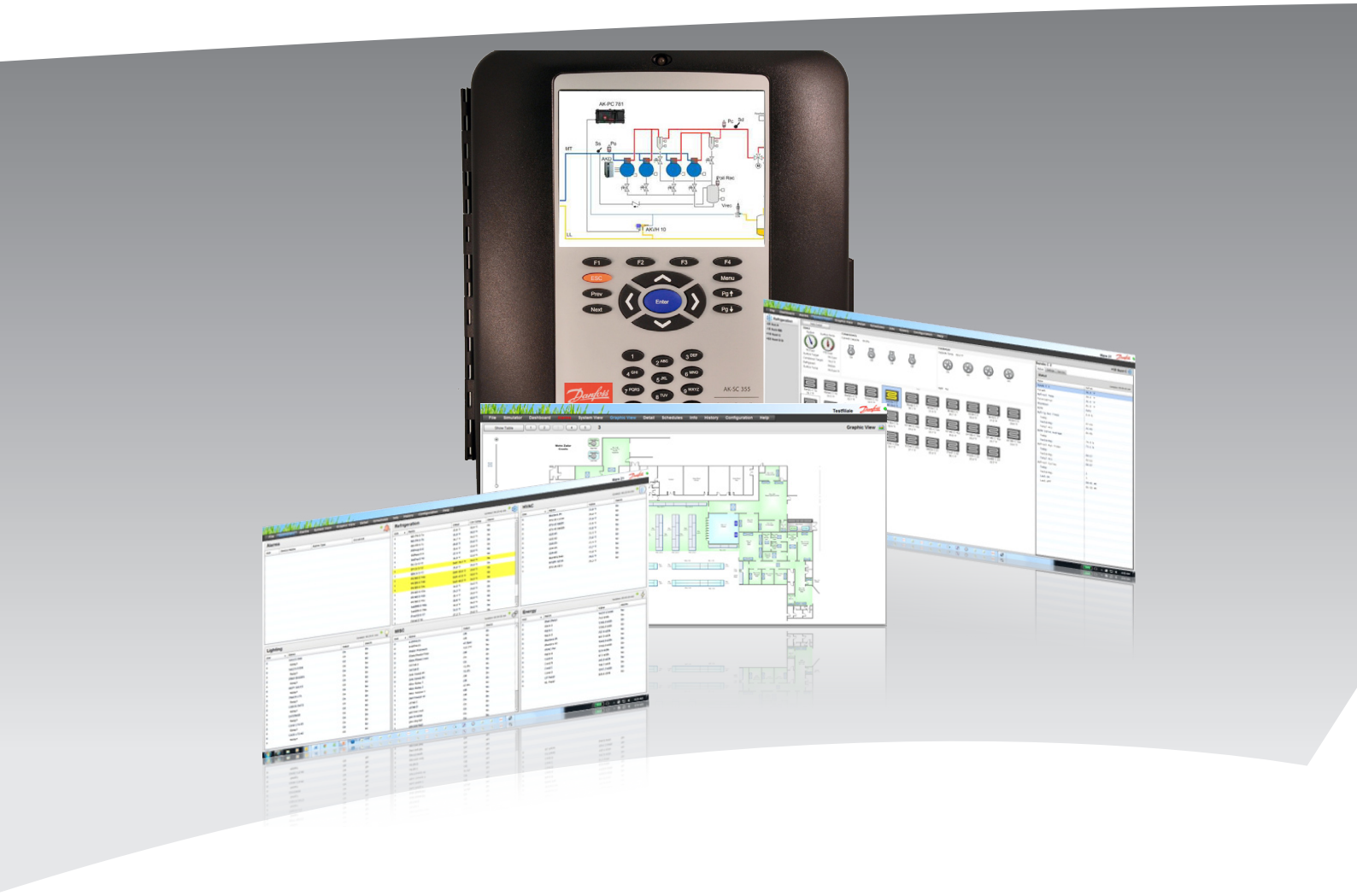

Quick setup guide
AK-SC 355 version 1.0

Manual

Introduction

This document is designed to guide you through the site setup process, via the 355 web browser connection. The intention of the document is not to explain all available setups in great detail, but to provide a guideline for initial setup.

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Mounting the AK-SC 355

The mounting location should be flat, dry and free of major vibrations. The AK-SC 355 should be mounted at eye level. Please consider the units' dimensions when mounting: Unit Width 10.5" (266 mm), Unit Height 12.5" (317 mm), Unit Depth 2.5" (63 mm), Mounting holes 8.0" (203.2 mm), Width- Mounting holes 10.00" (254 mm) Height.

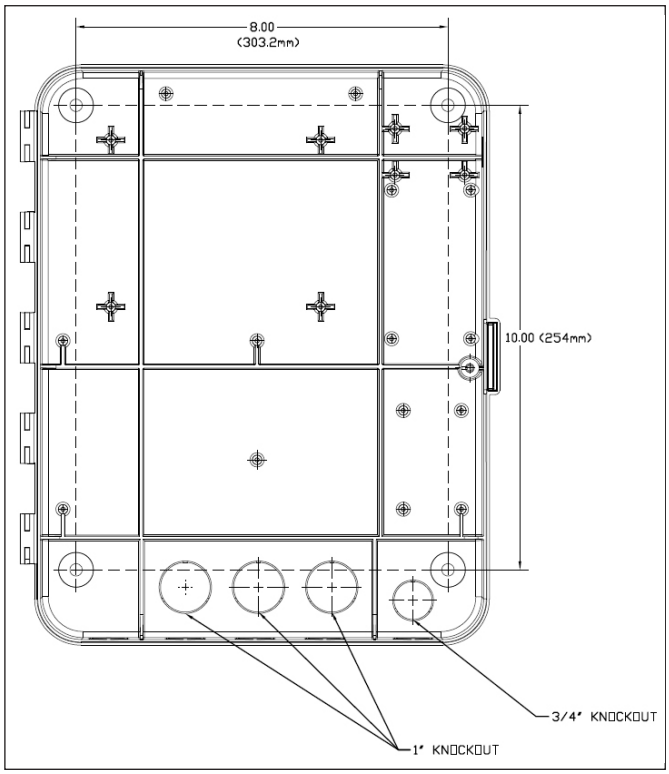
To allow the AK-SC 355 door to fully open please ensure that there is an area of at least 21" (533 mm) x 11" (280 mm) free to the left of the unit. In order to operate the latch mechanism, please ensure that there is 3" (76mm) of space free to the right of the unit. Please also leave an appropriate amount of room beneath the controller for the conduit connections. Finally, mount the controller using the appropriate screws through the available holes.

Environmental Range
Operating temperature
Screen: 32 to 104˚F (0 to +40˚c) DIN: 32 to 122 ˚F (0 to +50˚c) @ 90% RH (non-condensing)

Electrical Range
~ 100 - 240 V a.c. (+ / - 10%)
50/60 Hz
Built in alarm relay
30 V d.c. 1 Amp Class 2

Attention- Enable Battery to Protect Database!
Your AK-SC 355 ships with the battery jumper disabled. Open the AK-SC 355 and bring jumper 5 in position 1-2 to enable the battery.
Failure to enable the battery jumper, all settings will be lost on power failure.

Setting Your AK-SC 355 Unit Address
If more than one unit is installed on site, use the address switch in the AK-SC 355 to set a unique controller address.



Initial Connection

Connecting to the AK-SC 355
There are two methods to connect to the AK-SC 355 web-browser:
1) Online [using a valid IP address]
2) Offline [via the Danfoss Remote Management Tool (RMT)]

Authorization
Initial connection to your AK-SC 355 will require authorization. The factory default is:

- Username: Supervisor
- Password: 12345

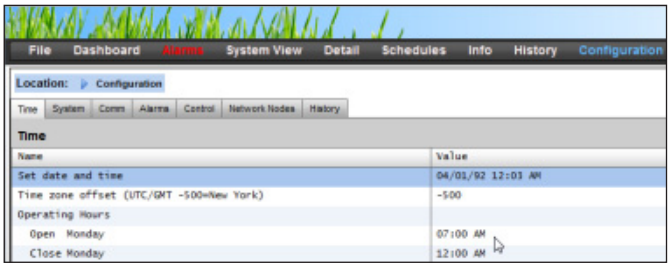
We recommend that you change these factory default settings during the initial setup.

- Note: In order to run the AK-SC 355 web-browser you will need to have the latest Adobe Flash version installed on your PC.

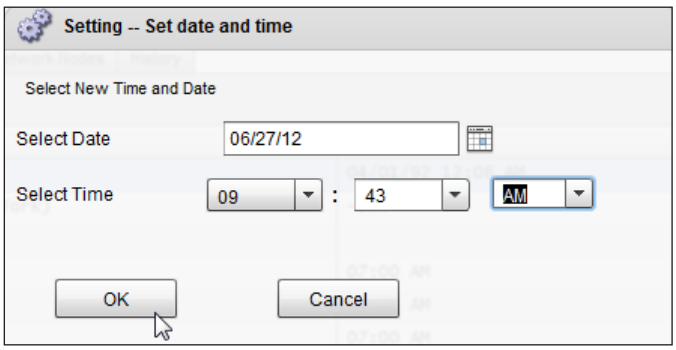
System Settings

Setting Date and Time

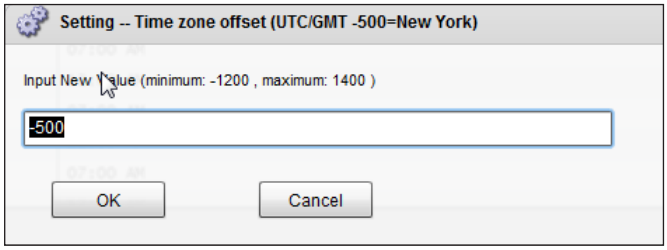
- Click on ***Configuration*** tab
- Click on the ***Time*** tab
- Double click on ***Set date and time***



- **Set the date and time**

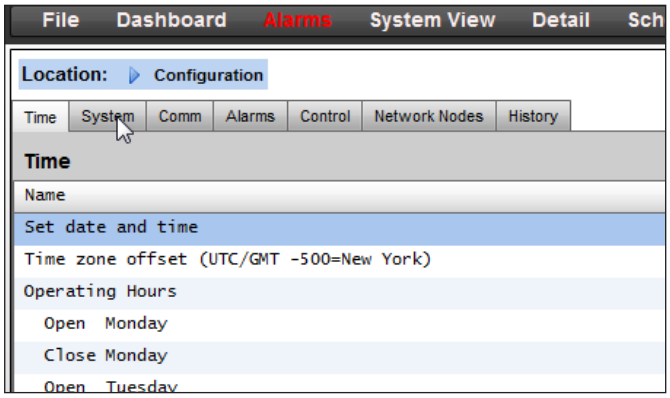


- Double click on Time zone offset
- Set time zone (-500 is New York, 100 is Central Europe)

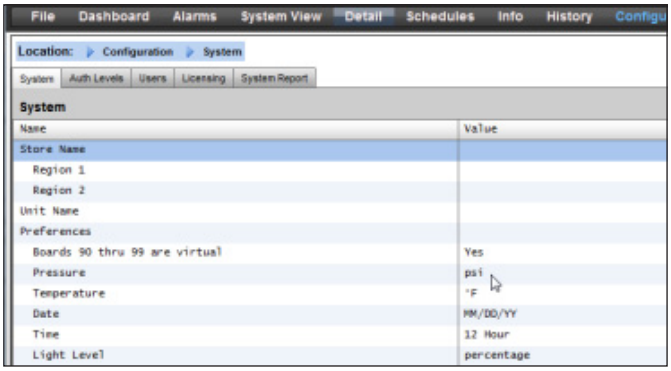


General Preferences

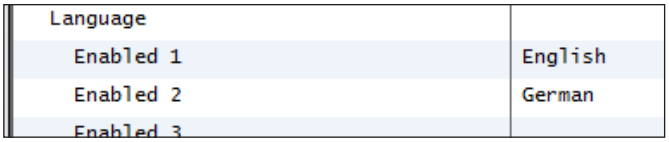
Click on **Configuration-> System**



Double click ***Pressure*** and select your appropriate measurement unit
Double click ***Temperature*** and select your appropriate measurement unit

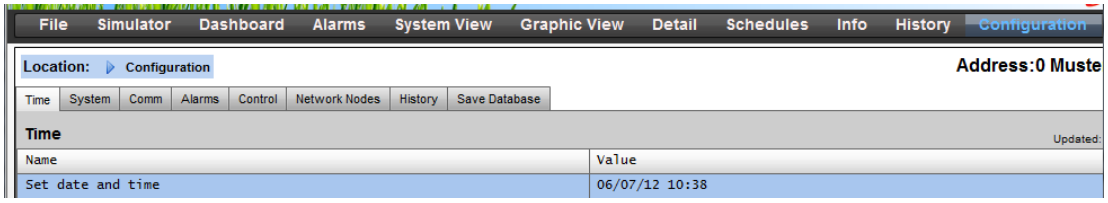


If you are using the box in a language other than English, please enable the language(s) you need. Maximum 5 different languages are possible at one time.



Communication

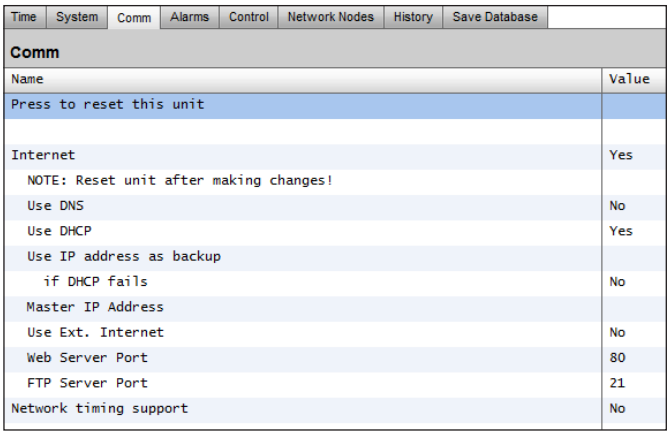
Under the ***Configuration*** menu select the tab ***Comm***.



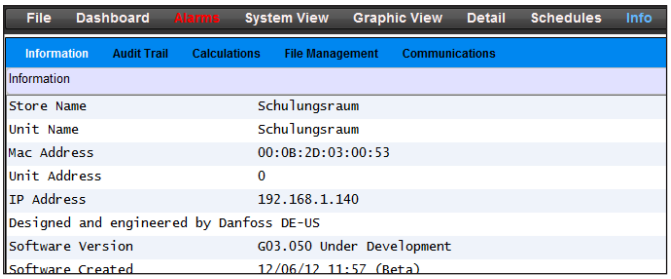
DHCP (Dynamic Host Configuration Protocol)

- If IT has not provided an IP address, please choose ***DHCP*** (Double click and ***DHCP*** = ***Yes***)

- Reset the AK-SC 355 (double click on line ***Press to reset this unit***) and find the ***IP address*** in the ***Info*** menu.



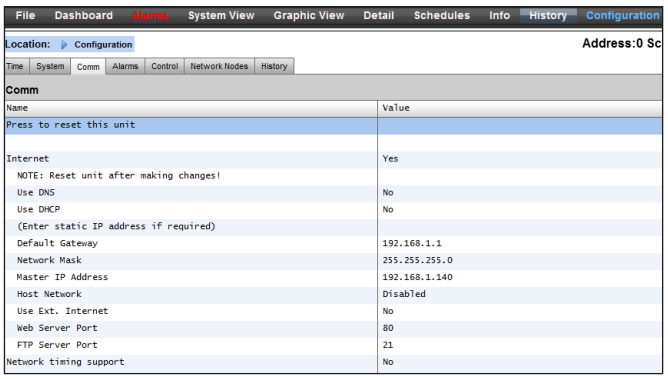
- Unit is now reset
- The IP address can be checked anytime via the ***Info*** tab



Non-DHCP (IP is known)

- If IT has provided an IP address, ***Network Mask*** and ***Master IP Address***, please change ***DHCP*** (double click and ***DHCP*** = ***No)***

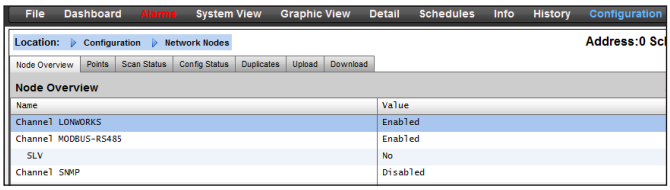
- Reset the AK-SC 355 (double click on line ***Press to reset this unit***)



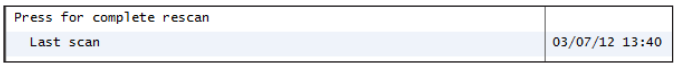
Scan network

Assuming LON and/or MODBUS networks are wired correctly, and any devices on the bus have a unique address, a network scan of the BUS system is required.

- *Choose **Configuration** > **Network Nodes** to enable the used BUS system.*
- *Double click to enable your required BUS channel.*



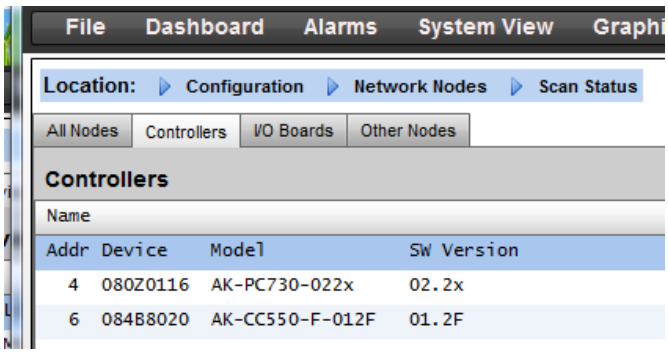
- As soon you checked the wiring, start a complete scan.
- Double click on ***Press for complete rescan***. Once the scan is done, the ***Last scan*** row reflects the date and time of the last scan.



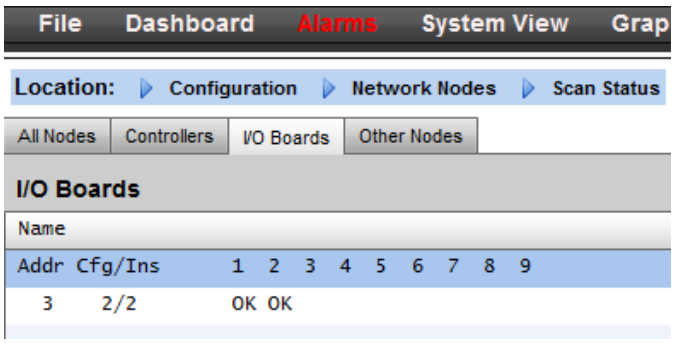
- Details are shown in the table.
- If nothing was configured offline the column ***Configured*** will show only zeros.
- The column ***Scanned*** will show the amount of devices that were scanned on the BUS systems.

Node Type	Configured	Scanned
OI8 Board	0	0
RO8 Board	0	0
SI8 Board	0	0
VO2 Board	0	0
Utility Meter	1	0
Generic	2	2
AK-CM	1	1
Calculations	3	N/A

- More details can be found in the ***Scan Status*** tab. Including a list of controllers with ***Address, Device, Model, and Software Version***.

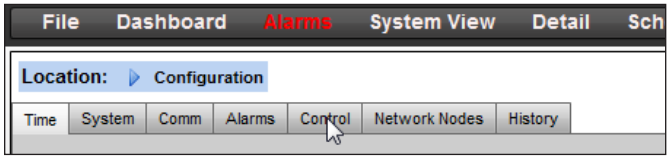


- Including I/O's with Addresses.

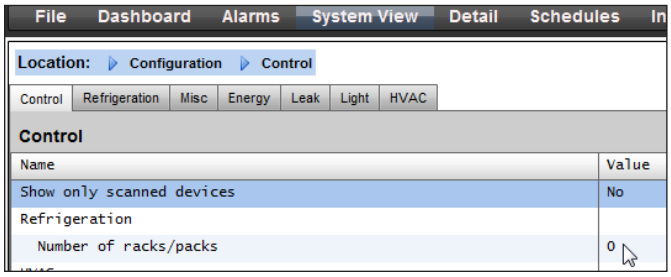


Configure Rack /Evaporator

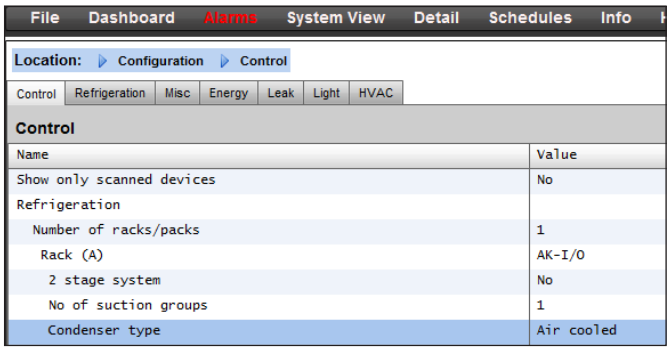
*Click **Configuration -> Control***



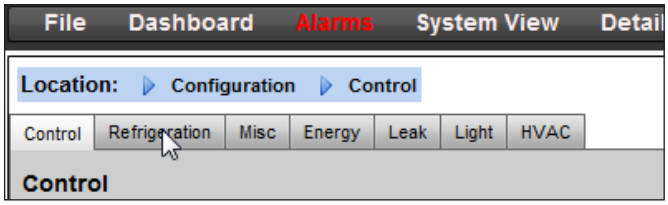
- Double click ***Number of racks/packs*** and enter the appropriate quantity in the ***Value*** column.



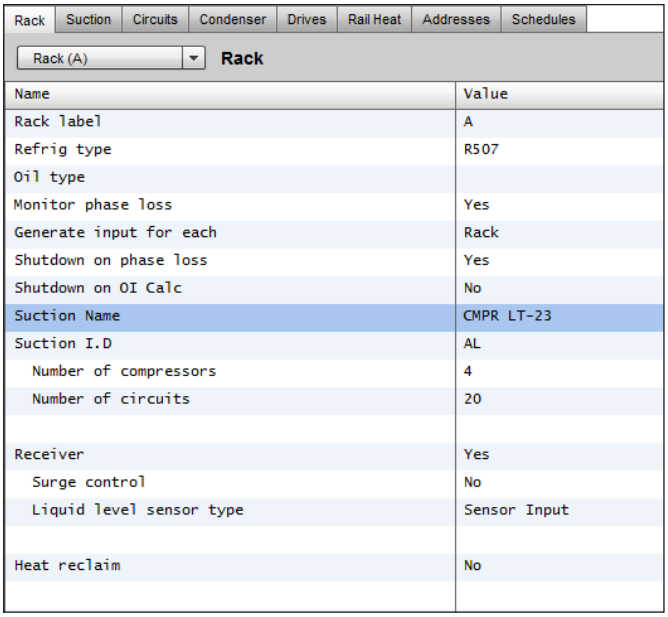
- Set options
  - o ***2 stage system*** – Change if needed,
  - o ***No of suction groups*** – set to number of suction groups on the rack
  - o ***Condenser type*** – set type



- Select ***Refrigeration*** tab then select ***Rack*** tab
  - o Next double click on each setpoint and edit as needed

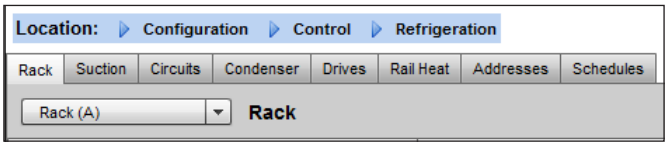


  - o ***Rack label*** (A)
  - o ***Refrig type*** (R507)
  - o ***Monitor phase loss*** (Yes)
  - o ***Generate input for each*** (Rack)
  - o ***Suction Name*** (CMPR LT-23)
  - o ***Suction ID*** (L)
  - o ***Number of compressors*** (4)
  - o ***Number of circuits*** (20)
  - o ***Receiver*** (Yes)
    - - ***Surge Control*** (No)
    - - ***Liquid level sensor type*** (Sensor Input)
  - o ***Heat Reclaim*** (No)

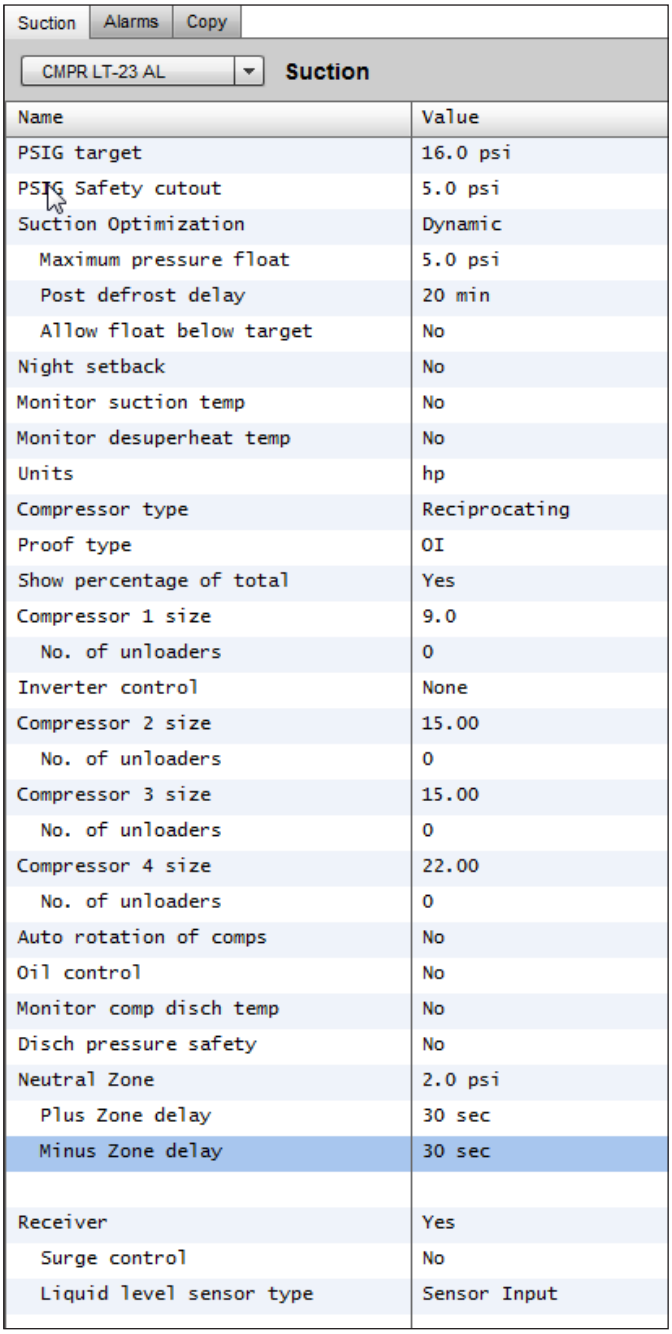


Suction group setup

- Click on ***Refrigeration*** and select ***Suction*** tab
  - o Next double click on each setpoint and edit as needed



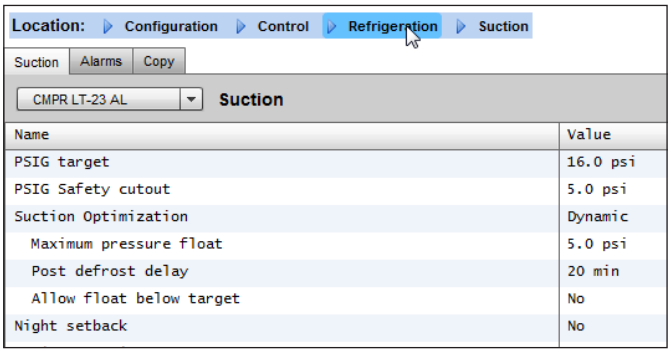
- o ***PSIG target*** (16.0)
- o ***PSIG Safety cutout*** (5.0)
- o ***Suction Optimization*** (Dynamic)
  - o ***Maximum pressure float*** (5.0)
  - o ***Post defrost delay*** (20 min)
  - o ***Allow float below target*** (No)
- o ***Night setback*** (No)
- o ***Monitor suction temp*** (No)
- o ***Display superheat temp*** (No)
- o ***Monitor desuperheat temp*** (No)
- o ***Units*** (hp)
- o ***Compressor type*** (Reciprocating)
- o ***Proof type*** (OI)
- o ***Show percentage of total*** (Yes)
- o ***Compressor 1 size*** (9.0)
  - o ***No. Of unloaders*** (0)
  - o ***Inverter control*** (No)
- o ***Compressor 2 size*** (15.0)
  - o ***No. Of unloaders*** (0)
- o ***Compressor 3 size*** (15.0)
  - o ***No. Of unloaders*** (0)
- o ***Auto Rotation of comps*** (No)
- o ***Oil Control*** (No)
- o ***Monitor comp disch temp*** (No)
- o ***Disch pressure safety*** (No)
- o ***Neutral Zone*** (2.0)
  - o ***Plus Zone delay*** (30)
- o ***Minus Zone delay*** (30)



Name	Value
PSIG target	16.0 psi
PSIG Safety cutout	5.0 psi
Suction Optimization	Dynamic
Maximum pressure float	5.0 psi
Post defrost delay	20 min
Allow float below target	No
Night setback	No
Monitor suction temp	No
Monitor desuperheat temp	No
Units	hp
Compressor type	Reciprocating
Proof type	OI
Show percentage of total	Yes
Compressor 1 size	9.0
No. of unloaders	0
Inverter control	None
Compressor 2 size	15.00
No. of unloaders	0
Compressor 3 size	15.00
No. of unloaders	0
Compressor 4 size	22.00
No. of unloaders	0
Auto rotation of comps	No
Oil control	No
Monitor comp disch temp	No
Disch pressure safety	No
Neutral Zone	2.0 psi
Plus Zone delay	30 sec
Minus Zone delay	30 sec
Receiver	Yes
Surge control	No
Liquid level sensor type	Sensor Input

Circuits or Evaporator Setup

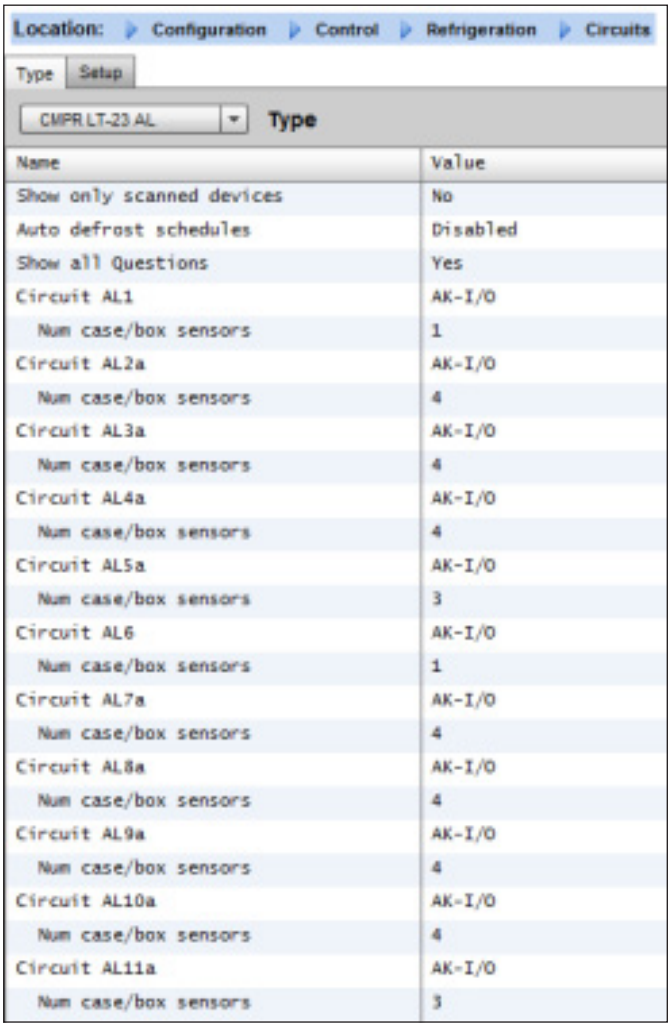
- Select ***Refrigeration->Circuits***



Name	Value
PSIG target	16.0 psi
PSIG Safety cutout	5.0 psi
Suction Optimization	Dynamic
Maximum pressure float	5.0 psi
Post defrost delay	20 min
Allow float below target	No
Night setback	No

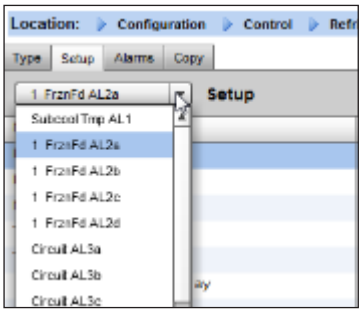
- Under the ***Type*** tab select the suction group from the drop down list directly below
- ***Show only scanned devices*** (No)
- ***Auto defrost schedule*** (Yes)
- ***Show all questions*** (Yes)

- Select each ***Circuit*** (AK-I/O)(DDL)
  - ***AK-I/O*** (Standard I/O modules)
  - ***Case Controller*** (Generic device)
- Select ***Num case /box sensors*** for number of sensors used in the circuit

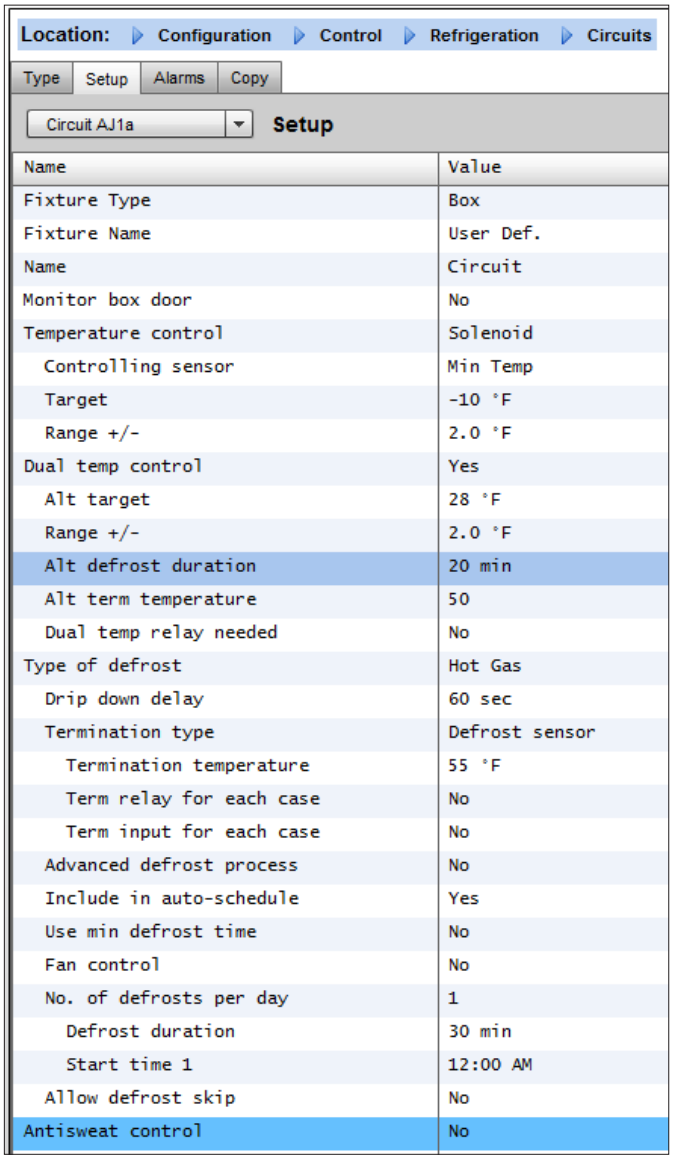


Name	Value
Show only scanned devices	No
Auto defrost schedules	Disabled
Show all Questions	Yes
Circuit AL1	AK-I/O
Num case/box sensors	1
Circuit AL2a	AK-I/O
Num case/box sensors	4
Circuit AL3a	AK-I/O
Num case/box sensors	4
Circuit AL4a	AK-I/O
Num case/box sensors	4
Circuit AL5a	AK-I/O
Num case/box sensors	3
Circuit AL6	AK-I/O
Num case/box sensors	1
Circuit AL7a	AK-I/O
Num case/box sensors	4
Circuit AL8a	AK-I/O
Num case/box sensors	4
Circuit AL9a	AK-I/O
Num case/box sensors	4
Circuit AL10a	AK-I/O
Num case/box sensors	4
Circuit AL11a	AK-I/O
Num case/box sensors	3

- Under the ***Setup*** tab (select first circuit via drop down menu)
  - o Select each circuit and edit as needed



  - o ***Fixture Type*** (DDL)
  - o ***Fixture Name*** (UD)
  - o ***Name*** (UD)
  - o ***Temperature cntrl*** (Solenoid)(DDL)
  - o ***Controlling sensor*** (DDL)(if using multiple sensors on the circuit)
  - o ***Target*** (UD)
    - o ***Range*** (+/- 2)
  - o ***Dual temp control*** (Yes)
    - o ***Alternate target*** (UD)
    - o ***Range*** (+/- 2)
    - o ***Alt defrost duration*** (UD)
    - o ***Dual temp relay*** (No)
  - o ***Type of defrost*** (Hot Gas)(DDL)
    - o ***Drip down delay*** (300)(UD)
    - o ***Termination type*** (Defrost)(DDL)
    - o ***Termination Temperature*** (UD)
    - o ***Term relay and input*** (No)
    - o ***Advance defrost process*** (No)
    - o ***Include in auto-schedule*** (UD)
    - o ***Use min defrost time*** (Yes)
    - o ***Min defrost time*** (UD)
    - o ***Fan control*** (No)
    - o ***No. of defrosts per day*** (UD)
      - ° ***Defrost duration*** (UD)
      - ° ***Start time*** 1 (Auto Scheduler will auto assign)
    - o ***Allow defrost skip*** (No)
  - o ***Antisweat control*** (No)
  - o ***Generate shutdown input*** (No)
  - o ***Num of shutdn schedules*** (UD)
  - o ***Include in suction float*** (Yes)
  - o ***Monitor leak detector*** (None)
  - o ***Generate cleaning input*** (None)
  - o ***Monitor door position*** (No)



Name	Value
Fixture Type	Box
Fixture Name	User Def.
Name	Circuit
Monitor box door	No
Temperature control	Solenoid
Controlling sensor	Min Temp
Target	-10 °F
Range +/-	2.0 °F
Dual temp control	Yes
Alt target	28 °F
Range +/-	2.0 °F
Alt defrost duration	20 min
Alt term temperature	50
Dual temp relay needed	No
Type of defrost	Hot Gas
Drip down delay	60 sec
Termination type	Defrost sensor
Termination temperature	55 °F
Term relay for each case	No
Term input for each case	No
Advanced defrost process	No
Include in auto-schedule	Yes
Use min defrost time	No
Fan control	No
No. of defrosts per day	1
Defrost duration	30 min
Start time 1	12:00 AM
Allow defrost skip	No
Antisweat control	No

Condenser Setup

- Click on ***Refrigeration*** and select ***Condenser***
  - Next double click on each setpoint and edit as needed
  - ***Fan type*** (Multi. Fan)
  - ***Number of fans*** (6)
  - ***Fan staging*** (Individual)
  - ***Fan staging monitoring*** (None)
  - ***Auto rotate fans*** (No)
  - ***1st Stage fan interlock*** (No)
  - ***Control sensor*** (Sat Cond Temp)
  - ***Monitor dropleg temp*** (Yes)
  - ***Target control type*** (Rate of Change)
  - ***Min cond*** T (65.0)
  - ***Max cond*** T (100.0)
  - ***Condenser Delta*** T (10.0)
  - ***Hot gas defrost offset*** (No)
  - ***Fan Inverter control*** (None)
  - ***Normal Reaction Zone*** (10.0)
  - ***Reaction Time***
    - ***Plus Zone*** (30)
    - ***Minus Zone*** (30)
  - ***Individual outside temp*** (No)
  - ***Split condenser*** (Yes)
    - ***Split based on*** (Ambient)
    - ***Control method*** (1valve/1split)
    - ***Split when below*** (50.0)
    - ***Split deadband*** (10.0)
    - ***Drop fans*** (No)
    - ***Split on heat reclaim*** (No)
    - ***Split pressure override*** (Yes)
      - ***Cutin*** (200.0)
      - ***Cutout*** (275.0)
  - ***Monitor inlet temp*** (No)
  - ***Bypass clear method*** (Manual)
    - ***High pressure bypass*** (75.0)
    - ***High pressure delay*** (1)
  - ***Enviroguard*** (No)

Condenser | Alarms

Rack (A) **Condenser**

Name	Value
Fan type	Multi. Fan
Number of fans	6
Fan staging	Individual
Fan stage monitoring	None
Auto rotate fans	No
1st Stage fan interlock	No
Control sensor	Sat Cond Temp
Maintain cond delta plus	Ambient Temp
Monitor dropleg temp	Yes
Target control type	Rate of change
Min cond T	65.0 °F
Max cond T	100.0 °F
Condenser Delta T	10.0 °F
Hot gas defrost offset	No
Fan inverter control	None
Normal Reaction Zone	10.0 psi
Reaction Time	
Plus Zone	30 sec
Minus Zone	30 sec
Individual outside temp	No
Split condenser	Yes
Split based on	Ambient
Control method	1valve/1split
Split when below	50.0 °F
Split deadband	10.0
Drop fans	None
Split on heat reclaim	No
Split pressure override	Yes
Cutin	200.0 psi
Cutout	275.0 psi
Monitor inlet temp	No
Bypass clear method	Manual
High pressure bypass	275.0 psi
High pressure delay	1 sec
Enviroguard	No
Bleed valve when split	No

If you are setting up a single suction rack with an air cooled condenser and 20 circuits, please continue below.

If you are setting up a pack/case controller [decentralized control], please continue with the chapter "Configure pack/ Case."

- Click on ***Refrigeration*** and select ***Addresses***
  - o Select ***Relays*** tab
    - ° Double click the ***Address*** line for each relay and set the address.
    - ° Double click the ***Type*** line and set the appropriate relay type.

Location: Configuration ▸ Control ▸ Refrigeration ▸ Addresses

Controllers | Relays | Sensors | On/Off Inputs | Variable Outputs | VLT

Rack (A) **Relays**

Name	Value
Mstr Defr Vlv A	Mstr Defr Vlv A
Address	00-0.0
Type	N-Closed
Split Fan A	Split Fan A
Address	00-0.0
Type	N-Closed
Split Valve A	Split Valve A
Address	00-0.0
Type	N-Closed
Cond Fan A1	Cond Fan A1
Address	00-0.0
Type	N-Closed

  - o Select ***Sensors*** tab
    - ° Double click the ***Address*** line for each sensor and set the address.
    - ° Double click the ***Type*** line and set the appropriate sensor type.

Location: Configuration ▸ Control ▸ Refrigeration ▸ Addresse

Controllers | Relays | Sensors | On/Off Inputs | Variable Outputs | VLT

Rack (A) **Sensors**

Name	Value
Inside Temp	Inside Temp
Address	00-0.0
Type	PT1000
Disch Press A	Disch Press A
Address	00-0.0
Type	AKS32-500
Dropleg Press A	Dropleg Press A
Address	00-0.0
Type	AKS32-500
Dropleg Temp A	Dropleg Temp A
Address	00-0.0
Type	PT1000

  - o Select ***on/off Inputs*** tab
    - ° Double click the ***Address*** line for each ***On/off Input*** and set the address.
    - ° Double click the ***Type*** line and set the appropriate sensor type.

Location: Configuration ▸ Control ▸ Refrigeration ▸ Addr

Controllers | Relays | Sensors | On/Off Inputs | Variable Outputs | VLT

Rack (A) **On/Off Inputs**

Name	Value
Phase Loss A	Phase Loss A
Address	00-0.0
Type	Voltage
Compressor AL1	Compressor AL1
Address	00-0.0
Type	Voltage
Compressor AL2	Compressor AL2
Address	00-0.0
Type	Voltage

- Setup ***Alarms***
  - For each control type that you have setup, you will need to configure the alarms for the IO used.
  - For suction control click on the ***Alarms*** tab and select the correct suction to edit the settings. Normal alarm type will only output the alarm once. Use ***Severe*** or ***Critical*** if you want the alarm output to repeat.

Location: Configuration ▸ Control ▸ Refrigeration ▸ Suction

Suction | Alarms | Copy

CMPR LT-23 AL — **Alarms**

Name	Value
Alarms Suspended: Rack A 0	Disabled
Phase Loss: Phase Loss A 00-0.0	Normal
Delay	15
Units	min
Action	1
Low Pressure: Suction Pres AL 00-0.0	Disabled
High Pressure: Suction Pres AL 00-0.0	Disabled
High Pressure: Disch Press A 00-0.0	Normal
Limit	above 250.0 psi
Delay	15
Units	min
Action	1

  - For ***Circuits***, click on the ***Alarms*** tab and select the correct circuit to edit the settings.

Location: Configuration ▸ Control ▸ Refrigeration ▸ Circuits

Type | Setup | Alarms | Copy

1 FrznFd AL2a — **Alarms**

Name	Value
Low Temperature: 1 FrznFd AL2a 00-0.0	Normal
Limit	below -25.0 °F
Delay	90
Units	min
Action	1
High Temperature: 1 FrznFd AL2a 00-0.0	Critical
Limit	above 10.0 °F
Delay	90
Units	min
Action	2
Delay after defrost for	30 min

  - For ***Condensers***, click on the ***Alarms*** tab and select the correct circuit to edit the settings.

Location: Configuration ▸ Control ▸ Refrigeration ▸ Condenser

Condenser | Alarms

Rack (A) — **Alarms**

Name	Value
Low Pressure: Disch Press A 00-0.0	Disabled
High Pressure: Disch Press A 00-0.0	Normal
Limit	above 250.0 psi
Delay	15
Units	min
Action	1
High dropleg temp: Dropleg Temp A 00-0.0	Disabled

  - Next click on ***Configuration*** then click on ***Alarms*** tab.
    - First set the number of network connections under the ***Connections*** tab. Then the connection details. The image below shows the settings for sending a text alarm to an IP address. Change the name for the network connection to make it easier to identify.

Connections | Service | Alarm Routing | Relays | System | I/O Comm

Connections

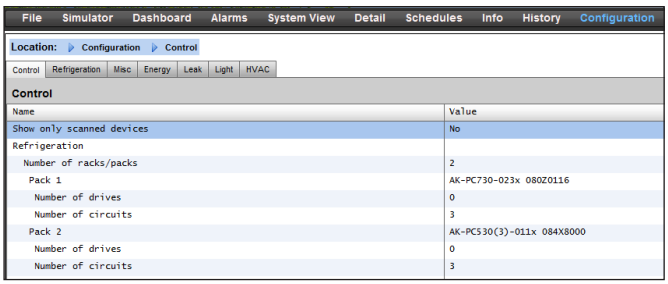
Name	Value
Number of network connections	1
Network Connection 1	
Type	Remote
Name	Network 1
Address	192.168.0.200
Date	MM/DD/YY
Lang	English
Time	12 Hour
Port	3001
Delay	5 min
Schedule 1	Not Used
Schedule 2	Not Used

If you are setting up a single suction rack with an air cooled condenser and 20 circuits, your setup is now complete. Please continue in the "Alarm Routing" section.

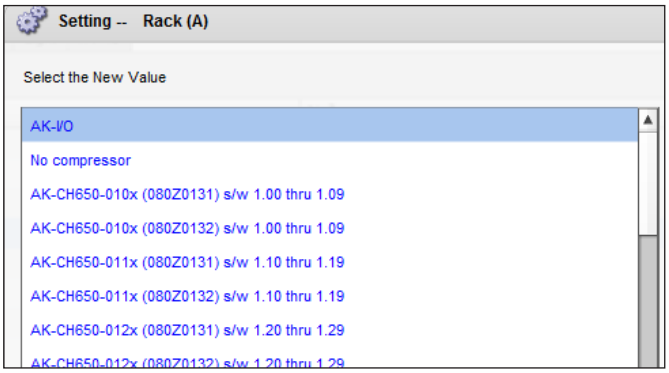
Configure Pack/Case [Decentralized Control]

From the ***Configuration*** menu, select the ***Control*** tab.

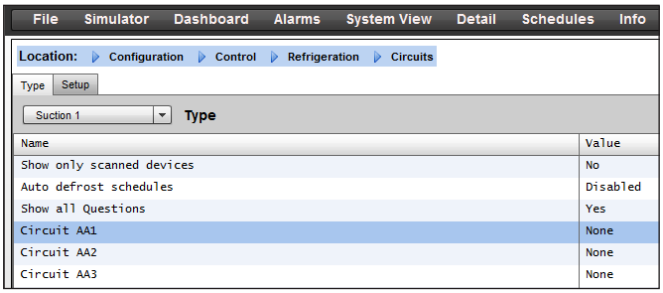
- First choose the number of pack controllers via the question ***Number of racks/packs.***



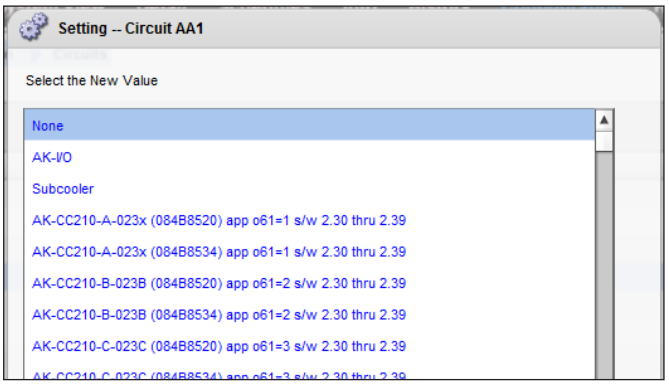
- Next step is to select the required pack controller type
  - o Select your controller by double clicking on **PackX**.
  - o If ***Show only scanned devices*** is selected, you will only find the controller types that are connected to you BUS system on the list.
  - o If not, you will get a full list of all controller types.



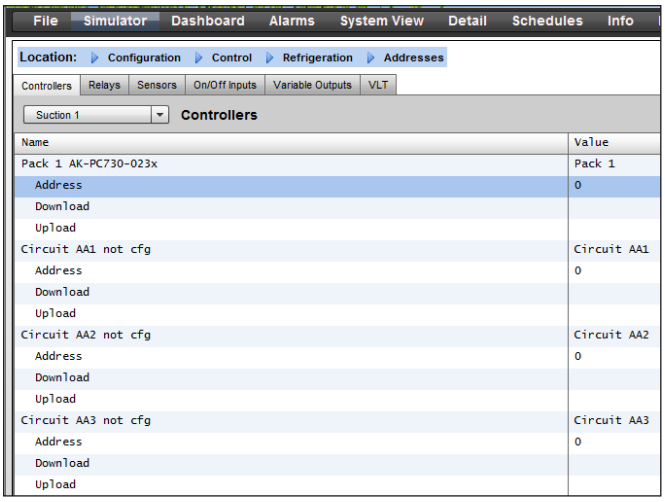
- Next step is to select the required evaporator [circuit] controllers.
- From the ***Control*** page select ***Refrigeration*** tab and then the ***Circuit*** tab.



- Next step is to select the required controller.
  - o Select your controller by double clicking on ***Circuit XX.***



- Next step is to assign an address to each controller.
  - o Go back to the ***Refrigeration*** tab and select the ***Controllers*** tab.
  - o Double click on the line ***Address*** and type in the address programmed in the controller.

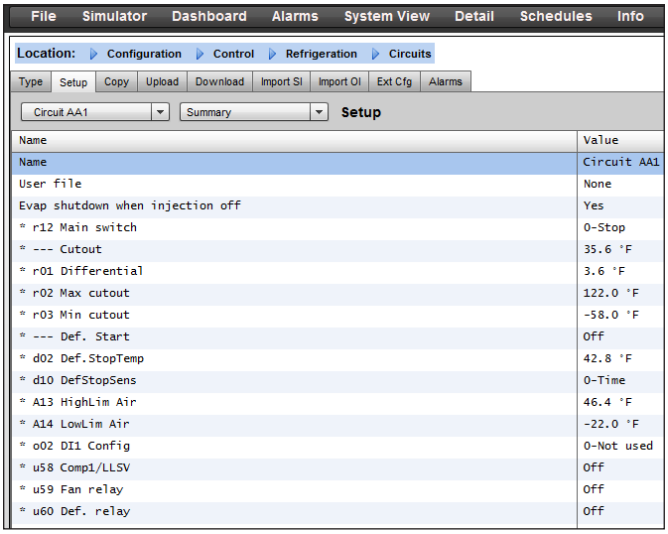


- To select the controller from ***Suction group 2*** [i.e. second pack controller], use the dropdown menu next to the word ***Controllers***.

- Once all controllers are addressed, complete another scan of the network as previously discussed.
- In normal setups the value for configured and scanned nodes in the line ***Generic*** is equal.

Node Type	Configured	Scanned
OI8 Board	0	0
RO8 Board	0	0
SI8 Board	0	0
VO2 Board	0	0
Utility Meter	1	0
Generic	2	2
AK-CM	1	1
Calculations	3	N/A

- You can now start programming all the controllers with the service tool, the ST500, or from the setup menu found in the ***Refrigeration*** section.



Alarm routing

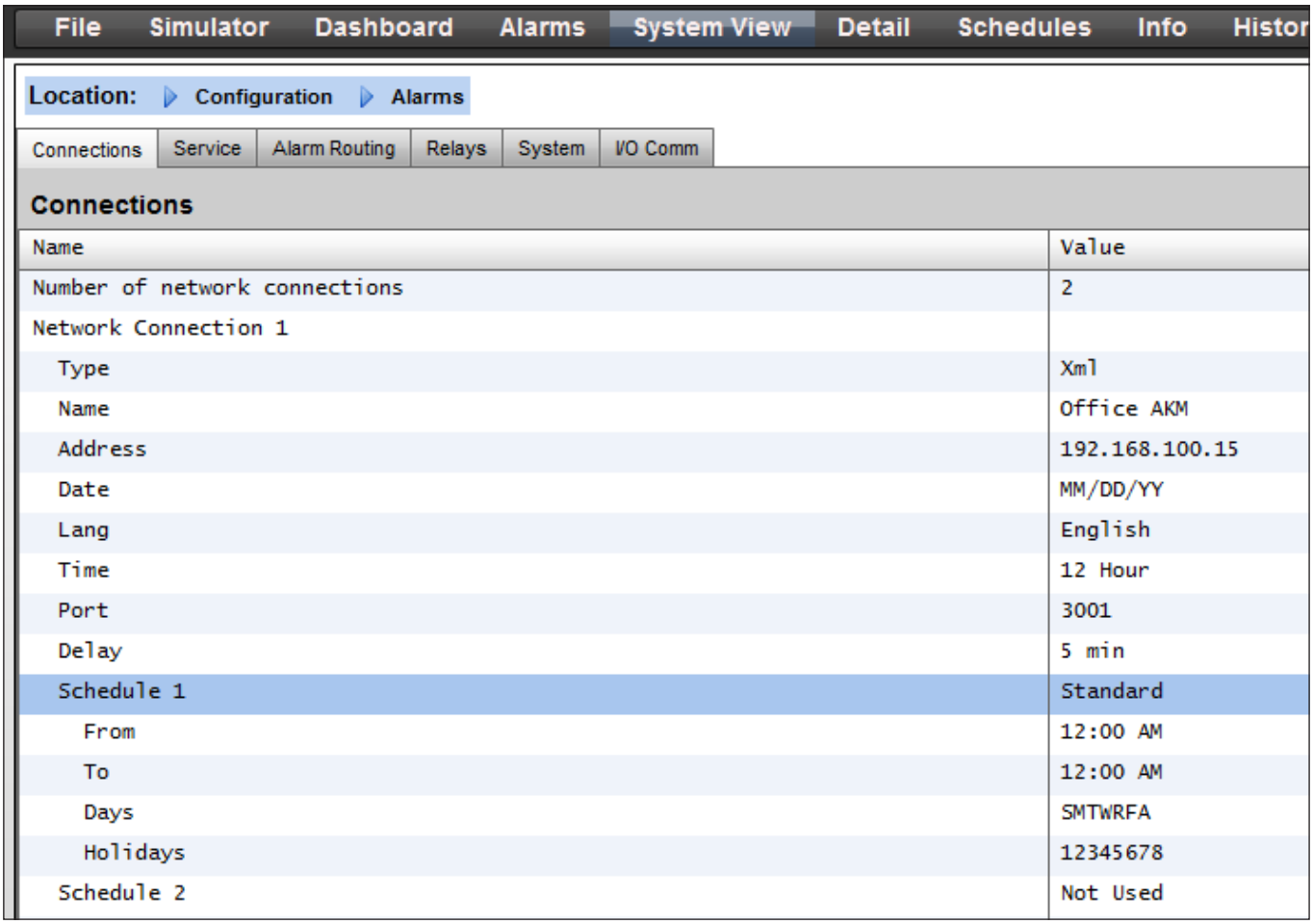
- 3 different alarm forwarding methods are available.
  - Text (to an IP client).
  - XML (to AKM, or Danfoss EDS service)
  - Email (with or without authentication)
- Maximum of 2 connections can be established (e.g. XML and Email).
- 1st step is to setup the number of network connections (see picture below).

XML Receiver

Click on ***Connections***

- Select the type by double clicking on the line ***Type***.
  - Enter a name and the IP address for the alarm receiver (AKM, EDS etc.).

- To enable the alarms, you need to setup a schedule. Otherwise alarms will not be able to send.

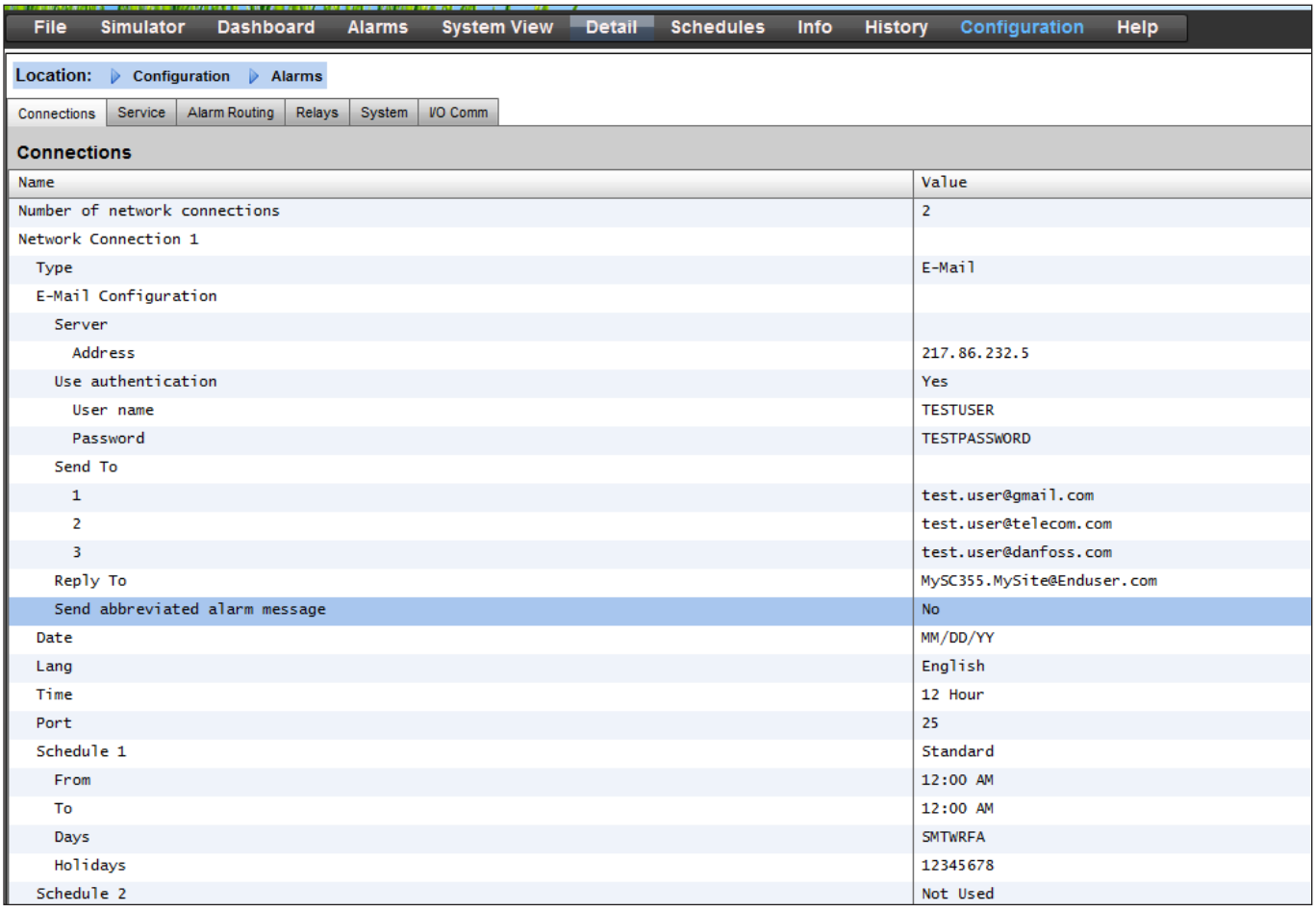


Name	Value
Number of network connections	2
Network Connection 1	
Type	Xml
Name	Office AKM
Address	192.168.100.15
Date	MM/DD/YY
Lang	English
Time	12 Hour
Port	3001
Delay	5 min
Schedule 1	Standard
From	12:00 AM
To	12:00 AM
Days	SMTWRFA
Holidays	12345678
Schedule 2	Not Used

Email receiver

Click on ***Connections***

- Select the type by double click on the line ***Type***, and enter the IP address of the mail server (e.g. the address of your POP3 server).
- Enter maximum of 3 email addresses of recipients.
- The ***Reply To*** address will be displayed as the sender address in your email inbox.



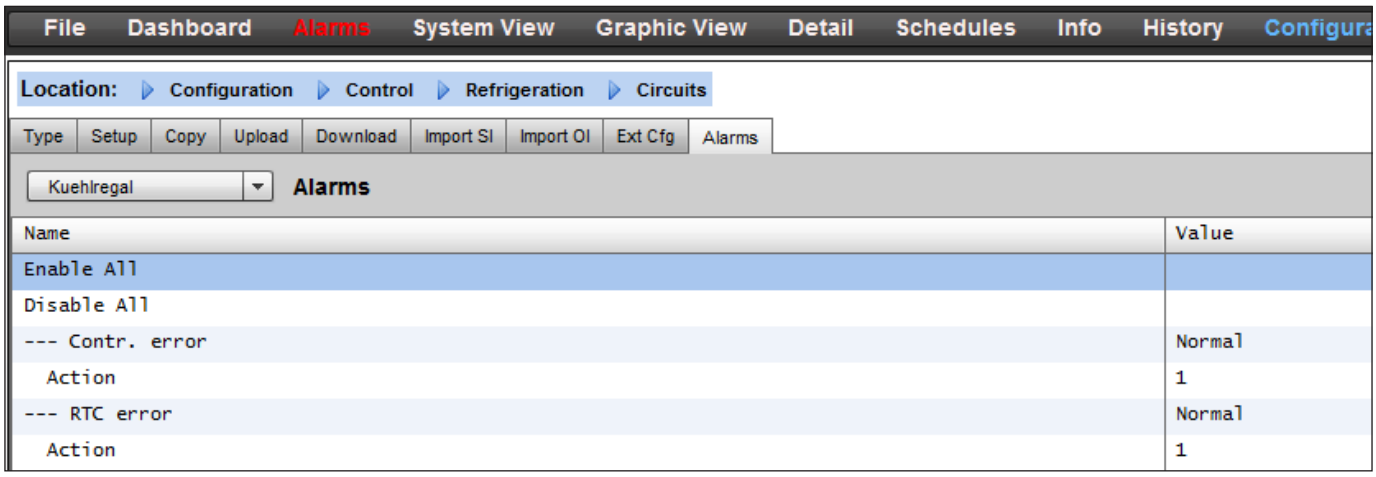
Name	Value
Number of network connections	2
Network Connection 1	
Type	E-Mail
E-Mail Configuration	
Server	
Address	217.86.232.5
Use authentication	Yes
User name	TESTUSER
Password	TESTPASSWORD
Send To	
1	test.user@gmail.com
2	test.user@telecom.com
3	test.user@danfoss.com
Reply To	MySC355.MySite@Enduser.com
Send abbreviated alarm message	No
Date	MM/DD/YY
Lang	English
Time	12 Hour
Port	25
Schedule 1	Standard
From	12:00 AM
To	12:00 AM
Days	SMTWRFA
Holidays	12345678
Schedule 2	Not Used

- To enable the alarms, you need to setup a schedule. Otherwise alarms will not be able to send.

Alarm Routing

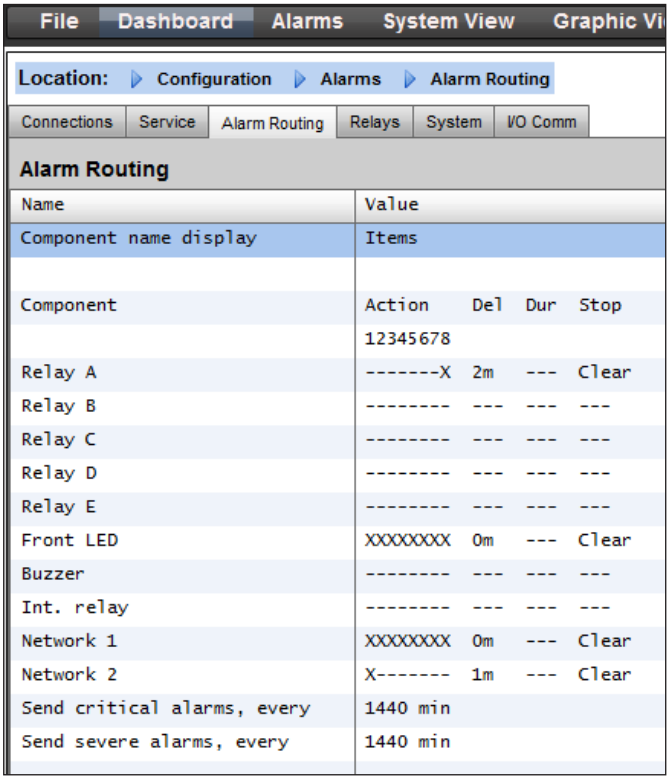
- Both Networks created in previous steps must be activated. Every alarm in the AK-SC 355 is related to an action (e.g. a temperature alarm is an action with the nr. 1, others have different actions). The AK-SC 355 will come with default actions, but the user is able to change them anytime.

E.g. Circuit actions

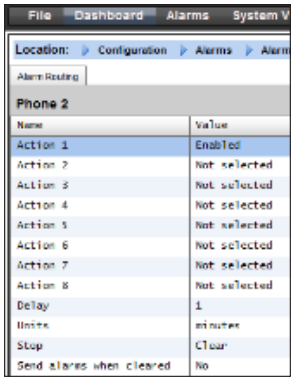


- If the user wants to email only actions with the nr. 1 action, and the email is created as a ***Network connection*** nr. 2 (see last site) then the alarm routing must be enabled as depicted in the image below.

All 8 actions of ***Network 1***, which is the XML route, are forwarded to AKM, EM800, Quantum or others systems. Network 2 is only active for action 1. This means that only action 1 is going out by Email. In this case, the email is delayed for one minute.



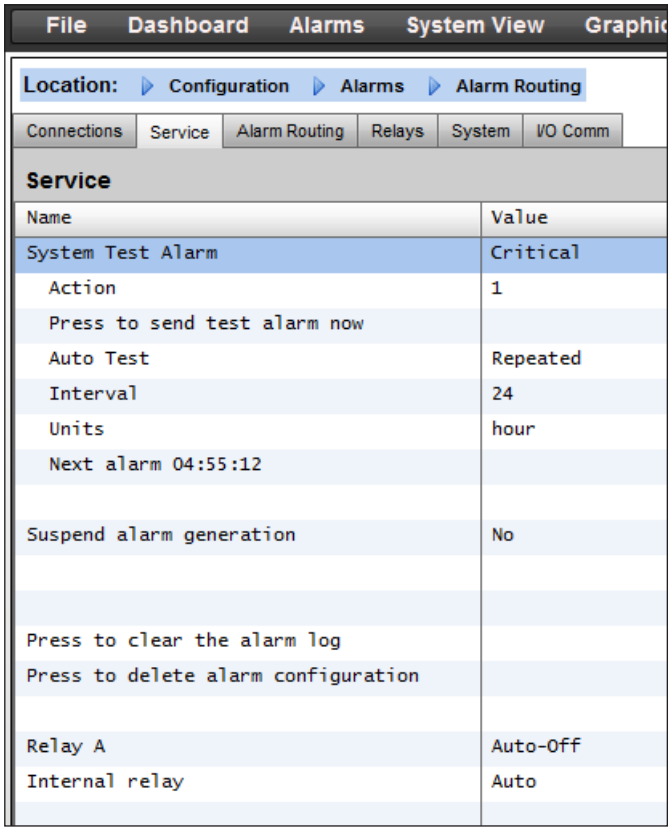
To change the delay, double click the line ***Network 2*** and make the appropriate changes.



Service

- To ensure routing is working properly, the AK-SC 355 allows you to test the settings.

- Click on the ***Service*** tab and double click ***Press to send test alarm now***.
- To get a daily alarm, double click on the line ***Interval*** and choose ***Repeated***.
- The interval should be 24 hours in this case.
- Both items can be changed by double clicking on the line.



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