Remote Input Module (RIM)
Installation and Operation
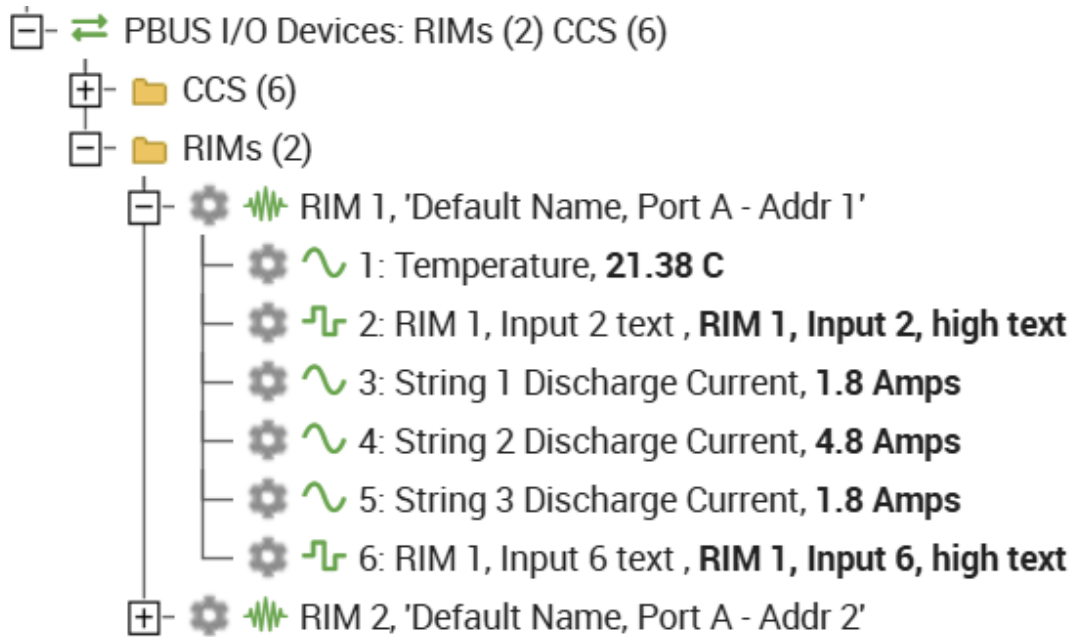
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Revision History

Release	Date	Revision Description
Rev 1	09/19/2008	Released for review
Rev 2	09/23/2008	Edits from review.
Rev 3	09/26/2008	Edit SNMP section. Add composite status. RIM version 1.3. ContactAgent version 3.4.
Rev 4	4/5/2016	Added RIM-2,3,4,5, cleaned up the warnings, corrected address, replaced the logo
Rev 5	8/8/2016	Added Environmental and Power Specifications
Rev 6	1/16/2017	Added French Safety Notes
Rev 7	11/4/2024	Removed French Safety Notes for space; Updated text and photos to represent PBT's current line of products.

Safety Notes

- ***High currents and voltages may be present on equipment terminals and inside the equipment. Make sure you understand and observe all appropriate safety codes and regulations. Follow prudent electrical safety practices when installing or servicing the equipment. Installation, maintenance and servicing of the equipment should only be performed by qualified, trained and authorized personnel.***

- Except as explained in this manual, there are no user-serviceable parts inside the PBT System components. Opening the equipment could expose you to dangerous voltages and void the product warranty. All product servicing should be referred to factory-authorized personnel.

- Use of user-made interconnection cable assemblies could result in damage to equipment and potential safety hazards and voiding of equipment warranties.

- Do not exceed the voltage specifications of the product.

- Make sure the equipment is grounded properly.

- The equipment should be protected from liquids, moisture, and corrosive or explosive vapors.

Important Symbols:

| ⚠ | **CAUTION!** The use of CAUTION indicates safety information intended to prevent damage and/or injury |

| ☑ | **NOTE:** A NOTE to provide additional information to help complete a specific task or procedure |

- ## *Contact Information*

If you have any questions about the installation or use of the equipment described in this manual, contact Phoenix Broadband Technologies at (215) 997-6007 or email customerservice@phoenixbroadband.com.

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▪ *System Overview*

The Phoenix Broadband Technologies (PBT) Remote Input Module (RIM) provides a method for increasing the number of monitored inputs on various PBT products. A primary application of the RIM is to increase the number of monitored inputs on the *SC4* and *SCMini-XC* controllers. The screens used in this document are from the *SC4* and may vary slightly in other products.
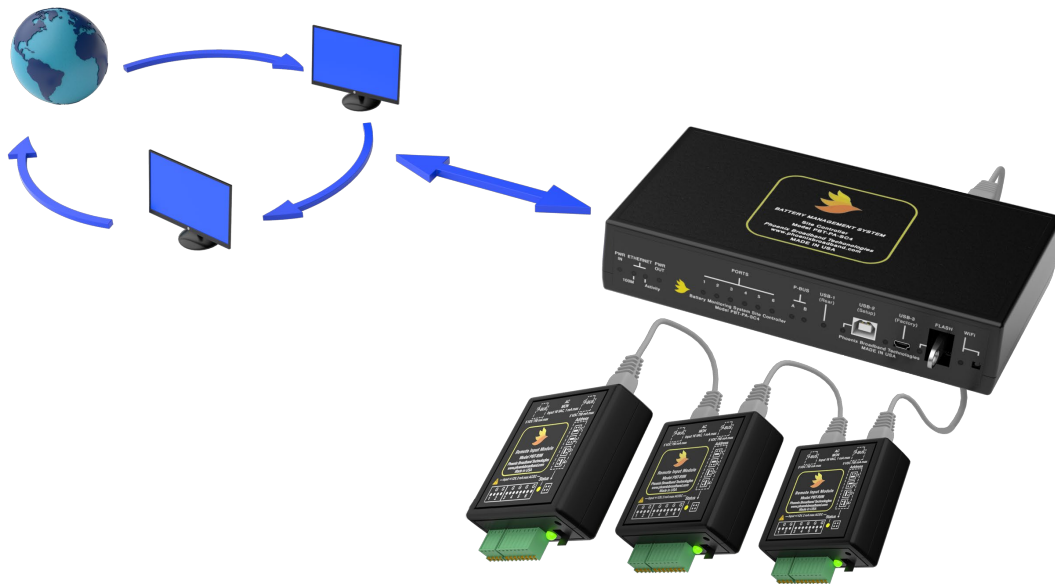
The RIM has 6 inputs that can be configured to monitor analog or digital signals. There is also temperature, AC line voltage and optional humidity measurement. The RIM is powered by the P-Bus Port on the *SC4* or *SCMini-XC*.

Up to 4 RIMs can be daisy chained together on each P-Bus input (2 on the *SC4* and 1 on the *SCMini-XC*), giving the *SC4* a total of 48 inputs and 24 for the *SCMini-XC*.   The RIM can be configured using the *SC4's* or *SCMini-XC's* web interface.

The RIM can be combined in a daisy chain with other compatible PBT devices including the Remote Output Module (ROM).

There are 5 different Model numbers in the RIM family with inputs designed for specific purposes.

| RIM-1	6 general purpose inputs configurable for contact closure or DC or AC voltages
RIM-2	2 precision temperature sensor inputs and 4 general purpose inputs
RIM-3	AC current sensor Inputs
RIM-4	6 precision temperature sensor inputs
RIM-5	3 combo discharge/charge sensor inputs

- ***Unpacking the RIM***

The RIM box contains:

1	RIM with mating barrier strip
1	2-foot CAT-5 Cable
1	AC Line Voltage Transformer (optional)
1	RIM Mounting Bracket
2	RIM Mounting Bracket Screws
1	Self Adhesive Velcro Square

☑ The RIM is powered from the controllers P-Bus port. The transformer is only used if AC Line Voltage Measurement is required.

▪ *Mounting the RIM*

The RIM is shipped with several mounting options. A bracket is provided that can be installed on the back of the RIM. This bracket can be used to mount the RIM on a wall or on an equipment rack rail. A piece of self adhesive, industrial Velcro is also provided that can be used to mount the RIM. An optional rack shelf that mounts the controller and the RIM is available.
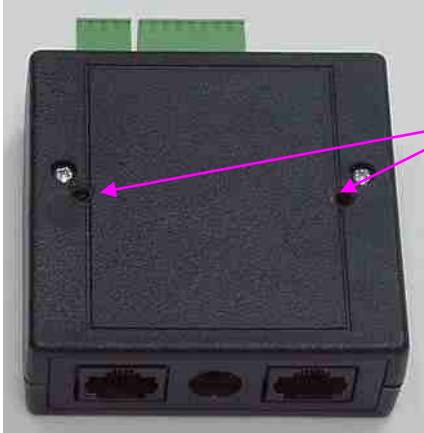

The mounting bracket is attached the back of the RIM with the two self tapping screws provided.

Holes for self-tapping screws

The bracket can be mounted in any one of 4 positions depending on the desired orientation on the RIM. Two examples of the bracket installation are shown below.

Once the bracket is secured to the RIM, the bracket can be secured to a wall using customer provide hardware appropriate for the wall construction.
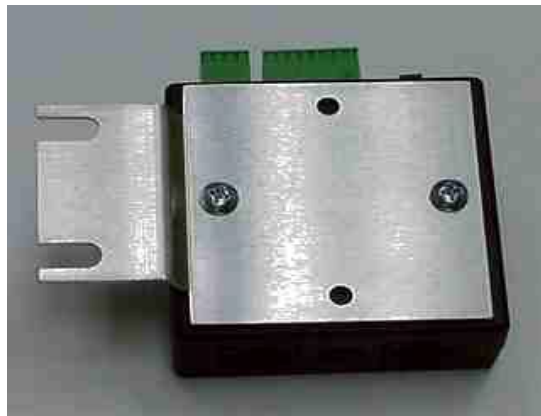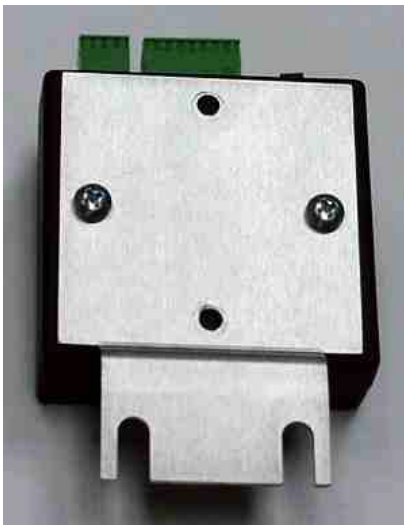
The hole spacing in the bracket is designed to fit a 1U space on an equipment rack rail. The bracket can be secured to a rack rail using customer provided hardware appropriate for the rack rail design.

- ### *Setting the RIM Address*

Each RIM connected in a daisy-chain must have a unique address. The address is set using the jumper on the RIM front panel. Each RIM is shipped with the address set to one.

Remove the jumper by pulling it straight out. Replace the jumper in one of the 4 positions shown on the RIM label to set the address. The jumper should always connect 2 pins on the address header. The RIM will not operate properly if an address jumper is not installed.

When the RIM power is connected the LED will flash red a number of times indicating the address setting. For example; if the

RIM Address Jumper

address is set to 4 the LED will flash red 4 times and then go green.

Verify the address setting by watching the LED when the RIM is connected to the controller in the following section.

- *Connecting the RIM to the controller*

The RIM is connected to the controller using a standard Ethernet cable. A 2-foot cable is provided with the RIM, but any CAT-5 cable up to 200 feet in length can be used.

⚠ Use caution when making your own cables as incorrectly wired cables can damage the RIM, and/or controller. Note that some CAT-5 cable testers only test the 4 wires used by Ethernet. The RIM uses all 8 wires. Make sure that your cable tester tests all 8 wires for opens and shorts.

We recommend connecting the RIM to the controller with the CAT-5 cable provided and verifying proper operation before attempting to make your own cable.

Connect the P-Bus port on the controller to "P-Bus" port on the RIM. Connect the other "P-Bus" port on the RIM to the next PBT Remote Module. Up to 4 RIMs with different address settings may be connected in a daisy chain with ROMs or other compatible PBT devices on a single P-Bus port.

The RIMs may be connected with the power on or off. When the power is applied, verify the address setting as described in the previous section. The controller should begin polling the RIM shortly after the power is applied. The RIM LED which is normally green will flash off momentarily when the RIM responds to the controller.

▪ *Connecting the RIM Inputs*

The RIM can monitor dry contact closure or low voltage digital signals. It can also monitor DC or AC analog signals.   The voltage presented to the RIM input must be ground referenced and must be in the range of +12 to -12 Volts.

⚠ Caution: Connecting the RIM inputs to voltages outside of this range may damage the RIM and void the warranty.

Connect the RIM inputs to the points to be monitored. The RIM barrier block will accommodate 20-26 AWG wire. Strip 0.25 inch of insulation from the wire. Solid wire works best, but if you use stranded wire be sure to twist the strands tightly together. Push the wire into the desired barrier block connection as shown.   There is an input and a ground connection for each input. The inputs are pulled up in the RIM.

For dry contact closures connect one side of the contact to a RIM input and connect the other side to the RIM ground.

For low voltage measurements (+12 to -12 volts) connect the low voltage signal to the RIM input and the signal reference (ground) to the RIM ground pin.

Contact Phoenix Broadband Technologies if you are unsure of how to connect your device to the RIM.

To remove a wire from the barrier block press the orange release button with a small screw driver and pull the wire free.

▪ *Web Interface*

The RIM is completely configurable through a series of Web pages. The RIM Web pages are accessed from the Web page of the controller. In the case of the *SC4* the RIM configuration pages can be accessed from "Strings, Batteries, I/O Devices" pane on the left side of the screen and then expanding the "PBUS" devices section by clicking the + box to the left.

Clicking the + box to the left shows only the connected RIMS. The device shown here (right) has 2 RIM modules. The present state of each RIM is shown in this section.

The cog icons next to each input allow for configuration of that input while the cog icon next to the RIM itself allows for renaming of the RIM as well as configuring the communication alarms for the RIM. When an input alarm is enabled the value for the input will be color coded with its alarm status, Green for Normal, Yellow for Minor Alarm, and Red for Major Alarm.
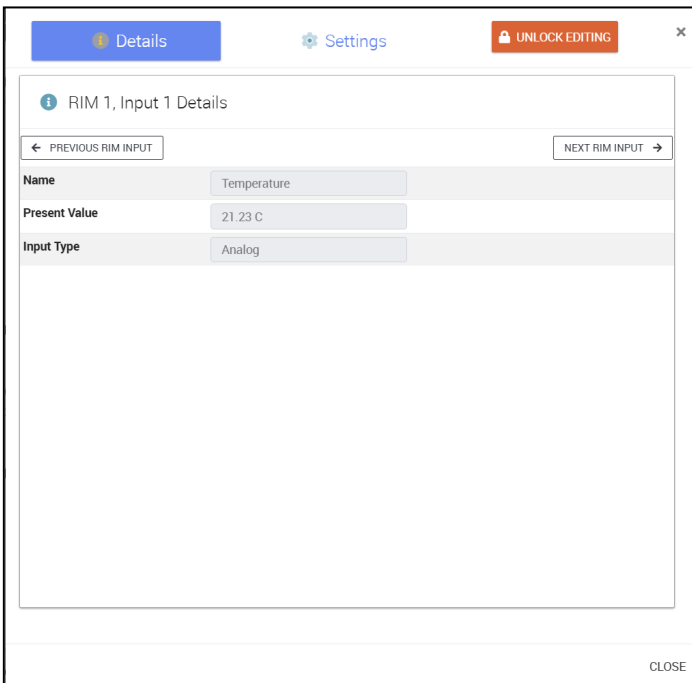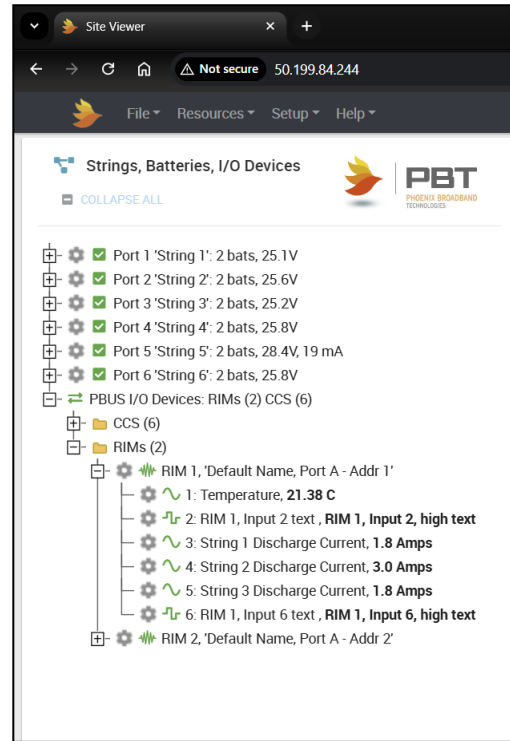
Configuring the Inputs

Clicking on the cog (shown above) for one of the inputs will bring up the Details and Settings window (shown to the left). This window shows the name/label of the input, present value of the RIM Input and the input type (analog/digital).

To configure the input press the "Settings" button at the top of the window. Before any settings can be changed, you must click on the "Unlock Editing" button at the top right of the window.

Password
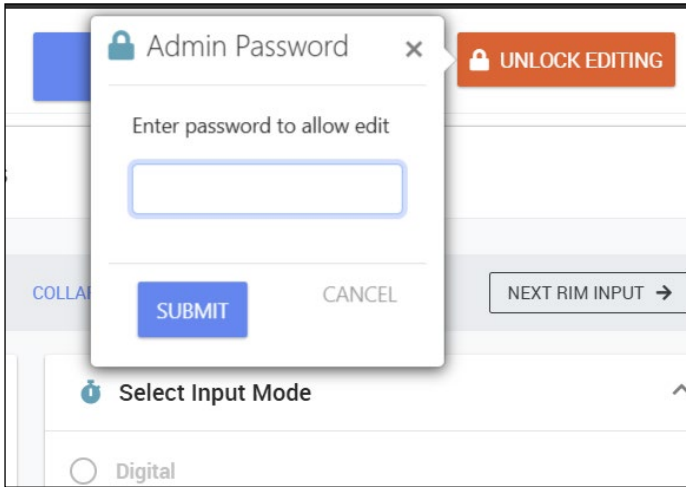
Type the password followed by clicking "Submit" or hitting enter on your keyboard. The password is case sensitive. The default password is "admin". The password can be changed from the SSH setup interface on the controller.

Once the password is entered the user configurable fields will change from grey to white.

Input Setup

Connecting a discharge sensor to a controller is a typical use case of RIM. Each discharge sensor ships with an Application Note that explains how to setup the RIM to communicate with the discharge sensor *(see PBT Application Note: 701-000017-00, "Discharge Current Sensor Installation")*. That app note will guide you through the required configuration points within the RIM to successfully setup the discharge sensor with the controller.

PBT's temperature probes are also a typical use case for the RIM. The RIM-2 and RIM-4 are specifically designed to integrate temperature probes into the controller. The RIM-2's first two inputs are for temperature probes while the RIM-4 is setup so that all six of its inputs are for temperature probes. The installation of the temperature probes to the RIM is straightforward and an install document is included with the temperature probe that shows how to connect it to the RIM *(see PBT document: 705-000018-00, "RIM with PBT-ETS Installation")*.

If you are setting up a PBT provided device via RIM that is not a discharge sensor or temperature probe, please refer to the documentation provided by PBT to set up that device. If you are using a RIM to connect a device that was not provided by PBT, please contact PBT before continuing. Setting up a device that has not been approved by PBT may cause equipment damage or personal injury.

- ### *Specifications*

Number of Inputs:	6 digital/analog (user-definable) Refer to the model number table in the System Overview section
Analog Measurements:	+/- 12VDC; 0-8 VRMS
Temperature Sensor:	+/- 2 deg C accuracy from -40 to +80 deg C
Humidity Sensor (Optional):	+/- 3% accuracy from 20% to 80% RH +/- 5% accuracy from 0 to 19% RH and 81 to 100% RH
Max # Units:	4 RIM Modules per host device P-BUS port
Interface to Host:	RS-485 on RJ-45 connector; power supplied by daisy chain
AC Line Measurement:	90 to 140 VAC, RMS, sine, 50/60 Hz
Power:	5 VDC, provided by the P-Bus
Environmental:	-40 C to 60 C, 0-95% Relative Humidity
Size:	2.7 x 3.2 inches (without mounting bracket)
Weight:	4 oz. (with mounting bracket)