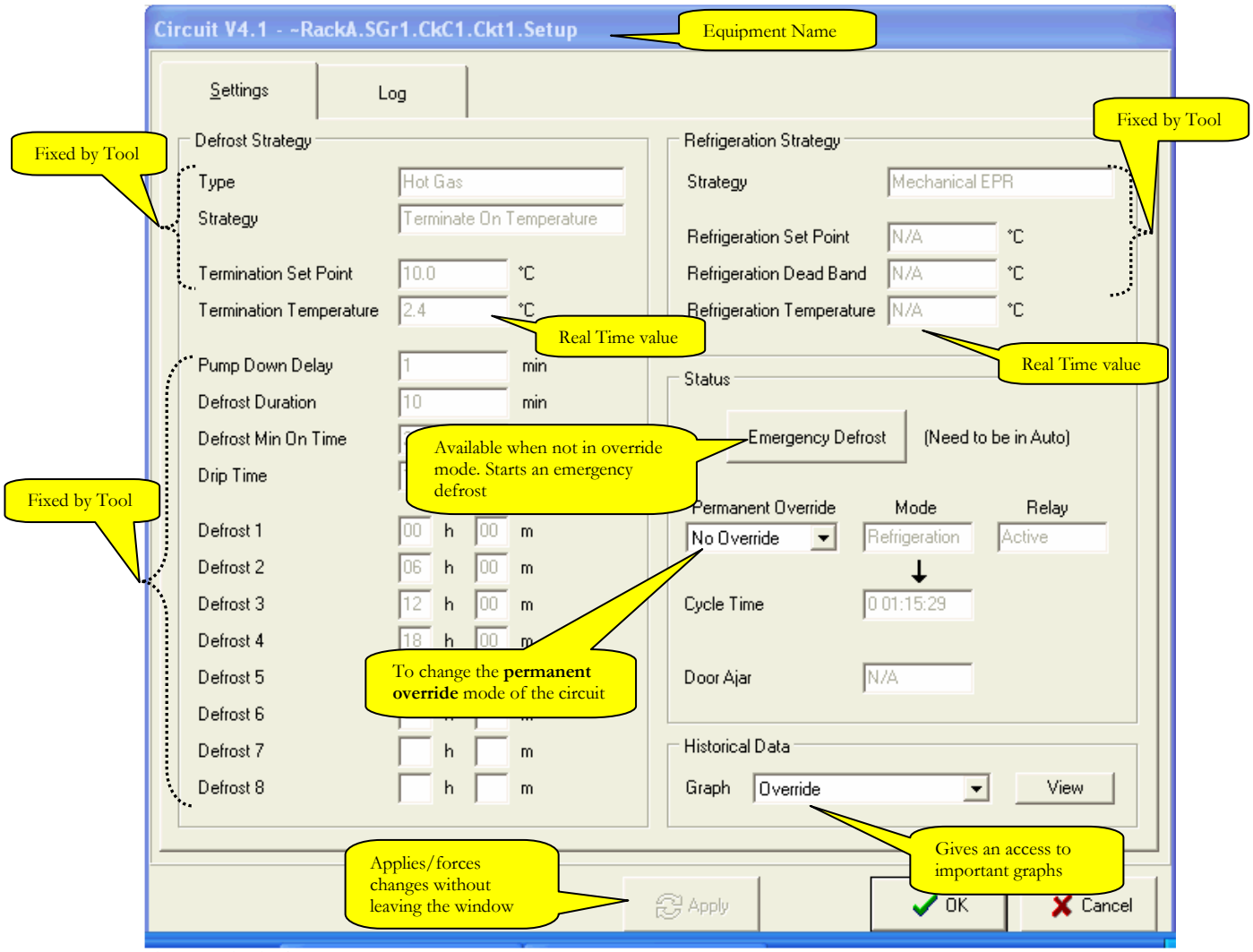


Figure 52 Circuit Plug-In

Log

The log tab exists for all plug-ins. Refer to the condenser plug-in section.

Circuits Scheduler Plug-In

This plug-in allows you to view the overall schedule for the rack for an entire day. This is for quick visualization only. To change the schedule, you have to start the Refrigeration Configuration Tool while in Maintenance or Configuration Mode in the Refrigeration Subsystem.

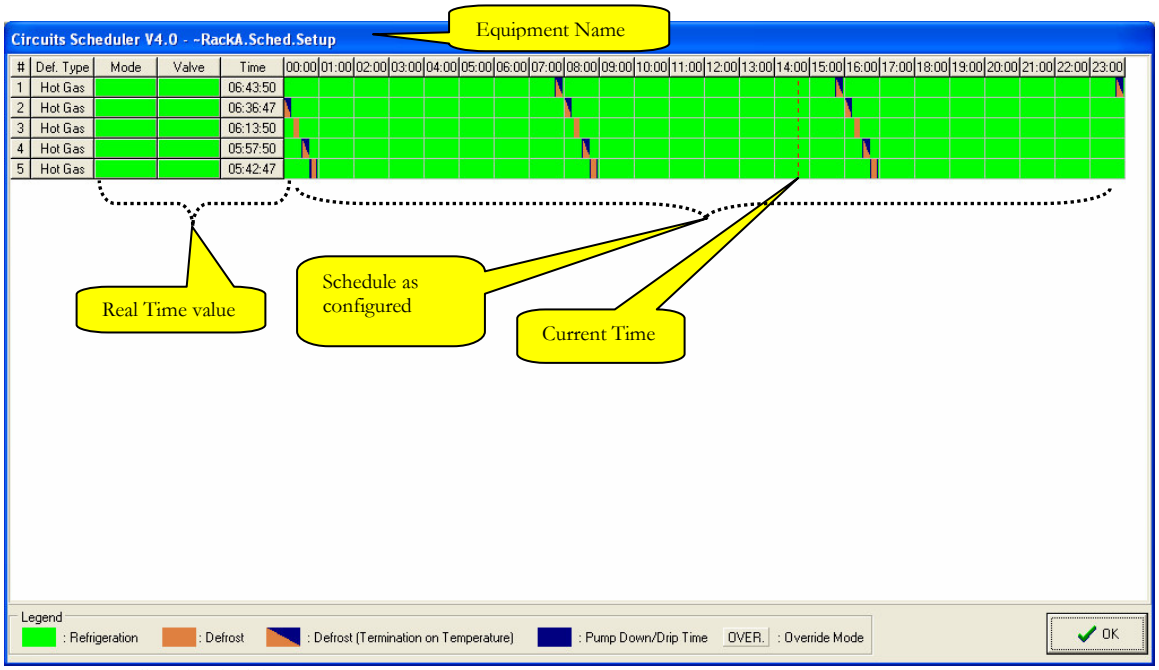


Figure 53 Overall Rack Schedule

Appendix A

Condenser Connections

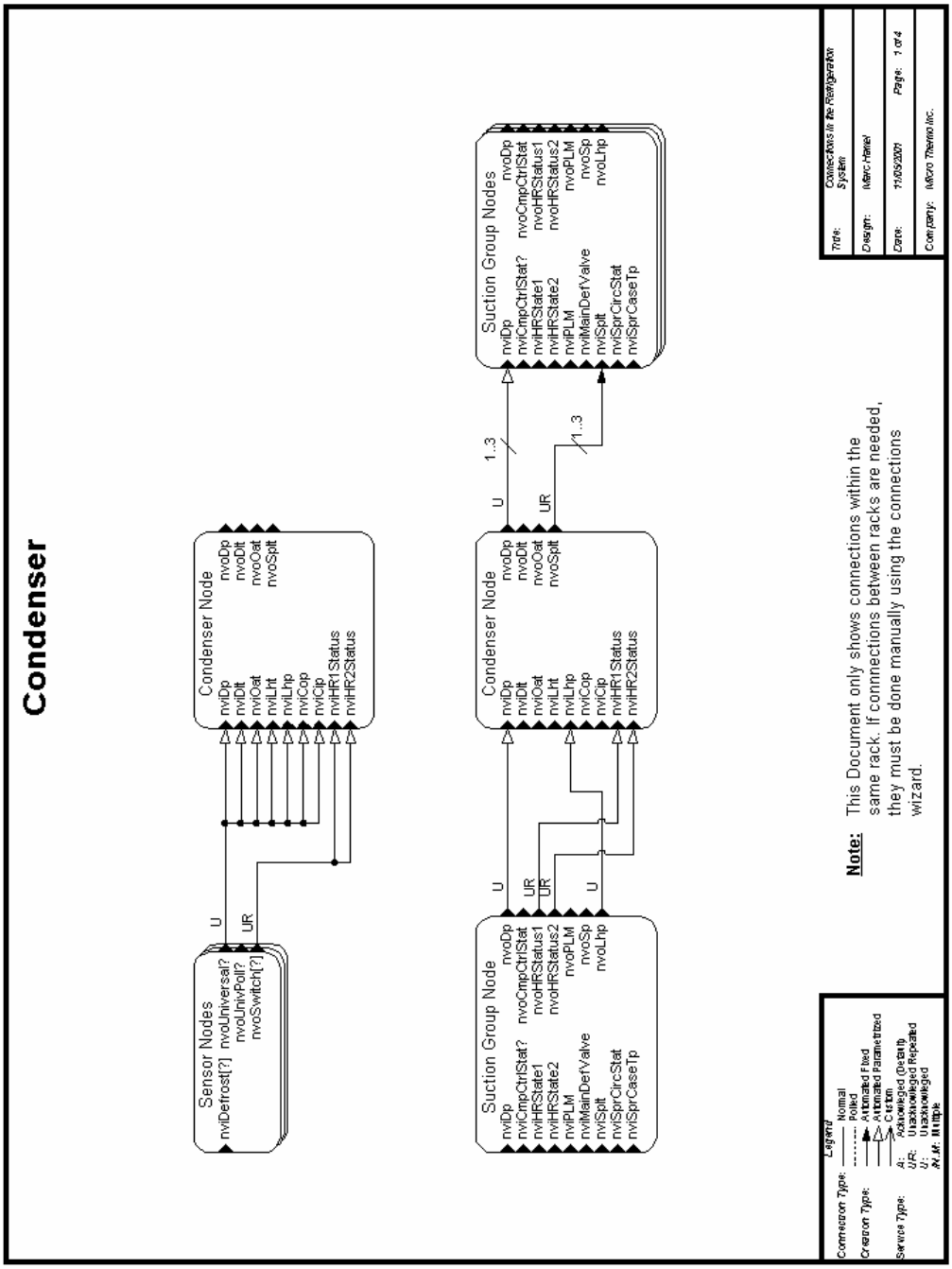


Figure 2 Condenser Connections

Suction Group Connections

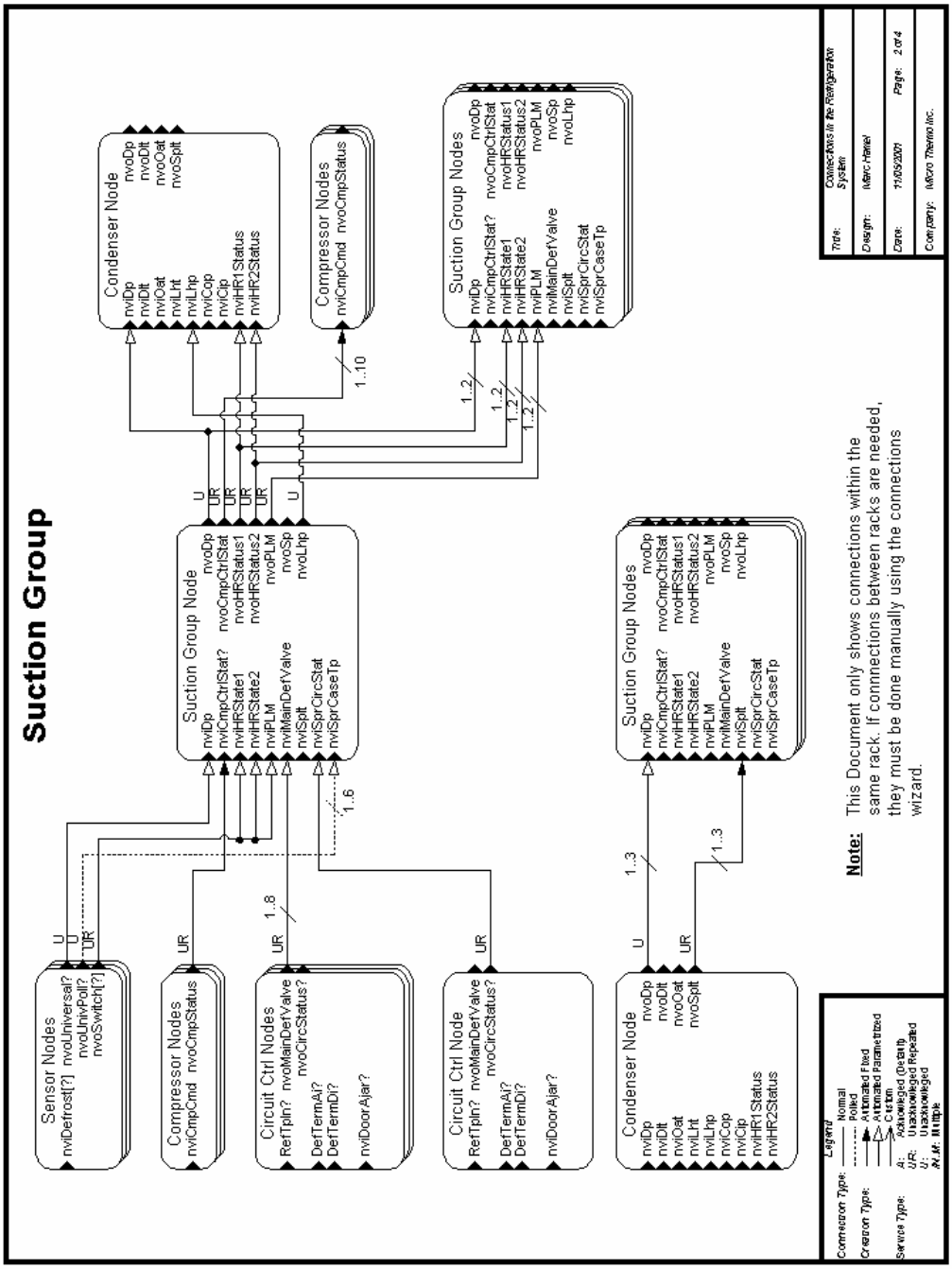


Figure 3 Suction Group Connections

Compressor Connections

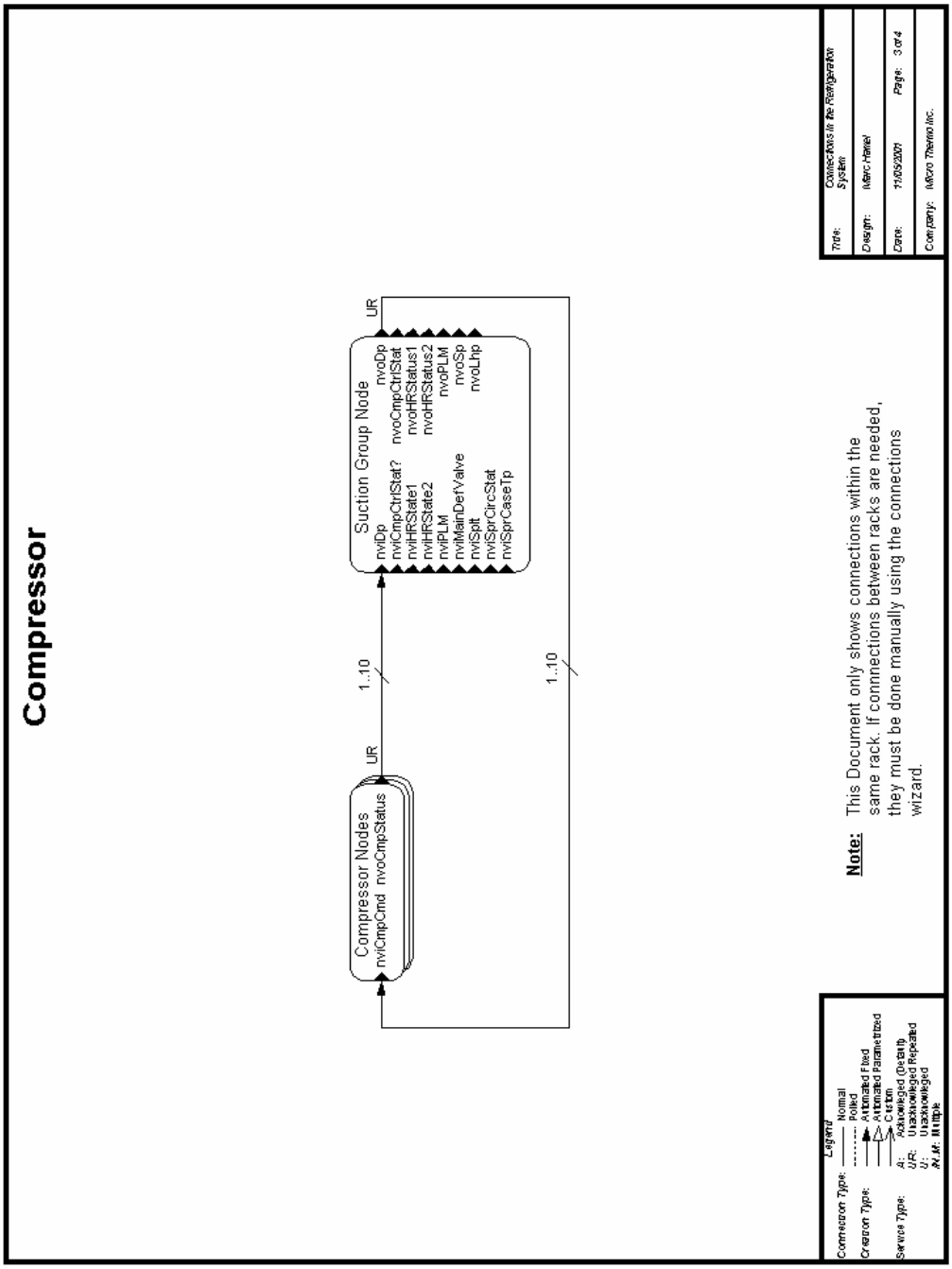


Figure 4 Compressor Connections

Circuit Controller Connections

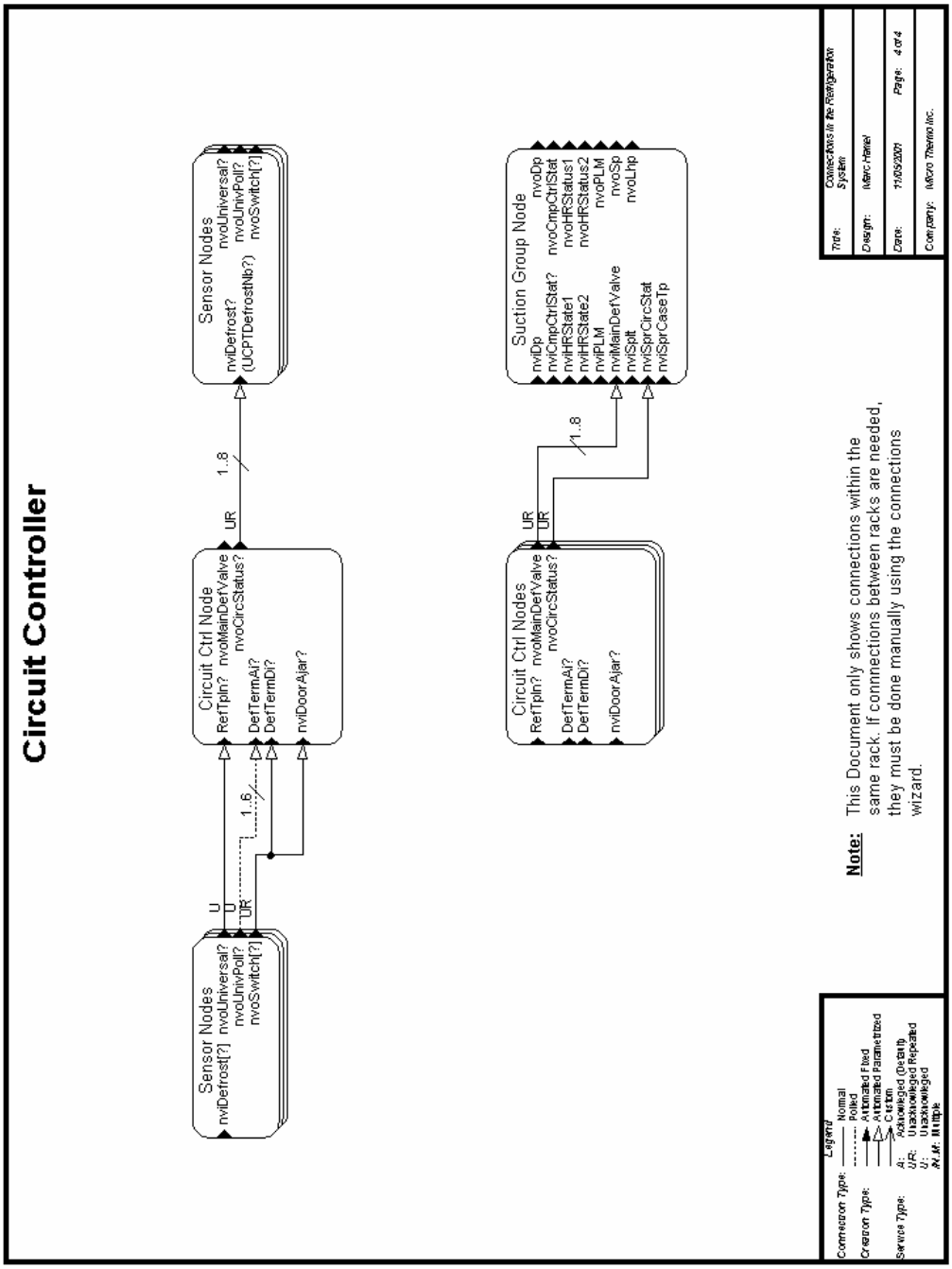


Figure 5 Circuit Controller Connections

Historique des révisions

REV	Description	Révisé Par	Date
1.1	Création et formatage du document	CBC	16 Juillet 03
1.2	Rédaction du document	CBC	21 Juillet 03
1.3	Rédaction du document	CBC	22 Juillet 03
1.4	Révision du document	JG	30 Juillet 03
2.0	Publication	CBC	06 Août 03
3.0	Publication pour MT Alliance Version 4.1	CBC	5 Février 04