DigiTrace

NGC-30

Installation Manual

Document INSTALL-114

tyco

Thermal Controls

Table of Contents

Section 1 – Overview

1.1 Introduction

The DigiTrace® NGC-30 is a control and monitoring system used with electric heat-tracing. This manual provides information pertaining to the installation, operations, testing, adjustment, and maintenance of all components of the DigiTrace NGC-30. For information about how to program the NGC-30, see the *DigiTrace NGC-30 Programming Guide* (INSTALL-111)

A NGC-30 system has by default a User Interface Terminal (NGC-UIT). From there on several components can be used to complete the system. The other individual components are: card rack (NGC-30-CR), card rack module with connectors (NGC-30-CRM), current transformer module (NGC-30-CTM), RMC (Remote Module for Control), RMM2 (Remote Monitoring Module) and NGC-30-CVM (Voltage Monitoring Module).

The information coincides with the specific releases of firmware for the User Interface Terminal (NGC-UIT) and controller components, which are listed in Table 1.1 below. As Tyco Thermal Controls releases new firmware to significantly modify or enhance any of these components, new documentation will accompany these releases. To ensure that the correct documentation is being used for your particular version of the DigiTrace User Interface Terminal (NGC-UIT), compare the firmware version number of each component against the number listed in the table below. As subsequent changes are made, supplements to this document will be included in manuals shipped after the firmware is released. Supplements will make specific reference to the operation or functional change.

Copies of this manual and updates may be downloaded from the Literature section of **www.tycothermal.com.**

Table 1.1 Component versions

Component	Version number
NGC-CRM/CRMS	V1.0X
NGC-UIT	V1.1X
MONI-RMM2	
MONI-RMC	

Section 2 – Installation and Wiring

2.1 Introduction

⚠ **WARNING: Electrical Hazard!** Ensure all personnel involved in installation, servicing, and programming are qualified and familiar with electrical equipment, their ratings, and proper practices and codes. Multiple voltages and signal levels may be present during the installation, operation, and servicing of this product. Do not power the product until the safety provisions outlined in this section have been observed.

This section includes information regarding the initial inspection, preparation for use, and wiring instructions for the components of the DigiTrace NGC-30.

2.2 Initial Inspection

Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, it should be kept until the contents of the shipment have been verified for completeness and the equipment has been checked mechanically and electrically. Procedures for installing the DigiTrace NGC-30 are given in this section. If the shipment is incomplete, mechanically damaged, defective in any way, or does not pass the electrical performance tests, notify the nearest Tyco Thermal Controls representative. If the shipping container is damaged, or the cushioning material shows signs of stress, notify the carrier as well as your Tyco Thermal Controls representative. Keep the shipping materials for the carrier's inspection.

2.3 Operating Environment

There are two types of User Interface Terminals (UITs) available with the NGC-30 panel, as shown in Table 2.1 below.

Table 2.1 NGC-30 User Interface Terminals (UITs)

UIT type	Output type	Area classification	Usage
NGC-UIT-ORD	Electrical mechanical contactors or solid-state relays	Ordinary	IP 54 (NEMA 12)
NGC-UIT-ORD-12	UIT is separated from Power distribution panel (including contactors) but build into a small panel, ready to be mounted on the wall.	NGC-UIT-ORD-12 must be installed in an Ordinary area	IP 54 (NEMA 12)

For model numbers see appendix A (NGC-30 Components)

⚠ **WARNING:** Some wiring configurations will use more than one power source. All power sources must be de-energized prior to performing any maintenance on a card rack module or its heating circuit. The operating environment should be within the limitations specified for the DigiTrace NGC-30 components as outlined in Appendices B, C, and D.

2.4 Installation Location

The wide ambient operating temperature range of the DigiTrace NGC-30 permits installation in almost any convenient location. Considerations should include: expected atmospheric conditions (weather), accessibility for maintenance and testing, the location of existing conduits, and hazardous area rating. Ambient temperature conditions may affect load current ratings.

⚠ **CAUTION:** Always be sure that the intended location is classified as an area that the product is approved for use in as defined by Article 500 of the National Electrical Code and/or Part I, Section 18 of the Canadian Electrical Code.

2.5 Mounting Procedures

A NGC-30 system can be bought as a complete power distribution panel. Each NGC-30 panel includes a set of "As Built" drawings that have been engineered, designed, and drafted based upon the model number and any special requirements that were requested when ordering. When bought as a complete system, the "As Built" drawings include an elevation/layout (with bill of materials) and schematics. If these drawings are not included, contact your Tyco Thermal Controls Representative and request the "As Built" drawings for your panel. Upon request, an electronic copy of these drawings can be provided.

For mounting the panel, locate the elevation and layout drawing which includes a bill of materials. The enclosure mounting information will be provided on the "As Built" drawings.

2.6 Wiring Procedures

In case the system is bought as a complete panel, refer to the “As Built” schematics for wiring of incoming / outgoing power and incoming RTD connections. This paragraph describes the system when it is build by TTC as a complete panel / solution.In case the customer buys the NGC-30 as components only, then the following paragraphs don’t apply.

2.6.1 INCOMING POWER WITH DISTRIBUTION SYSTEM

Main Circuit Breaker Locate the main circuit breaker in the panel by using the supplied elevation/layout drawing, and connect per the associated schematic drawings. Depending upon the size and type of main circuit breaker and voltage loss calculations, use the appropriate size and number of wires to connect to the main circuit breaker.

Branch Circuit Breakers The branch circuit breakers are pre-wired to the contactors or solidstate relays in the panel, so no further incoming power wiring is required to these circuit breakers.

2.6.2 OUTGOING POWER WITH DISTRIBUTION SYSTEM

Load Power Terminal Blocks Locate the outgoing heater terminal blocks using the supplied elevation/layout drawing, and connect per the associated schematic drawings. Depending upon the size of the branch circuit breaker and voltage loss calculations, use the appropriate size and number of wires to connect from the panel’s Load Power Terminal Blocks to the heat-trace power junction box.

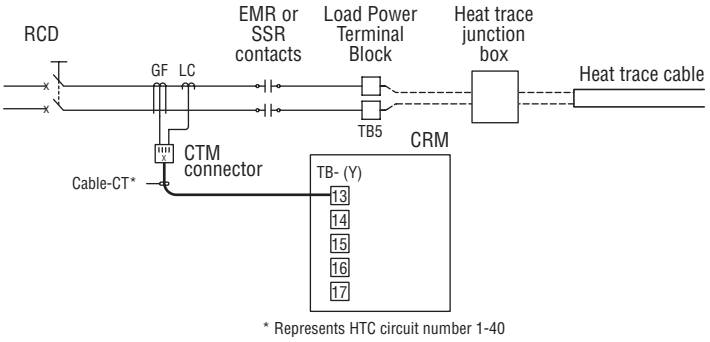


Fig. 2.2 Heat trace power wiring diagram for a NGC-30 equipped with CRM modules

2.6.3 INCOMING RTD WIRING

Ordinary Installations Wired to Terminal Block in Panel

The RTD wiring from the NGC-30-CRM/-CRMS pre-wired to RTD terminals. The field RTD wiring (3-wire with shield) will be terminated by the installer at the RTD terminal blocks. Refer to the Installation Drawings for the RTD Termination Schedule. In case the RTD info is collected via RMMs in the field than the RTD wiring need to be brought back to the RMM. The RMM is connected via a RS-485 ModBus connection back to the panel.

See Fig. 2.4 for a typical RTD installation to NGC-30 CRM(S) module.
For connection to a RMM see RMM installation manual Install-061.

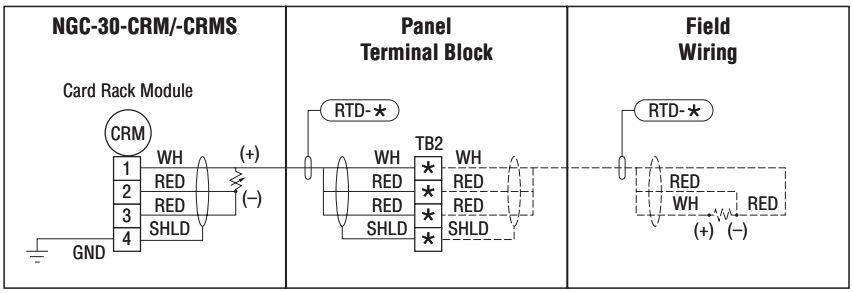


Fig. 2.4 Typical RTD installation connected up to CRM(S) module

2.6.4 CONNECTING THE RS-485 DEVICE NETWORK

The NGC-UIT display is typically linked to a network of DigiTrace NGC-30-CRM/-CRMS, RMC and optional RMM2. These are connected to the DigiTrace NGC-UIT using an RS-485 communication cable (shielded, two conductor, twisted pair). The following illustration shows how the RS-485 network for the NGC-UIT system may be configured.

Device must be mounted in series.

(Terminated devices are shown in gray)

Branching of the network is not allowed.

Connect no more than two RS-485 cables to any device.

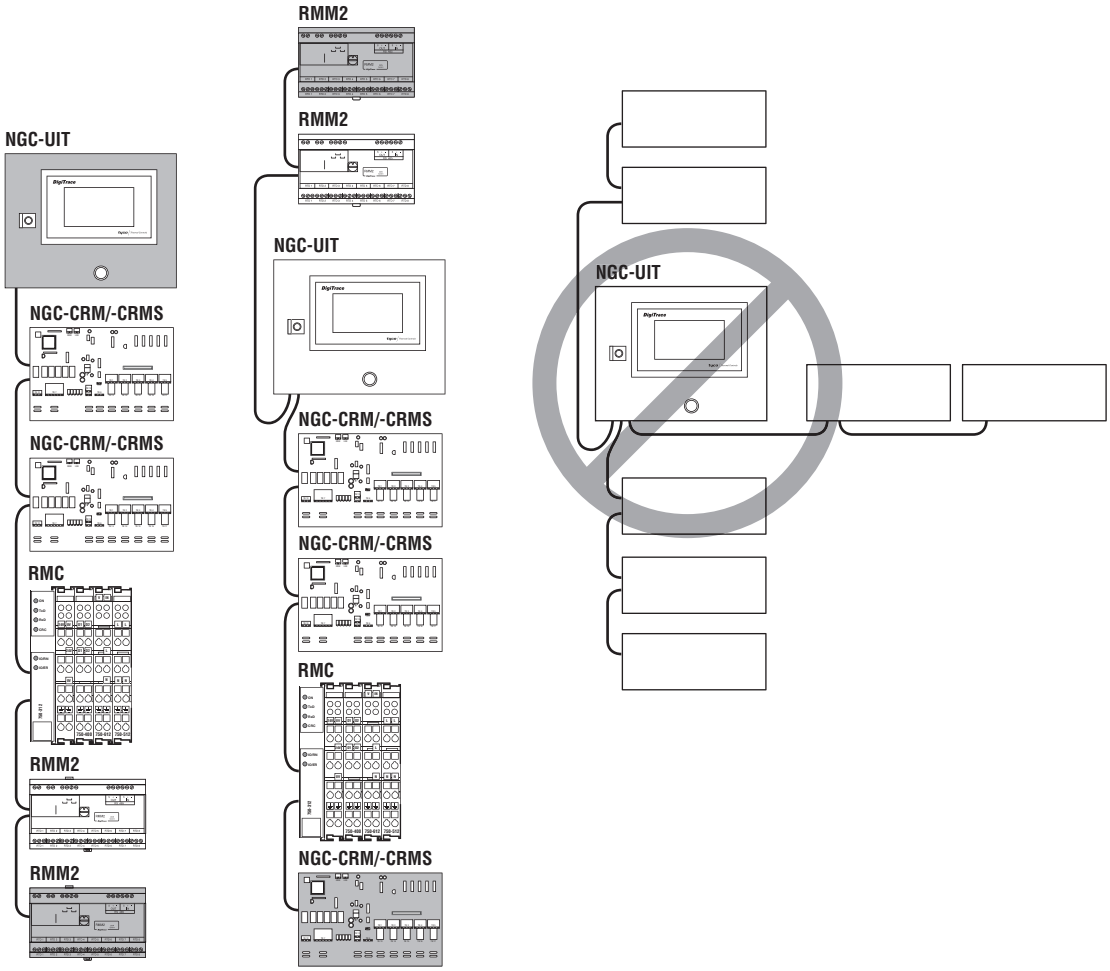


Fig. 2.5 RS-485 network configuration for the NGC-UIT system

In order for the RS-485 network to work properly, you must enable the termination resistor for the first and last device. The devices shown in gray in Fig. 2.5 represent the devices for which you must enable the termination resistors. The devices that are not grayed out represent the devices for which you should not enable the termination resistors.

Optional RMM2 installed in the field

Refer to the *RMM2 Installation Instructions* (Install-061) for field installation instructions. You must connect a RS-485 connection from the RMM2 to an open RS-485 connector in the NGC-30 panel. To make this connection, a pre-wired terminal block (TB4 - Terminals 4, 5 & 6) will be provided in the NGC-30 panel. Connect the RS-485 wire from the RMM2 to TB4 while maintaining the correct polarity. If the RMM2 is the first or last device in the RS-485 network, connect the J17 termination jumper to pins 1 and 2. If the RMM2 is not the first or last device in the RS-485 network, connect the J17 termination jumper to pins 2 and 3.

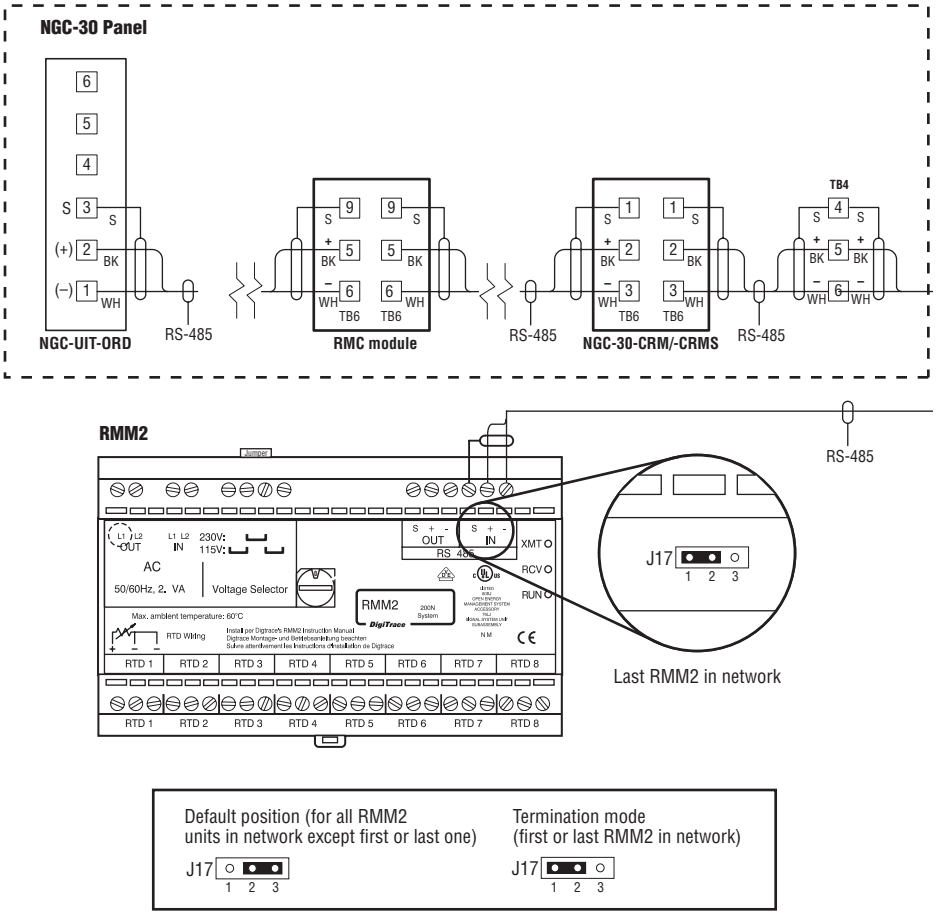


Fig. 2.6 RMM2 RS-485 field wiring and termination jumper setting

Remote NGC-UIT-ORD-12

Refer to the *NGC-UIT-ORD-12 Installation Instructions* (INSTALL-118) for field installation instructions. You must make an RS-485 connection from the NGC-UIT-ORD-12 to the NGC-30 panel where the components like CRM / CRMS and/or RMC are installed. To make this connection, a pre-wired terminal block has been provided in the NGC-UIT-ORD-12 and in the NGC-30 panel. If the NGC-UIT-ORD-12 and/or NGC-30-CRM/-CRMS is the first or last device in the RS-485 network, see Fig. 2.8 and Table 3.2 for details on how to terminate the RS-485 network.

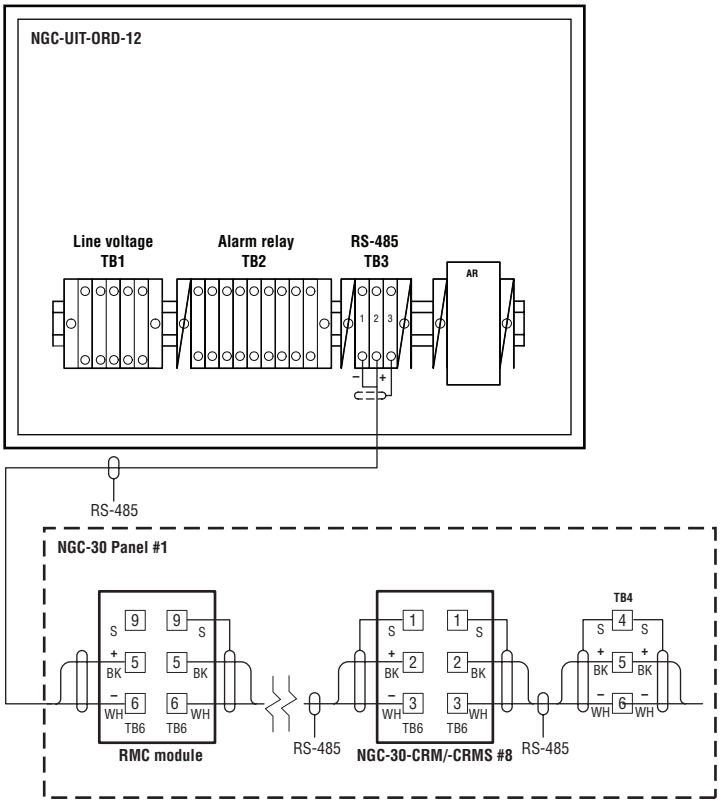


Fig. 2.7 NGC-UIT-ORD-12 RS-485 field wiring

The following figure shows the RS-485 termination options for the NGC-30-CRM/-CRMS.

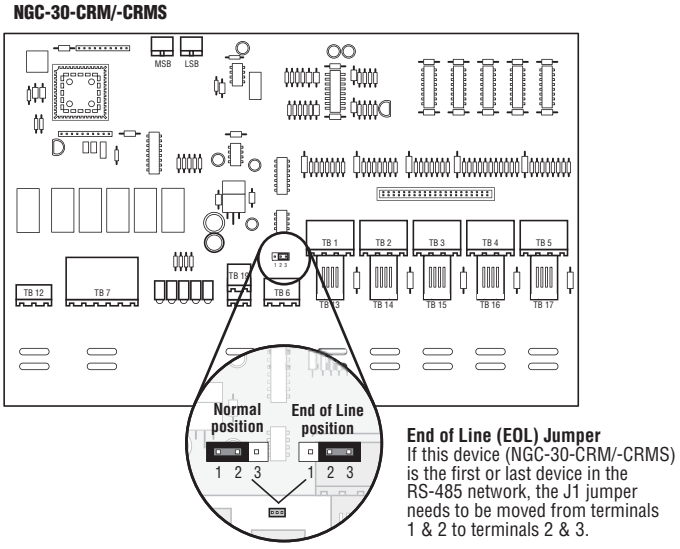


Fig. 2.8 Termination of RS-485 network for NGC-30-CRM/-CRMS

NGC-30 panel with NGC-UIT installed connected to an NGC-30 panel without NGC-UIT installed

You must make an RS-485 connection from the panel that has the NGC-UIT (panel #1) installed to the NGC-30 (panel #2) that does not have the NGCUIT installed (see Fig. 2.9). To make this connection, a pre-wired terminal block has been provided in the panel #1 (TB4, Terminals 4, 5 and 6) and in panel #2 (TB4, Terminals 1, 2, & 3). Connect the RS-485 wire from TB4 in panel #1 and the other end to TB4 in panel #2 maintaining

the correct polarity. If the NGC-30-CRM/-CRMS is the first or last device in the RS-485 network, see Fig. 2.8 and Table 3.2 for details on how to terminate the RS-485 network.

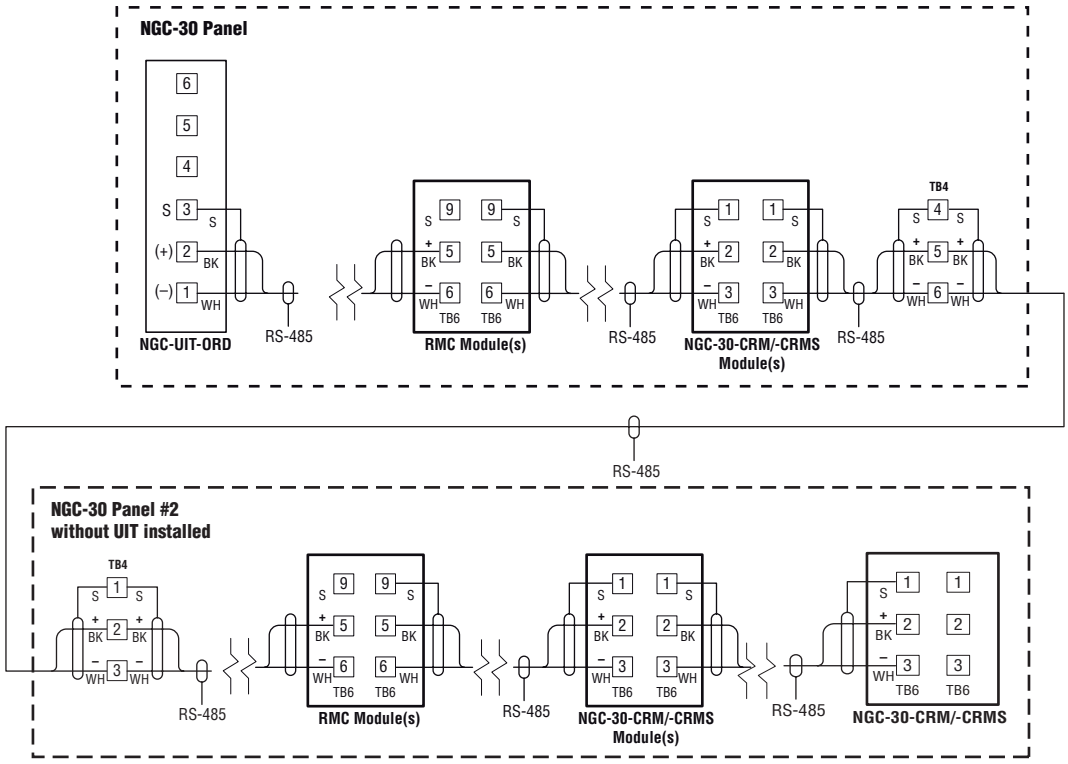


Fig. 2.9 RS-485 field wiring between two NGC-30 panels

2.7 Connections for Remote Annunciation

NGC-UIT's relay 1 has been factory-configured and wired for "Any Alarms". It will energize a light on the front of the panel if any alarm occurs. Relay 1 was also wired to a common alarm relay/terminal block for remote annunciation of any alarms.

NGC-UIT Relay 1

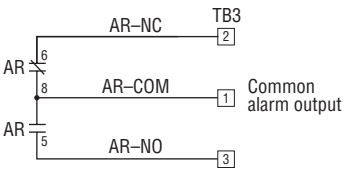
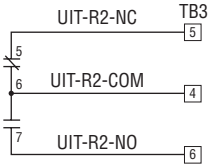


Fig. 2.10 Relay 1 wiring

The NGC-UIT has two other Form C alarm relays (configurable through the NGC-30 program) for external alarms. Each relay can be connected to an annunciator light or distributed control system. Each relay's contacts have been wired from the NGC-UIT to a terminal block in the panel.

NGC-UIT Relay 2



NGC-UIT Relay 3

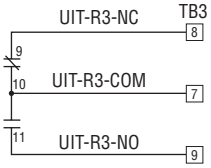


Fig. 2.11 Relays 2 and 3 wiring

Note: The above relays are shown in the energized position without an alarm condition. The relay will change state with an arm condition or loss of power.

2.8 RS-232, RS-485 or Ethernet Remote Port Connections to a Host Computer

The NGC-UIT can communicate with a DCS (distributed control system) or other host computer using serial communications through the NGC-UIT external communication port. The NGC-UIT port can be configured (via the NGC-30 software) for RS-232, RS-485, or Ethernet serial communication. The default from the factory is RS-232. Only one of these ports may be used at a time.

The RS-232 port can be used as a direct connection to a single PC located within 15 meter (50 feet) of the panel. (Refer to Fig. 2.12). For an RS-232 connection, a 1 meter (3 feet) long RJ11 to 9-pin female D-connector (NGC-UIT-232, part number: 10332-005) has been provided with the NGC-UIT. Plug the RJ11 connector into the RS-232 connector on the NGC-UIT and the other end into the 9-pin male connector on the user's computer.

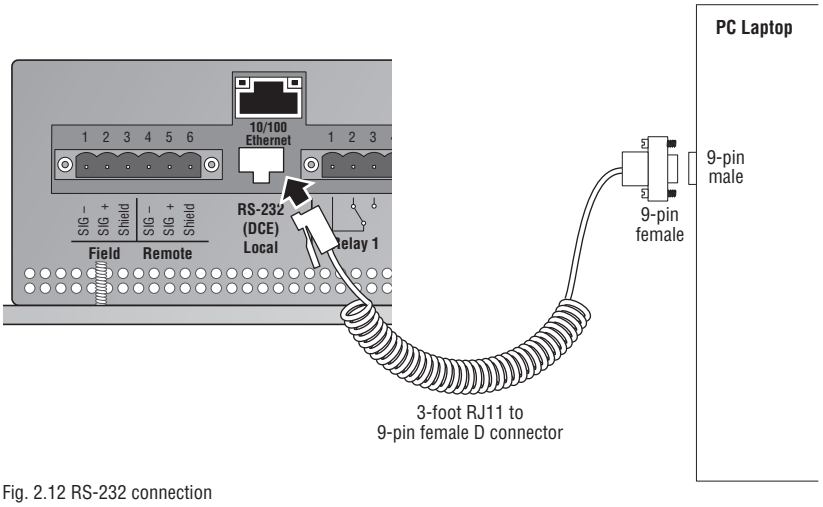


Fig. 2.12 RS-232 connection

Use the RS-485 port when multiple NGC-UIT units are to be connected to a host computer or the connection is longer than 15 meter (50 feet). An RS-485 to RS-232 converter may be required to make the connection to the user's PC.

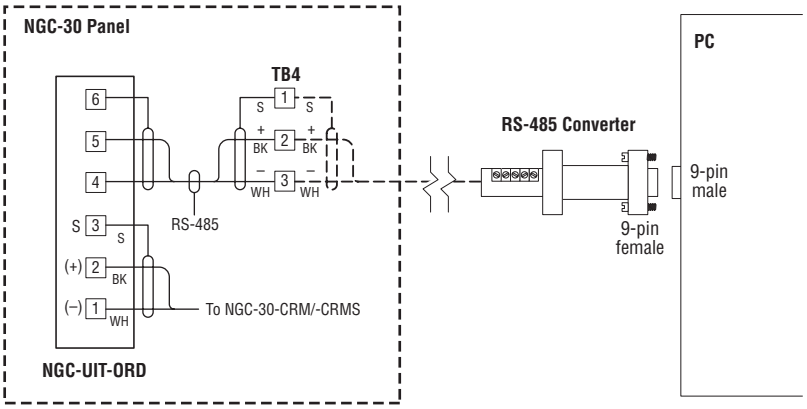


Fig. 2.13 RS-485 connection

The Ethernet port can be used to connect multiple NGC-UIT units to a host computer or if the connection is longer than 15 meter (50 feet), by connecting to the user's LAN system.

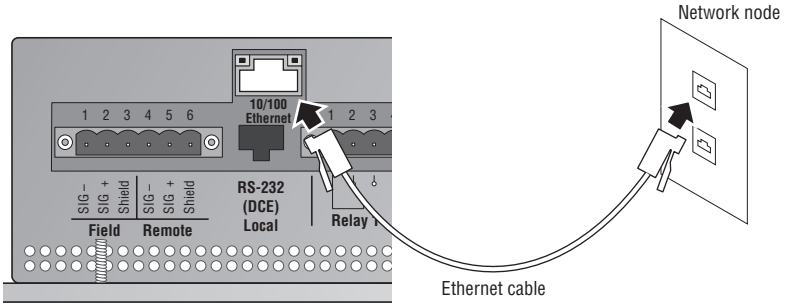


Fig. 2.14 Ethernet connection

2.9 Testing the NGC-30 System

Once the wiring to the panel has been finished, confirm that it was done properly by completing the following steps:

1. Turn the power on to all devices (NGC-30-CRM/-CRMSs, RMC and optional RMM2s) and NGC-UIT.
2. Once the NGC-UIT has booted up to the Main screen, Go to the Network |Device Screen and press “Update Network.”

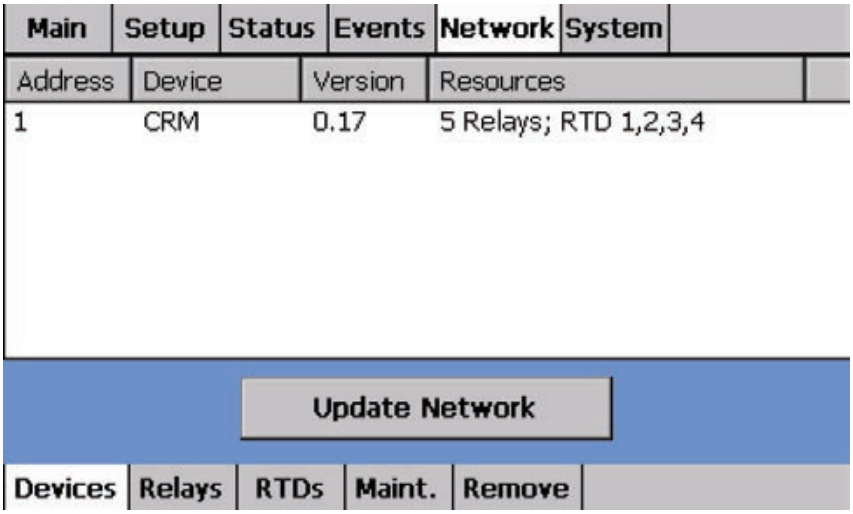


Fig. 2.15 Network|Devices screen

3. Confirm all devices have been scanned into the Network database.
4. If a device or an RTD is installed but does not show up in the Network|Devices Screen, turn the power off to the system and:

   For Devices:
   a. Confirm the device has a unique address (refer to section 3.2 on page 14)
   b. Confirm the device is being powered
   c. Confirm the RS-485 connection is in place with the correct polarity (refer to section 2.6.5)

   For RTDs:
   a. Confirm the RTD connection is in place with the correct polarity
   b. Perform a resistance check of the RTD. The resistance should be in a range of 70–250 ohms

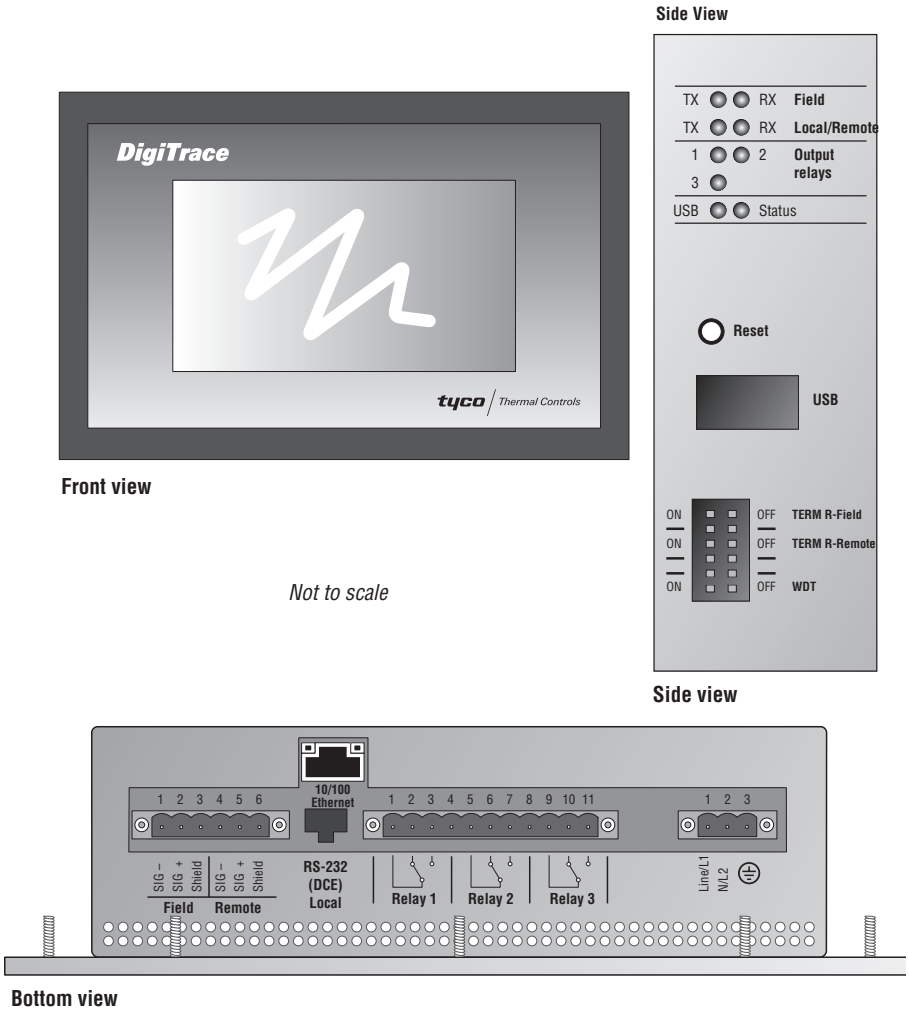
Turn the power on to all devices (NGC-30-CRM/-CRMSs, RMC and optional RMM2s) and NGC-UIT.Once the NGC-UIT has booted up to the Main screen, Go to the Network|Device Screen and press “Update Network.” Confirm all NGC-30-CRM/-CRMS (RMC), RTDs and/or RMM2s have been scanned into the Network database.

Section 3 – DigiTrace NGC-30 Components and Operation

The NGC-30 is comprised of a number of modular components, allowing the ultimate in design flexibility. This section shows the NGC-30 with all of its control and motoring components (excludes the optional distribution section). Appendix B, C, and D includes the specifications for these components.

3.1 User Interface Terminal (NGC-UIT)

The NGC-UIT is a panel mounted color LCD display with touch screen overlay. The NGC-UIT includes software that interfaces with the NGC-30-CRM, NGC-30-CRMS (card rack modules), RMC (Remote Module for Control) and RMM2 (Remote Monitoring Module). The NGC-UIT is used as a control panel, setup device and user display.



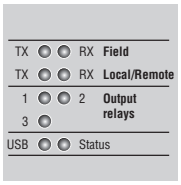
Not to scale

Fig. 3.1 Touch screen display

3.1.1 LED STATUS

The LED Status lights are found on the side of the NGC-UIT-ORD. Refer to Table 3.1 for LED fuctions.

Table 3.1 LED Status Light Fuctions



LED functions

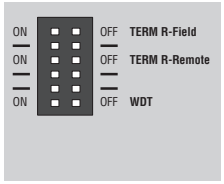
State	Status	USB	Field		Local/Remote		Relays
			RX	TX	RX	TX	
OFF	No power	No USB key detected	No activity	No activity	No activity	No activity	Relay in NO position
Green	Normal operation*	USB key inserted*	Flicker on receipt of data packet	Flicker on transmission of data packet	Flicker on receipt of data packet	Flicker on transmission of data packet	Relay energized contacts in NC position
Yellow	UIT loading	USB in use*					

* State controlled by software, all other states controlled by hardware.

3.1.2 CONFIGURATION SWITCHES

The configuration switches are found on the side of the NGC-UIT-ORD. Refer to Table 3.2 for LED functions.

Table 3.2 Configuration Switch Functions



Configuration Switches

Switch	Position		Comments
	On	Off	
TERM R-FIELD (Field Port Termination Select)	120 Ohm Termination Enabled (Factory Default)	Termination Disabled	This switch should be enabled if this NGC-UIT-ORD is the first or last in a series of devices connected via RS-485
TERM R-REMOTE (Remote Port Termination Select)	120 Ohm Termination Enabled	Termination Disabled (Factory Default)	Enable only if this NGC-UIT-ORD is the last in a series of devices connected via RS-485
WDT (Watch Dog Timer)	WDT Enabled (Factory Default)	WDT Disabled	WDT should normally be enabled

3.1.3 RESET SWITCH

The reset switch can also be found on the side of the NGC-UIT-ORD panel. A pointed object is required to press the restart switch and restart the UIT software.

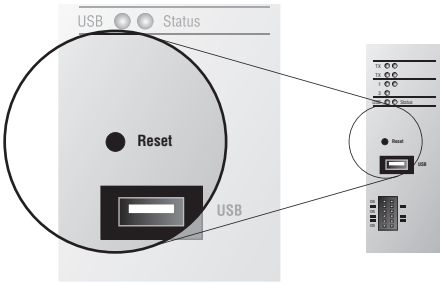


Fig. 3.2 Reset switch

3.2 Card Rack Module (NGC-30-CRM/-CRMS) and Current Transformer Module (NGC-30-CTM)

Each Card Rack Module (NGC-30-CRM, NGC-30-CRMS) and Current Transformer Module (NGC-30-CTM) provide ground-fault and line current sensing, alarming, switching, and RTD input for five Loops. The NGC-30-CRM is used with electromechanical relays. The NGC-30-CRMS is used with solid-state relays. The NGC-30-CRM/-CRMS may be connected to one User Interface Terminal (NGC-UIT).

Each NGC-30-CRM/-CRMS must have a unique communication address. The valid address switch range for the NGC-UIT is 1–99. SW1 is the ones digit (0–9) and SW2 is the tens digit (0–9). See Fig. 3.3

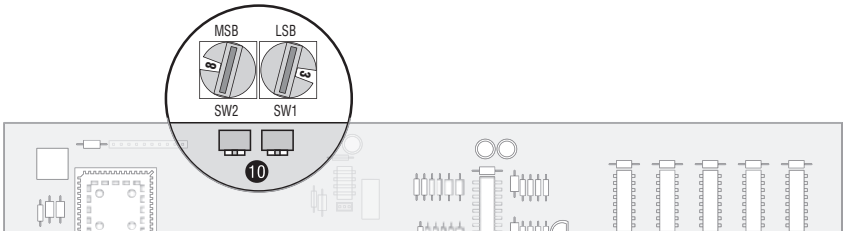
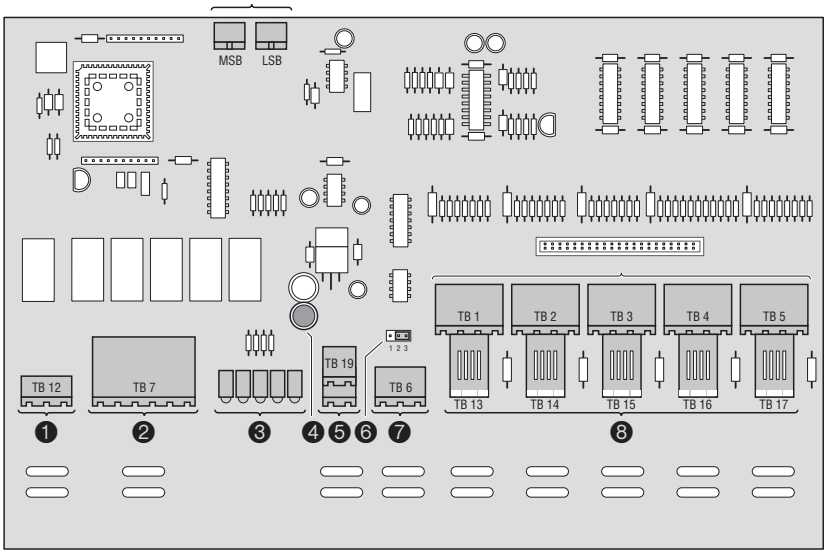


Fig. 3.3 Communication address switch

Note: When adding an NGC-30-CRM/-CRMS to the system, a network update on the NGC-UIT must be performed.

NGC-30-CRM/-CRMS ❿

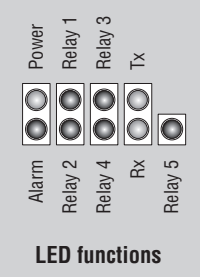


❶ Alarm output
❷ Relay outputs (5x)
❸ LEDs (9x)
❹ Fuse
❺ 12 Vdc Inputs (2x)
❻ End of Line (EOL) jumper
❼ RS-485 Communications
❽ Line & ground-fault sensor inputs (5x)
❾ RTD Inputs
❿ Address Switches

Fig. 3.4 NGC-30-CRM/-CRMS BoardlLayout

Each NGC-30-CRM/-CRMS has a cluster of nine LED lights to advise the status of the board. Number 3 in Fig. 3.4 shows the location of the LED lights.

Table 3.3 LED Display



LED function	LED description	LED color
Alarm	Energized upon Alarm	Red
Power	Energizes upon power to unit	Green
Relays 1, 2, 3, 4, 5	Energizes upon relay closed	Red
RX & TX	Energizes upon received and transmit of RS-485 data	Amber

3.3 Card Rack (NGC-30-CR)

The card rack (NGC-30-CR) has the capability to house one to four card rack modules (CRMs).

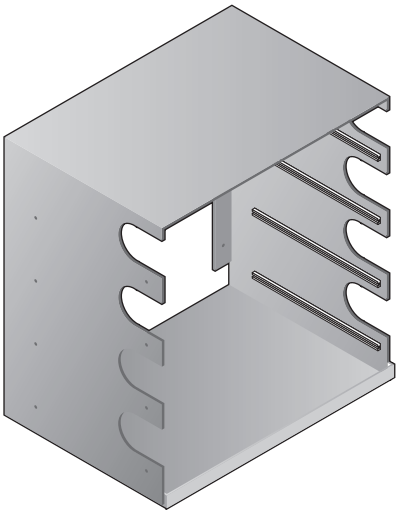


Fig. 3.5 NGC-30 card rack

3.4 Voltage Monitoring Module (NGC-30-CVM) – Optional

The optional voltage sensor can monitor 80–290 Vac. This voltage sensor connects to one of the five line current/ground-fault inputs of the NGC-30-CRM/-CRMS (**Note:** By using the optional voltage sensors, the NGC-30-CRM/-CRMS board looses one circuit).

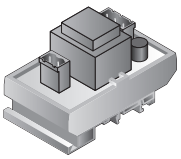


Fig. 3.6 NGC-30 voltage monitoring module

3.5 Remote Monitoring Module (RMM2) – Optional

The DigiTrace remote monitoring module (RMM2) provides additional temperature monitoring capabilities. Each RMM2 accepts up to eight RTDs that measure pipe, vessel, or ambient temperatures. The RMM2 can be installed in the NGC-30 enclosure or can be located in the field to reduce RTD field wiring. A single, twisted pair RS-485 cable connects up to 16 RMM2 for a total monitoring capacity of 128 temperatures.

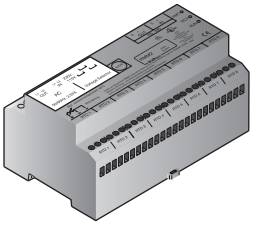


Fig. 3.7 RMM2 module

Set the RS-485 address for the RMM2 using the rotary switch provided. Note the orientation of the clear plastic cover, then remove the cover. Use a slotted screwdriver to rotate the selector switches to the appropriate positions to select the RS-485 address. The single character visible on the switch indicates the RS-485 address assigned.

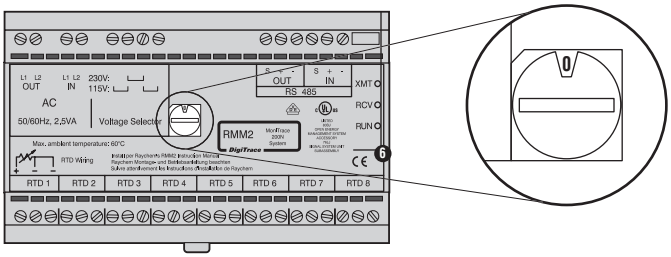


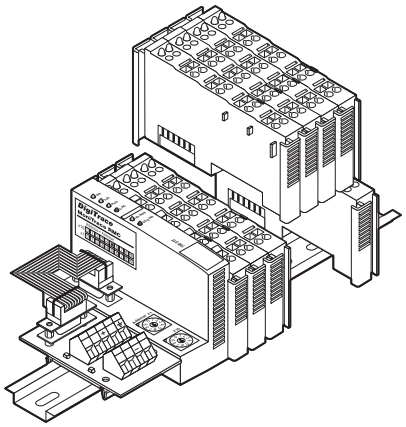
Fig. 3.8 RMM2 rotary switch

More details regarding the installation of the MONI-RMM2 can be found in the MONI-RMM2 Installation Instruction (Install-061).

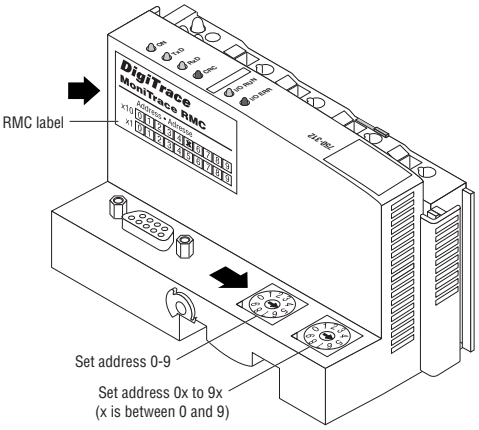
Table 3.4 RMM2 Switch Settings

Switch Settings	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Device Address	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47

3.6 DigiTrace RMC



The remote modules for control (RMC) provide multiple relay outputs for switching heating cable circuits controlled by the DigiTrace NGC-30 User Interface Terminal. RMC units are modular and may be configured with 2 to 40 relay outputs. Secondly each RMC unit includes two inputs to monitor the status of circuit breakers or power contactors. A single UIT control unit can communicate with up to 10 RMCs via a single, twisted pair RS-485 cable to provide distributed control of up to 250 heating cable circuits.



Select the RS-485 address for the RMC unit.
Each RMC connected to a NGC-30 Control and monitoring unit must have a unique address; if two RMC units are assigned the same address, communications faults will result. To ensure you assign an unique address to each RMC unit, review the system layout. If a layout document does not exist, create one. Assign an unique address (01–99) to each RMC unit.

Set the RS-485 address for the RMC unit.
Use a small flat-blade screwdriver to rotate the address switch marked “x1” to the desired address. For an address of 50, set the “x1” to 0 and the x10 to 5. For an address of 59, set x1 to 9 and x10 to 5. Mark the address setting on the RMC label.

For more information see the MONI-RMC installation instructions (Install-079).

3.7 Remote User Interface Terminal (NGC-UIT-ORD-12)

The Remote User Interface Terminal (NGC-UIT-ORD-12) is a panel mounted display for use with the NGC-30 panel that allows for the user interface to be mounted remotely. Like the NGC-UIT-ORD, it has a 14.61 cm X 8.26 cm (5 ¾ inch x 3 ¼ inch) LCD color display with touch screen technology, and provides an easy user interface for programming with no keyboards or cryptic labels. It is rated IP 54 (NEMA 12), and must be mounted in a nonhazardous indoor area.

The User Interface Terminal (NGC-UIT-ORD) is mounted remotely (in a nonhazardous location). It communicates via RS-485/RS-232 or 10Base-T Ethernet, selectable; and the port can be used to communicate with the DigiTrace Supervisor software. For more information, refer to the NGC-UIT-ORD-12 Installation Instructions (INSTALL-118)

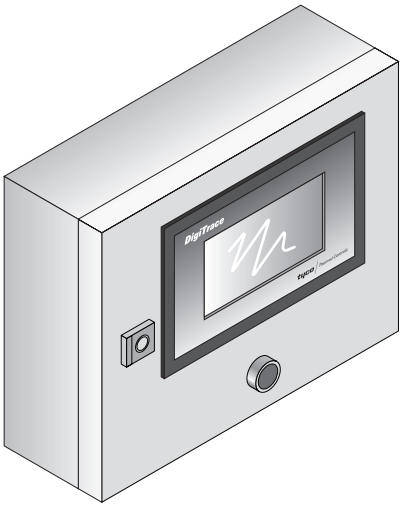


Fig. 3.9 Remote user interface terminal

Section 4 – Appendices

Appendix A - NGC-30 Components

The following table shows all NGC-30 components and its European Part Number

Product Name	Product Description	Part Number (ASW)
NGC-UIT-ORD-E	User Interface Terminal	10332-004
NGC-UIT-ORD-12-E	User Interface Terminal with enclosure	10332-006
NGC-30-CRM-E	Card Rack Module (EMR)	10720-008
NGC-30-CRMS-E	Card Rack Module (SSR)	10720-009
NGC-30-CTM-E	Current Transformer Module	10720-010
NGC-30-CVM-E	Voltage Monitoring Module (CVM)	10720-011
NGC-30-CR-E	Card Rack	10720-012
MONI-RMM2-E	Remote Monitoring Module for MoniTrace 200N	307988-000
MONI-RMM2-EX-E	Remote Monitoring Module for MoniTrace 200N, ATEX Zone 2	676040-000
MONI-RMC-BASE	External Control Module for MoniTrace 200N	309735-000
MONI-RMC-2RO	Two Channel Output Module for MoniTrace 200N	920455-000
MONI-RMC-2DI	Digital Input Module for MoniTrace 200N	062367-000
MONI-RMC-PS24	Transformer 24V DC, Stabilised	972049-000
MONI-PS12	Transformer 12V DC	1244-001505

Appendix B - NGC-30-CRM/-CRMS Specifications

Table B.1 NGC-30-CRM/-CRMS Specifications	
General	
Approvals/certifications	Class I, Div. 2, Groups A,B,C,D Ex nC IIC T5 Class I, Zone 2, AEx nC IIC T5 Our products satisfy the requirements of the relevant European Directories
Supply voltage	12 Vdc ± 10%
Internal power consumption	< 5 W per NGC-30-CRM/-CRMS
Ambient operating temperature	–40°C to 60° (–40°F to 140°F)
Ambient storage temperature	–40°C to 75°C (–40°F to 167°F)
Environment	PD2, CAT III
Max. altitude	2000 m
Humidity	0–90% noncondensing
Electromagnetic Compatibility	
Immunity	Heavy industrial
Emission	Residential, commercial, light industrial
Temperature Sensors	
Type	100 Ω platinum RTD, 3 wire, α = 0.00385 ohms/ohm/°C Can be extended with a 3-conductor shielded cable of 20 ohm maximum per conductor
Quantity	Up to five wired directly to each NGC-30-CRM/-CRMS
Current Sensors	
Mounting	Din Rail – 35 mm
Quantity per NGC-30-CTM	Five for ground-current measurement Five for line-current measurement
Line Current Sensors	
Max. current	60 A
Accuracy	± 2% of reading
Ground-Fault Sensor	
Range	10–200 mA
Accuracy	± 2% of range
Voltage Sensor	
Range	80–290 Vac 50/60 Hz
Accuracy	± 1% of span
Outputs	
CRM output relays	Form A 3-Amp @ 277 Vac max 50/60 Hz
CRMS SSR outputs	12 Vdc @ 30 mA max per output
Alarm relay	SPST 3-Amp @ 277 Vac max 50/60 Hz
Communication to NGC-UIT	
Type	2-wire RS-485
Cable	One shielded twisted pair
Length	1200 M (4000 ft.) maximum
Quantity	Up to 52* NGC-30-CRM/-CRMS may be connected to one NGC-UIT
Connection Terminals	
Power supply/pilot relay/RTD/comm port (RS485)	18–12 AWG (0.8 - 3.3mm2)
	* May require repeaters

Appendix C - NGC-UIT Specifications

General		
	 Class I, Div. 2, Groups A,B,C,D Ex nC IIC T5 Class I, Zone 2, AEx nC IIC T5	
	 Our products satisfy the requirements of the relevant European Directories	
Supply Voltage	100 – 240 Vac ±10%, .25 A max/25 VA, 50/60 Hz	
Operating temperature	–40°C to 65°C (–40°F to 149°F)	
EMC	Immunity – industrial Emission – commercial/light industrial	
Vibration	Unit tested to IEC-60068-2-6	
Shock	Unit tested to IEC-60068-2-27	
Dimensions	260 mm wide X 168 mm high X 76 mm deep (10-1/4” wide X 6-5/8” high X 3” deep)	
Control Outputs		
Relay outputs	Three relay outputs, Form C contacts, switching loads up to 277 Vac/3 Amps	
	Relays may be assigned for alarm outputs	
	11 position Phoenix-style pluggable screw terminal connector with retaining screws	
Network Connection		
Local port/remote	RS-485/RS-232, selectable. Port may be used to communicate with Supervisor Software	
	RS-232 is non-isolated, RJ-11 connection	
	RS-485, 2-wire isolated. Phoenix-style pluggable screw terminal connector with retaining screws.	
	Maximum number of devices 256. Fail safe design with optional termination resistors.	
	Data rate to 9600 to 57600 baud	
	Maximum cable length for RS-485 not to exceed 1200 m (4000 feet). Cable to be shielded twisted pair	
Field port	RS-485, 2-wire isolated. Used to communicate with external devices, such as NGC-30-CRM/-CRMS, 5GF-C and RMM2. Maximum cable length not to exceed 1200 m (4000 ft). Cable to be shielded twisted pair	
	Phoenix-style pluggable screw terminal connector with retaining screws. Maximum number of devices 256. Fail safe design with optional termination resistors	
	Data rate to 9600 baud	
LAN	10/100 Base-T Ethernet port with Link and Activity Status LEDs	
USB port	USB 2.0 Host port Type A receptacle	
Status LEDs		
Relay	Three LEDs showing the ON/OFF Status for each relay, LED ON indicates relay is energized	
Field	Transmit and Receive activity	
Local/remote	Transmit and Receive activity	
USB host	Three colors showing status:	Green = USB key inserted Red = USB key fault Yellow = USB in use
UIT status	Three colors showing system status:	Green = Normal condition Red = Fault condition Yellow = Loading software/configuration
LCD Display		
Display	LCD is a 6.5 inch QVGA, color TFT transflective device with integral CCFL backlight. (For use indoors or when protected from direct sunlight)	
Touch screen	4-wire resistive touch screen interface for user entry. Usable with gloved fingers	

Appendix D - Device Address

Table D.1 Device Address

Device	Device Type	Switch Setting	Device Address
NGC-30-CRM/-CRMS	Relay Output/RTD	1–99	1–99
RMC	Relay Output	1–99	1–99
RMM2	RTD	0	32
RMM2	RTD	1	33
RMM2	RTD	2	34
RMM2	RTD	3	35
RMM2	RTD	4	36
RMM2	RTD	5	37
RMM2	RTD	6	38
RMM2	RTD	7	39
RMM2	RTD	8	40
RMM2	RTD	9	41
RMM2	RTD	A	42
RMM2	RTD	B	43
RMM2	RTD	C	44
RMM2	RTD	D	45
RMM2	RTD	E	46
RMM2	RTD	F	47

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