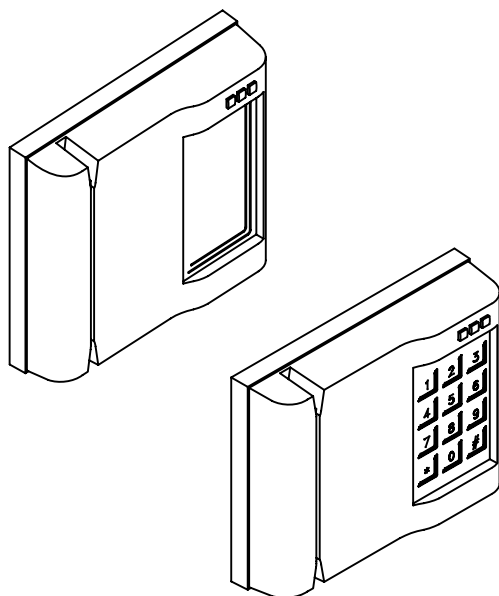


Model 1000/1010 Dual Tech
Proximity/Magnetic Stripe Reader
Installation Manual



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Regulatory



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Introduction

The Dual Tech reader combines proximity reader technology and magstripe reader technology. The Model 1000 and 1010 readers are identical in their functionality, except that the Model 1010 includes an integrated keypad used for the entry of a personal identification number (PIN).

There have been five editions of the GE Model 1000/1010 Dual Tech (Prox/Magstripe) reader. The version of the reader can be identified by the number of stripes on the face-plate of the reader.

- First edition 2 stripes
- Second edition 3 stripes
- Third edition 1 stripe
- Fourth edition 0 stripes, labeled Model 1000
- Fifth edition 2 stripes with GE logo

This document provides instructions for the fifth edition of the Dual Tech reader.

Safety

Radio interference



WARNING: This is an FCC 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.

Electrostatic discharge (ESD) precaution



WARNING: Circuit board components are vulnerable to damage by electrostatic discharge (ESD). ESD can cause immediate or subtle damage to sensitive electronic parts. An electrostatic charge can build up on the human body and then discharge when you touch a board. A discharge can be produced when walking across a carpet and touching a board, for example. Before handling any board, make sure you dissipate your body's charge by touching ground. This discharges any static electricity build-up.

Product features

The GE Model 1000/1010 readers offer:

- The ability to read ProxLite, ISO ProxLite, and Entreé proximity badges and ProxLite keytags and ABA track 2 formatted magnetic stripe cards of up to 20 numeric digits.
- Power-on self test.
- “Hot swap” support allowing a reader to be connected or disconnected without powering down the micro.
- Built-in tamper switch for detecting cover or off-the-wall tamper conditions.
- Switch-selectable supervised or unsupervised micro communication.
- Switch-selectable door status and exit request (REX) switch supervision.
- Switch-selectable 40-bit Wiegand 4001 or 4002 format output.
- Switch-selectable 12-digit or IBM® 10-digit badge ID output.
- A door strike relay for AC or DC operation, jumper-selectable normally open or normally closed contacts.
- A keypad (Model 1010) for personal identification number (PIN) entry.
- Weather resistant for outdoor use. See *“Mounting the reader” on page 7*.
- Rugged polycarbonate housing.
- 12 to 48 VDC operation.
- LED and beeper user interface.
- Compatible replacement for the IBM Model 5029 reader.

System requirements

For UL compliant installation notes, refer to *“UL listed installations” on page 33.*

Host software	<ul style="list-style-type: none">Secure Perfect® Edition 3.0 or laterPicture Perfect™ 1.7 or later
Microcontrollers	<ul style="list-style-type: none">Micro/2 (Picture Perfect only)Micro/4 (Picture Perfect only)Micro/5-PX with 2RP or 8RPMicro/5-PXN with 2RP or 8RPM5PXNplus with 2RP or 8RPMicro/PX-2000Micro/PXN-2000M2000PXNplusM3000PXNplus with 2RP or 8RP
Micro firmware	For Micro/5-PX, Micro/5-PXN, Micro/PX-2000 and Micro/PXN-2000: <ul style="list-style-type: none">Secure Perfect: 3.1.0.6 or laterPicture Perfect: 1.7.0 or later
Badge and keytag formats	<ul style="list-style-type: none">Magstripe: ABA Track 2 (up to 20 digits)GE Proximity <p>Note: Proximity Perfect credentials, which were discontinued in 2001, are not supported.</p>

Technical specifications

For UL compliant installation notes, refer to *"UL" on page 33*.

Operating temperature range	without heater kit: +33 F (+1 C) to +150 F (+66 C) with heater kit: -31 F (-35 C) to +150 F (+66 C)
Relative humidity	5% to 95% (non-condensing)
Physical dimensions (HxWxD)	4.75" (121 mm) x 6.00" (152 mm) x 1.63" (42 mm)
Index of protection	IP34
Input voltage range	12 to 48 volts +/- 5% measured at the reader
Reader power consumption	65mA @ 12VDC nominal (90mA with relay/LED active) 40mA @ 48VDC nominal (50mA with relay/LED active) Max: 105mA @ 15VDC nominal (with relay/LED active)
Heater kit power consumption	400 mA @ 24 VAC
Cable specifications	Belden 8725 or equivalent, 20 AWG minimum, shielded pairs
Maximum cabling distance	3000 ft (914 m) @ 12 VDC with 20 AWG cable 5000 ft (1524 m) @ 12 VDC with 20 AWG cable and local power 3000 ft (914 m) @ 48 VDC with 20 AWG cable 5280 ft (1609 m) @ 48 VDC with 18 AWG cable
Door strike relay	1.0 A @ 30 VDC maximum
Read range	ProxLite: up to 6 inches. ISO ProxLite: up to 5 inches ProxLite Keytag: up to 2 inches Entrée: up to 5 inches
Magnetic stripe	ABA Track 2 formatted cards up to 20 digits
Agency approvals	CE UL 294 FCC Class A part 15

Parts list

- Model 1000 reader
- Model 1010 reader
- Optional 1000/1010 to 5029 mounting plate
- Optional housing, surface mount
- Optional tool, 1/8 inch hex tamper key
- Optional 1000/1010 cold weather kit

Refer to the GE product catalog for part numbers and ordering information.

Installation overview

The following steps are general instructions for installing the 1000/1010 reader. Each step is explained in further detail in the sections that follow.

1. Mount the reader backplate.
Refer to “Mounting the reader” on page 7.
2. Configure the reader.
Refer to “Configuring the reader” on page 16.
3. Connect the reader.
Refer to “Connecting the reader” on page 21.
4. Test the reader.
Refer to “Testing the reader” on page 30.

Mounting the reader

The reader comes with a backplate suitable for mounting directly onto a standard dual-gang U.S. electrical box. For other mounting applications, see [Figure 2](#) through [Figure 7](#).

If mounting outdoors, a 1/8" (3.175 mm) foam gasket (installer supplied) is highly recommended. Ensure that adequate cutouts are provided for the connectors and tamper spring. For installations where below freezing temperatures are anticipated, order and install the optional Cold Weather Kit. Please refer to your product catalog for the Cold Weather Kit part number.

If readers are to be mounted side-by-side, their centers should be offset by at least 10 inches to provide interference-free operation.

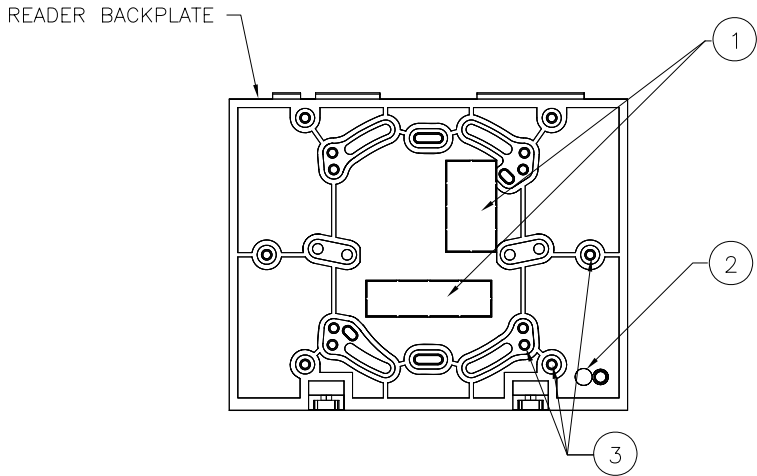
Prepare the reader backplate

The plastic backplate on the Model 1000/1010 Dual Tech reader, can be adapted for field wiring termination to an 11-pin Phoenix connector or a 9-pin D-subminiature connector (DB9).

Unscrew the backplate from the reader assembly and place it on a flat surface. Use a utility knife to remove the appropriate connector cutout. See item 1 in [Figure 1](#).

Additionally, the reader can be configured for off-the-wall tamper operation by punching out the appropriate hole on the reader backplate exposing the tamper spring. See item 2 in [Figure 1](#).

Figure 1. Reader backplate preparation



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- 1 Prior to mounting the backplate, remove the connector cutout to suit the installation.
- 2 Punch or cut to enable off-the-wall tamper.
- 3 For mounting installations other than a standard dual-gang box or 5029 plate, select other mounting hole locations on the backplate. Place the backplate face down on a flat surface and then using a small Phillips head screw driver or round punch, punch through selected mounting holes.

Mounting diagrams

There are four reader mounting methods:

1. **Dual-gang box mounting.** Refer to *Figure 2, “Model 1000/1010 reader dual-gang box mounting,” on page 10* and *Figure 3, “Model 1000/1010 reader, dual-gang box mounting, Continued,” on page 11.*
2. **Direct wall mounting.** Refer to *Figure 4, “Model 1000/1010 reader, direct wall mounting,” on page 12*
3. **Surface box mounting.** Refer to *Figure 5, “Model 1000/1010 reader, surface mount box,” on page 13* and *Figure 6, “Model 1000/1010 reader, surface mount box, Continued,” on page 14.*
4. **5029 back box and environmental hood mounting.** Refer to *Figure 7, “Model 1000/1010 reader, 5029 back box or environmental hood mounting,” on page 15.*

Figure 2. Model 1000/1010 reader dual-gang box mounting

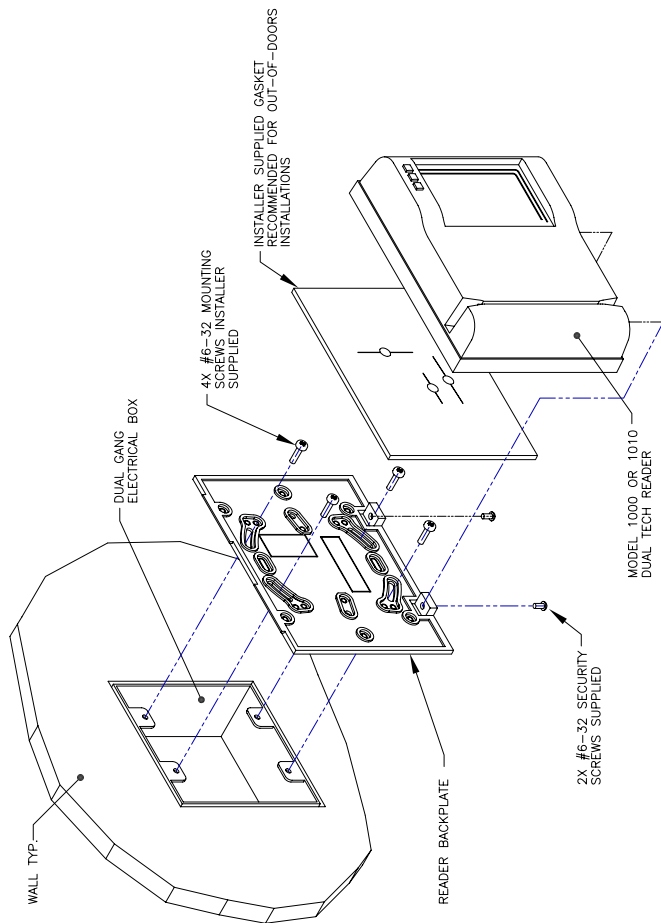


Figure 3. Model 1000/1010 reader, dual-gang box mounting, Continued

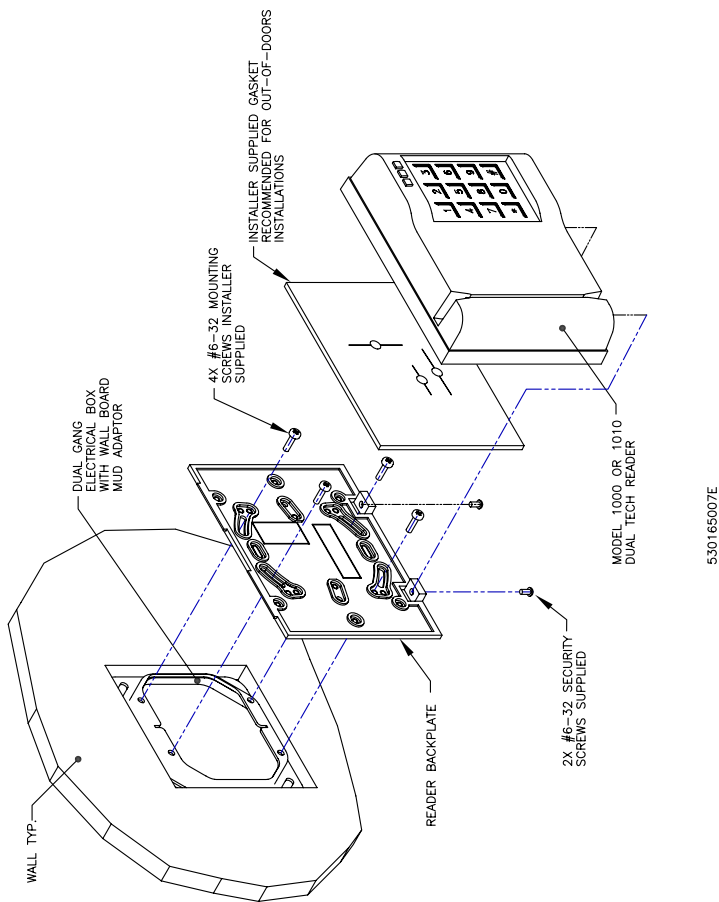


Figure 4. Model 1000/1010 reader, direct wall mounting

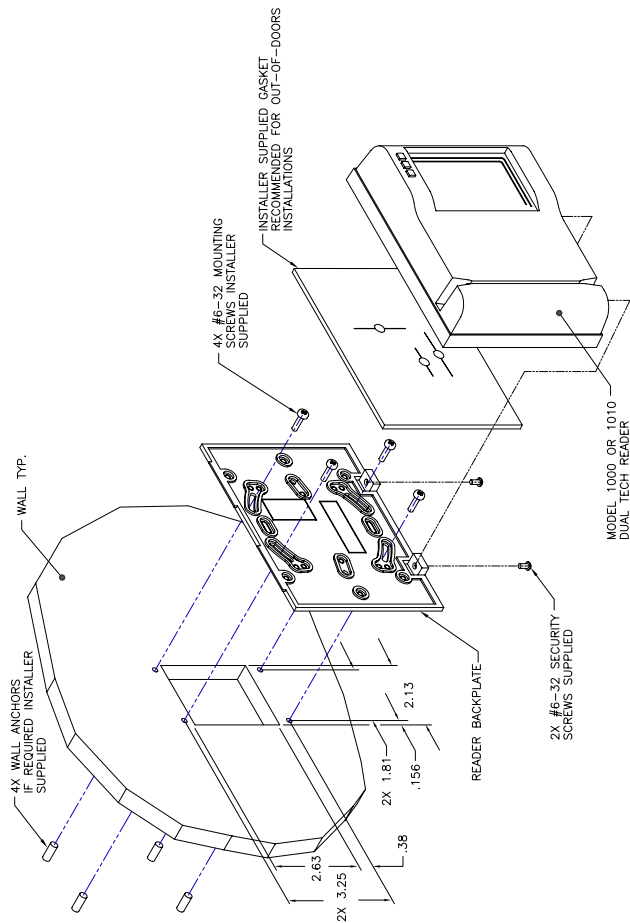
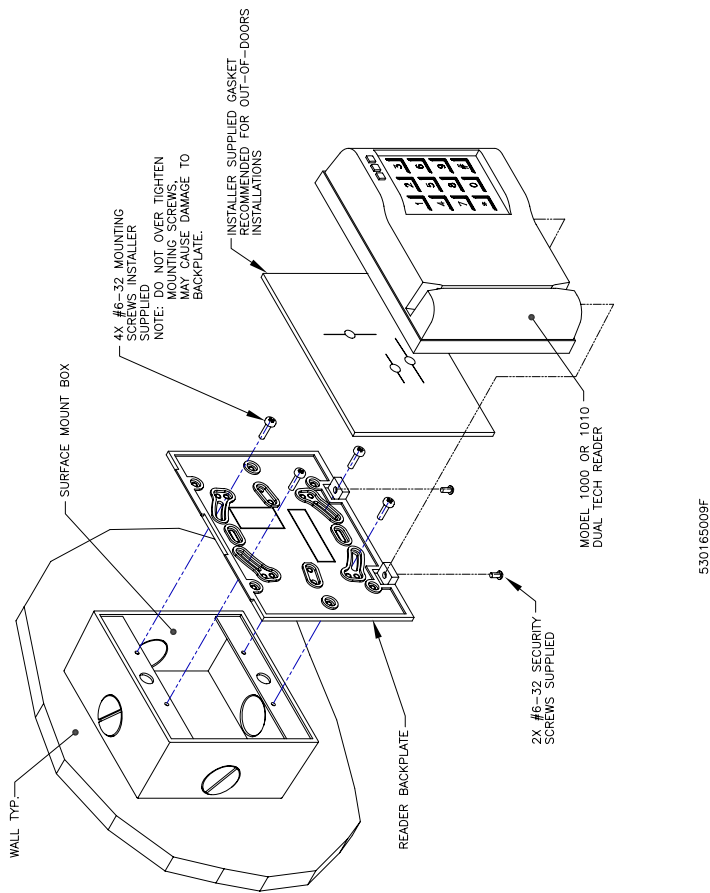


Figure 5. Model 1000/1010 reader, surface mount box



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Figure 6. Model 1000/1010 reader, surface mount box, Continued

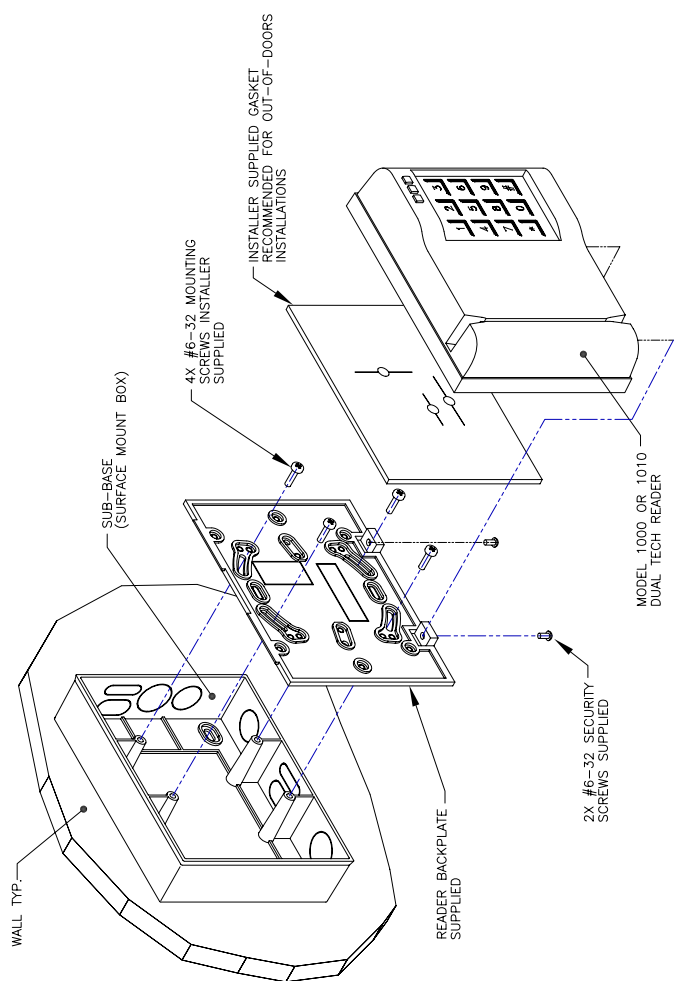
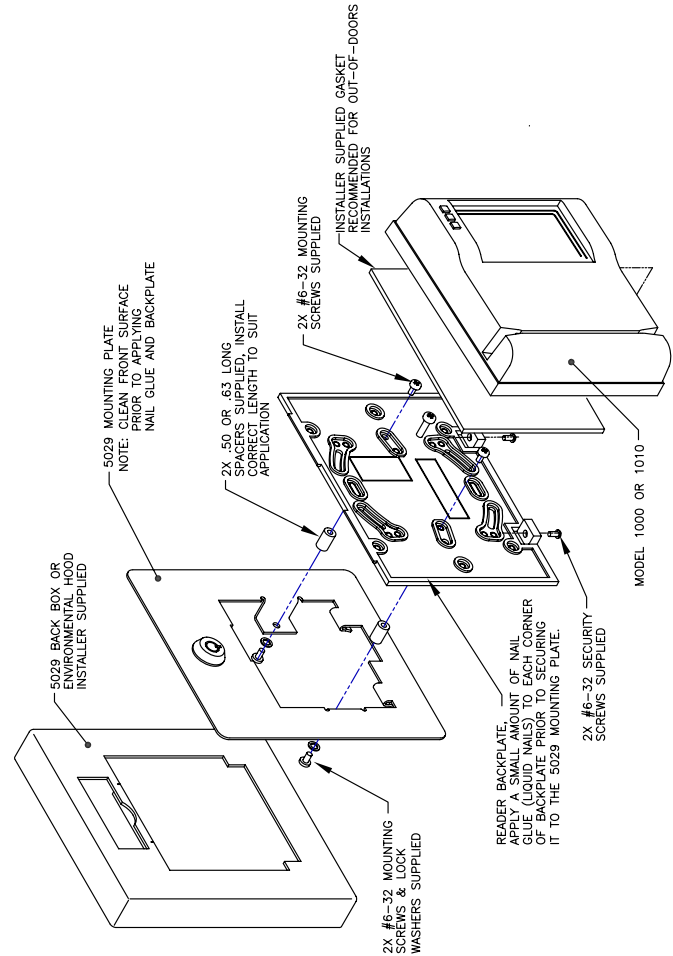


Figure 7. Model 1000/1010 reader, 5029 back box or environmental hood mounting



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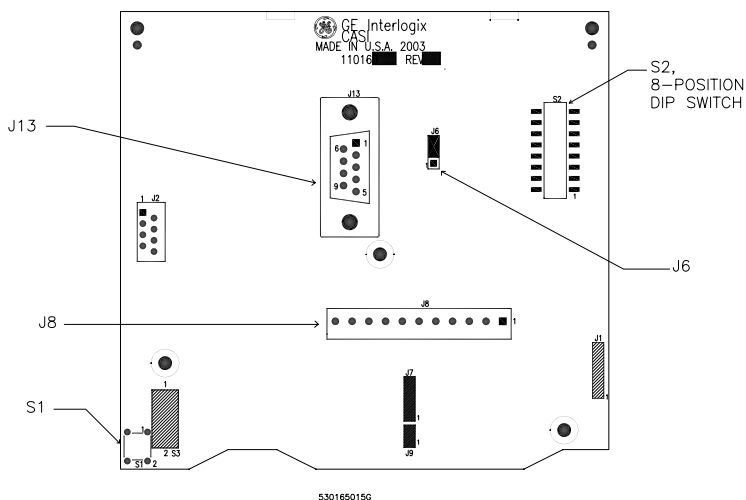
Configuring the reader

The configuration and operation of the reader are controlled by setting the following switch and jumper:

- S2: Option select switch
- J6: Door strike relay output

Refer to [Figure 8](#) for the location of the switch and the jumper.

Figure 8. Model 1000/1010 reader, jumper setting



Option select switch S2

The option select switch controls the operating mode, badge mode, beeper output, indicator mode, and Wiegand format. Refer to the tables below for switch settings

Note: Switch S2-8 is reserved for future use.

Operating mode

Switch S2-1 and S2-2 determine the operating mode: Wiegand, F/2F or supervised F/2F operating mode.

Table 1. Operating mode

Mode	S2-1	S2-2
Wiegand	OFF	OFF
F/2F	ON	OFF
Supervised F/2F	ON	ON

Wiegand mode: The reader sends Wiegand data (2 data signals) to the micro. No supervision is performed. REX and door input states **are not** reported.

F/2F mode: The reader sends and receives F/2F data (1 data signal) to and from the micro. Communication failures between the reader and the micro are not reported. REX and door input states **are not** reported.

Supervised F/2F mode: The reader sends and receives F/2F data (1 data signal) to and from the micro. Communication failures between the reader and the micro are reported. REX and door input states **are** reported.

4-state door/REX supervision

Switch S2-3 sets the supervision at 4-state or 2-state.

Table 2. 4-state door/REX supervision

Supervision	S2-3
4-State Door/REX Supervision	ON
2-State Door/REX Supervision	OFF

4-state: REX and door inputs are reported as cut line, short circuit, closed circuit, and open circuit. Ensure that end-of-line resistors are installed properly. Refer to the wiring diagram shown in [Figure 10](#) on page 26.

Note: To enable four-state supervision for the door and the REX, install a jumper at position J8. Both points must be terminated with resistors as shown in [Figure 10](#) on page 26.

Note: The REX terminals on the reader shall not be connected in UL listed installations.

2-state: REX and door inputs are reported as open circuit and closed circuit.

Note: Door/REX supervision has no effect in Wiegand or F/2F mode. The state of these inputs are not reported.

Badge mode

Switch S2-4 determines the badge mode: 10 digit or 12 digit.

Table 3. Badge mode

Badge mode	S2-4
IBM 10 digit output	ON
Standard 12 digit output	OFF

Beeper output

Switch S2-5 determines if the beeper will sound.

Table 4. *Beeper output*

Beeper output	S2-5
Enabled	ON
Disabled	OFF

Indicator mode

Switch S2-6 sets the indicator mode to IBM or standard mode LED and sound indicators. Refer to “Indicators” on page 31 for more information.

Table 5. *Indicator mode*

Indicator mode	S2-6
IBM indicators	ON
Standard indicators	OFF

Wiegand format

Switch S2-7 sets the Wiegand output format to 4001 or 4002.

Table 6. *Wiegand format*

Wiegand format	S2-7
4001	ON
4002	OFF

Door strike relay output jumper J6

Jumper J6 controls the normally closed or normally open state of the door strike relay

Table 7. Door strike relay output

Jumper	Jumper selection	Contact
J6	Pins 1 and 2 Shorted	Normally Closed Selected
	Pins 2 and 3 Shorted	Normally Open Selected

Factory default switch and jumper settings

Table 8. Factory default settings

Switch/Jumper	Switch/Jumper selection	Setting
S2-1	ON	Supervised F/2F
S2-2	ON	Supervised F/2F
S2-3	OFF	2-state door/REX supervision
S2-4	ON	IBM 10-digit badge output
S2-5	ON	Beeper output enabled
S2-6	ON	IBM indicators
S2-7	OFF	4002 Wiegand format
J6	Pins 2 and 3 shorted	Strike relay contact normally open

Connecting the reader

Pinouts

The Model 1000/1010 Reader contains two connectors: a standard 9-pin D-subminiature connector (DB9) and an 11-pin Phoenix connector. The pinouts for the DB9 connector are listed in the table below. The pinouts for the Phoenix connector are listed on [page 22](#).

Note: Signals on the DB9 connector are also available on the Phoenix connector to allow the installer to choose either the DB9 or the 11-pin Phoenix for connecting the reader.

Table 9. Pinouts for the DB9 connector

PIN number	Signal	Cable color (BELDEN)
1	Ground	Black
2	Switch common	Orange
3	F/2F Data 1	Red
4	Door strike relay output	Blue
5	Exit DI (exit request button)	Violet
6	Door strike relay return	White
7	12 to 48 VDC	Yellow
8	Door DI (door contact switch)	Grey
9	Door DO input from microcontroller (to control the strike relay)	Brown

Table 10. Pinouts for the Phoenix connector

PIN #	Signal	Cable color (BELDEN)
1	Exit request return ^a	Black
2	Door return ^a	Orange
3	Door DO input from microcontrollers (to control the strike relay)	Red
4	Door DI (door contact switch)	Blue
5	12 to 48 VDC	Violet
6	Door strike relay return	White
7	Wiegand data 0	Yellow
8	Door strike relay output	Gray
9	F/2F or Wiegand data 1	Brown
10	Exit DI (exit request button)	
11	Ground/switch common	

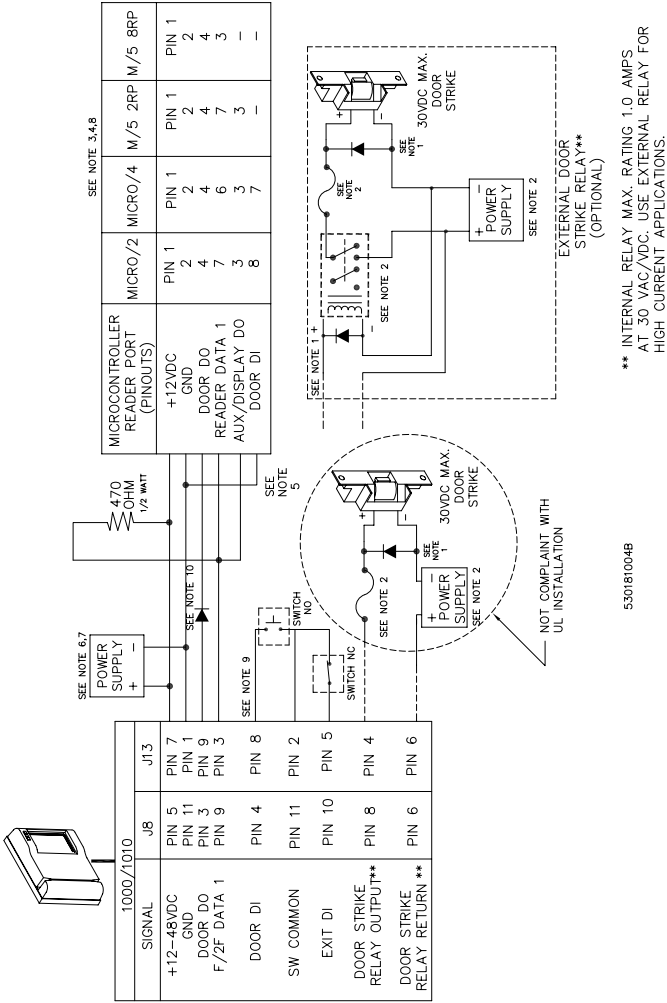
a. Used for 4-state supervised DI points only. See [Figure 10](#).

Wiring diagrams

Use the wiring diagrams starting on [page 24](#) to connect the reader to the micro.

- Refer to [Figure 9](#), “Wiring diagram for F/2F installations: unsupervised and 2-state supervision,” on [page 24](#).
- Refer to [Figure 10](#), “Wiring diagram for F/2F installations: 4-state supervision,” on [page 26](#).
- Refer to [Figure 11](#), “Wiring diagram for Wiegand installations,” on [page 28](#).

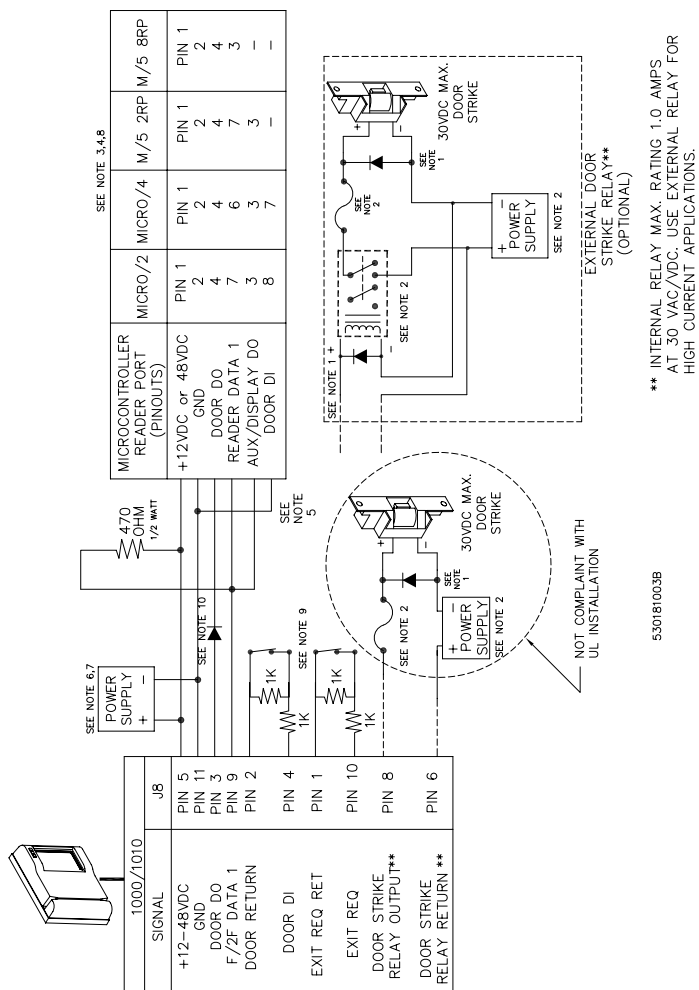
Figure 9. Wiring diagram for F/2F installations: unsupervised and 2-state supervision



Note: Unless otherwise specified:

- 1 Protection diodes may be 1N4002, 1N4003, or 1N4004 for the door strike assembly (supplied by the installer) for DC strikes only.
- 2 Fuse, power supply (fused primary), and relay provided by the installer/customer.
- 3 For 12 VDC micros, the maximum cabling distance is 3,000 feet (914 m), using shielded 20 AWG cable.
For 48 VDC micros, the maximum cabling distance is 5,280 feet (1609 m), using shielded 18 AWG cable, and 3,000 feet (914 m), using shielded 20 AWG cable.
- 4 Connect all shields together at the micro end, connect to ground stud in the cabinet using 14 AWG wire. No shield connections at reader.
- 5 Micro/2 and Micro/4 only: If wiring door DI switch through reader (as shown), door DI on reader board must be connected to Ground.
- 6 For 12 VDC micros, a 12 VDC user-supplied power supply, located at the reader, may be installed to extend the maximum cable distance to 5,000 feet (1524 m) when using shielded 20 AWG cable.
For 48 VDC micros, a local power supply should not be used.
- 7 Local power supply must be at the same voltage level as the micro power supply.
- 8 The Micro/5 2RP and the Micro/5 8RP can only be used with a Micro/5 operating at 12 VDC.
- 9 Door contacts and REX switch connections are for 2-state Door/REX supervision when configured for supervised F/2F only. No connections should be made when the reader is configured for unsupervised F/2F mode. Request to exit (REX) terminals on the reader are not to be connected for UL listed installations.
- 10 Blocking diode may be type 1N5817 or GE part number 521224001 (included with reader). The diode must be installed in a secure location, not accessible through the reader removal.

Figure 10. Wiring diagram for F/2F installations:
4-state supervision



Note: Unless otherwise specified:

- 1 Protection diodes may be 1N4002, 1N4003, or 1N4004 for the door strike assembly (supplied by the installer) for DC strikes only.
- 2 Fuse, power supply (fused primary), and relay provided by the installer/customer.
- 3 For 12 VDC micros, the maximum cabling distance is 3,000 feet (914 m), using shielded 20 AWG cable.
For 48 VDC micros, the maximum cabling distance is 5,280 feet (1609 m), using shielded 18 AWG cable, and 3,000 feet (914 m), using shielded 20 AWG cable.
- 4 Connect all shields together at the micro end, connect to ground stud in the cabinet using 14 AWG wire. No shield connections at reader.
- 5 Micro/2 and Micro/4 only: If wiring door DI switch through reader (as shown), door DI on reader board must be connected to Ground.
- 6 For 12 VDC micros, a 12 VDC user-supplied power supply, located at the reader, may be installed to extend the maximum cable distance to 5,000 feet (1524 m) when using shielded 20 AWG cable.
For 48 VDC micros, a local power supply should not be used.
- 7 Local power supply must be at the same voltage level as the micro power supply.
- 8 The Micro/5 2RP and the Micro/5 8RP can only be used with a Micro/5 operating at 12 VDC.
- 9 Resistors for 4-state Door/REX supervision are 1 K ohm, ¼ watt +/- 5% minimum. Tolerance of +/- 2% is recommended mode. Request to exit terminals on the reader are not to be connected in UL listed installations.
- 10 Blocking diode may be type 1N5817 or GE part number 521224001 (included with reader). The diode must be installed in a secure location, not accessible through the reader removal.

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Note: Unless otherwise specified:

- 1 Protection diodes may be 1N4002, 1N4003, or 1N4004 for the door strike assembly (supplied by the installer) for DC strikes only.
- 2 Fuse, power supply (fused primary), and relay provided by the installer/customer.
- 3 For 12 VDC or 48 VDC micros, the maximum cabling distance is 2,000 feet (914 m), using shielded 20 AWG cable. A local power supply should not be used.
- 4 Connect all shields together at the micro end, connect to ground stud in the cabinet using 14 AWG wire. No shield connections at reader.
- 5 Micro/2 and Micro/4 only: If wiring door DI switch through reader (as shown), door DI on reader board must be connected to Ground.
- 6 The Micro/5 2RP can only be used with a Micro/5 operating at 12 VDC.
- 7 Blocking diode may be type 1N5817 or GE part number 521224001 (included with reader). The diode must be installed in a secure location, not accessible through the reader removal.

Testing the reader

Perform the following test procedure to verify correct operation of the Models 1000 and 1010 Dual Tech readers:

1. Check all cabling and electrical connections from the reader to the microcontroller.
2. Verify that the microcontroller is properly configured (refer to the appropriate microcontroller manual).
3. Ensure the proper version of the firmware is installed in the microcontroller. Refer to the appropriate microcontroller manual.
4. Verify that the reader is properly configured. Refer to *“Configuring the reader” on page 16*.
5. Close the tamper switch by joining the reader and backplate so that the tamper alarm is suppressed or by ensuring the spring is compressed when using off-the-wall tamper.
6. Apply power to the reader and verify that the power-on self test completes as described in the table *“Indicators” on page 31*.
7. Verify that the reader is not beeping. If the reader is beeping, refer to the troubleshooting guide at the end of this manual.
8. Verify proper reader operation as follows:
 - a. Select a known good test badge. Be sure that the badge is properly enrolled in the host system. If the reader is used with a keypad, assign a proper PIN.
 - b. Ensure that the door is closed and latched. This is the first step to verify that the reader strike relay is wired properly.

- c. Pass the card through or present a card to the reader. Observe that the reader behaves as described in the table *“Indicators” on page 31*.
- d. If used with a keypad, enter the PIN number and press #. Observe that the reader behaves as described in the table *“Indicators” on page 31*.
- e. Observe that the green LED turns on, indicating a valid access has been granted by the host.
- f. Open the door. This verifies that the reader strike relay operates properly.

Indicators

A tri-color LED (red, yellow, and green), and a beeper are incorporated into the reader and operate as indicated in the following table.

Condition	Standard indicators (S2-6 = OFF)	IBM indicators (S2-6 = ON)
Power-on self test	All LEDs turn on, all LEDs turn off, 1 short beep	All LEDs turn on, all LEDs turn off, 1 short beep
Reader ready	Yellow LED on continuously	Red LED on continuously
Card read	Yellow LED blinks off briefly, 1 short beep	Red LED on continuously, Yellow LED blinks on briefly, 1 short beep

Condition	Standard indicators (S2-6 = OFF)	IBM indicators (S2-6 = ON)
PIN entry (Model 1010 in supervised mode only)	Green LED flashes quickly, 1 short beep every time a key is pressed	Red LED on continuously, Yellow LED blinks on every time a key is pressed or stays on until PIN complete, 1 short beep every time a key is pressed
Valid access	Yellow LED on continuously, Green LED on until door strike is deactivated	Red LED on continuously, Green LED on until door strike is deactivated
Loss of communication (supervised mode only)	Red LED flashes slowly, 3 short beeps every 30 seconds	Red LED flashes quickly 3 times every 30 seconds, 3 short beeps every 30 seconds
Tamper (supervised)	Red LED flashes quickly, 3 short beeps every 30 seconds	Red LED flashes quickly 5 times every 30 seconds, 5 short beeps every 30 seconds
Tamper (unsupervised)	Red LED on continuously, 3 short beeps every 30 seconds	Red LED flashes quickly 5 times every 30 seconds, 5 short beeps every 30 seconds
Reader wired for 4-state supervision, but S2-3 configured for 2-state	Red LED flashes quickly 5 times every 10 seconds, 5 short beeps every 10 seconds	Red LED flashes quickly 5 times every 10 seconds, 5 short beeps every 10 seconds

Regulatory approvals

UL



UL listed installations

The following are the results of the UL evaluation of the Model 1000/1010 readers:

- Operating temperature range: +32 F (+0 C) to +120 F (+49 C)
- Relative humidity: 85%
- The Cold Weather Kit was not evaluated by UL.
- The Model 1000/1010 readers were evaluated by UL for indoor use only.
- Using the internal relay of the reader to control/activate the door strike will result in an installation that is not UL compliant.
- The Model 1000/1010 readers were evaluated by UL for use with the Micro/5-PXN, Micro/5-PX, Micro/PXN-2000, and the Micro/PX-2000. Micro/2, Micro/4, M5PXNplus, M2000PXNplus, and M3000PXNplus installations were not included in the evaluation.

CE



Manufacturers
Declaration of Conformity
For



Product Identification: 430138001
430139001

Model/type: Model 1000, Dual Tech Reader **BOM revision level:** G
Model 1010, Dual Tech Reader+Keypad **BOM revision level:** J

Category (description): Proximity/Magstripe Reader


Brand: GE Security

Manufacturer: GE Security
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791 Park of Commerce Blvd.
Boca Raton, Florida 33487
USA

EU Representative: GE Security B.V.
Kelvinstraat 7
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Concerning	R&TTE		
	EMC	Safety	Radio
A sample of the product has been tested by:	PSE 12955 Bellamy Brothers Blvd. Dade City, FL 33525	PSE 12955 Bellamy Brothers Blvd. Dade City, FL 33525	
Test report reference	03C245I	03C245	03C245C
Applied standards	EN50130-4(1998)	EN60950 (2000)	EN300-330v1.3.1(04-2001)

Equipment class identifier (*RF products falling under the scope of R&TTE*)

☐ Not Applicable ☒ None (class 1 product) ☐  (class 2 product)

Means of Conformity:

We declare under our sole responsibility that this product is in conformity with Directive 93/68/EEC (Marking) and/or complies with the essential requirements and all other relevant provisions of the 1999/5/EC (R&TTE) based on test results using harmonized standards in accordance with the Directives mentioned.

CE/FCC compliance

To make the Model 1000/1010 Reader installation CE and FCC compliant, the cable connecting the reader to the micro must have its shield grounded at the micro, according to one of the methods specified in the figures below.

Figure 12. Typical installation (Internal to the micro)

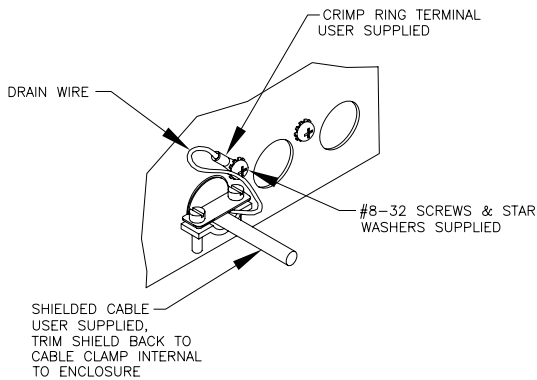
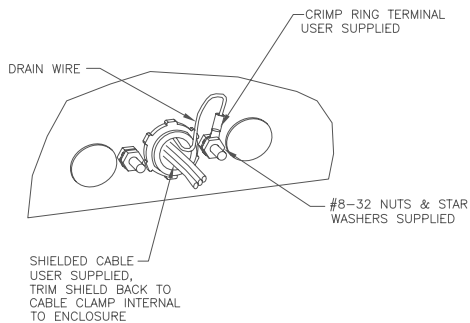


Figure 13. Typical installation (External to the micro)



Notes

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