rcc.1081 BACnet® Case Controller
Mounting & Wiring Instructions

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Introduction

Novar's rcc.1081 BACnet® Case Controller consists of 10 user configurable inputs and eight (8) outputs. The eight (8) outputs consist of seven (7) form C relay outputs and one (1) pulse width modulated solid state output plus one (1) 12VDC stepper motor output.



Figure 1. rcc.1081 BACnet Case Controller

The rcc.1081 is a multi-function controller that provides superheat control when connected to EEV valves as well as suction pressure regulation when connected to EEPR valves. The rcc.1081 can also control display case and cold room ambient air temperatures and manage defrost cycles for improved system energy consumption efficiencies.

In addition to providing local control functions, the rcc.1081 will continually monitor the operating conditions of its associated display case and transmit the data via BACnet MS/TP to a higher level Opus® Executive Controller.

Specifications

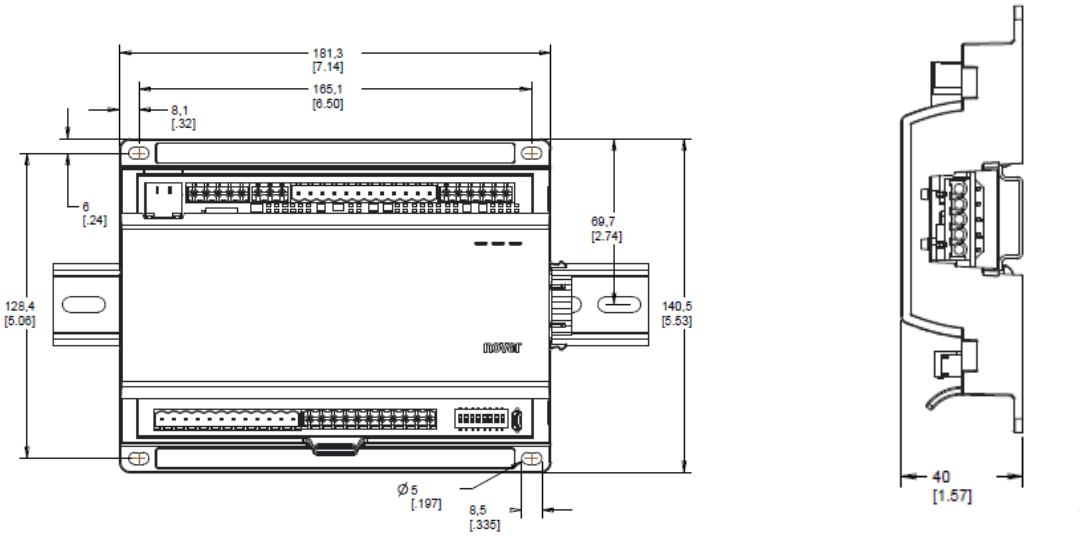


Figure 2. rcc.1081 Dimensions

Physical Dimensions

Width:	7.14 inches (181mm)
Height:	5.53 inches (141mm)
Depth:	1.57 inches (40mm)
Weight:	1.15 lbs

Operating Environment

Humidity:	5% to 95% Relative Humidity, non-condensing
Operating Temp:	32°F to 140°F (0°C to 60°C)
Storage Temp:	-40°F to 158°F. (-40° to 70° C)

Operating Voltage

22VAC - 28VAC, 50/60Hz

Power Supply

Power and universal inputs are classified as NEC Article 725 Class 2 (power limited.) Total power consumption of the controller and all connected sensors and valves must be less than 100VA. Refer to Table 4 for typical VA consumption.

LEDs

Indicate power, BACnet connectivity and module health status

Safety and Precautions

Observe all national and local electrical codes during installation

Mounting

The controller may be mounted in any orientation on a panel or a DIN rail but must be in a position that allows clearance for wiring or servicing.



Figure 3. rcc.1081 on DIN Rail

WARNING!

Electrical Shock Hazard! Can cause severe injury, death or property damage. Disconnect power supply and load power sources before beginning wiring or making wiring connections to prevent electrical shock or equipment damage.

Din Rail Mounting Procedure

Table 1. Din Rail Mounting Procedure

Step	Procedure
1	Holding the controller with its top tilted in towards the DIN rail, hook the top ridge of the DIN rail channel on the back of the controller onto the top of the DIN rail.
2	Gently press down on the bottom half of the **rcc.1081** to allow the DIN latch to engage under the DIN rail bottom edge.



Figure 4. rcc.1081 DIN Latch Release

Din Rail Un-Mounting Procedure

Table 2. DIN Rail Un-Mounting Procedure

Step	Procedure
1	Remove all wiring connectors from the controller to expose DIN latch release
2	Pull down DIN latch release with one hand to release the fastener from the DIN rail.
3	Lift the bottom of the controller away from the DIN rail with your other hand.
4	Unhook the top ridge of the DIN rail channel on the back of the controller from the top of the DIN rail.

NOTE!

Please use caution when pulling the DIN latch release! Over extending the DIN latch release can damage the resistance spring of the mechanism.

Panel Mounting Procedure

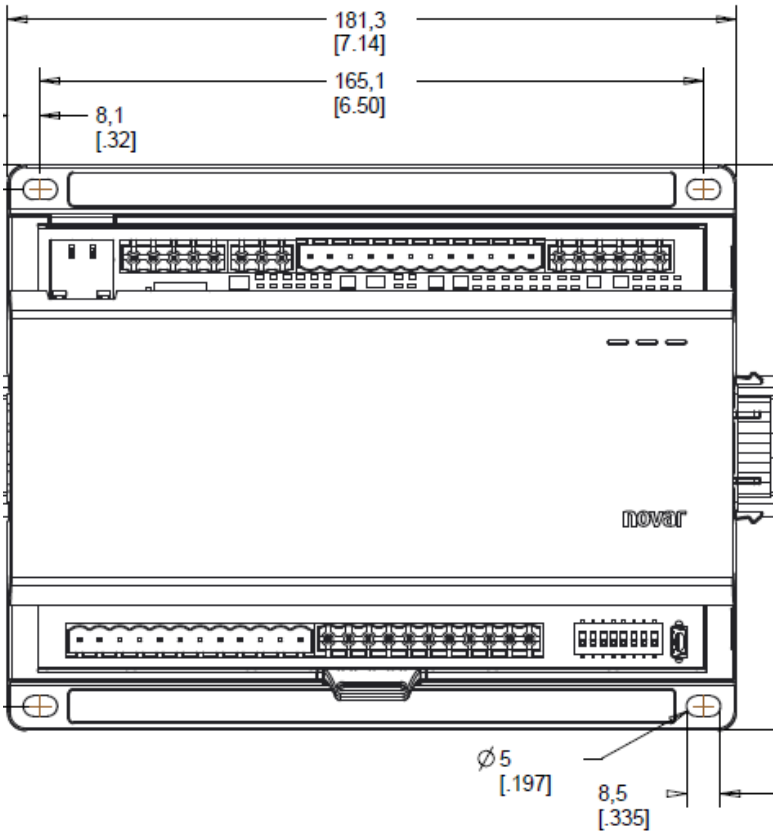


Figure 5. rcc.1081 Mounting Hole Dimensions

Table 3. Panel Mounting Procedure

Step	Procedure
1	Position the base of the product level against the panel wall and mark the wall to show the location of the corner holes.
2	The controller mounts using four screws inserted through the corners of the base. Fasten securely with four No. 6 or No. 8 machine or sheet metal screws.

Power & I/O Wiring

Removable terminal blocks are used to make all wiring connections to the rcc.1081. Attach all wiring to the appropriate terminal blocks (reference Figure 6. rcc.1081 I/O Connection Diagram). All wiring must comply with applicable electrical codes and ordinances, or as specified in installation wiring diagrams.

WARNING!



Electrical Shock Hazard! Can cause severe injury, death or property damage. Disconnect power supply and load power sources before beginning wiring or making wiring connections to prevent electrical shock or equipment damage.

Power Consumption

The rcc.1081 requires a 24Vac power supply. The total power draw for the controller, sensors and valves cannot exceed 100 VA when powered by the same transformer. Table 4 below shows the typical power consumption for a rcc.1081 and common 12Vdc Stepper valves.

Table 4. Power Consumption Table

Product	RCC-1081 w/RCC-RUI	Sporlan CDS-8	CDS-9, 17 and 17	SEI/EEV
Typical VA Draw	< 10VA	10VA	5VA	10VA

NOTE!



For multiple RCC-1081 controllers operating from a single transformer, the same side of the transformer secondary must be connected to the same power input terminal on each controller.

RCC-1081 controllers utilize half-wave voltage rectification and may not be mixed with full-wave rectified devices such as the older RCC-521 Case Controller. Do not attempt to power both types of controllers from the same transformer.

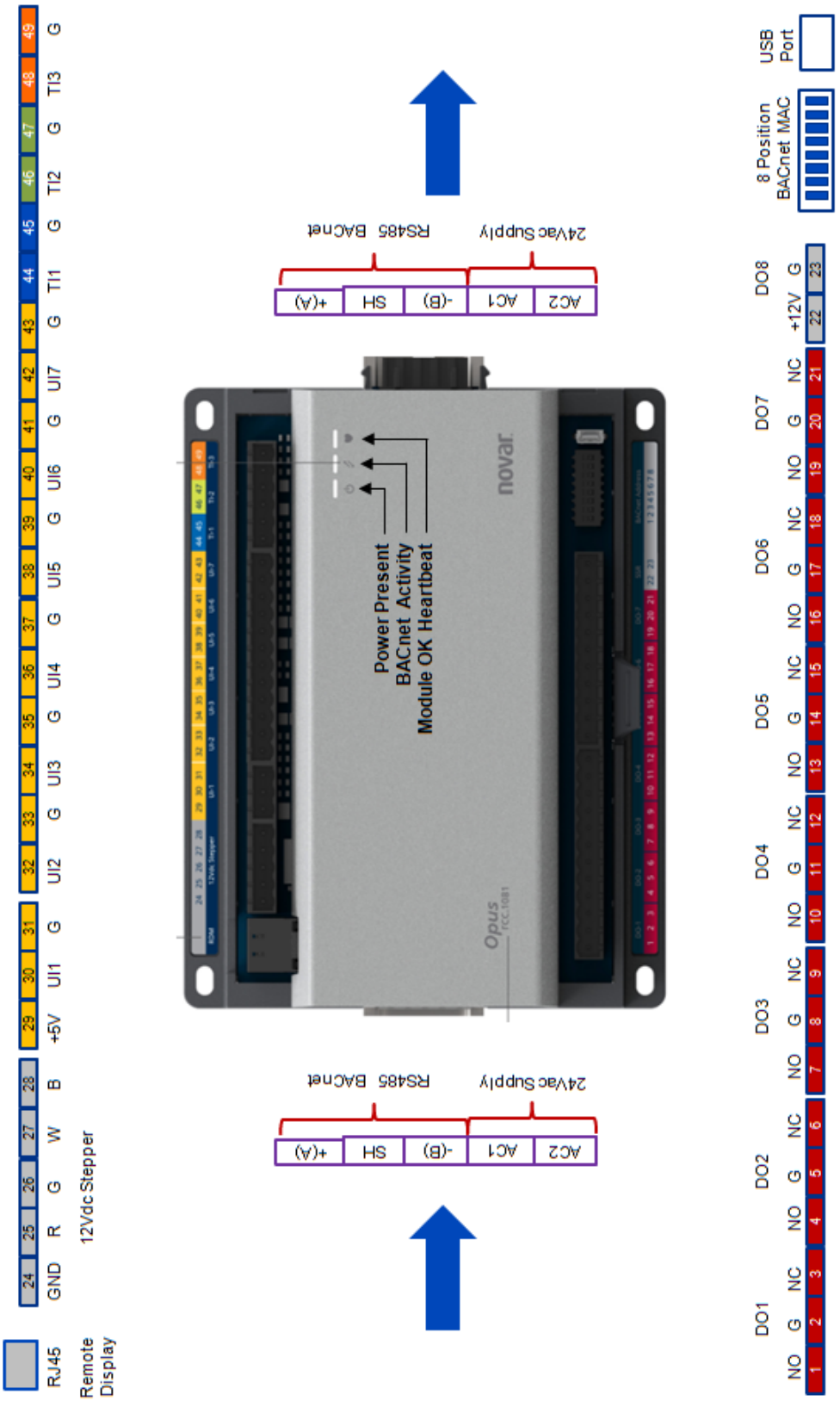


Figure 6. rcc.1081 I/O Connection Diagram

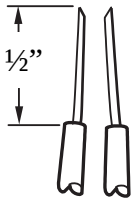
Wiring Method

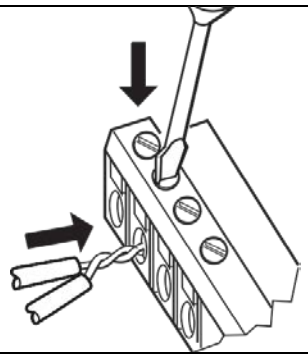
Each terminal block can accommodate the following gauges of wire:
— Single wire: from 22 AWG to 14 AWG solid or stranded
— Multiple wires: up to two 18 AWG stranded

NOTE!

When attaching two or more wires to the same terminal, other than 14 AWG (2.0 sq mm), be sure to twist them together. Deviation from this rule can result in improper electrical contact.

Table 5. Preparing wiring for terminal blocks

Step	Procedure
1	Strip 1/2 in. (13 mm) from wires to be attached at one terminal. 
2	Cut a single wire to 3/16 in. (5 mm). Insert the wire in the required terminal location and tighten the screw.
3	If two or more wires are being inserted into one terminal location, twist the wires together a minimum of three turns before inserting them. 
4	Cut the twisted end of the wires to 3/16 in. (5 mm) before inserting them into the terminal and tightening the screw.

	
5	Pull on each wire in all terminals to check for good mechanical connection.

BACnet Network Wiring

A two-conductor shielded cable should be used to make the BACnet MS/TP Network Communications connections from the Opus Executive Controller to the terminals on the left side of the **rcc.1081**.

The BACnet network should originate from the main Opus Executive Controller and connect to the rcc.1081 with the supplied 5- position terminal block. Multiple devices can be connected via daisy chain wiring or a pass-through connection between devices. Stubs or branches off the BACnet network are not allowed.

In order to guarantee the network performance of each BACnet segment, the BACnet network segments from the Opus Executive Controller should contain only **rcc.1081** modules or other Novar approved BACnet MS/TP devices.

NOTE!

Network termination and/or biasing resistors should NOT be applied to any Opus BACnet installation.

NOTE!

The default baud rate for the **rcc.1081** is 38400 baud.

NOTE!

Do not exceed the maximum recommended length (1200 M / 4000 ft.) for any BACnet segment.

Setting BACnet Address

Every **rcc.1081** comes from the factory set to a BACnet address of 255. Each controller must be assigned an **unique** BACnet MAC address (ranging from 4 through 254) in order for the Opus xcm Executive Controller to be able to identify and communicate with it.

NOTE!

When assigning a MAC address – addresses 0, 1, 2, & 3 should be avoided as they are commonly used for the router, diagnostic tools etc, and addresses 255 is never used because it is reserved as a broadcast address.

Users have the option to set the **unique** BACnet MAC address using the rcc.RUI Remote display (reference the rcc.1081 User Manual for instructions) or it can be entered into the controller using the eight (8) DIP switches on the front of the controller.

To set the BACnet address of a rcc.1081 using the DIP switches on the controller:

1. Find an unused address on the MS/TP network to which the controller connects.

2. Locate the DIP switch bank on the front of the Controller for addressing. This is labeled MAC Address

3. With the rcc.1081 powered down, set the DIP switches for the BACnet address you want. Add the binary value of DIP switches set to OFF (down) position to determine the MAC address (see Table 6). Example: if only DIP switches 1, 3, 5, and 7 are in the OFF (down) position the BACnet address would be 85 (1 + 4 + 16 + 64 = 85).

Table 6. DIP Switch Values for MS/TP MAC Address

DIP Switch #	1	2	3	4	5	6	7	8
VALUE (when in OFF position)	1	2	4	8	16	32	64	128

Model & Part Numbers

Table 7. Novar Part Numbers

Part No.	Product Description
RCC-1081	Refrigeration Case/Circuit Controller Module
RCC-RUI	Remote Display
RCC-CBL-2	Remote Display Cable, RJ45, 2 meters
RCC-CBL-5	Remote Display Cable, RJ45, 5 meters
RCC-SP150-2	Sensor, Pressure, 150psig, w/2 meter Cable
RCC-SP150-5	Sensor, Pressure, 150psig, w/5 meter Cable
RCC-SP150-M	Replacement Sensor, Pressure, 150psig, No Cable
RCC-SP300-2	Sensor, Pressure, 300psig, w/2 meter Cable
RCC-SP300-5	Sensor, Pressure, 300psig, w/5 meter Cable
RCC-SP300-M	Replacement Sensor, Pressure, 300psig, No Cable
RCC-ST2K-2	Sensor, Temperature, 2K NTC, w2 meter Cable
RCC-ST2K-5	Sensor, Temperature, 2K NTC, w5 meter Cable
RCC-ST2K-8	Sensor, Temperature, 2K NTC, w8 meter Cable
RCC-ST2K-8-TJ	8 meter 2K Thermistor temperature probe with removable probe tip
709031000	Two-conductor shielded cable, RS-485 (1000 foot reel)
730090000	24-VAC Transformer (40 VA)

Regulatory Compliance

This device has been tested and found to be in compliance with the requirements set forth in UL 873, Temperature-Indicating and Regulating Equipment, and is recognized by Underwriters Laboratories, Inc., for installations in the United States.

This device has been tested and found to be in compliance with the requirements set forth in C22.2, No. 24-93, Temperature-Indicating and Regulating Equipment, and is recognized by Underwriters Laboratories, Inc., for installations in Canada.

Federal Communications Commission (FCC)

This device complies with Part 15 of the FCC Rules. The product meets emissions requirements for product specific standards EN 55022/FCC/IC, Class A. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE!



This device has been tested and found to comply with the limits established for Class A digital devices. It is intended to be used in a commercial environment. Operation of this equipment in residential environments may cause harmful interference, in which case the user may be required to correct the interference at their own expense.

CAUTION!



Any changes or modifications not expressly approved by Novar could void your authority to operate this equipment.

Canadian Department of Comms (DOC)

NOTE!

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numerique de la Classe A respecte toutes les exigencies du Reglement sur le material broilleur du Canada.

Waste Electrical & Electronic Equip

NOTE!

Customers are advised to dispose of this product at the end of its useful life according to applicable local laws, regulations, and procedures.

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