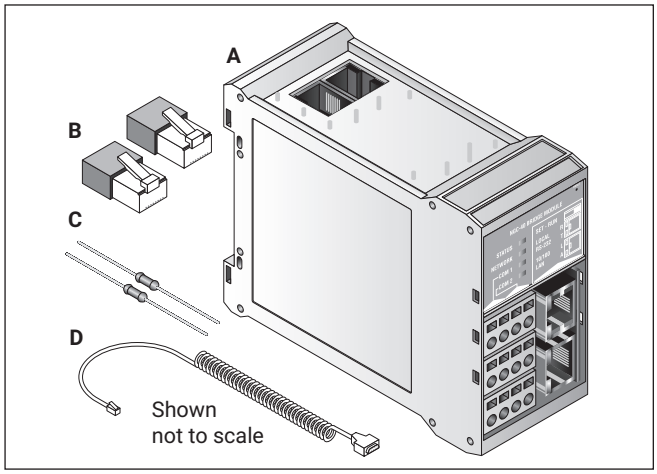
NGC-40-BRIDGE

Control and Monitoring Modules for use with the nVent RAYCHEM NGC-40 System Installation Instructions



APPROVALS

Intertek
4008 717

Hazardous Locations
Class I, Div. 2, Groups A,B,C,D T4
Class I, Zone 2, AEx nC IIC T4 IP20
Ex nL IIC T4 X
−40˚C ≤ Ta ≤ +65˚

Conforms to:
FM Class Number 3600 (11/98)
FM Class Number 3611 (10/99)
ANSI/UL STD. 60079-15-2009
UL STD. 61010-1

Certified to:
CAN/CSA STD. C22.2 No. 213-M1987 (R2004)
CAN/CSA STD. C22.2 No. 61010-1:2004
EN 61010-1 (2001)
CAN/CSA STD. E60079-15:02 (R2006)

(Russia, Kazakhstan, Belarus)
For other countries contact your local nVent representative.

OIECEx Marking:
IECEx ETL 17.0062X
Ex ec IIC T4 Gc

ATEX Markings:
ITS17ATEX402833X
Ex II 3 G Ex ec IIC T4 Gc

DESCRIPTION

The nVent RAYCHEM NGC-40-BRIDGE module provides the interface between a panel's internal CAN-based network and upstream devices. Multiple communications ports are supported, allowing serial and Ethernet connections to be used with external devices.

TOOLS REQUIRED

- Small flat-blade screwdriver

ADDITIONAL MATERIALS

- Power supply 24 Vdc @150 mA per NGC-40-BRIDGE
- Custom built CAN cables with RJ-45 connections

KIT CONTENTS

Item	Qty	Description	
A	1	NGC-40-BRIDGE module	
B	2	CAN bus termination block	PTM# 10392-043
C	2	RS-485 termination resistors	120 Ω – 1% - 1/4 watt
D	1	NGC-40-BRIDGE serial cable	TTC# 10332-005

Special conditions of use:

- The overall equipment is evaluated to type of protection "ec"
- For full connection details see these installation instructions
- The equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC/EN 60664-1
- The equipment shall be installed an enclosure that provides a minimum ingress protection of IP54 in accordance with IEC/EN 60079-0
- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment

⚠ WARNING:

This component is an electrical device that must be installed correctly to ensure proper operation and to prevent shock or fire. For technical support, call nVent at (800) 545-6258.

GENERAL

Supply voltage	24 Vdc ± 10%
Internal power consumption	< 3.6 W per NGC-40-BRIDGE
Ambient operating temperature	–40ºC to 65ºC (–40ºF to 149ºF)
Ambient storage temperature	–55ºC to 75ºC (–67ºF to 167ºF)
Environment	PD2, CAT III
Max. altitude	2,000 m (6,562 ft)
Humidity	5 – 90% noncondensing
Mounting	Din Rail – 35 mm

ELECTROMAGNETIC COMPATIBILITY

Emissions	EN 61000-6-3 Emission standard for residential, commercial and light industrial environments
Immunity	EN 61000-6-2 Immunity standard for industrial environments

COMMUNICATIONS COM1, COM2

Type	2-wire RS-485
Cable	One shielded twisted pair
Length	1,200 m (4,000 ft) maximum
Quantity	Up to 255 devices per port
Data rate	9600, 19.2K, 38.4K, 57.6K, 115.2K baud
Data bits	7 or 8
Parity	None, even, odd
Stop bits	0, 1, 2
Tx delay	0 – 5 sec.
Protocol	Modbus RTU or ASCII
Connection terminals	Wago cage clamp terminals

COMMUNICATIONS COM3

Type	RS-232
Cable	Custom TTC# 10332-005
Length	15 m (50 ft) maximum
Data rate	9600, 19.2K, 38.4K, 57.6K, 115.2K baud
Data bits	7 or 8
Parity	None, even, odd
Stop bits	0, 1, 2
Tx delay	0 – 5 sec.
Protocol	Modbus RTU or ASCII
Connection terminals	RJ-11

CAN NETWORKING PORT

Type	2-wire isolated CAN-based peer-peer network. Isolated to 300 V.
Connection	Two 8-pin RJ-45 connectors (both may be used for Input or Output connections)
Protocol	Proprietary NGC-40
Topology	Daisy chain
Length	10 m (33 ft) maximum
Quantity	Up to 80 CAN nodes per network segment
Address	Unique, factory assigned

ETHERNET

Type	10/100 BaseT Ethernet network
Length	100 m (328 ft)
Data rates	10 or 100 MB/s
Protocol	Modbus/TCP
Connection terminals	Shielded 8-pin RJ-45 connector on front of module

PROGRAMMING AND SETTING

LED indicators	
Alarm conditions	RESET, Configuration lost, CAN communications fail
Configuration switch	SET/RUN slide switch on front of module

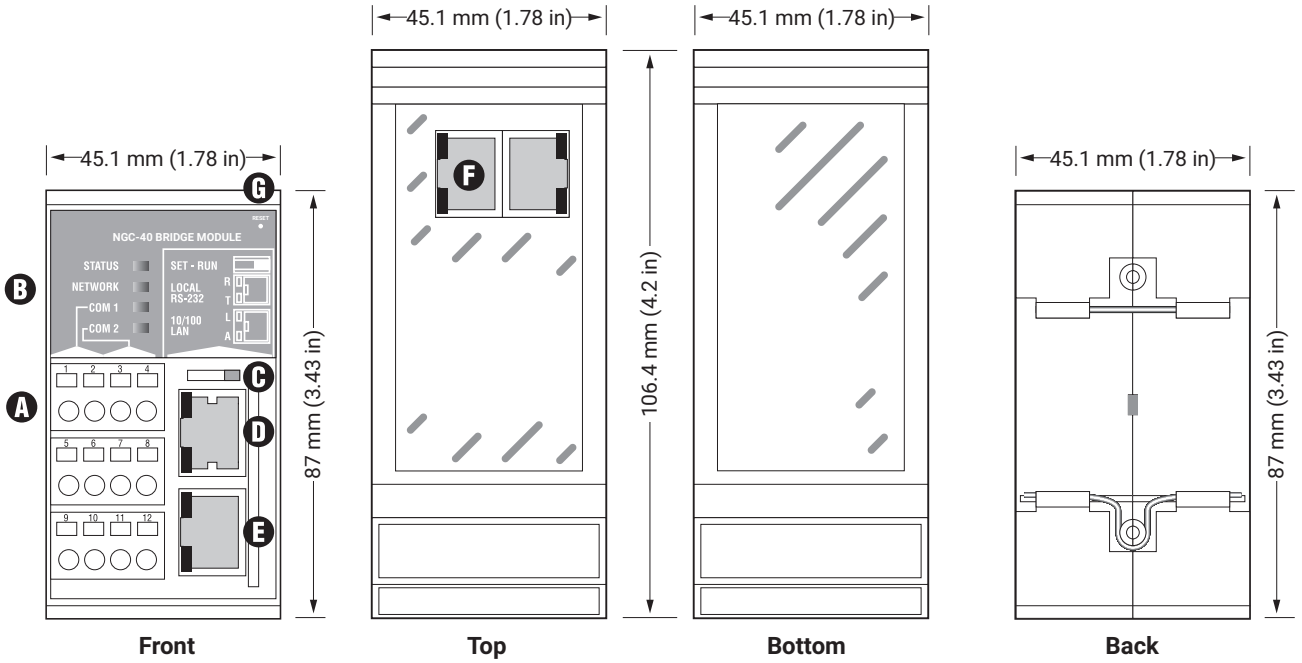
CONNECTION TERMINALS

Wiring terminals	Cage clamp, 0.5 to 2.5 mm² (24 to 12 AWG)
CAN networking and module power	Two RJ-45s, one each IN and OUT. Provides CAN bus signals and +24 Vdc power.

HOUSING

Size	45.1 mm (1.78 in) wide x 87 mm (3.43 in) high x 106.4 mm (4.2 in) deep

System Components



System Components (Continued)

A. WIRING TERMINALS

TERMINALS	FUNCTION
1	COM 1 (485) + in
2	COM 1 (485) + out
3	COM 2 (485) + in
4	COM 2 (485) + out
5	COM 1 (485) – in
6	COM 1 (485) – out
7	COM 2 (485) – in
8	COM 2 (485) – out
9 – 12	Not used

B. STATUS LEDS

STATUS: Indicates status of the module

Off	No power
Green	OK/Normal
Yellow	(flashing) Configuration mode
Red	(flashing) Internal fault

NETWORK: Indicates CAN network activity

Off	No link detected
Green	Link OK, receive data packets
Yellow	Transmit data packets
Red	(flashing) Network error

COM: Indicates COM1 & 2 (RS-485) activity

Off	No activity
Green	(flashing) Receipt of data packet
Yellow	(flashing) Transmit of data packet

C. COMMUNICATION SLIDE SWITCH

D. RS-232 PORT

Status: Indicates status of RS-232 port

Top LED

Off	No activity
Green	(flashing) Receipt of data packet

Bottom LED

Off	No activity
Yellow	(flashing) Transmit of data packet

E. ETHERNET PORT

Status: Indicates status of the LAN

Top LED

Off	No LAN detected
Green	ON, LAN detectedt

Bottom LED

Off	No LAN activity
Yellow	(flashing) LAN activity (data packet)

F. CAN BUS/MODULE POWER

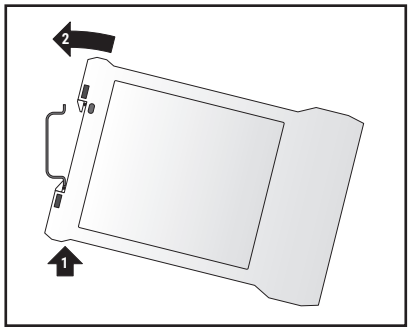
G. RESET BUTTON

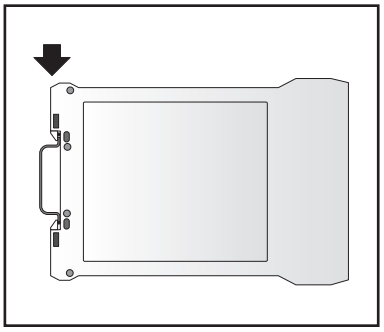
Mounting the NGC-40-BRIDGE

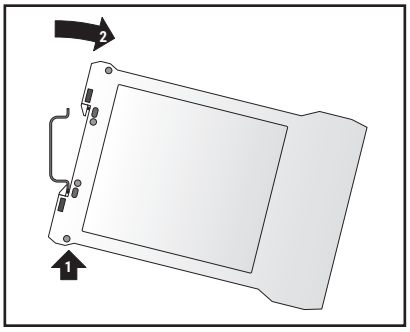
Each NGC-40-BRIDGE mounts on a DIN 35 rail.

MOUNTING: Insert the rear bottom of the module into the DIN rail, then push up and inwards to engage the clip.

REMOVAL: Push the module upwards to disengage the clip, then rotate the module toward you.



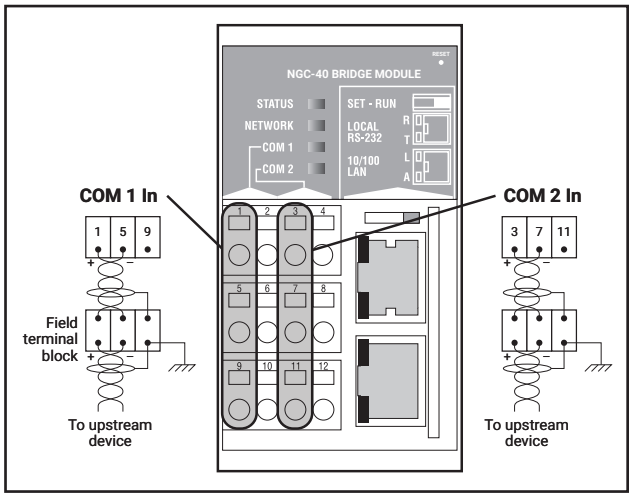




RS-485 Connection Diagrams – North American Installation Technique

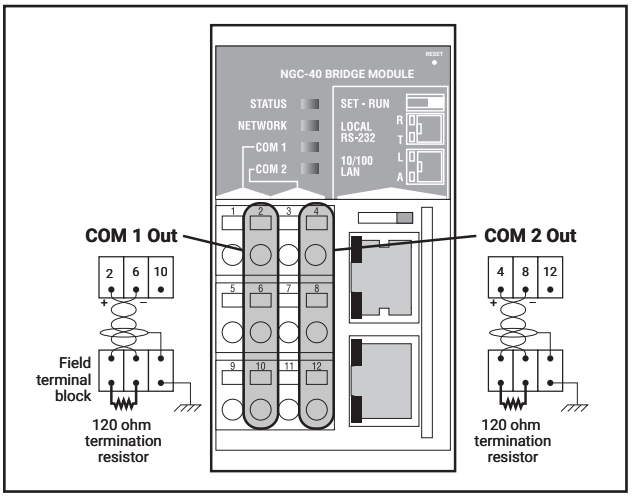
COM 1&2 Connections (In)

Wiring for Com 1 & Com 2 must be terminated on a panel mounted terminal block. No ground wires should be terminated on terminals 9 & 11. Terminate Com shields at the panel mounted field terminal block chassis ground.



COM 1&2 Connections (Out) and RS-485 Termination Resistor

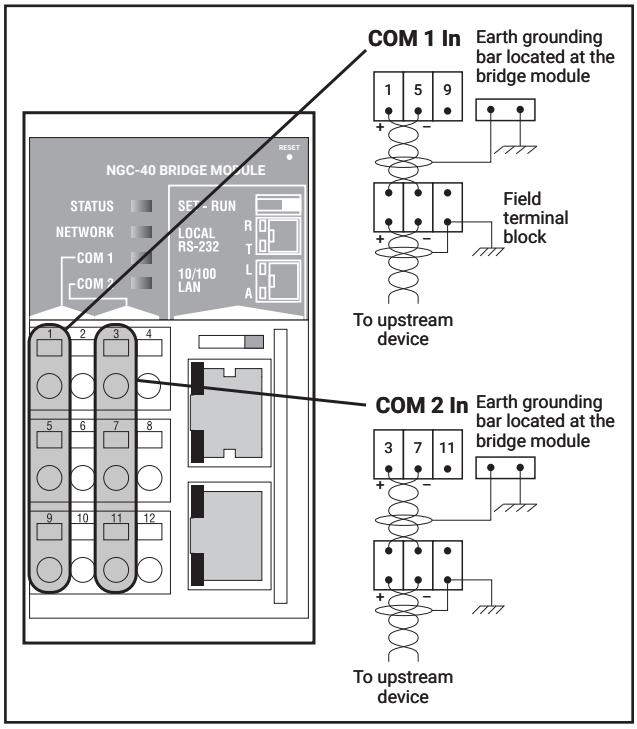
Wiring for Com 1 & Com 2 must be terminated on a panel mounted terminal block. No ground wires should be terminated on terminals 10 & 12. Terminate Com shields and 120 Ω termination resistors (included) at the panel mounted field terminal block as shown.



RS-485 Connection Diagrams – European Installation Technique

COM 1&2 Connections (In)

Wiring for Com 1 & Com 2 must be terminated on a panel mounted terminal block. No ground wires should be terminated on terminals 9 & 11. Terminate Com shields at the panel mounted field terminal block chassis ground. The Com cable shield from the field terminal block to the Bridge should be terminated at the earth ground bar.



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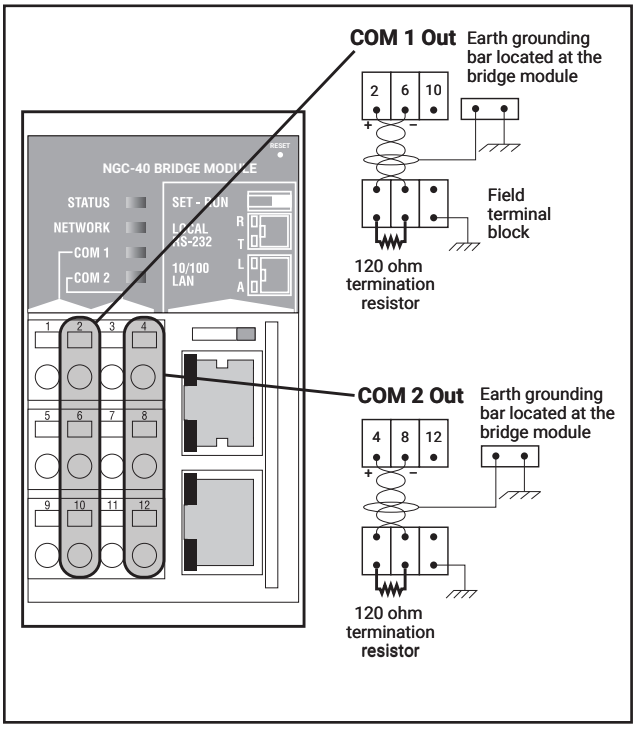
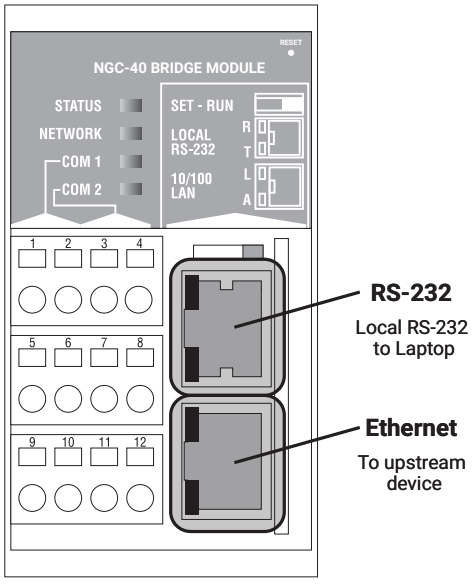


Local RS-232 (COM 3) & Ethernet



Switch Setting RS-232

User Interface – Configuration Switch

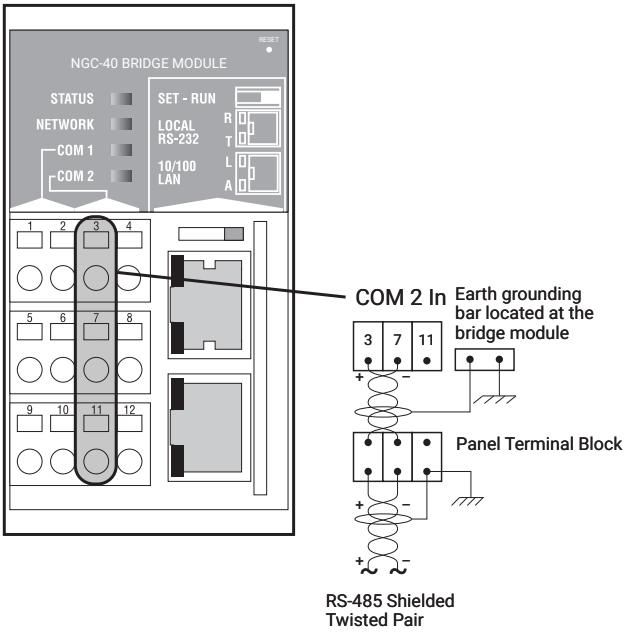
A slide switch is provided on the front of the module to allow the user to set the bridge into a known state for configuration of the communication ports, as shown in the following table:

	Switch Position	
Bridge Module Settings	**SET Configuration mode**	**RUN Normal operating mode**
Modbus address	1	Settings based on the user configuration parameters
Local RS-232		
Protocol	RTU	
Data rate	9600 baud	
Data bits	8	
Stop bits	2	
Parity	No parity	

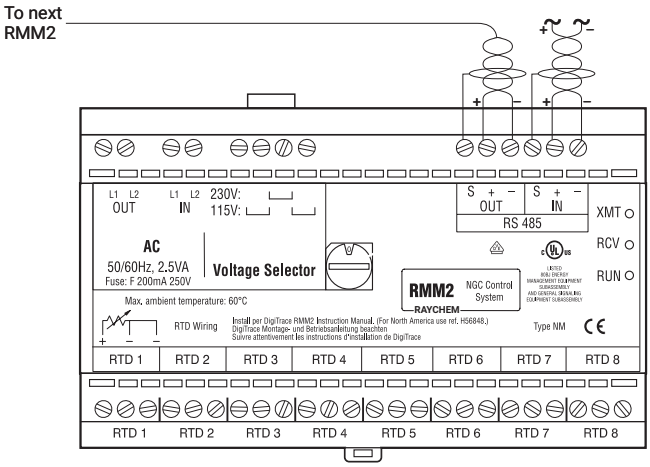
RMM2 Connection – Optional

When using the field mounted RMM2 for RTD input, it must be connected to the COM 2 In as shown below.

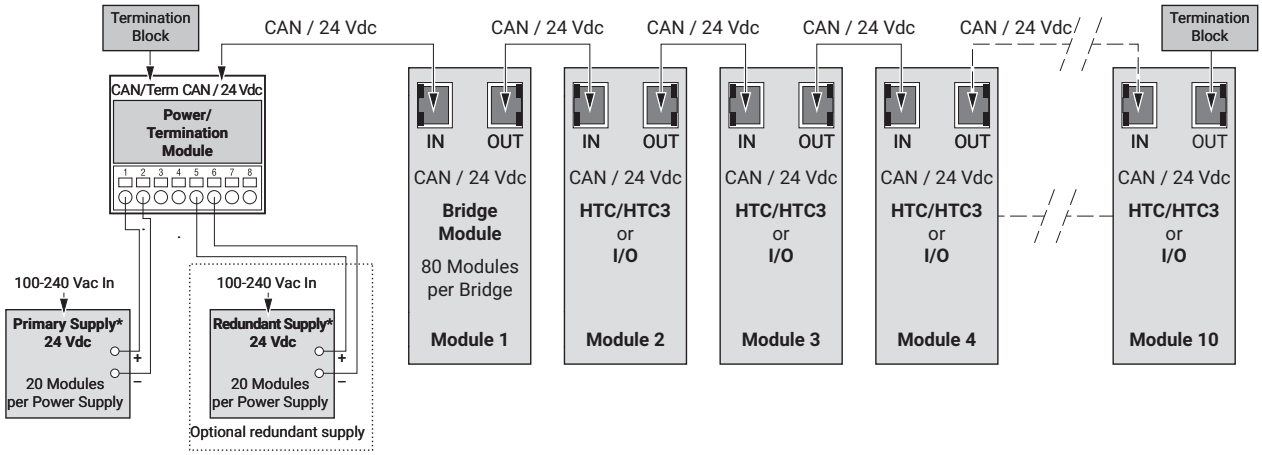
Panel



Field

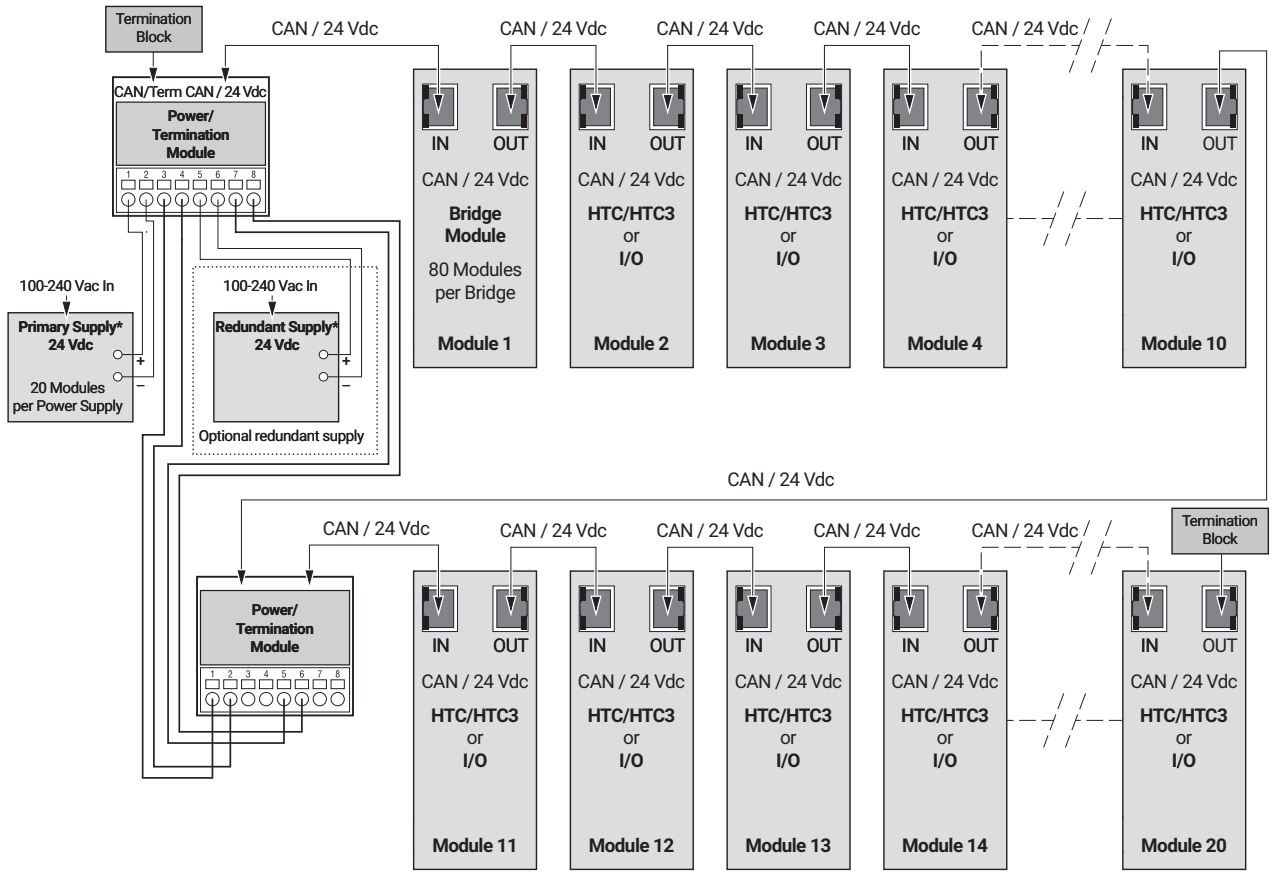


NGC-40 CAN Bus Connections for Up to 10 Modules



* Power supply shall have a means for disconnect from line voltage

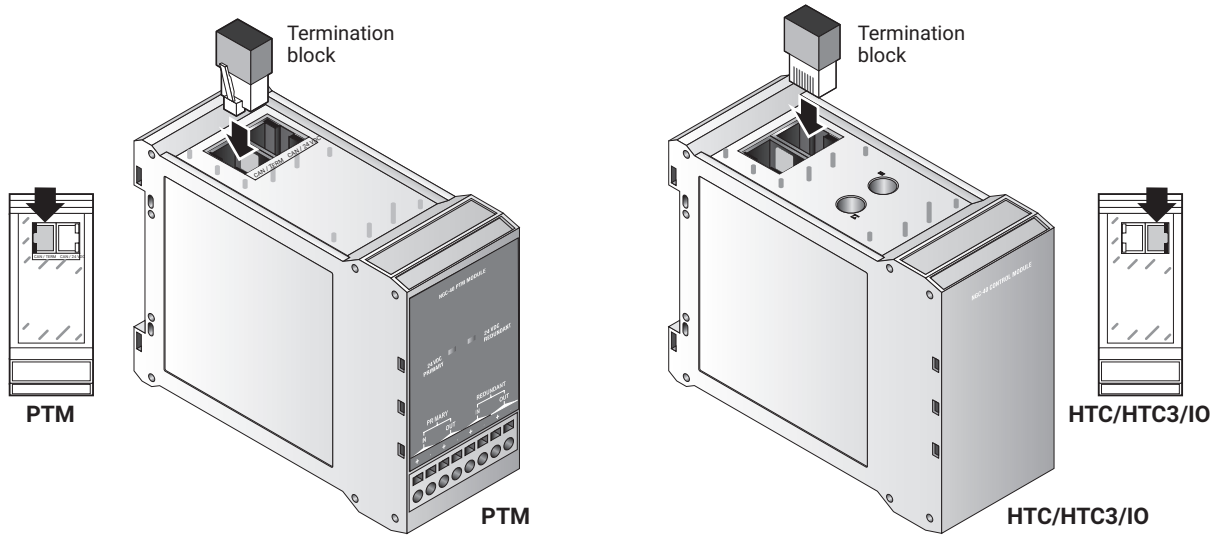
NGC-40 CAN Bus Connections for Up to 20 Modules



* Power supply shall have a means for disconnect from line voltage

CAN Bus Termination Block

A termination block (included) is required at each end of the CAN/24 Vdc bus.
See NGC-40 CAN bus connection wiring diagram for more details.



Provide Suitable Panel Enclosure and Determine Locations for NGC-40-BRIDGE Assembly in Panel*

1. **Provide suitable panel enclosure**

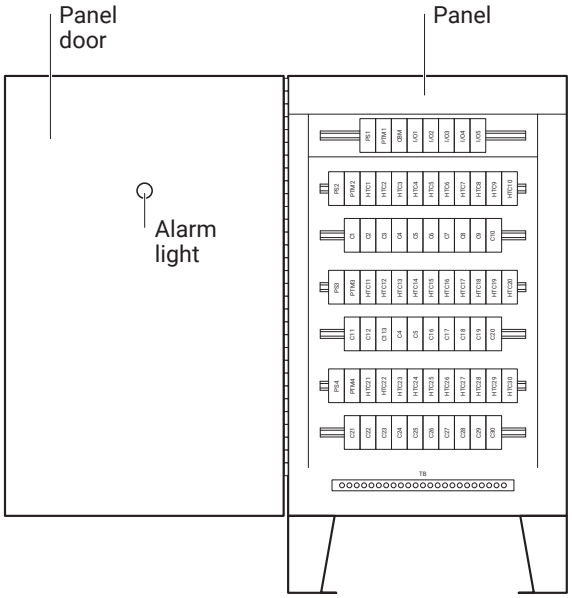
   The NGC-40-BRIDGE must be mounted in an enclosure to protect its electronic components. For indoor applications, use a minimum NEMA 1 enclosure (NEMA 12 recommended). For outdoor applications, use a NEMA 4 or NEMA 4X enclosure depending on the requirements.

   Note: The nVent RAYCHEM NGC-40-BRIDGE is designed for operation in ambient temperatures from –40°C to 65°C (–40°F to 149°F). If the ambient temperature is outside this range, a space heater and/or cooling fan will be required in the panel.

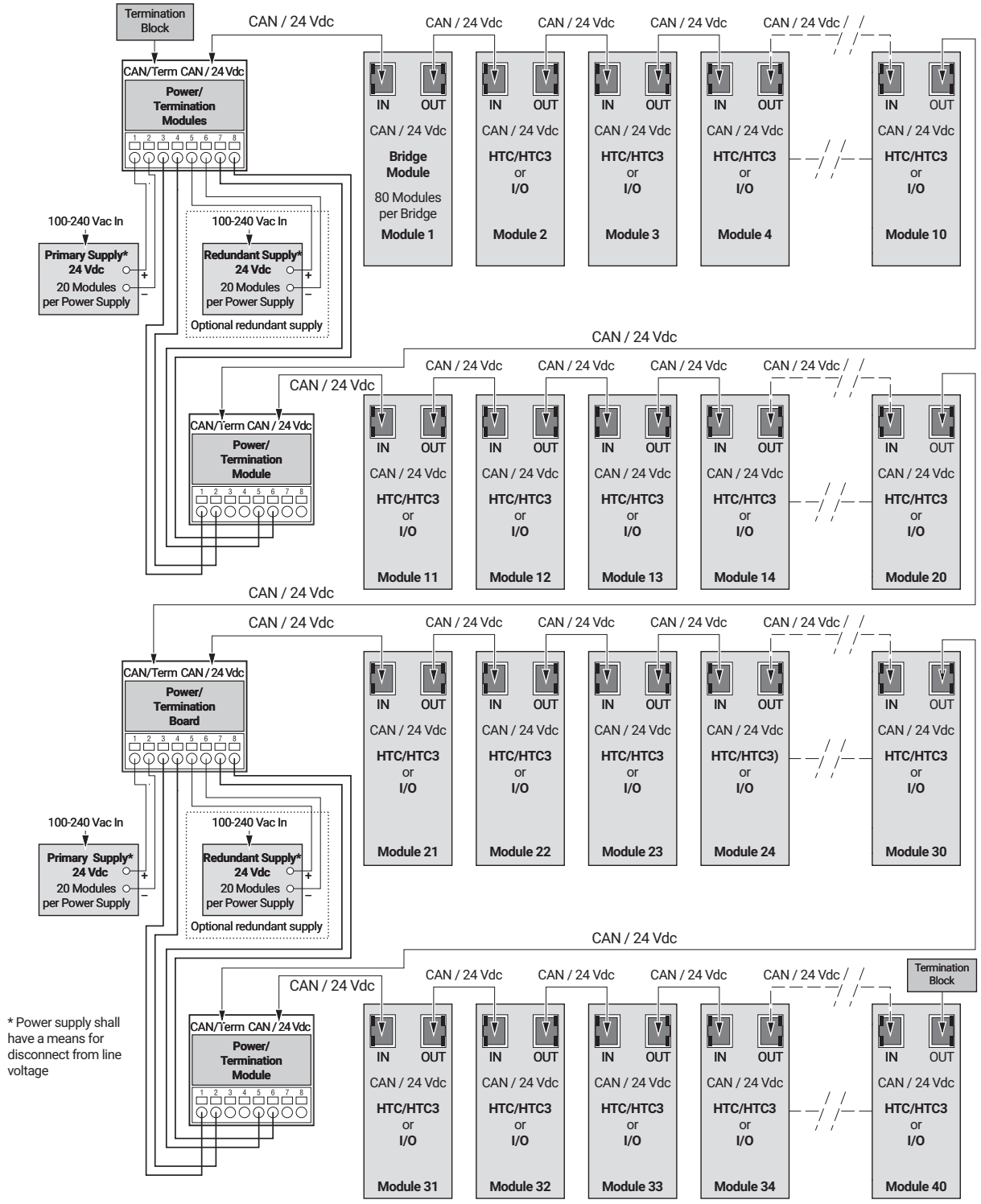
2. **Determine locations for the NGC-40-BRIDGE assembly in the electrical panel.**

   The NGC-40-BRIDGE should be located in the rear of the panel. The NGC-40-BRIDGE assembly is an electronic unit and must not be located where it will be exposed to strong magnetic fields or excessive vibration.

*North American panel installation techniques



NGC-40 CAN Bus Connections for Up to 40 Modules



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