

### **PRODUCT OVERVIEW**

The RM-iC series readers provide an enclosed RM-4 board and attached iCLASS read head, available in the following styles:

- *RM1-iC* - enclosed RM-4 and attached iCLASS read head
- *RM2-iC* - enclosed RM-4 with keypad and attached iCLASS read head
- *RM2L-iC* - enclosed RM-4 with keypad, LCD display, and attached iCLASS read head.

The *RM-iC Quick Start Installation Guide* provides a synopsis of installation and connection information for RM-iC series readers. Refer to the *Readers, Inputs, and Outputs (RIO) Guide* for in-depth technical and installation information.

### **Specifications**

The following specifications apply to all RM-iC series readers:

- Power: 12VDC, 300 mA
- Cable: Belden 9841
- Cable distance from iSTAR or apC: 4,000 ft.
- Temperature
  - ◆ Indoor: 32° F to 120° F (0° C to 49° C)
  - ◆ Outdoor: -31° F to 151° F (-35° C to 66° C)
- Qualified on 26-bit, 35-bit, 37-bit, and 32-bit MIFARE serial number formats.

### **NOTE**

UL has only evaluated the 26-bit HID card format for this unit.

### **Standards**

RM-iC series readers are Underwriters Laboratories Inc. (UL), Listed to Standard UL 294, Access Control System Units, Fifth Edition. RM-iC series readers must be wired in accordance with the National Electrical Code (ANSI/NFPA 70), local codes, and the authorities having jurisdiction.

**INSTALLATION** Installing an RM-iC series reader involves:

1. Installing the mount plate
2. Wiring the components
3. Connecting and grounding the cable shields on the reader bus
4. Setting the RM-4 (reader) address
5. Installing the ARM-1 relay board (optional)
6. Installing the heater kit. (optional)

**Installing the Mount Plate**

Figure 1 shows RM-iC standard housing, mount plate, and gasket. All RM-iC series readers conform to the same housing, mount plate, and gasket dimensions.

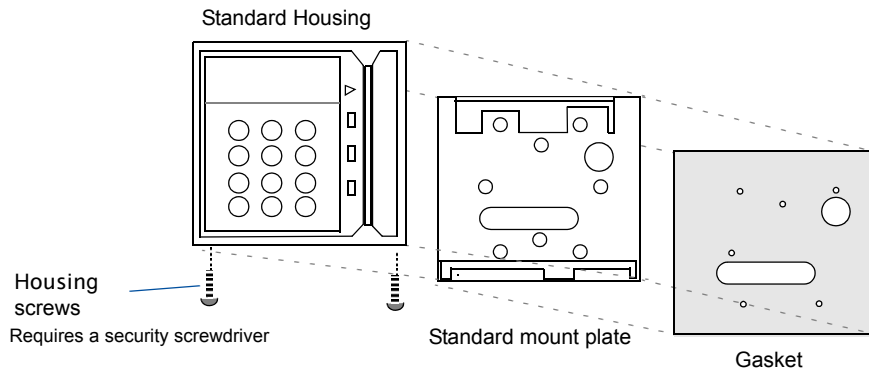


FIGURE 1. Standard Housing and Mount Plate

Figure 2 shows mount plate dimensions.

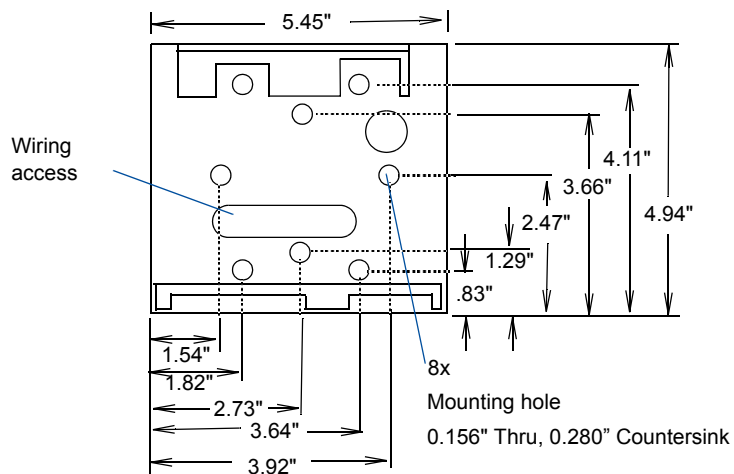


FIGURE 2. Mount Plate Dimensions



This device has been approved for outdoor use when properly installed with RM Heater Kit Installation (P.N. 130-915) and the supplied gasket material. Position the gasket with the RM plate so that the mounting holes are properly aligned. Ensure that the gasket is placed between the mounting surface and mating surface of the RM plate. Fasten the RM plate to the mounting surface with the gasket material in between. Install the gasket so that no gaps or wrinkles are present.

**Wiring the Inputs, Outputs, Reader Bus**

Figure 3 shows RM-4 P1 and P5 wiring.

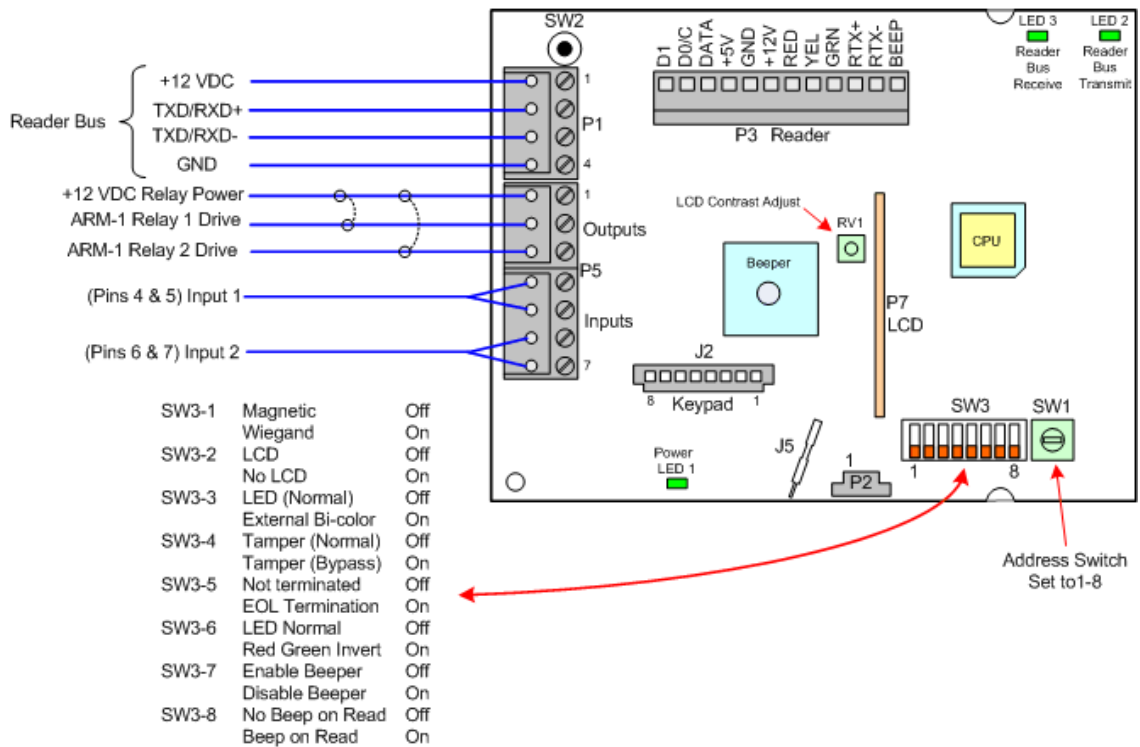


FIGURE 3. RM-4 Wiring Requirements

**Wiring the Reader** Figure 4 shows RM-4 P1 and P5 wiring.

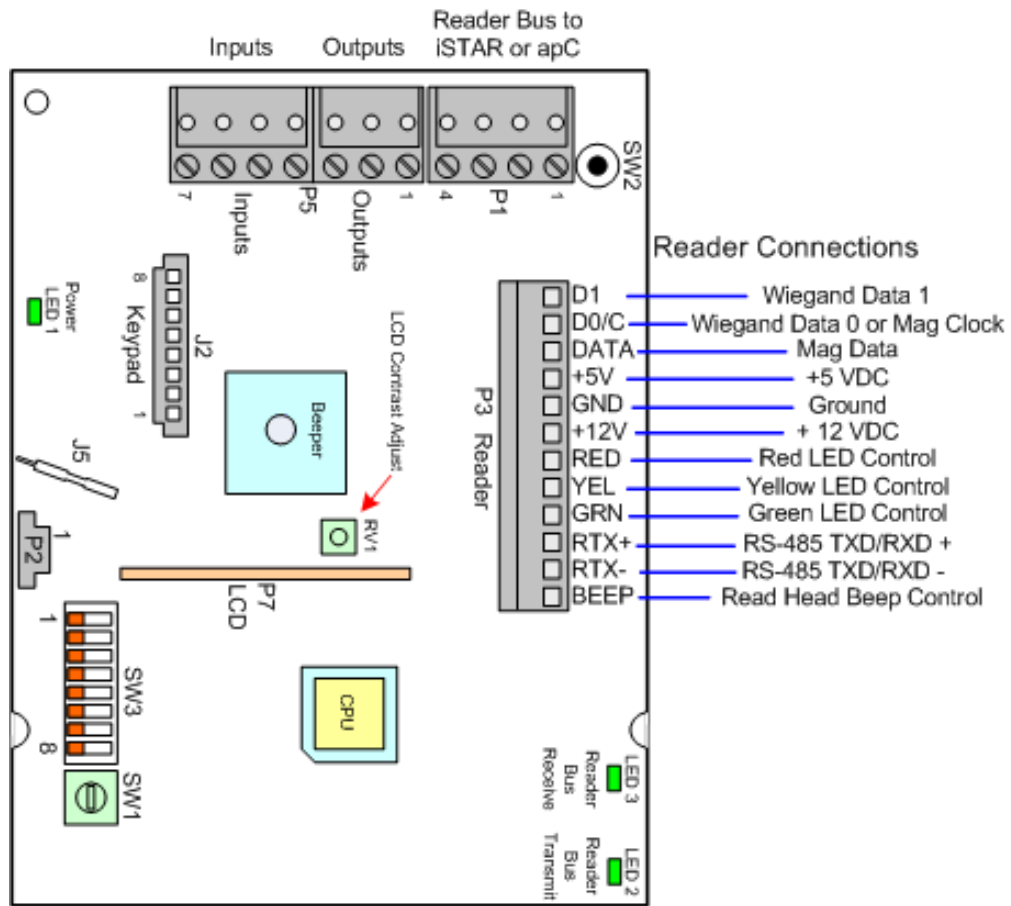


FIGURE 4. RM-4 Reader Wiring

**Grounding and Shielding**

When bus wiring more than one RM-iC reader (Figure 5):

1. Attach the shields along the bus together (insulate each connection). Snip off the shield wire at the end of the bus.
2. Attach the shield to the ground at only one point, the ground stud inside the cabinet adjacent to the knockout.
3. Attach a local earth ground (18 or 22 gauge) wire to the J5 component.

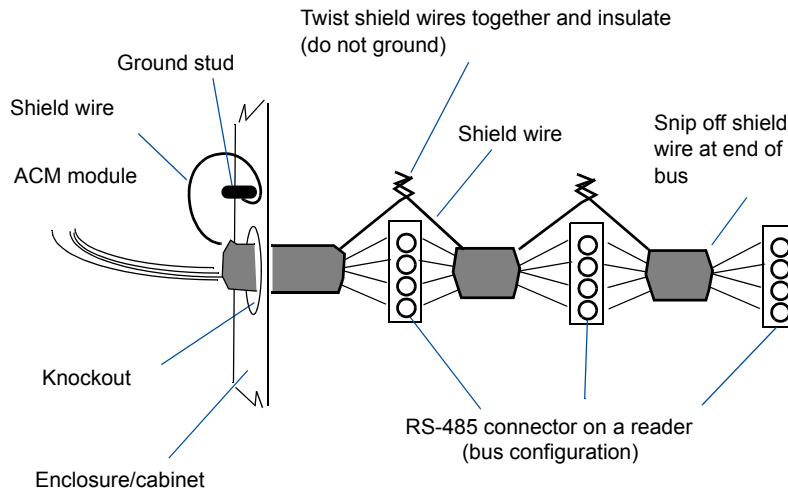


FIGURE 5. Reader Shield Wiring

**Setting Module Address and EOL Termination**

To set the module address, set SW1 (16 position rotary switch) to a number from one to eight. Every RM-iC series reader on a bus must have a unique address.

To set RS-485 EOL termination, set SW3-5 to the On (closed) position if the module is the last unit in the bus. If the module is not last, SW3-5 should be Off (open).

**Installing the ARM-1 Relay**

Two ARM-1 relay components can be connected to the RM-iC series reader through the P5 connector (Table 1).

- P5-1 is the common (+12 VDC) pin for either ARM-1.
- P5-2 is the output drive (GND) for the first relay.
- P5-3 is the output drive (GND) for the second relay.

TABLE 1. ARM-1 Wiring

Module	Wiring
ARM-1 Relay	P2-1 to RM P5-1, P2-2 to RM P5-2
ARM-2 Relay	P2-1 to RM P5-1, P2-2 to RM P5-3

**NOTE** The ARM-1 has not been evaluated by UL.

**Installing the Heater** RM-iC readers require a heater kit (Model 130-915) when installed outdoors in an environment and where temperatures may drop below 40° F (5° C).

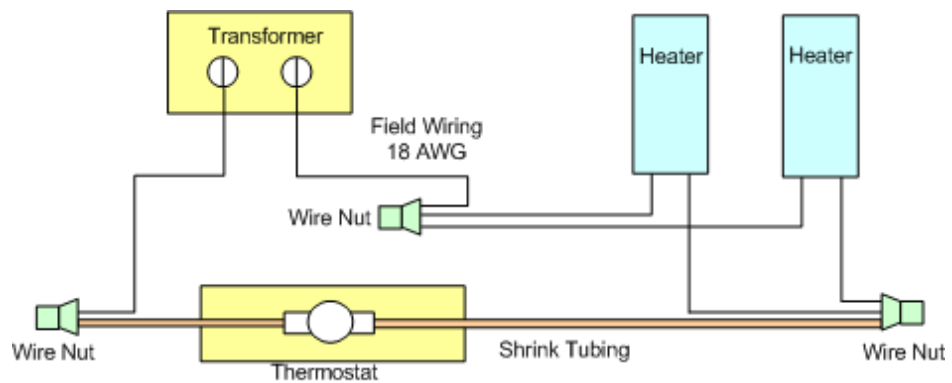
The Model 130-915 heater kit contains the following parts:

**TABLE 2.** Heater Parts

Quantity	Description
1	Transformer 12 VAC 40VA
2	Heater Strips
1	Thermostat (turns on at 40 ° F)
3	Wire nuts
2	6-32 x 1/4" screws to mount thermostat to RM plate.

Part # 130-915A is supplied without a transformer. A UL Listed Class 2 transformer rated output 12 VAC, 40 VA is required for proper installation.

Figure 6 shows RM/heater wiring.



Notes:

- 1.) Heater strips are connected in parallel as shown.
- 2.) Install thermostat and all wire nut connections inside the junction box, as close to the mounting place as possible, not in reader housing.

**FIGURE 6.** RM/Heater Wiring

Figure 7 shows RM installation

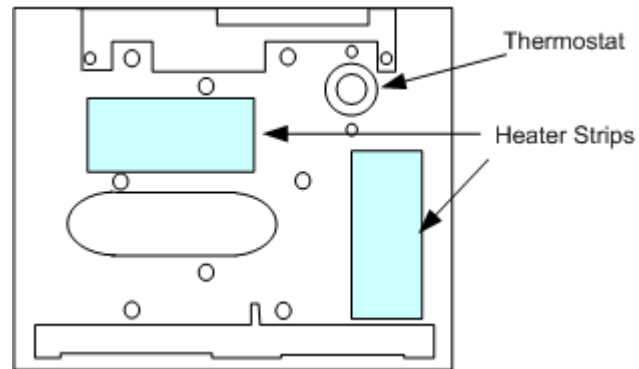


FIGURE 7. RM Installation

### Heater Strip Application



To avoid problems such as placing the strips too far away from the thermostat, not allowing the thermostat to shut off, or locating the strips too close to the PCB and causing component over-temperature concerns, follow mounting diagram and heater strip application instructions.

To apply the heater strip:

1. Clean the attachment surface of the back plate with a solvent such as alcohol (use all required precautions when handling solvents).
2. Carefully remove the release film from the adhesive.
3. Locate the heater on the clean surface of the back plate exactly as shown in Figure 6.
4. Gently roll in place to remove air bubbles.
5. Allow to remain for 72 hours before use, for maximum adhesion.

Air gaps or bubbles under the heater cause localized overheating and possible heater burnout. Also, application of adhesives at temperatures below 50° F is not recommended.

### Installing the Thermostat

To install the thermostat:

1. Fasten the thermostat to the RM plate with the body of the device facing the junction box and the face sitting flat against the RM plate surface.
2. With the back (or outside) surface facing up, align the thermostat such that the screw holes of the thermostat allow for the 6-32 x 1/4" screws to secure the device to the RM plate.

3. Use two (Quantity 2) 6-32 x 1/4" screws to mount the thermostat to the RM Plate. Tighten the screws allowing the thermostat to be sufficiently secured to the plate. Do not over tighten the screws.

## TESTING WITH APC OR ISTAR HARDWARE

To test an RM-iC series reader with an apC or iSTAR:

1. Measure the supply voltage to the RM-4.

The voltage can be measured between pin 1 (+12 VDC supply) and pin 4 (ground) on the P4 connector. The voltage must be +12 VDC (+/-5%).

2. Check the RM-iC reader address setting.

The RM-iC must be set to an unused address, between 1 and 8, when connected to the apC or iSTAR. Use rotary switch SW1 to set the reader address.

3. Check the RM-4 for communications to the apC or iSTAR. Observe LED2 and LED3.

4. Check the supervised inputs. Configure the inputs on the apC or iSTAR.

With no switches or resistors connected to the supervised input 1 and 2 lines, the C• CURE 800/8000 Monitoring Program should report inputs as "Open Loop". When you connect the 1,000-ohm resistor to the input terminals, the C• CURE 800/8000 Monitoring Program should report that the input as "Deactivated". Supervised inputs #1 is found at pins 4 and 5 of P5. Supervised input #2 is found at pins 6 and 7 of P5.

5. Check the outputs.

The outputs can be functionally tested by using the "momentary activate" feature in the C• CURE 800/8000 Monitoring Program. When the outputs are momentarily activated, the signal will change state for a few seconds. A 1,000 ohm resistor and an LED can be connected to the output to observe the functionality. Connect the resistor to pin 1 of P5 (+12VDC). Connect the anode of the LED to the resistor and connect the cathode to pin 2 of P5 for output #1 and to pin 3 of P5 for output #2.

6. Check the reader interface.

The reader interface can only be tested with the reader chosen for the installation. Reading a card will cause the display to show "Access Granted" or "Access Denied", depending upon the clearance of the card.



**TESTING READERS  
WITH  
iSTAR PRO  
HARDWARE**

To test an RM-iC series reader with iSTAR Pro, use the iSTAR Pro S4 switch, positions 5 through 8.

Table 3 shows S4 settings for Positions 5 through 8.

**TABLE 3.** S4 Diagnostic Settings

Switch Setting				Description
Position 5	Position 6	Position 7	Position 8	
Off	Off	Off	Off	Display status messages (ICU Block Off)
On	On	On	On	Display status messages (ICU Block On)
Off	Off	Off	On	Display card data
Off	On	Off	On	Display card data in fast mode
Off	Off (2 second LCD display) On (1 second LCD display)	On	Off	Test inputs
Off	Off	On	On	Manual output test (RMs and R/8s)
Off	On	Off	Off	Automatic ACM output test
Off	On	On	On	Automatic output test (including RMs and R/8s)
On	Off	Off	Off	Ethernet/PCMCIA port and device test
On	On	Off	Off	DIMM memory test
On	Off	Off	On	Battery charger test

## CANADIAN RADIO EMISSIONS REQUIREMENTS

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la class A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

## FCC DIGITAL DEVICE LIMITATIONS

### Radio and Television Interference

This equipment has been tested and found to comply with the limits for a digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and television reception.



**Caution:** Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.