GE Contactless Medium Read-Range Reader Model 260 Installation Guide

WARNING

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures.

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Introduction

The GE Contactless Medium Read-Range Card (Model 260) is the latest evolution in contactless reader 13.56 MHz technology, and features universal compatibility with all ISO 15693 and ISO 14443A badge credentials. The GE Model 260 reader combines simple, cost-effective installation with the end-user convenience of extended read range. The reader housing is a durable gray polycarbonate making the reader equally well-suited for interior and exterior security locations. The reader is easy to install on all types of conventional and metal wall surfaces, stanchions, and pedestal-mount configurations.

FIGURE 1: GE Contactless Medium Read-Range Reader (Model 260)

FIGURE 2: GE Model 260 Reader Backplate (includes tamper switch)

.12
(3.17)
REF.

0.50
(12.70)
REF.

KNOCKOUT AREA FOR MOUNTING
(4X)

11.44
(290.57)
REF.

8.62
(218.94)

METAL WALL
INSTALLATION SWITCH

TAMPER SWITCH
LOCATION

8.37
(212.59)

11.44
(290.57)
REF.

MICRO CABLE
CONNECTOR

530477002A
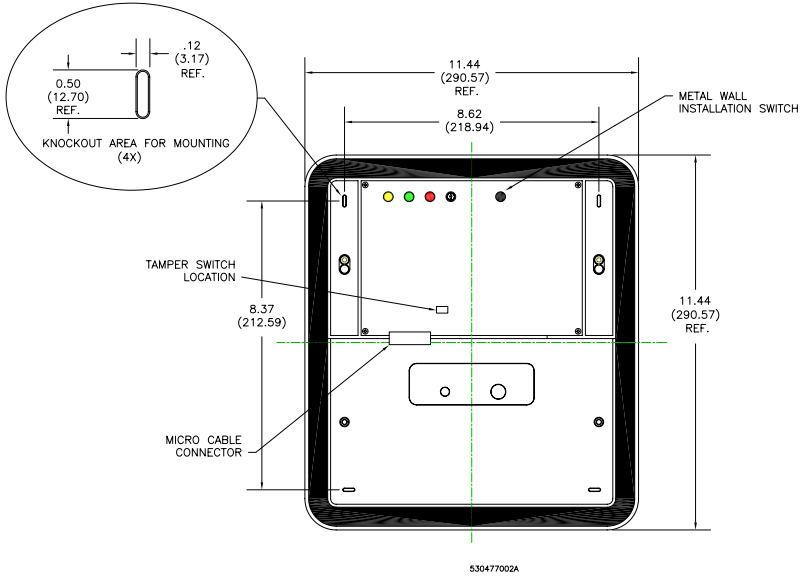
Product Overview

Features

- Exceptional read range of up to 14 inches (355.6 mm) for ISO 15693-compliant credentials. (Read range will vary with credential type and quality, as well as installation environment).

- Universal compatibility with all ISO 15693 and ISO 14443A credentials (badges, disc tags, and key fobs).

- Supervised four-state (open, closed, wire cut, and wire short) monitoring for door contacts and REX (request to exit) switches, and wiring.

- Electrical protection (reverse polarity diode protection on power lines).

- Data lines; high-speed transient voltage suppressor diodes

- Compatible with Micro/5 2RP and 8RP Reader Processor boards, Micro/PX-2000, and Micro/PXN-2000 controllers

- IP 65-rated sealed for deployment in both interior and exterior environments.

- Integrated reader tamper protection and microcontroller supervised data communications.

Access Control System Compatibility

The Model 260 badge reader outputs a 16-digit badge identification (BID) number. As a result, the Model 260 reader is compatible with Picture Perfect while microcontrollers on a Secure Perfect system must be field-configured for Model 260 compatibility.

Picture Perfect Edition Setup

Refer to **Access/Badge Formats** or to the Picture Perfect online help for assistance. A 16-digit BID format must be defined within Picture Perfect. Enter a suitable badge format description. Example: **16-digit BID** and define the format: **%16S**.

Secure Perfect Edition Setup

The Secure Perfect Edition access control system supports Badge IDs (BIDs) up to a maximum of 12-digits. Since a Model 260 reader will output a 16-digit BID number, the Secure Perfect microcontrollers must be specifically configured to receive the incoming 16-digit BID number, and convert it into the Secure Perfect-compatible 12-digit BID format.

To make a Secure Perfect 4.0 or higher system compatible with the GE Contactless Medium Read-Range Readers, do the following:

- Install Secure Perfect Edition, 4.0 or higher
- Load the **Secure Perfect Update CD** in the server CD drive
- Locate the Badge Formats folder
- In the Badge Formats folder, locate the **15693.REG** file
- Double-click the **15693.REG** to configure the Secure Perfect Edition system and microcontrollers for operation with GE Contactless Medium Read-Range Readers

Note: For earlier versions of Secure Perfect Editions, please contact CASI Sales Engineering for the **15693.REG** file.

This file configures the Secure Perfect Edition's system to communicate with the GE Contactless readers. To restore Secure Perfect Edition's system back to factory settings, install the **BADGE FORMATS.REG** file.

Mounting Considerations

FOR PROTECTION AGAINST ENVIRONMENTAL INTERFERENCE

Model 260 readers require care and consideration in the manner in which they are mounted. This includes consideration of the other equipment and structural elements that are mounted near the reader, whether visible or hidden. The following covers the major factors to consider.

Environmental Interference

There are three types of environmental interference:

1.   Electrical Noise (field wiring related)

2.   Field Blocking (conductive material in read field)

3.   Overlapping Fields (side-to-side & back-to-back installation)

FIGURE 3: GE Model 260 Reader Environmental Considerations

Sample Entranceway
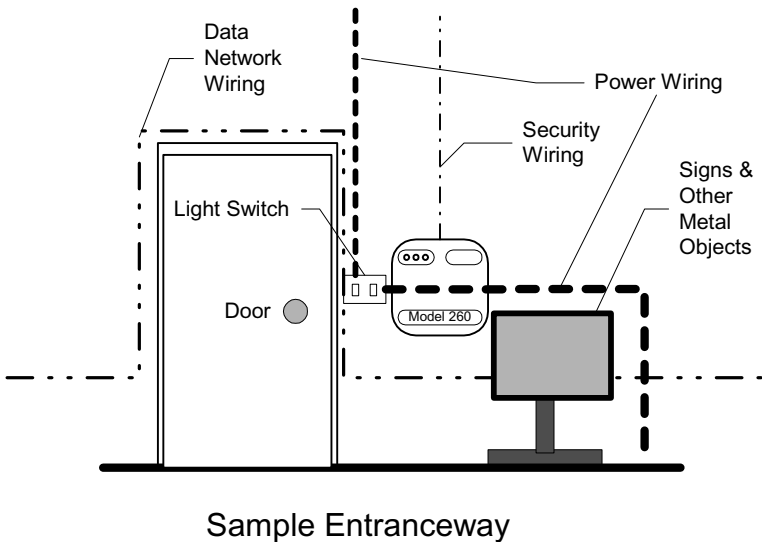
The reader may encounter a wide range of interference as shown in Figure 3, "GE Model 260 Reader Environmental Considerations," on page 5. Common causes include:

Power Wiring

Power wiring carries electrical noise that can interfere with the operation of the reader. This is more common with traditional 125 KHz proximity readers. However, this is a potential issue with the GE Model 260 reader, particularly if data noise is introduced by coupling from the reader's power wiring. Any power wire may inductively or capacitively couple noise into the reader data line.

Data Network Wiring

Data network wiring can generate noise, which may possibly be in the operating frequency range of the reader. This noise can interfere with reader-to-credential communication and reduce read range.

Security Wiring

While not normally a source of noise itself (although it can cause problems if bundled in a loop directly behind the reader), security wiring can inductively or capacitively couple to data or power wiring, and transfer noise to the reader.

Signs and Other Metal Objects

Signs and other metal objects within the read field of the reader can absorb or block reader-to-credential communication and reduce range.

Use shielded cable for reader communication. Reader installation considerations should avoid read field blocking and overlapping conditions.

Installation on Metal Surface

Mounting the GE Reader directly on a metal (or other electrical conducting surface) will reduce read range to approximately 9.45 inches (240 mm). For maximum read-range, ensure the metal wall installation switch is set to the "< 0.75 inch" position.

Another potential source of interference is mounting two or more readers in close proximity as shown in Figure 4.

FIGURE 4: Pole-Mounted Readers
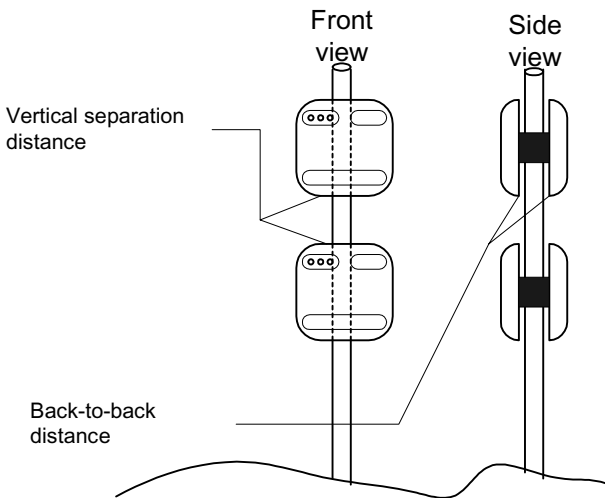
The following problems may occur when mounting multiple GE Model 260 readers in close proximity:

- The signal energy from one reader may interfere with the read range of the other.
- Overlapping read fields can cause a single credential to be read simultaneously by two or more readers.

To ensure proper operation and optimal read range, take the following precautions:

1. Mount all readers before tuning any of the readers.

2. Ensure that the back-to-back distance is at least 3.28 feet (one meter).

   Note: If a metal plate is installed between the two readers, the back-to-back distance restriction may be ignored. However, read range will be reduced to approximately 9.45 inches (240 mm).

   Note 2: Reduced credential read range and the simultaneous read of a credential by both readers may result if the readers are installed less than 19.68 inches (500 mm) apart.

3. Ensure that the vertical separation distance is at least 19.68 inches (500 mm). A more narrow vertical separation gap may be used if the simultaneous read of a credential by two or more readers is acceptable.

FIGURE 5: Parking Entrance/Exit Application A
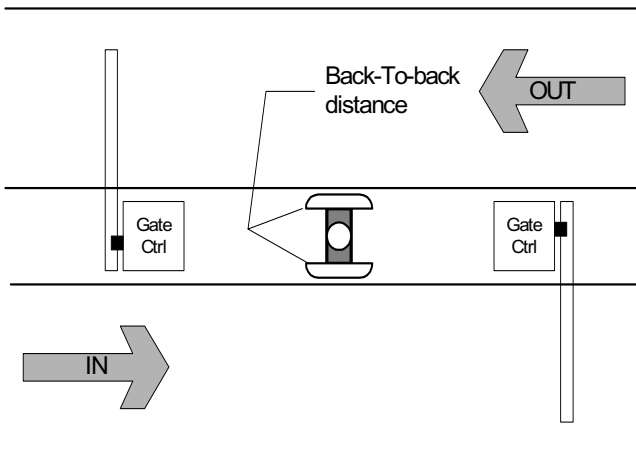
A common use for the GE Model 260 is parking lot applications. However, the parking lot application presents opportunities for all of the interference types as described earlier.

FIGURE 6: Parking Entrance/Exit Application B

Reader-Control
Gap

OUT

Gate
Ctrl

Readers

Gate
Ctrl

IN
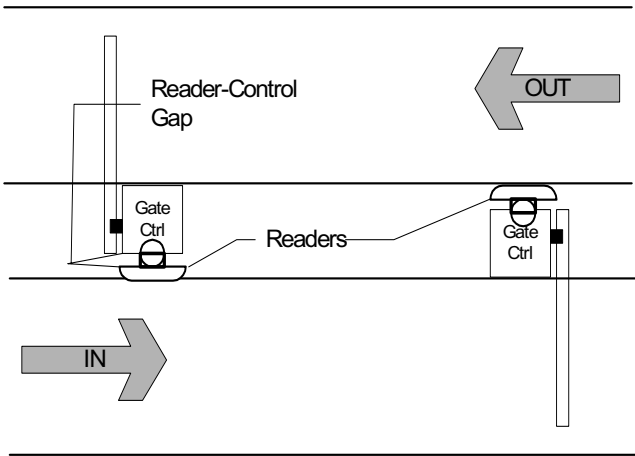
In Application A, the back-to-back and (if used) vertical gap guidelines above must be observed. Remember to mount all readers (and all other structures) before tuning the reader.

In Application B, successful installation requires close attention to electrical noise from the gate control mechanism (and its associated wiring) that may cause reader-to-reader signal interference.

Reader/sign
distance

OUT

Gate
Ctrl

Gate
Ctrl

Readers

Metal sign

IN

Signs and other metal objects, including hidden wiring may interfere with the reader's read field.
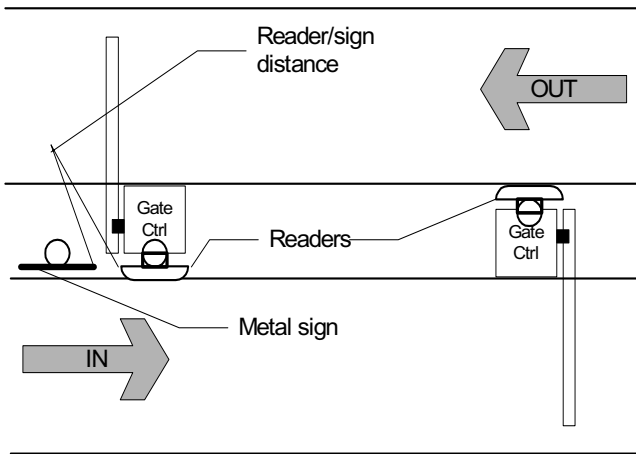
Metal signs are common items in both indoor and outdoor installations. The signs may be free standing (see Figure 3, "GE Model 260 Reader Environmental Considerations," on page 5) or fixed in position (see Figure 7, "Parking Entrance Exit and Metal Sign Applications," on page 10.)

To ensure optimal read-range performance, ensure all metal signs and other conductive objects are placed at a distance that is at least:

• 19.68 inches (500 mm) from the front of the reader.

• 5.91 inches (150 mm) from the back of the reader.

• 3.94 inches (100 mm) from the side of the reader.

Installation

FIGURE 8: Model 260 Reader Backplate and Cover

11.44
(290.57)

1.00
(25.40)

11.44
(290.57)

11.75
(298.45)

0.73
(18.54)

1.16
(29.46)
WHEN ASSEMBLED

1.10
(27.94)

11.75
(298.45)

( ) = MM

530477001A
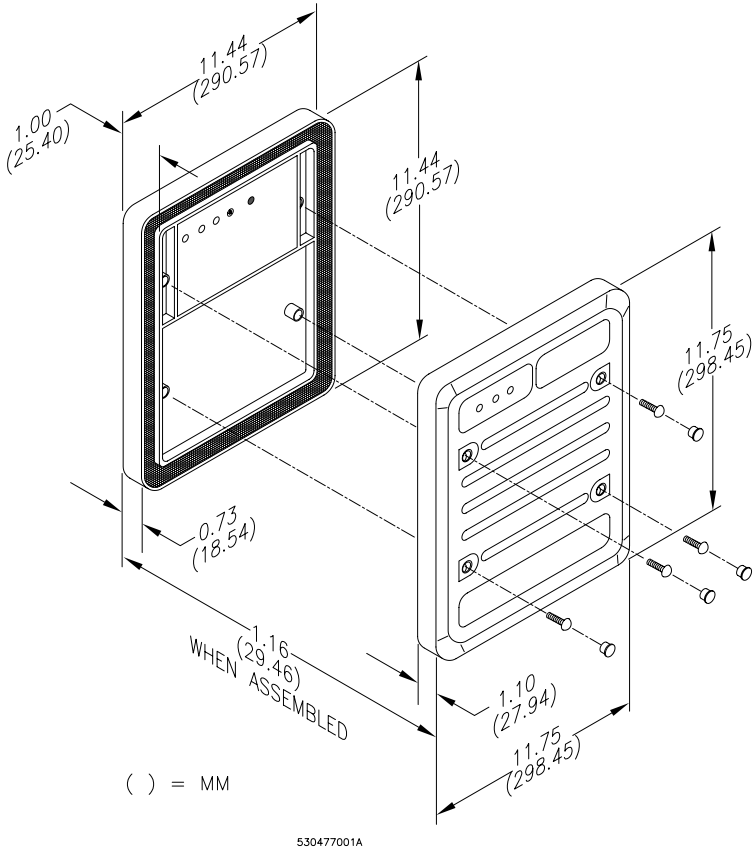
The cover is secured with four supplied screws (screw hole plugs included).

Installation: Model 260 on Metal

The GE Model 260 reader can be field-tuned to accommodate installation on or near metal surfaces. To accomplish this, perform the following steps:

1. Remove the front cover.

2. Mount reader back-plate assembly.

3. Terminate the communications cable at the microcontroller using the wiring diagram in Figure 9, "GE Model 260 Reader Wiring Diagram to Micro/5 8RP," on page 16 or Figure 11, "GE Model 260 Reader to 2RP," on page 18.

4. Terminate the communications cable at the reader using the wiring diagrams in Figure 10, Figure 11, Figure 12, or Figure 13.

5. Wall-type selection switch. Set the two-position slide switch to match the wall surface.

6. Connect the communications cable to power up the reader. **IMPORTANT**: Within three seconds, you must press the Tune button or the reader will go into tamper operation (red LED flashes). You will be unable to tune the reader in this condition. If this occurs, remove, then reconnect the communications cable.

7. Press the Tune button and release when the reader beeps.

8. Tune the Trim POT until the green LED flashes.

    • If the yellow LED flashes, turn **RIGHT**.
    • If the red LED flashes, turn **LEFT**.

    Note: The green LED flashes for approximately six minutes. You can stop the flashing by pressing the Tune button. The yellow LED will be on. The reader will shift into reader-tamper operation (red LED flashes).

9. Install the reader cover.

10. The red LED will stop flashing after approximately 30 seconds.

The Model 260 is now tuned and set for optimal read-range for its environment.

If new metal components are introduced into the read-range field, you may need to re-tune the reader. Follow the tuning process steps above.

Micro Selection

- Micro⁄5 for 2RP and 8RP installation instructions: refer to the *Micro/5 Installation Guide.*

IMPORTANT: DO NOT use the Model 260 Reader with a Micro/5 2SRP reader processor.

- Micro⁄PX-2000 and Micro⁄PXN-2000 controllers: refer to the *Micro/ PX-2000* and *Micro/PXN-2000 Installation Guide.*

- Micro⁄Reader-Junction Box: refer to the point-to-point wiring diagrams in this manual.

Reader-to-Micro Wiring Distance

Table 1: Model 260 Current and Cable Distance

Cable Distance					
Supply Voltage	**12 VDC**		**13.6 VDC**		**24 VDC**	
Current	18 AWG	22 AWG	18 AWG	22 AWG	18 AWG	22 AWG
Distance					
230 mA @12 VDC	928 ft. (283 m)	390 ft. (119 m)	1,423 ft. (434 m)	597 ft. (182 m)	4,649 ft. (1,417 m)	1,949 ft. (594 m)

Wiring

Table 2: Reader 12-Position Field Wiring Connector

Pin	Definition
1	Micro control, reader beeper (option)
2	Ground
3	8 VDC to 30 VDC
4	Door contact
5	Reader Data 1
6	Exit request (REX)
7	Green LED
8	Micro control, red LED (option)
9	Reserved for future use
10	Reserved for future use
11	Reserved for future use
12	Reserved for future use

Installation Notes (unless otherwise specified).

All numbered items below are referenced on the appropriate wiring diagrams that follow.

1. Fuse, power supply, door strike, protection device, and relay are provided by the installer.

2. The 470 included Ω ½-watt resistor, must be installed at the Micro/5 2RP terminal block. The Micro PX-2000/PXN-2000 and Micro/5 2RP and 8RP boards do not require this resistor.

3. Shielded cable is recommended in electrically noisy environments.

4. If using shielded cable: **At the reader end**: connect all shields together and insulate them. **At the Micro end**: connect the shield to the micro cabinet as indicated in the appropriate Micro Installation Manual.

5. If using a local power supply, do not connect the power (8-30 VDC) line from the microcontroller to the reader. The ground line of the power supply must be connected to the micro (pin 2 on the reader connector).

6. J3 is typically not used in this installation. See Figure 13, "GE Model 260 Reader to Micro/Reader Junction Box and Microcontroller," on page 22.

7. Blocking diodes may be 1N4148 or equivalent (installer supplied) and located in a secure area.

8. Protection diodes may be 1N4002, 1N4003, or 1N4004 (installer supplied) for the door strike assembly.

9. Install two 1k Ω ¼-watt resistors (installer-supplied) at Door DI and Exit DI, as shown.

10. Connect a protection device across the door strike.

    AC Door Strikes: Connect an MOV (metal oxide varistor) across the door strike. (Included with Micro/5 2RP, 8RP, and PX(N)-2000).
    DC Door Strikes: Connect a diode across the door strike (cathode to positive side of door strike). (Included with Micro/5 2RP, 8RP, and PX(N)-2000).

11. Relay Coil Current Restriction (Micro/5 2RP with external relay).

    The relay coil current must be limited to 40 mA to prevent damage to the board. Verify that the relay coil requires less than 40 mA.
    12 VDC relay: coil resistance must be greater than 300 Ω.

   The Micro/5 2RP with internal or AUX DO relay current through the relay contacts must be limited to less than 2 A to prevent damage to the 2RP. Current limiting may be achieved by using either a current-limiting power supply or by wiring in an external fuse.

12. Connect protection diode across relay coil. Connect a diode across the relay coil (cathode to positive side of relay coil).

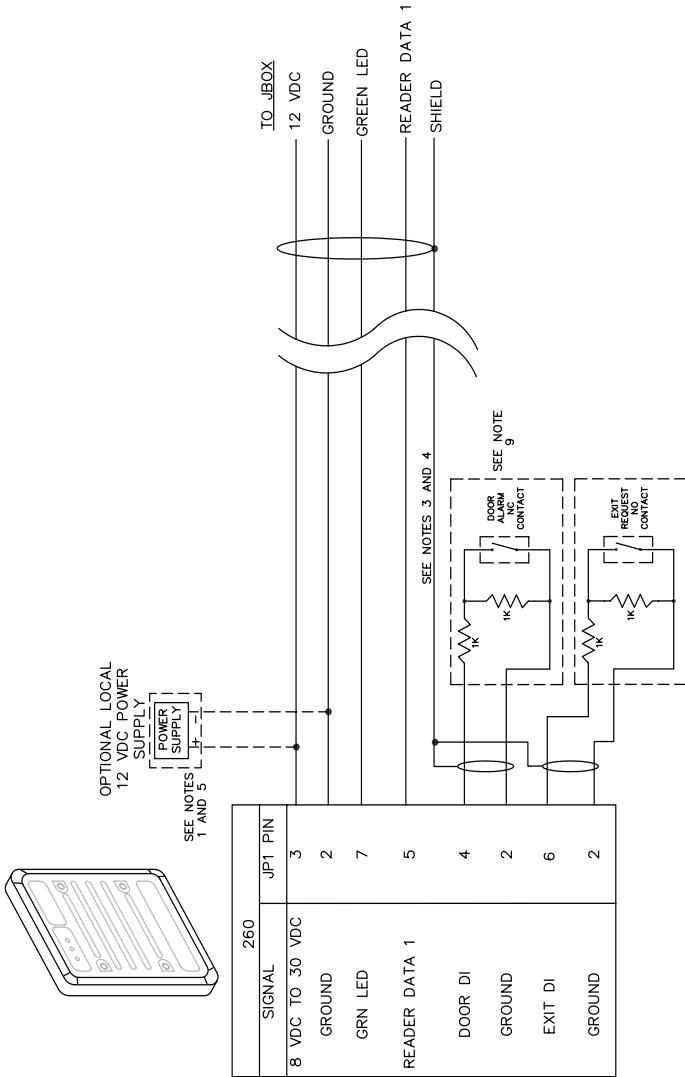**General note**: Pair wires as shown in all wiring diagrams.

Point-to-Point Wiring Diagrams

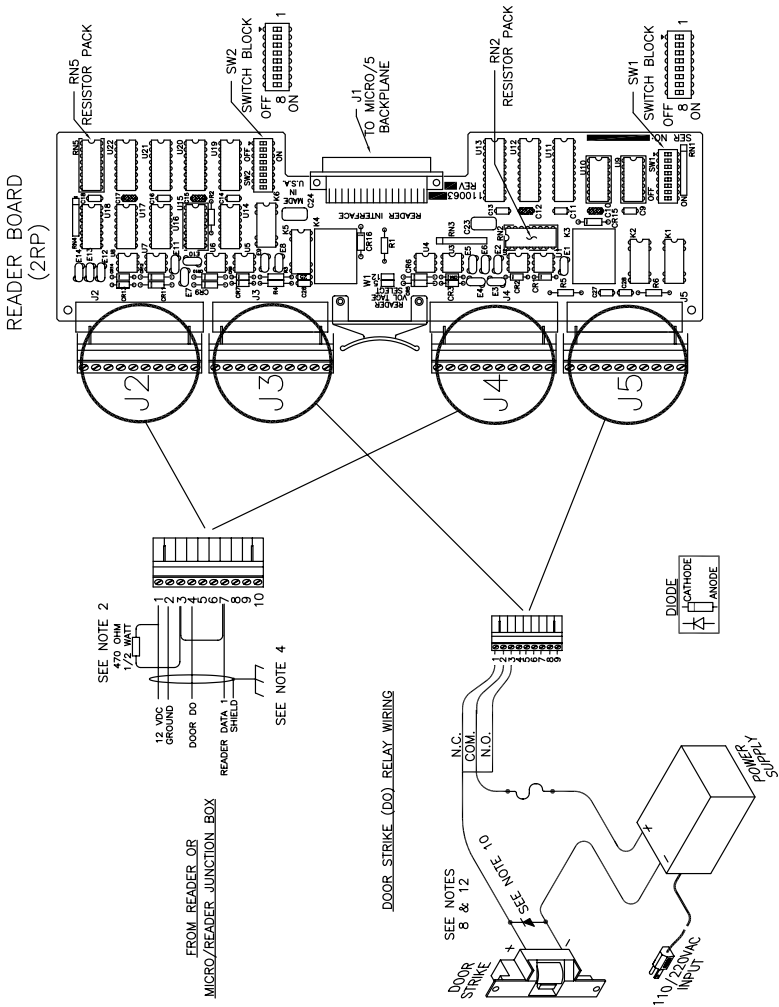## FIGURE 9: GE Model 260 Reader Wiring Diagram to Micro/5 8RP
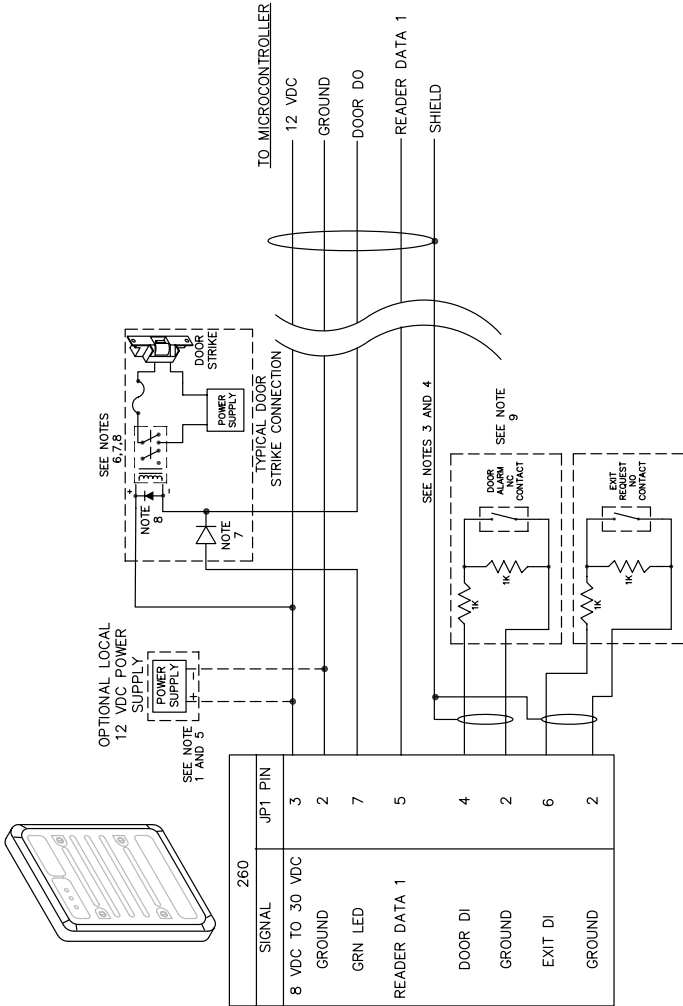
FIGURE 10: GE Model 260 Reader Wiring Diagram to J-Box

Table 3: 2RP Reader Switch Settings

Reader Technology and Format	SW-1	SW-2	SW-3	SW-4
Supervised F/2F	ON	OFF	ON	OFF

Table 4: Reader Board 2RP Address Settings

Reader Board	SW 1				SW 2			
	5	6	7	8	1	2	3	4
1	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
3	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
4	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON

Note: Switches SW2-5, 6, 7, and 8 are not used.

<u>Jumper W1</u>   **<u>RN2 and RN5 (labeling)</u>**
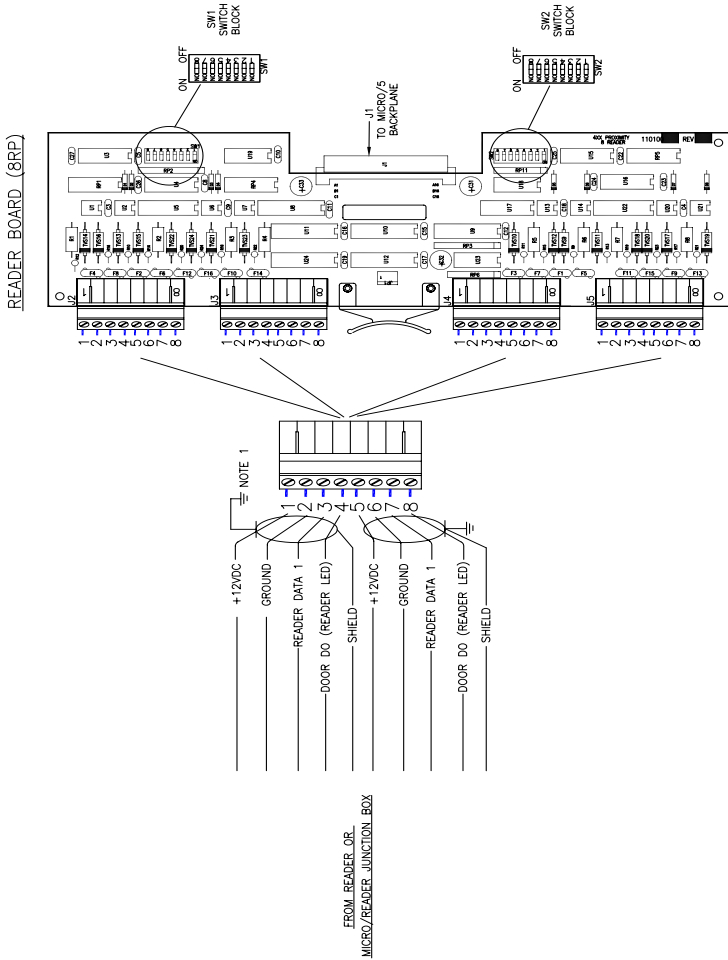
Set to 12 V   Use 2k Ω (202) resistor packs

5304750004A

Table 5: 8RP Reader Technology and Format

Reader Technology and Format	SW1-1	SW1-2	SW1-3	SW1-4
Supervised F/2F	ON	OFF	ON	OFF

Table 6: 8RP Board Address Settings

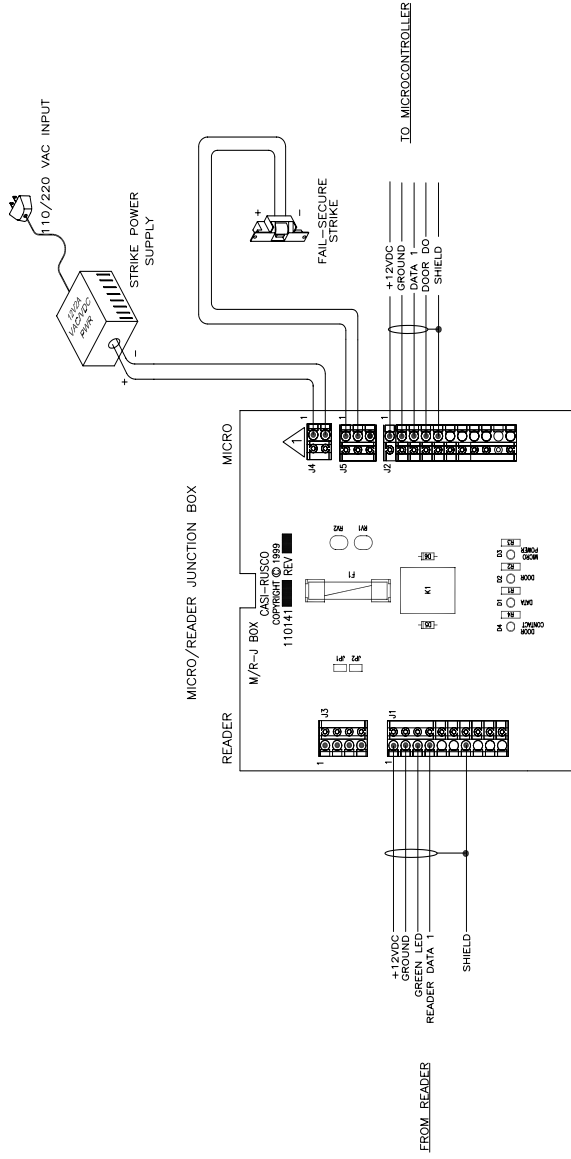| Board Type	SW 1			
	5	6	7	8
Standard	ON	ON	ON	OFF
Board 1[a]	Does not apply.		OFF	ON
Board 2[b]			OFF	ON

a. Readers 1 - 8.
b. Readers 9 - 16.

Note: the 8RP Reader appears to the Microcontroller as four 2RP boards.

Board Type	SW 2							
	1	2	3	4	5	6	7	8
Standard	OFF	OFF	ON	ON	ON	OFF	ON	OFF
Board 1[a]	ON	OFF	ON	OFF	ON	OFF	ON	OFF
Board 2[b]	ON	ON	OFF	OFF	OFF	ON	OFF	ON

a. Readers 1 - 8.
b. Readers 9 - 16

Troubleshooting

If the operation of a component is in doubt, substitute a known-good component and retry the system. Always verify wiring against the provided wiring information before powering up the reader.

Table 7: Error Conditions and Possible Solutions

Condition	Possible Solutions
None of the LEDs are on.	Present a known-good ISO 15693 or ISO 14443A type card to the reader while listening for the beeper. If the beeper sounds, the reader is faulty and should be replaced. If the beeper does not sound, check the following: • Power connections to the reader • Reader supply voltage at connector JP1 pin 3 and that the ground connection JP1 pin 2 is secure
The green LED is always on. The green LED indicates that the door strike is open. It is controlled by the input on connector JP1 pin 7.	Disconnect the wire on JP1 pin 7. If the green LED stays on, the reader is faulty and should be replaced. If the green LED goes off, then the problem is most likely not in the reader. Reconnect the wire on JP1 pin 7 and measure the voltage at JP1 pin 7. A low voltage (0 to 2 VDC) turns on the green LED. If the voltage is low, there are two possibilities: • A short to ground in the wiring between the reader and microcontroller, or • The host system may be energizing the door strike
The door does not open and the green LED does not light when an ISO 15693 or ISO 14443A card is presented.	Verify that the door strike and the green LED are wired correctly. Verify that the access card has been entered and that the reader has been properly configured in the host system.

Condition	Possible Solutions
The green LED does not light, but the door strike unlocks the door when a valid ISO 15693 or ISO 14443A card is presented.	Verify that the door strike is wired correctly. Refer to the appropriate wiring diagram. Disconnect the wire from JP1 pin 7 (green LED) and connect JP1 pin 7 to JP1 pin 2 (ground). If the green LED is now on, the reader is good and the connection to the reader is defective. If the green LED does not light, replace the reader.
Green LED lights but the door does not open.	Verify correct door strike wiring and operation. The reader is functioning. If not, check that the blocking diode is functioning. If it is not, replace it.
Reader sounds a short triple beep every 30 seconds and the red LED flashes slowly (every 2 seconds).	The reader has lost communication with the microcontroller. Check the reader-to-microcontroller wiring, in particular, the terminations for Reader Data 1. Refer to the appropriate wiring diagram. Verify that the 2RP AUX DO is jumpered to the reader data 1 on the microcontroller. Jumper between 2RP JP2 and JP4, pins 3 and 7. Verify that the correct pull-up resistor is installed on the microcontroller (470 Ω ½-watt, 2RP JP2 and JP4, pins 1 and 3). Verify that the microcontroller has the correct firmware. Refer to the manual that came with your microcontroller for instructions. Try the reader on a different reader input port at the microcontroller. If this corrects the problem, the operational status of the original port is suspect. Replace the reader with one you know is working correctly. If this corrects the problem, then the reader is probably faulty and should be replaced. If none of the above steps have identified the problem, there may be a significant noise source present in the installation which is interfering with the reader-to-microcontroller communications. If this is the case, use shielded wire for reader-to-microcontroller connections.

Condition	Possible Solutions
The reader sounds a short triple beep every 30 seconds and the red LED flashes quickly (every 400 ms).	Indicates a tamper violation. Ensure the reader is properly attached to its backplate. The red LED will continue to blink for 30 seconds. The reader is ready for use when the yellow LED is steadily on.
The reader sounds a short triple beep every 5 seconds and the red LED also flashes every 5 seconds.	Check that the 4-state supervised switches are connected with two 1K Ω resistors to the door contact and the exit request inputs or, if the inputs are not used, that resistors are installed at the reader connector: DI: Pins 2 and 4, 1K Ω REX: Pins 2 and 6, 2K Ω A 470 Ω ½-watt pull-up resistor is required between 12 VDC and Reader Data 1 on the Micro/5 2RP (only).

Technical Specifications

- Cable: Belden (shielded) 8777, 9873, 9773
- Agency Certifications: FCC Part 15; CE Mark, and UL 294 (pending)
- Color: Gray
- Dimensions with backplate (HWD): 11.75" x 11.75" x 1.16" (298.45 x 298.45 x 29.46 mm)
- Environmental: Interior or Exterior
- Humidity Range: 0 to 95%, non-condensing
- Input Voltage Range: 8 to 30 VDC
- Index of Protection: IP 65 (IEC 529)
- Microcontroller Communications: F/2F supervised door input, REX, and reader communication/power monitoring
- Minimum Wiring: 4 conductors
- Operating Temperature/Range: -20 to 158° F (-29 to 70° C)
- Read Range:
    - 14 in. (355,6 mm) maximum for ISO 15693
    - 7 in. (177.8 mm) maximum for ISO 14443A
- Weight: 2.35 lbs. (1.06 kg)

Table 8: Current and Cable Distance

Cable Distance						
Supply Voltage	**12 VDC**		**13.6 VDC**		**24 VDC**	
Current	18 AWG	22 AWG	18 AWG	22 AWG	18 AWG	22 AWG
Distance						
230 mA @12 VDC	928 ft. (283 m)	390 ft. (119 m)	1,423 ft. (434 m)	597 ft. (182 m)	4,649 ft. (1,417 m)	1,949 ft. (594 m)

Table 9: Functional Specifications

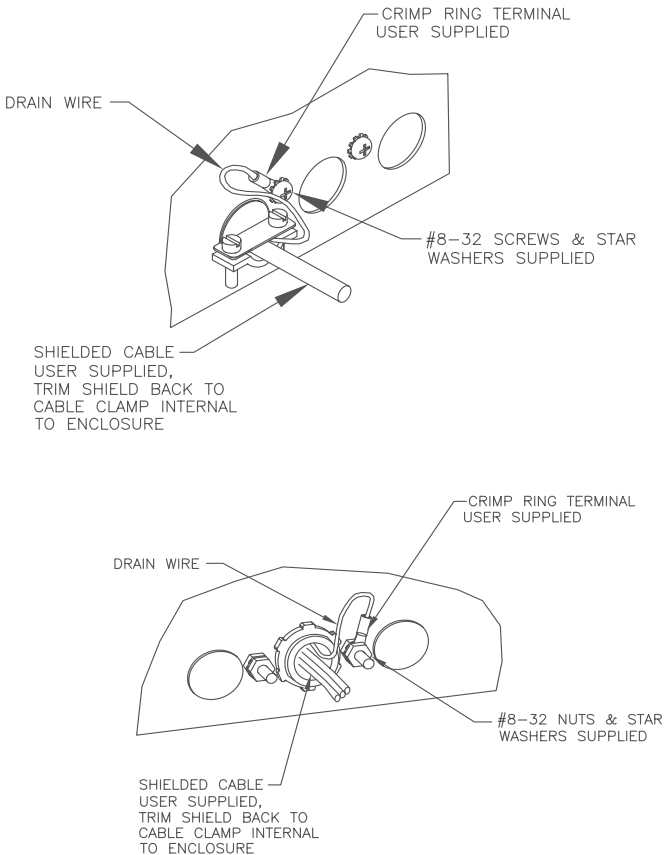| International Standards	ISO 15693 and ISO 14443A
Microcontroller compatibility	• Micro/5-PX and Micro/5-PXN with 2RP and 8RP processor boards (incompatible with M/5 and 2SRP board configurations) • Micro/PX-2000 and Micro/PXN-2000
Status Indicators	Red, Yellow, and Green LEDs and Beeper

Regulatory Notices

FCC

Changes or modifications not expressly approved by GE-Interlogix for compliance could void the user's authority to operate the equipment.

FCC and CE Compliance.

Shield grounds must be stripped back through the knockout hole (strain relief) and grounded to the external ground stud provided on the microcontroller.

FIGURE 14: Stripping of Shield Grounds

CRIMP RING TERMINAL USER SUPPLIED

DRAIN WIRE

#8-32 SCREWS & STAR WASHERS SUPPLIED

SHIELDED CABLE USER SUPPLIED, TRIM SHIELD BACK TO CABLE CLAMP INTERNAL TO ENCLOSURE

CRIMP RING TERMINAL USER SUPPLIED

DRAIN WIRE

#8-32 NUTS & STAR WASHERS SUPPLIED

SHIELDED CABLE USER SUPPLIED, TRIM SHIELD BACK TO CABLE CLAMP INTERNAL TO ENCLOSURE

530065012A

CE Manufacturers Declaration of Conformity

$C\epsilon$

Manufacturer's Name:	**CASI-RUSCO**
Manufacturer's Address:	**791 Park of Commerce Boulevard, Suite 100 Boca Raton, FL USA 33487**
EU Representative:	**Interlogix Europe & Africa Excelsiorlaan 28 B- 1930 Zaventum Belgium**
Product Identification:	**Product: GE Interlogix-CASI Medium Read-Range Reader Model Number: 260 Brand: CASI**
Means of Conformity:	• Hereby, CASI-RUSCO, declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. • Hierbij verklaart CASI-RUSCO dat het apparoat in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG. • Par la présente CASI-RUSCO déclare que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE. • Hiermit erklärt CASI-RUSCO, dass sich diese Ausrüstung in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet". (BMWi)
Notices:	Approved for use in the following countries: A GR N B H PL CZ IS P DK IRL E FIN I S F LU CH D NL GB