NGC-30

LUNCH AND LEARN MANUAL

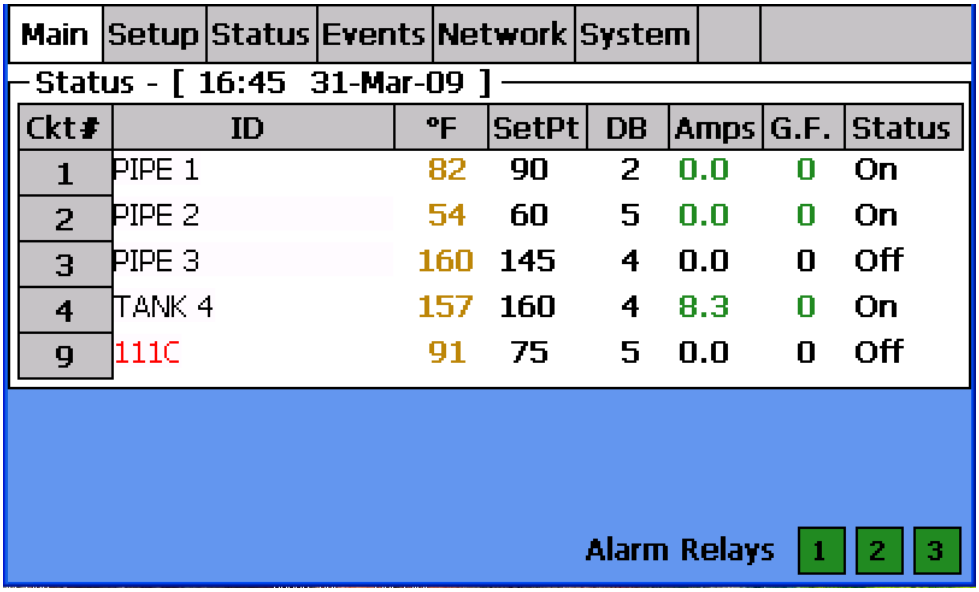


Table of Contents

Connection Diagram 3

Connecting to the Demo Unit 3

Information Charts 4

RTD Switch Settings 4

Color Coding of Main Screen 4

nVent RAYCHEM NGC-30-CRM/-CRMS LED Functions 4

Getting Started 5

Demonstration Flow 5

Set the Stage 6

The Main Screen 8

Get Someone Involved 9

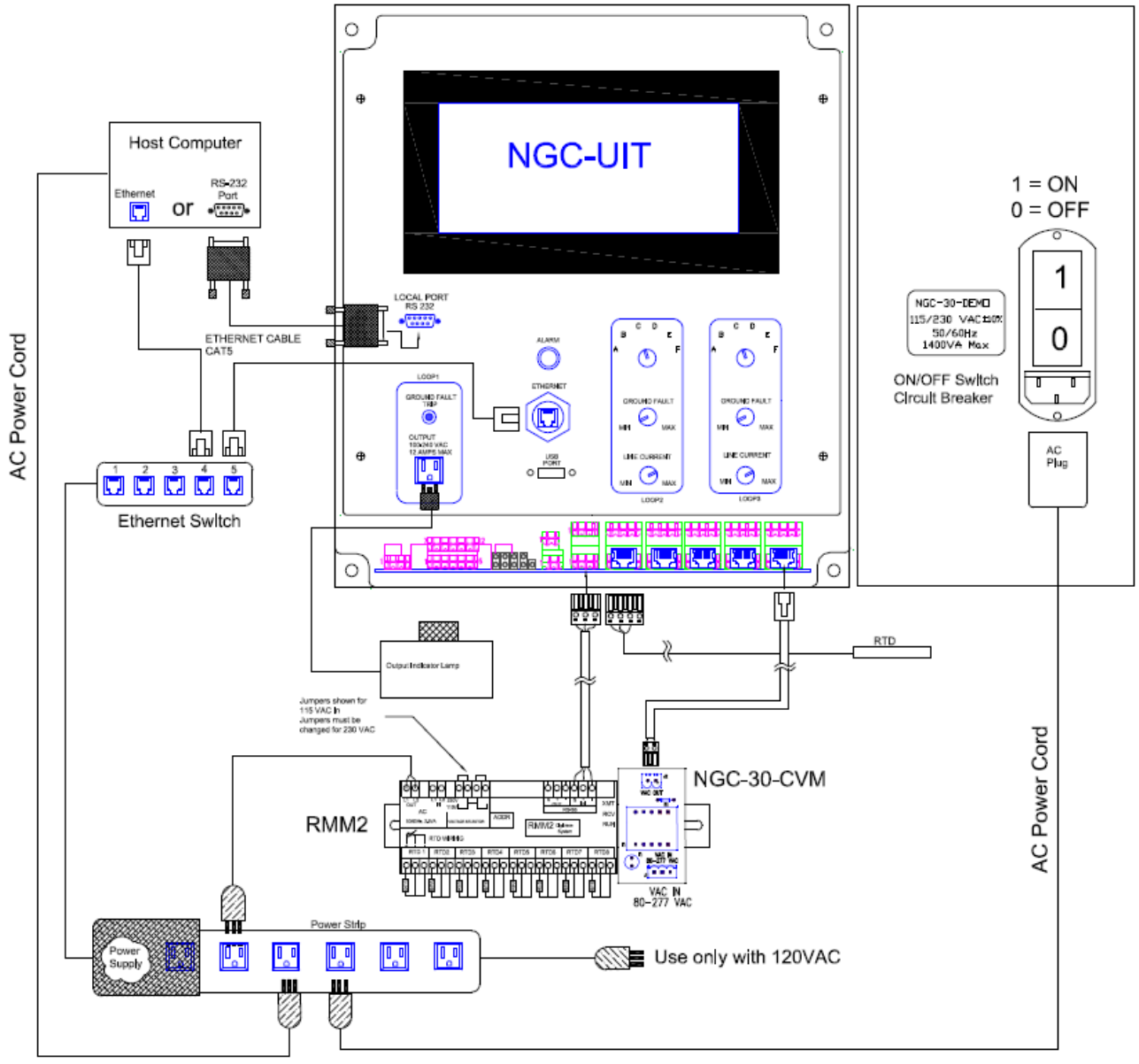
Program a Circuit 10

Alarms and the Events Lists 16

The Network Tab 17

Security 19

Connection Diagram



Connecting to the Demo Unit

See the nVent RAYCHEM NGC-30 Demo Unit Connection Guide for instructions on how to connect your computer to the NGC-30 Demo Unit and run the CER Host Program and RAYCHEM Supervisor.

Information Charts

(Inside the NGC-30 cover)

RTD Switch Settings

	Circuit #3	
A	113°F	45°C
B	141°F	61°C
C	152°F	67°C
D	182°F	83°C
E	Shorted	
F	Open	

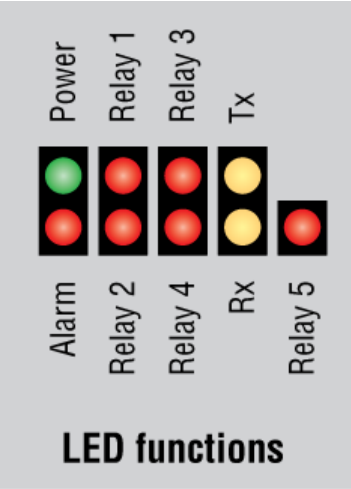
	Circuit #4	
A	112°F	44°C
B	140°F	60°C
C	153°F	67°C
D	183°F	84°C
E	Shorted	
F	Open	

Color Coding of Main Screen

The data in the °F/°C, Amps, and G.F. columns are displayed in color to identify their current state.

Color	Description
Green	When heater is energized (status On), within Normal range of setup parameters
Red	In Alarm condition
Orange (°F/°C only)	Temperature not within setpoint + Dead Band range

NGC-30-CRM/-CRMS LED Functions



Getting Started

Demonstration Flow

The recommended flow of the NGC-30 demonstration is as follows. You can experiment or adjust based on the audience questions or your read on their interest level.

- **Set the Stage**
  Explain what it is that their looking at. Many people think this is an actual panel and not a demonstration unit.
- **Show the Main Screen**
  Explain the main screen and what it shows.
- **Get Someone Involved**
  Pick someone from the audience and have them come up to interface with the demo unit.
- **Program a Circuit**
  The idea here is to provide as little guidance as possible and let the person “figure it out” in real time. This shows the audience how easy the UIT makes interacting with the system.
- **Show an Alarm and the Events List Features**
  This allows us to emphasize the alarm notification features and that everything is in plain language, not secret codes.
- **The Network Tab**
  It demonstrates the full range of information here emphasizes the tools built into the unit to help shorten the commissioning cycle.
- **Security**
  It shows the built-in password function is important so that the customer feels comfortable that anyone can’t just wander up to the UIT and change settings at random.

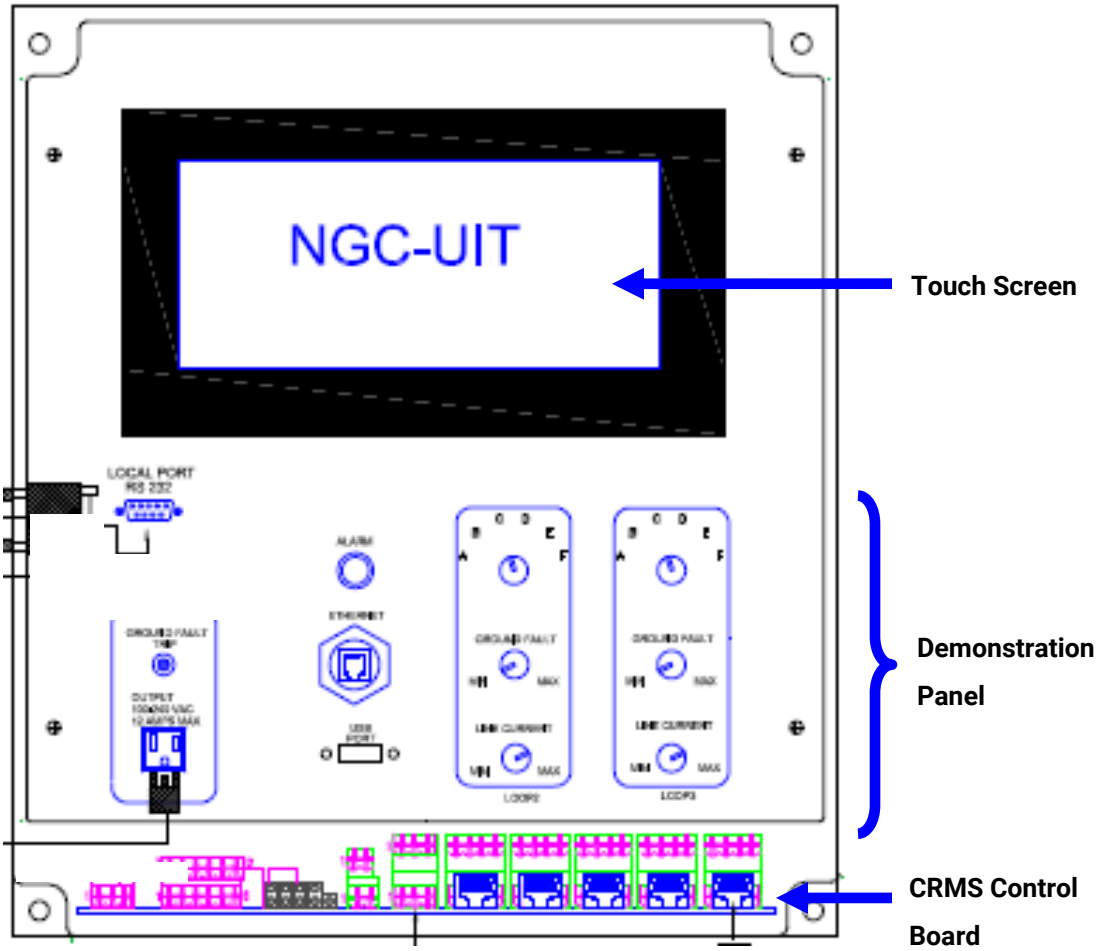
Set the Stage

Explain that this is a demonstration model of the NGC-30 platform and not a real panel.

Go through the elements of the demo unit and point out the following:

- Touch screen interface – revolutionizes interaction with the system and makes it incredibly easy.
- CRMS card – this is the control circuitry. Five heat tracing circuits are supported on one card.
    - Network Interfaces – point out the Ethernet, nVent RAYCHEM RS-485 and RS-232 connections and that each UIT in the field supports each of these.
    - RS-232 – for at the panel interface if you're using nVent RAYCHEM Supervisor on a laptop
    - RS-485 – the main communications interface between the control boards, the UIT and accessories like the nVent RAYCHEM RMM2 and PLI.
- Demonstration panel – these are the adjustment knobs and are used to show the system response to changes in temperature, line current and ground-fault current.

IMPORTANT: Typically there is no time to demonstrate the system response using the demonstration panel features and I don't make an effort to show this unless the audience wants to see it specifically or there is a lot of time left.


NGC-UIT
Touch Screen
Demonstration Panel
CRMS Control Board

The Main Screen

The Main screen displays the summarized information for each circuit. Point out:

- Full text circuit ID for easy identification of the circuit.
- Measured pipe temperature so that you know what the present status is of the pipe temperature.
    - At this point, touch the UIT on one of the circuits to bring up the Status screen for that circuit.
    - Mention that if you want to know any additional information on that particular circuit, touch it and the applicable Status screen will appear with additional information.
    - Then touch the Main tab to return to the Main screen
- Setpoint is listed so that you can compare the measured temperature to the setpoint. Because no-one knows what the target temperature is from memory.
- For circuits with On/Off control mode, the deadband setting is displayed.
- Then the line current and ground-fault currents are displayed
- The status of the heat tracing circuit is also shown – is it on or off at that moment.
- Finally, the status of the 3 internal alarm relays is displayed. If an alarm is active on any one of those relays, then the displayed square will be red. All green means everything is good.

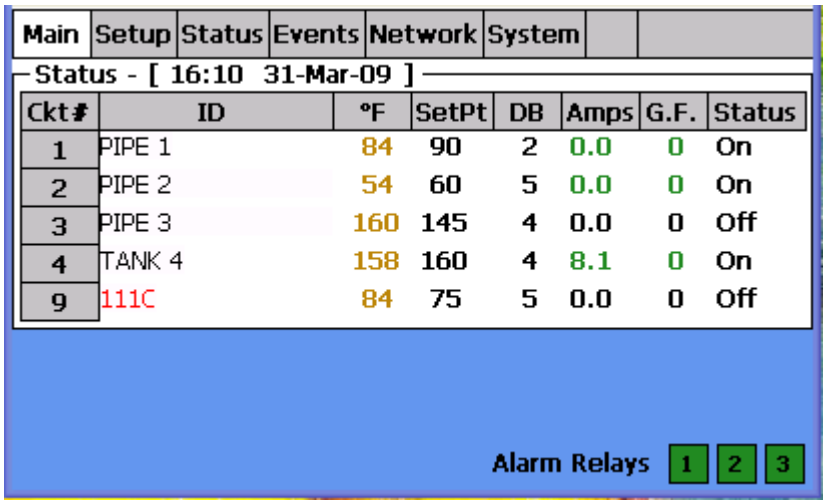


Figure 1: Show the Main Screen

Get Someone Involved

At this point you should get someone from the audience up to actually use the touch screen for the rest of the demonstration.

Good candidates are usually young engineers.

- They are more familiar with this type of interface.
- They are more interested in new “cool” technology like this.
- Their boss, if attending, will usually pressure them go up.
- They’re the ones who will talk about this to their peers if we make a good impression.

Regardless, you need to get someone to run the touch screen instead of you. The touch screen interface is a primary differentiator for us and you need to have the audience walk away feeling like they could figure it out easily and be excited about specing it into their present or next contract.

Program a Circuit

Now it's time to have your assistant program a circuit.

The approach is to provide guidance to the person operating the demo unit and letting them figure out how to accomplish what you've asked them to do. The real power of this exercise is in the audience seeing how little guidance is needed to actually use our system.

Suggestion:

Use keywords in your questions – when you ask someone to do a task, include a word that they would see on the screen which would give them a clue as to what to click on to accomplish your task.

- Example: Instead of asking them to "Program a circuit", ask them "How would you ***set up*** a circuit? What do you think you would do?" This guides them towards touching the Setup tab at the top of the screen.

Step 1:

The demo unit should have the Main screen on display. If not, instruct the user on how to get there.

- "Touch the Main tab".

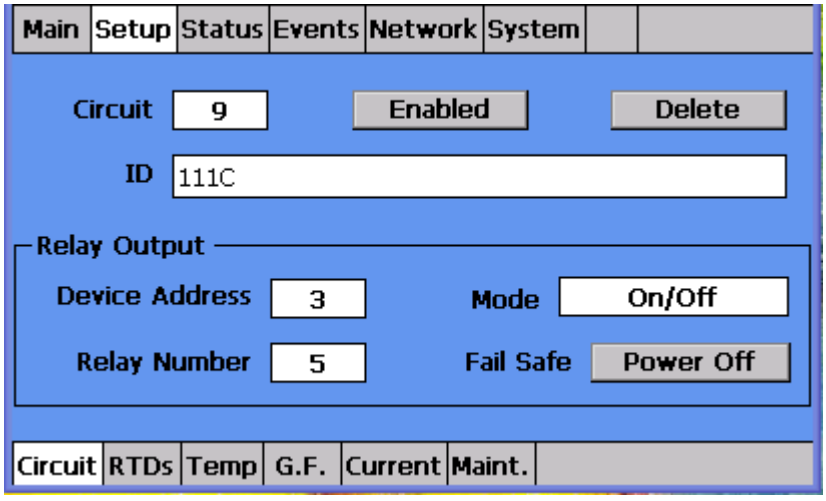


Figure 2: The Setup Screen

Preface the activity with a version of the following script:

"The NGC system User Interface Terminal is designed to be an intuitive interface to the heat-tracing system. Its design uses plain language and is based on standard PC navigation set up and techniques. Data is entered similar to texting on your cell phone. So if you use a computer or a cell phone, the interface with the NGC User Interface Terminal is very similar. OK, so let's get started.

Step 2: Navigate to the Setup Screen

"OK, user, we want to set up a circuit, what is the first thing you think you'd do from this screen?"

- The user should choose the Setup tab on the top of the screen.
- If they are having trouble say:
    - "Since this is a tab based architecture, which tab would you select to set up a circuit?"

Step 3: Select a circuit number

"Now we need to add a circuit, let's add circuit #5. How would you do that?"

- Hopefully, the user touches the white box to the right of the Circuit text. This will bring up the circuit number pop up box.
- If the user is touching the word "Circuit" instead of the white box, then address the whole group and say; "Any time that you want to make an entry, touching the white boxes gets you to that information entry point."
- If circuit #5 already exists, have the user select another number.

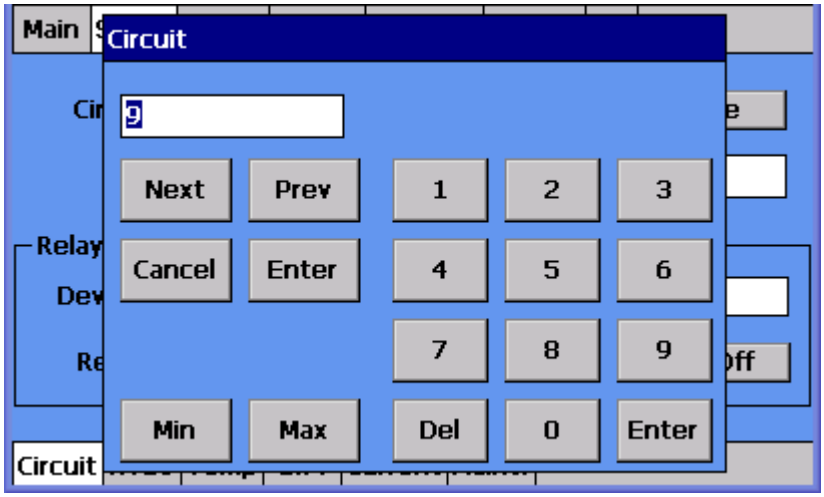


Figure 3: Entering the Circuit Number

"Next, we want to create a label or ID for that circuit. How would you do that? Pick any name you want".

- User should touch the white box next to the word "ID". This will bring up the ID text entry pop up box.
- Text is entered using multiple touches of the buttons to select the desired letter or number. This is exactly the way it works for texting on your cell phone.
- Once the text is entered, the user should touch the Enter button.

Figure 4: Entering the Circuit ID

"Most panels will have multiple control cards so you have to define the address for the control board which you want to assign the circuit to. Where would you start?"

- User should touch the white box next to the words "Device Address".
- If you don't know the CRM card device address, instruct the user to go to the Network screen and get the device address from there. Then go back to the setup menu.

"Now you need to assign this circuit to a relay on the CRMS board. What do you do to do that?"

- User should touch the white box next to the word "Relay".
- Relay assignment pop up box should appear and at least one relay should be unassigned.
- User should select one of the unassigned relays. At that point the ID text will automatically be dropped into the unassigned box that was selected and all that has to be done to complete this is for the user to touch the Next button.
- If all the relays are assigned, simply instruct the user to "Cancel" out of the Assign Relay Number screen, select a circuit number and then touch the "Delete" button. Confirm the circuit deletion by touching "Yes".
- Then go back to the circuit number you are programming, select relay number and there should be an "Unassigned" relay.
- User should select the unassigned relays. At that point the ID text will automatically be dropped into the unassigned box that was selected and all that has to be done to complete this is for the user to touch the Next button.

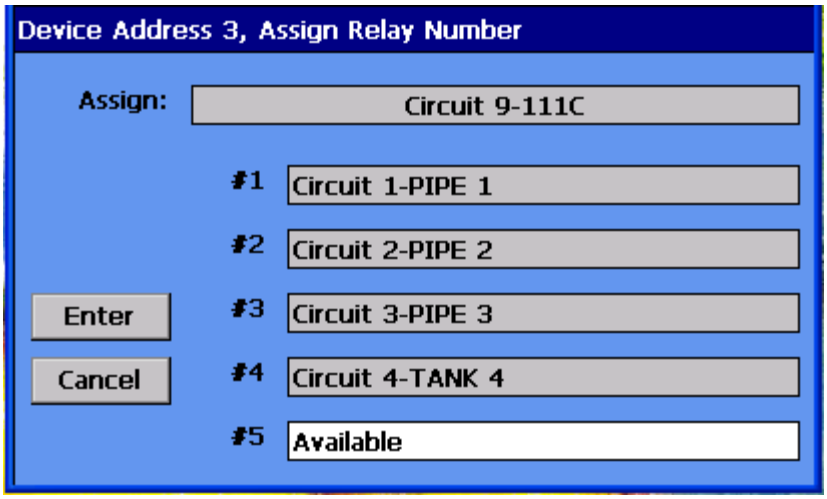


Figure 5: Assigning a Relay Number

"Next we need to select a control mode."

- User should touch the white box next to the word "Mode".
- Advise the user to select On/Off mode for simplicity.

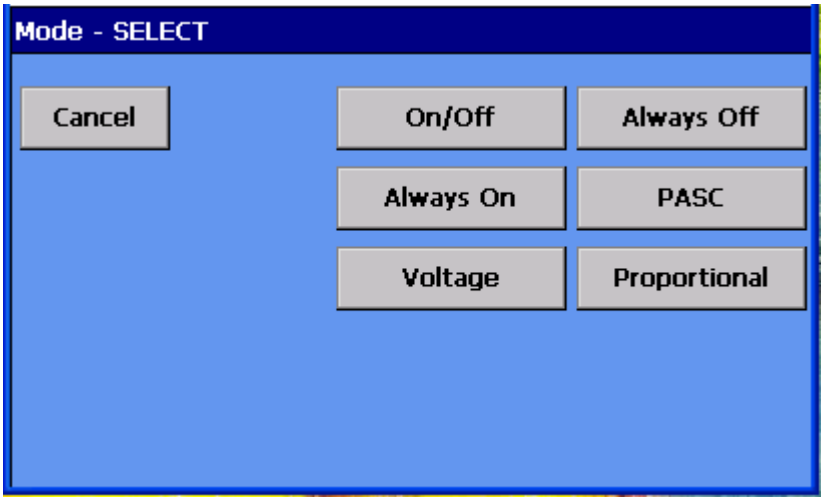


Figure 6: Select a Control Mode

"Now RTD's must be assigned to this circuit."

- Give the user some time to figure out how to get to the RTD screens before you direct them to the bottom menu tabs.

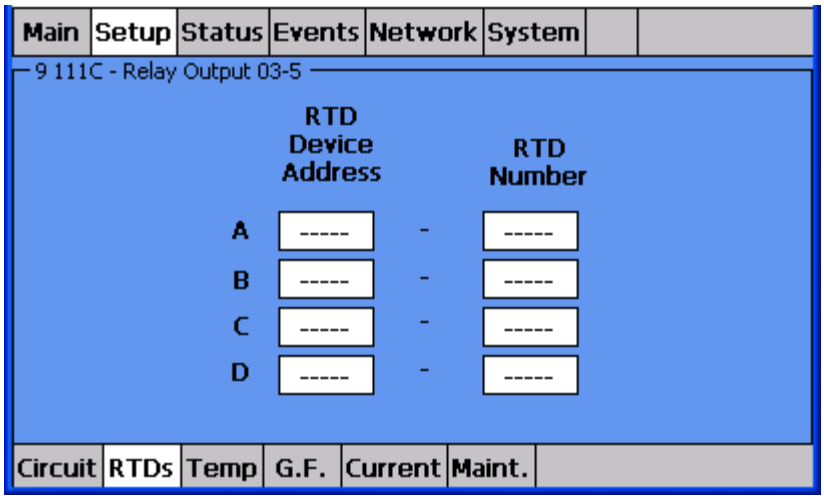


Figure 7: Assigning RTD's

"The NGC-30 can have up to 4 RTD's assigned as control points for the circuit. The system will control (decide whether to turn on or off) based on the lowest measured temperature value.

"RTD's can be assigned from two different sources; hardwired into the CRM Control boards or from an RMM2. So we first need to know the device address of the RTD source; either the CRM card or the RMM2. This information can be found by going to the Network screen."

- User should touch the Network tab on the top menu.
- Note the addresses for the CRM card and the RMM2 and then have the user return to the Setup/RTD menu.
- Once back at the Setup/RTD screen, have the user enter one of the device addresses in the device box.
- The user should now enter an RTD Number for the corresponding device address.
    - If for either the device address or the RTD Number, the user enters a number and that number doesn't get displayed on screen, it is probably the case that the user has entered an incorrect number. This is one of the "idiot-proofing" features of the C&M system.

At this point in the demonstration, I usually start to move things along more quickly and show the group the remaining screens without having the user change or enter any data. The group usually has an understanding of the setup process and the touch screen interface. However, if as I instruct the user to go through the remaining Setup screens, they begin making changes on their own, I never discourage it because it shows the group how quickly someone can pick this up.

“The temperature set points and alarm thresholds are set in the Temp menu.”

- The user usually goes to the Temp menu and may begin making changes,
- I usually only point out that this is where the data is entered for temperature and then move on.

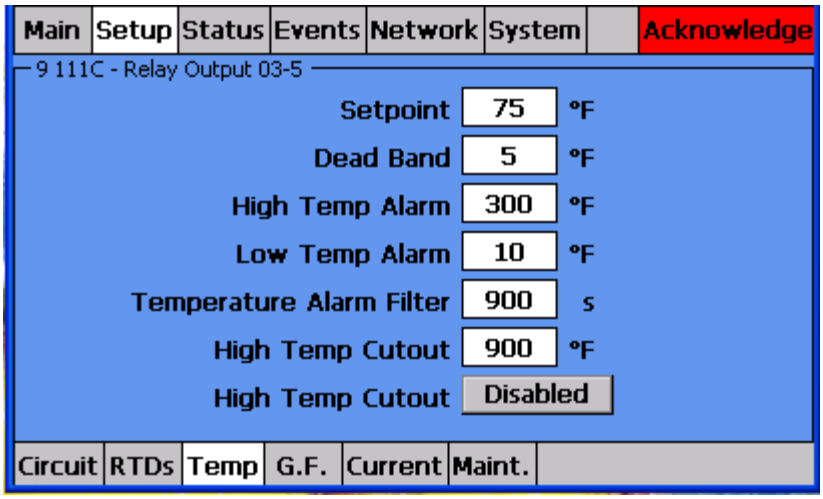


Figure 8: Setting Temperature Values

“Next, it’s the Ground-Fault screen. Notice that there are two entries, one for an alarm and one for trip. We added the alarm to give operators and indication that a ground fault problem may be coming so that they can put it on their schedule to investigate. Without this feature, the control system would just shut down the heat tracing when the trip threshold was reached and now repair becomes critical. The Alarm feature helps manage these issues if they occur without having the potential of shutting the plant down.”

- The user may change values here.
- I recommend giving the above speech and moving on.

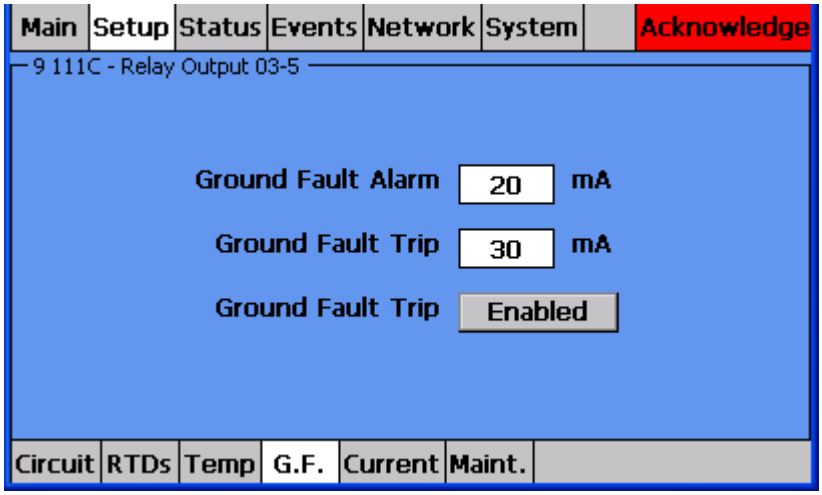


Figure 8: Setting Ground-Fault Values

"The current monitoring set points and alarm thresholds are set in the Current menu."

- The user usually goes to the Current menu and may begin making changes.
- I usually only point out that this is where the data is entered for current and then move on.

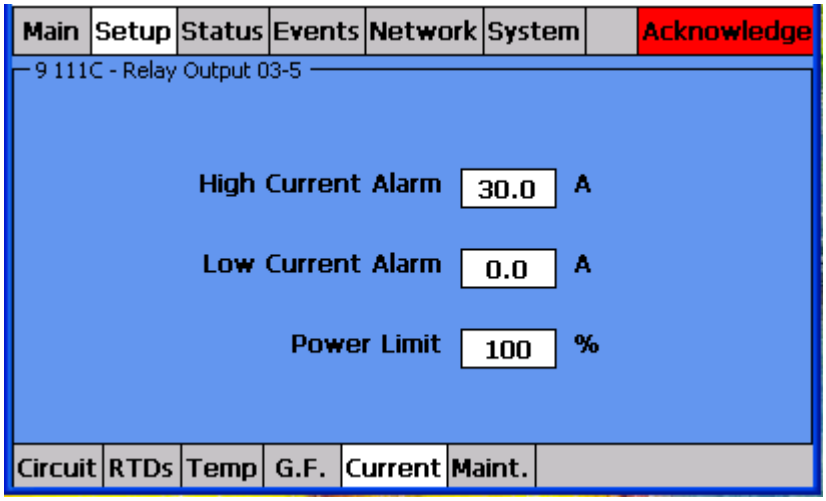


Figure 9: Setting Line Current Values

"Now let's return to the Main screen. That's all there is to setting up a circuit."

- I usually point out how little direction was given to the person running the NGC-30 UIT, that entries were fairly intuitive and just by looking at the screens that person could figure out what they were supposed to do.
- Make the point that this is one of the most valuable things about the NGC-30 systems – it is an intuitive interface that uses plain language and is easy for users to figure out.

Alarms and the Events Lists

This section shows the group how the NGC-30 notifies the user of alarm conditions and how to use the Events list to see active or specific alarms.

- Instruct the user to go to push the red Ground-Fault Trip button on the left side of the demo unit.
- The red Circuit power indicator light should go off and the red "Aknowledge" fault indication section of the UIT screen should illuminate.

"What we just did was to induce a ground current fault in circuit 1. The NGC-30 system responds by first disabling the circuit and then posting the red fault indicator with the word "Aknowledge" in it. The UIT display also changes the circuit #1 text to red to provide a visual indication that this is where the problem is."

"Touching the fault indicator area will bring you to the Events screen where this fault is displayed in flashing red. It is displayed in flashing red because it is considered an operator safety related fault. This means that if the fault goes away, the circuit does not automatically turn on, it must be manually reset."

“If you touch the flashing red area, the NGC-30 system will take you directly to the circuit 1 Status screen. The Alarm Reset button is highlighted in red and you can only re-energize the circuit by pressing that button.”

- Instruct the user to press the Alarm Reset button if they have not already done so.
- Circuit 1 should turn back on.

“Let’s go back and look at the Events list. The Events list stores up to 2,000 entries. Once it exceeds that number, it drops out the first entry and adds the most recent event. The entries are all in plain language, easy to understand and any fault values have associated numbers displayed, like we saw for the ground-fault event. Also, each event has a time and date stamp assigned and the circuit number is referenced. So no secret codes to decipher, everything is straightforward.”

“You can scroll up and down using the arrows at the bottom of the screen. Also, there is a built in sorting function. If you touch the “Event, Press for Alarms” button, the various fault types will be sorted and displayed. Touch once and all the active alarms are displayed. This is very useful when working in the panel so that you don’t have to scroll around the full list of 2,000 events to see what you want.”

“The Events list can also be downloaded either to a USB stick or via RAYCHEM Supervisor so you can keep a history or archive if you like.”

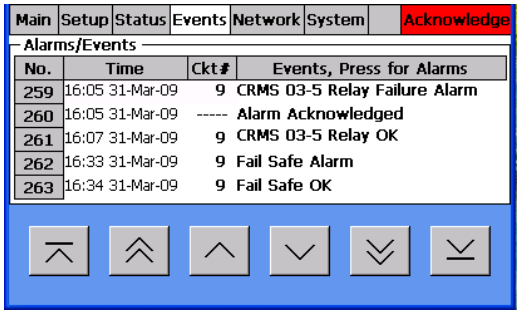


Figure 10: The Events Screen

The Network Tab

The Network tab is a great asset when commissioning a system because it allows the heat-tracing documentation to be compared directly to how the NGC-30 system thinks it is set up. The value of this is that connections, addressing, relay and RTD assignments can be checked prior to reviewing alarms. This significantly reduces the troubleshooting time, especially with wiring.

The goal here is to show that the NGC-30 has built in tools that support the commissioning of the panel and assist in troubleshooting.

“Let’s look at the Network tab next. This is a really powerful tool that is built into the NGC-30 system.”

- Instruct the user to touch the “Update Network” button. The UIT shows a search progress bar.

“When the NGC-30 system is first powered on, the commissioning engineer can come to this screen, hit the Update Network button and the NGC-UIT will go out and search its network to see what is connected to it. Then it will display a list of the devices it sees, the address of those devices and the resources associated with them. This is really powerful because nothing ever gets wired up correctly the first time and you can spend a lot of time trying to

guess what is causing an alarm when the information on these screens can tell you directly. Using this screen, the commissioning engineer can take his paperwork and go through all of the devices that are supposed to be in the system and compare that to what is listed on the NGC-UIT screen. The device addresses can be checked along with the resources. The resource information is great because it shows whether anything is missing. For example on the RMM, all of the RTD's that the NGC-UIT sees are listed. If you know that you are supposed to have all of the RTD's from 1 to 8, but you look at the list and #4 is missing, then you know you have a wiring problem. So before you even begin looking at faults, you are confident that at least all the devices are there. This is very powerful in reducing the time it takes to commission the system."

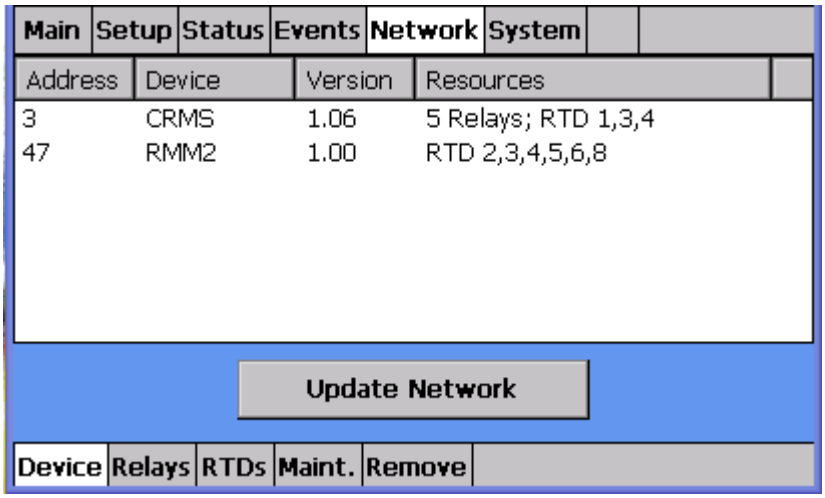


Figure 11: The Network Screen

"Going to the Relay menu tab shows what circuit is assigned to each relay on each CRM control board. Again, this allows the engineers to quickly confirm that the circuits they think are heating certain pipes are indeed controlling the heat tracing to those pipes."

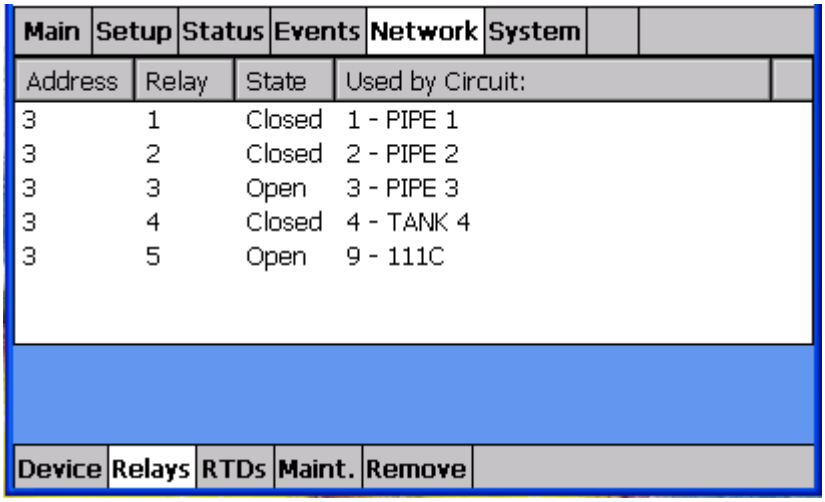


Figure 12: The Network/Relays Screen

"The RTD menu tab shows which circuits are using which RTD's. Because the NGC-30 system is so flexible, an RTD may be assigned to more than one circuit. This would be the case for freeze protection for example where multiple circuits can control off one ambient temperature RTD. Again, you can see how quickly and easily the RTD assignments can be confirmed before start up."

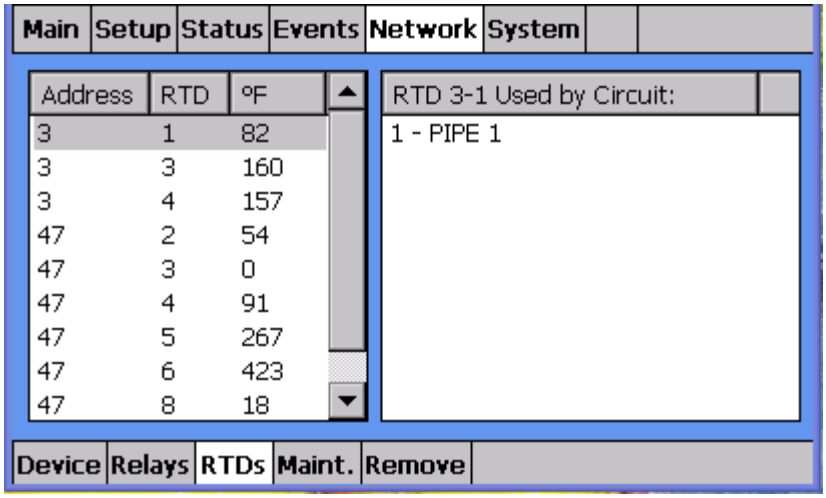


Figure 13: The Network/Relays Screen

"The information available in the Network screens can have a significant impact on reducing commissioning time. You have confidence that the wiring and connections are good before you turn the panel on and this will significantly reduce the number of alarms that are generated when the panel is first turned on This is powerful, useful stuff which no one else on the market has today."

Security

This section addresses the security features of the NGC-30 System.

"The NGC-30 system incorporates two levels of passwords to protect the settings from unauthorized change."

- Instruct the user to go to the System/Password tab and press Yes or OK. But caution them not to enter anything otherwise you may not be able to get back into the unit.

"This is where passwords can be set. The Level 1 password prohibits changing of any programmable values so that someone cannot simply walk up to the unit and start playing with the settings. The Level 2 password is required to reset the Events list and exit the operating system. Operators should never have to exit the UIT operating system though."

"So the NGC-30 system has protection built in."

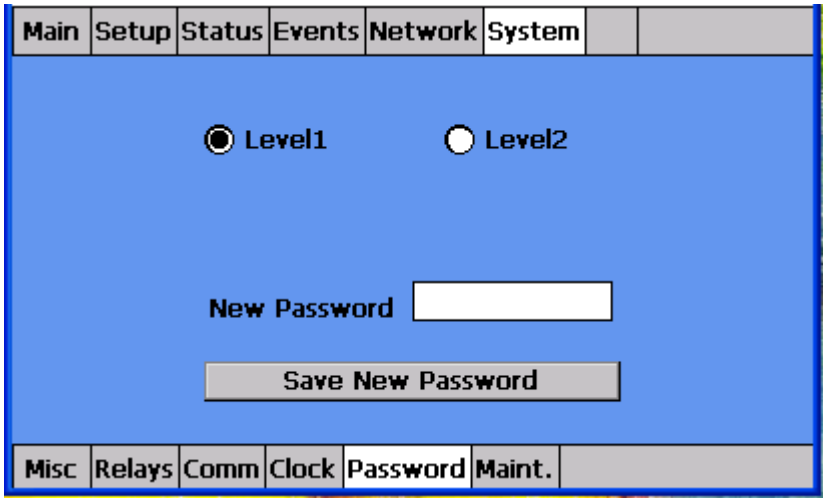


Figure 14: The System/Password Screen

At this point I ask if there are any questions as an hour has usually passed and the meeting will begin breaking up. Anything you get asked that you don't know the answer to, write down and call product marketing. Feel free to try us via cell phone during the meeting if you want!

North America
Tel +1.800.545.6258
Fax +1.800.527.5703
thermal.info@nvent.com

Europe, Middle East, Africa
Tel +32.16.213.511
Fax +32.16.213.604
thermal.info@nvent.com

Asia Pacific
Tel +86.21.2412.1688
Fax +86.21.5426.3167
cn.thermal.info@nvent.com

Latin America
Tel +1.713.868.4800
Fax +1.713.868.2333
thermal.info@nvent.com

nVent

nVent.com

©2018 nVent. All nVent marks and logos are owned or licensed by nVent Services GmbH or its affiliates. All other trademarks are the property of their respective owners.
nVent reserves the right to change specifications without notice.