

RCC-RUI-HUB Mounting & Wiring Instructions

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Introduction

The RUI HUB is a RCC Case Controller Remote Display network expansion module that allows the connection of up to five (5) RCC-RUIs to a single RCC-1081 Case Controller (when used in Mode #4 multi-case Lineup Control Applications) or up to three (3) RCC-RUIs when used with a RCC-1044-EEV Multi-Channel EEV Valve Controller used in its Mode #3 multi-evaporator Superheat Control Application.

NOTE!



The RUI HUB with multiple RUI displays can only be used with an RCC-1081 configured for Mode #4 or a RCC-1044-EEV configured for Mode #3. If used in any application Mode other than those listed, RUI's with addresses greater than 1 will display an error message of diS (disabled, no temperature associated with this address).

This document contains instructions for the mounting, wiring, and start-up of a RUI HUB. For further product information on the installation, addressing and startup of the RCC-RUI Remote Display, see the RCC-RUI User Manual (Rev D or higher) available at www.novar.com/manuals



Figure 1. RCC-RUI-HUB Module

Specifications

RCC-RUI-HUB Module

Power Requirements- 22-28 Vac 50/60Hz
Voltage: Class II, non-grounded power source

Operating Environment-
Temperature- Storage: -40°F to 168°F (-40°C to 70°C.)
Operating: 0°F to 140°F. (-0°C to 60°C.)

Humidity: 0 to 95% Relative, non-condensing

Maximum Power Consumption: 6 VA

Physical Dimensions-
Length: 3.0 inches (76.2mm)
Width: 3.0 inches (76.2mm)
Height: 1.5 inches (38.6 mm)
Weight: 2.9 ounces (81.7 grams)

Maximum Cable Lengths –
RCC to HUB module: 15-100 feet* (4.57 m) *see note
Total of all RUI Ports: 50 feet (15.24 m)

UL Certification: UL Listed per 60730-1

NOTE!



Use of the RCC-RUI-HUB requires the following minimum Firmware revisions in the RCC-1081 and the RCC-RUI displays.

RCC-1081 FW revision 1.26 or higher

RCC-RUI FW revision 2.0 or higher.

Powering the RUI HUB Module

The RUI HUB may be powered from the same 24Vac power source as the RCC-1081 or RCC-1044 controller as long as the total load on the 24Vac (including valves) does not exceed the 100VA Class 2 requirement.

Mounting the RUI HUB Module

The RUI HUB is designed to be mounted in an un-refrigerated, non-condensing, location inside (or nearby) one of the refrigerated display cases incorporating a RCC and RCC-RUI display.

Snap-Track Installation

The RUI HUB is supplied with a piece of snap-track as an optional installation method (Figure #2). The RUI HUB module must be removed from the snap-track before installation and then can be easily reinserted back into the snap-track after it's attached to the mounting surface. When using Snap-Track mounting, care must be taken to assure none of the pins on the backside of the HUB Printed Circuit Board (PCB) are contacting any snap-track fasteners (see Figure #3 for this dimension)



Figure 2. Included Snap-track

Panel-Mount Installation

When used without the snap-track mounting base, the RUI HUB may be mounted using the four perimeter Printed Circuit Board (PCB) mounting holes with appropriate length standoffs to assure no PCB board pins come in contact with a conductive material. The location and spacing of the four PCB mounting holes can be seen in Figure #3 below.

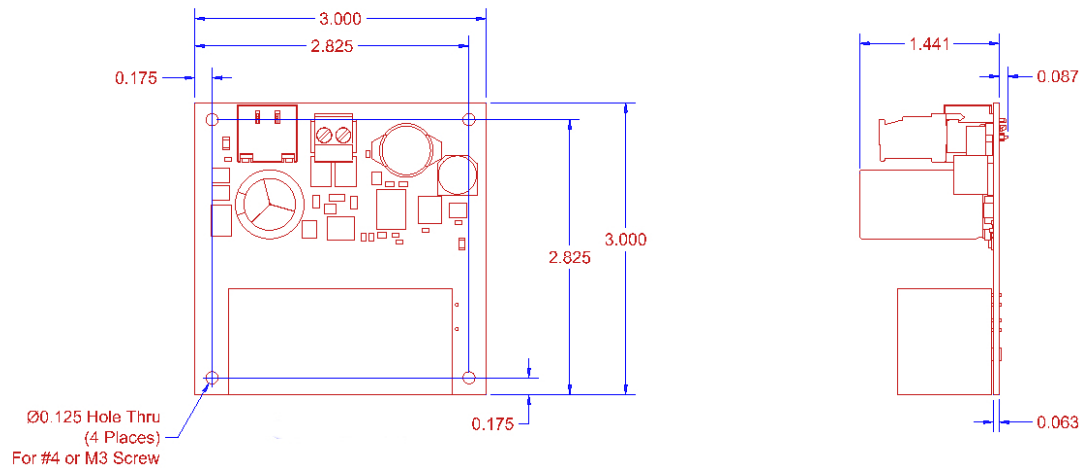


Figure 3. Mounting Hole Locations (inches)

Wiring the RUI HUB Module to RUI Displays

The RUI HUB module supplies each networked RUI with +5Vdc power plus refrigerated case status data over standard CAT-5 cable with RJ-45 connectors.

To assure each RUI receives sufficient +5Vdc power, the maximum length of the RUI Network must be kept shorter than 50 feet.

The maximum length of the RUI Network is determined by the total CAT-5 cable length of all RUIs connected to the individual RUI ports.

A simple formula to calculate the available cable length (in feet) for each RUI HUB port is as follows:

$$P1(\text{ft}) + P2(\text{ft}) + P3(\text{ft}) + P4(\text{ft}) + P5(\text{ft}) = \text{Total} \leq 50\text{ft}$$

Example: For a three case lineup with three RCC-RUI modules:

$$P1(5\text{ft}) + P2(10\text{ft}) + P3(15\text{ft}) = 30\text{ ft} \leq 50\text{ft} = \text{OK}$$

Additionally, the length of the CAT-5 cable between the RCC controller and the RCC-RUI-HUB is not included in the 50ft maximum as it is not part of the RUI port expansion network.

NOTE!



Maximum Cable Lengths –

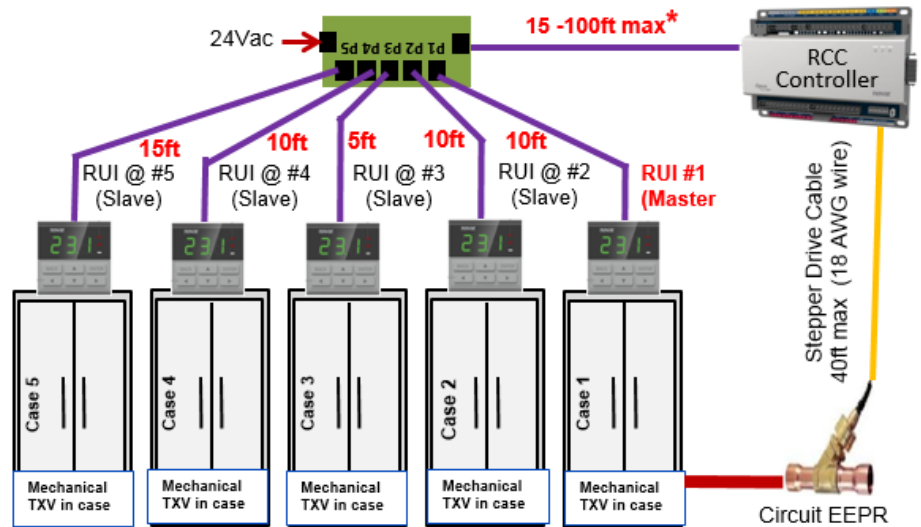
RCC to HUB module: 15 feet (4.57 m) if all pins in the CAT-5 cable between them are connected or up to 100 ft (30.48 m) if the +5V and ground pins are disconnected at the RCC end

Total of all HUB ports: (figure #5) 50 feet (15.24 m)

NOTE!



For maximum RUI Network length efficiency it is recommended that the RUI HUB be mounted in a location centrally located at a midpoint between all its associated cases and no more than 100ft away from its RCC controller. (See Figure #4)



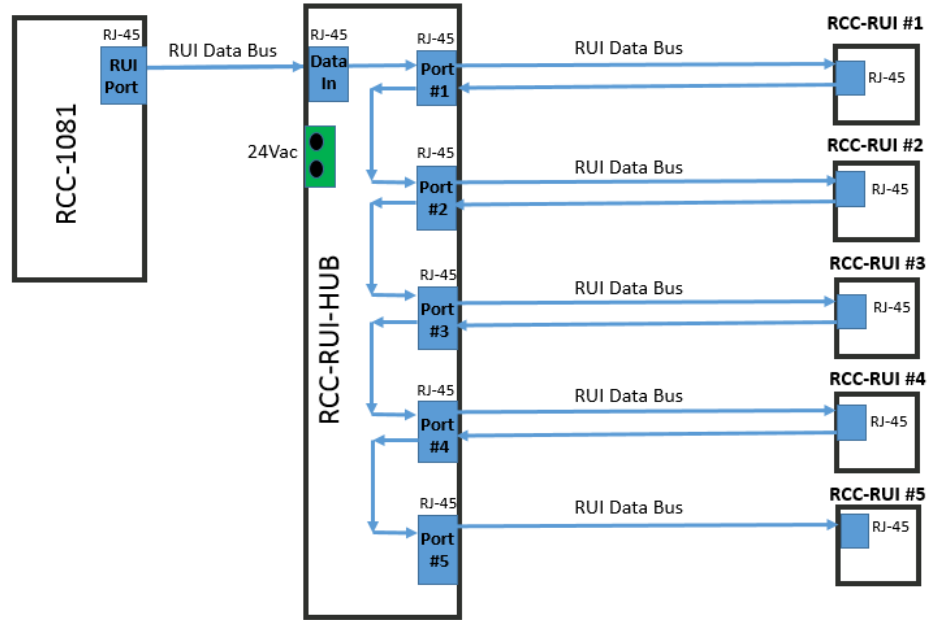
* Maximum cable length between a RCC Controller and RUI HUB is 15ft if off-the-shelf CAT-5 cables are used or up to 100ft if user supplied customized cable with +5Vdc and GND disconnected at the RCC Controller end (see note and Figure #6)

Figure 4. Cable Runs

NOTE!



Connection of multiple RCC-RUI modules to the RUI HUB ports must be done in sequential order beginning with Port #1. No ports may be skipped otherwise the RUI Data Bus continuity will not be maintained. (See Figure #5)



Note: Ports 6, 7 and 8 are currently not used

Figure 5. RCC-RUI-HUB Data Flow Diagram

NOTE!



Pins #1, #3 (+5V) and pins #6 and #8 (GND) on the RCC to RUI HUB connection cable may be disconnected at the RCC controller end to extend the distance between the two devices up to 100 feet. (See Figure #6)

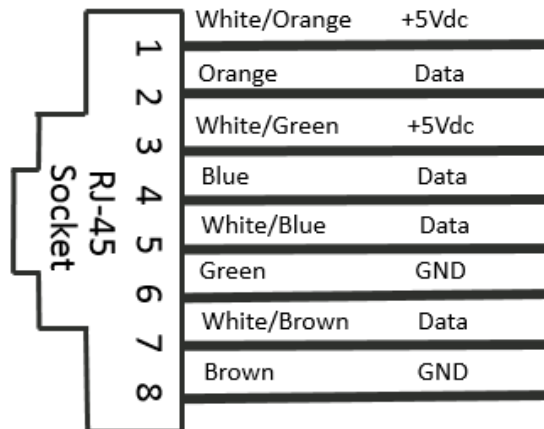


Figure 6. RUI HUB RJ-45 Connector Pin-out

Setting the RCC-RUI Address

When used with a RUI HUB

In order to display the temperature of each individual case in a line-up, a case address must be set in each RCC-RUI display connected to a RUI HUB port.

RCC-RUI address #1 (on HUB Port #1) will display the first case discharge air temperature and the first case defrost termination temperature sensor value. RCC-RUI address #2 (on HUB Port #2) will display the second case discharge air temperature and second case defrost termination sensor, etc., etc.

The process for setting an RCC-RUI address connected to a RCC-1081 case controller is as follows. The same addressing process also applies to use with a RCC-1044 controller.

- When first connected to the RUI HUB that is connected to a RCC-1081 case controller configured for Mode #4 lineup control, the RUI display will read “rAd” (RUI address).
- To change the address, use the up and down arrows.
- To save the desired address, press and hold the Enter Button for at least 2 seconds.
- After the address is set, you can read it again by pressing the “Back” button and the right arrow button for about 2 seconds. The address will be displayed and shown as long as the buttons are held. When the buttons are released, the RCC-RUI returns to normal display.
- To clear the address of an RUI, press and hold the “Enter” and “Left” arrow buttons at the same time for about 6 seconds. The display will return to “rAd”, allowing you to re-set the address.
- The display that is set to address #1 will go into the RCC-1081 Network and Test Mode setup, as described in the RCC-RUI User Manual available at www.novar.com/manuals. The display will show either “tSt” or “nEt” to reflect these modes. RUI’s with addresses greater than #1 will begin to display their case temperatures.

Error Messages for “slave” RUI’s (Addresses >1)

The alarms below are the only alarms that will display on a slave RUI connected to a RUI HUB port. All other alarms will be displayed only on the “master” RUI (address = #1).

- AxA = Air Temperature sensor alarm (the one matched to the display address)
- dxA = Discharge Temperature sensor alarm (the one matched to the display address)
- PrF = The display is not communicating properly with the RCC-1081
- diS = The temperature sensors associated with this display are disabled

Other RCC-RUI Differences When Used with a RUI HUB

- 1) The BACnet communication alarm LED only functions on the master RUI (address #1). Therefore, if the RCC-1081 loses BACnet communication it will only be indicated on the master RUI.
- 2) The sensor status LED functions on all RUI's, but only for the sensors associated with its case address.
- 3) There is no indication of an RUI address conflict. Multiple displays set to the same addresses will all display the same information.
- 4) In RCC-1081 Mode #4, all RUI's display only the temperatures associated with their case. The circuit control temperature (hi, low, average, or blended air temp) can be only be viewed via the menus of the master RUI at address #1.

Model & Part Numbers

The part numbers shown in Table 1 should be used to order Novar parts.

Table 1. Novar Part Numbers

Part No.	Product Description
RCC-RUI-HUB	Refrigeration Case Controller Display Wiring Hub
RCC-1081	Refrigeration Case Controller
RCC-1044-EEPR	Multi-Channel EEPR Valve Controller
RCC-1044-EEV	Multi-Channel EEV Valve Controller
RCC-RUI	RCC-1081 Remote User Interface
RCC-CBL-2	Remote Display Cable, RJ45, 2.0M
RCC-CBL-5	Remote Display Cable, RJ45, 5.0M
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 60730-1 and is recognized by Underwriters Laboratories, Inc., for installations in the United States.

Federal Communications Commission (FCC)

This device complies with Part 15 of the FCC Rules. The product meets emissions requirements for product specific standards EN 55011/FCC/IC/C-Tick, 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 his own expense.

CAUTION!



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

Canadian Dept. of Comm.(DOC)

NOTE!



This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled Digital Apparatus, ICES-003, of Industry Canada.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouiller: Appareils Numériques, NMB-003, édictée par l'Industrie Canada.

**Waste Electrical &
Electronic
Equipment**

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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