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# GEM-2D Second Door Access Control Accessory INSTALLATION INSTRUCTIONS

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WI1239A 6/04

## GENERAL DESCRIPTION

The **GEM-2D** is a module that connects to the GEM-ACM1D, an accessory that adds integrated access control to the burglary alarm functions of the GEM-X255 control panel. The GEM-ACM1D provides controlled access to a door by releasing a locking device (such as a magnetic lock or electric strike) when the proper credential is presented to the card reader. The GEM-2D allows the GEM-ACM1D to independently control a second access relay using a separate card reader. For a full description of the GEM-ACM1D, see WI1221.

Two readers can be used to control one door. Each reader can be programmed to allow its own independent access schedules to control both exit and entry permissions for a single door.

The GEM-2D is basically identical to the GEM-ACM1D, except that the GEM-2D uses separately wired card readers, door contacts and locking device relays that all function in the same manner as the GEM-ACM1D.

**Note:** Readers connected to the GEM-2D do not provide Arm/Disarm capability.

Access control is integrated with the burglary functions of the GEM-X255. It can be used to arm and disarm the system, annunciate and report alarms and troubles, and monitor the access door without the need for additional contacts.

Up to 4 GEM-ACM1D modules may be connected to a GEM-X255 control panel via standard, unshielded station wire. Each module is capable of controlling access through 2 doors and uses a keypad location in the system for communication. Any polling failures, AC/DC Power or Battery Troubles associated with the ACM will be displayed as a **KEYPAD/ACM TROUBLE** at the other keypads. Any ACM Tamper will be displayed as a **KEYPAD/ACM TAMP**ER at other keypads. GEM-X255 panel code version 5 or higher must be used for GEM-ACM1D module installations.

Although the GEM-ACM1D and the GEM-2D perform all access decisions immediately without consulting the panel, the panel limits the number of users to 195. In addition, the Event Scheduler (requires use of PCD-Windows Quick-loader download software) is used to control user access by scheduling "User Off" and "User On" events, with the total number of events is limited by the panel to 255. **Note:** Be aware that more than one event can be assigned to

each user, and the total number of events allowed is always limited to 255 regardless of how many users are programmed.

The GEM-ACM1D requires the panel for uploading user codes/attributes (and their associated schedules), uploading door attributes, digital dialer reporting and all Keypad/ACM trouble/information displays.

Each of the two model 6005B access card readers can be programmed to function independently on different doors, or together controlling access for both sides of one door. The GEM-ACM1D supports a variety of card readers, including the Polaris XYZ magnetic card reader, the ShadowProx proximity card reader, the HID proximity readers, and the 26-bit standard Wiegand card readers. The GEM-ACM1D also supports the use of any "Request to Exit" device, including the T-Rex exit detector.

## SPECIFICATIONS

**Housing Dimensions:** 11"x12<sup>1</sup>/<sub>8</sub>"x3" (28x30.8x7.6cm)  
HxWxD

**GEM-X255 Current Draw:** 5mA

**Operating Temperature:** 0–49°C (32–120°F)

**Input Power:** 16.5VAC via CLASS 2 Plug-In 50VA Transformer

**Door Zone Loop Voltage:** 10-13VDC

**Door Zone Loop Current:** 2.4mA with 2.2K EOLR

**Door Zone Loop Resistance:** 300 ohms maximum

**Combined Door Lock Power:** D1 PWR (terminals 3+ and 4-) + D2 PWR (terminals 5+ and 6-)

Voltage Rating: 12VDC

Maximum Current: 1.5A

Battery Standby Time:

1. JP3 not installed: Standby Time = 0\*

2. JP3 installed: Refer to battery standby chart in WI1221\*\*

**Reader 1 PWR:** READER 1 PWR (terminals 17+ and 18-)

Voltage Rating: 12.5VDC to 11.7VDC with JP1 set to 12V. 5V with JP1 set to 5V.

Maximum Current: 125mA

Battery Standby Time:

1. JP3 not installed and 4AH battery used = 4 Hour\*

2. JP3 installed: Refer to battery standby chart in WI1221\*\*

**Reader 2 PWR\*\*\*:** READER 2 PWR (terminals 35+ and 36-)

Voltage Rating: 12.5VDC to 11.7VDC with JP4 set to 12V. 5V with JP4 set to 5V.

Maximum Current: 125mA

Battery Standby Time:

\* UL installations require JP3 to be removed.

\*\* Not Evaluated by UL.

\*\*\* Requires GEM-2D to be installed.

1. JP3 not installed and 4AH battery used = 4 Hour\*
2. JP3 installed: Refer to battery standby Chart in WI1221\*\*

## POWER SUPPLY

The integral power supply includes two primary linear regulators. The first regulator is used to power the panel, the card readers and to re-charge the battery. The panel and card readers are supported with battery standby. The second regulator is used to supply up to 1.5A 12VDC for the door locks, which provides enough current to support two 750mA magnetic locks. The Door Lock Power has an option to enable battery standby with a shunt connector placed across jumper JP3. The battery is prevented from damage caused during extended power failures with a battery drop out circuit that disconnects the battery when there is no AC present and battery voltage drops to approximately 9VDC. When AC is restored, the battery is automatically re-connected and begins to recharge.

The GEM-ACM1D tests the battery under load every 4 hours and when the RESET button is pressed. The low battery condition will only restore after it passes the active test. The duration of this test is 15 seconds.

There are several advantages to this power supply design. The separation of the door lock power from the rest of the system reduces the likelihood that turning off the power to the door lock coils will affect performance of the system. The use of linear versus switching regulators significantly reduces electrical noise that may hinder the sensitivity of proximity card readers.

## SYSTEM REQUIREMENTS

The following system hardware is required:  
 Gemini GEM-X255 Control Panel version 5 or higher.  
 EPROM Upgrade must be installed in control panel.

## INSTALLING THE GEM-2D

When connecting the GEM-2D to the GEM-ACM1D, insert the pins of the GEM-2D into receptacles J4F and J5F located on top of the GEM-ACM1D. Before inserting, align all pins and receptacle sockets, then fully insert the GEM-2D

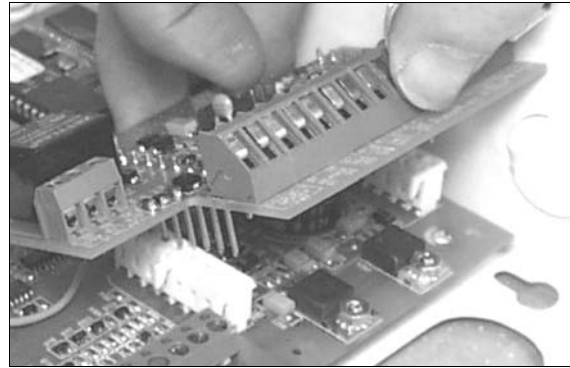


Figure 1: Installing the GEM-2D. Before inserting, align all pins and receptacle sockets, then fully insert the GEM-2D into receptacles J4F and J5F located on top of the GEM-ACM1D.

into the GEM-ACM1D. See Figure 1 illustrating the installation of the GEM-2D into the GEM-ACM1D.

## GEM-2D WIRING/CONFIGURATION

### Connect 2nd Door Strike (Mag Lock).

**NOTE:** Before installation, always check with local laws having jurisdiction concerning the installation of magnetic locking devices. There may be strict limitations with regard the installation of magnetic or similar exit door locking devices. Local laws may require the installation of electrically separate panic hardware to ensure the door can be opened in the event of an emergency. Door strike outputs are controlled by schedules programmed into the panel. These door strike outputs can operate DC-powered locking devices such as magnetic door locks or other electromechanical locks and can be configured to operate in "Fail Secure" (which remain locked when power fails) or "Fail Safe" (which unlock when power fails) configurations.

For normally closed door strikes, connect ground to terminal 4, wire terminal 3 to terminal 14, then connect the positive door strike wire to terminal 16. See Figs. 2 and 3 below. The GEM-ACM1D can supply a constant combined maximum 12V output of 1.5A for D1-PWR and D2-PWR.

## Lock Wiring for the GEM-2D

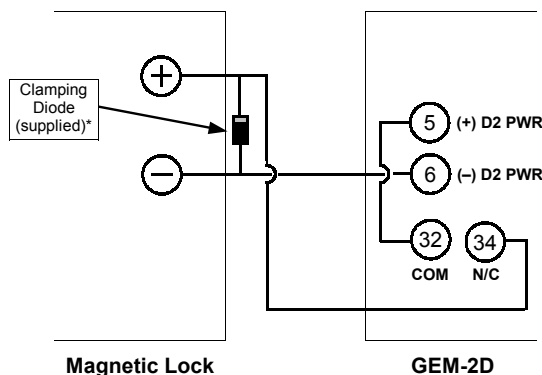


Fig. 2: Normally Energized Lock Wiring ("Mag Lock")

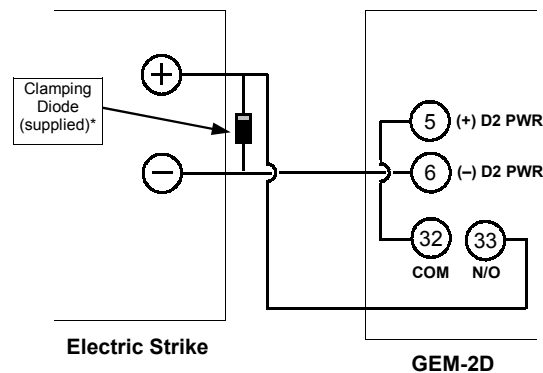
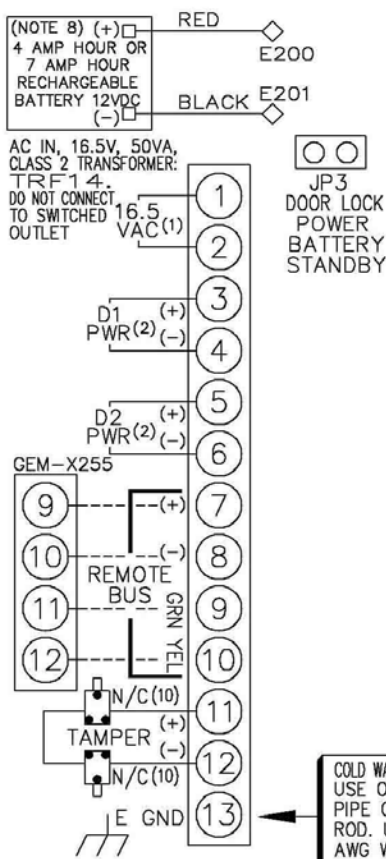


Fig. 3: Normally De-Energized Lock Wiring

# GEM-ACM1D WIRING DIAGRAM

(REFER TO W11221)



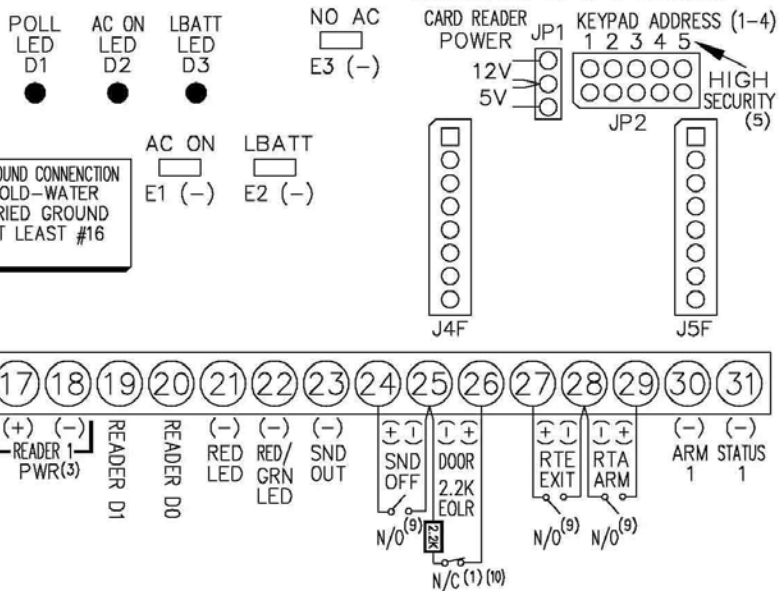
- 1) END-OF-LINE RESISTOR, 2200 OHMS, RED, RED, RED, 5%, 1/2W, (EOL2.2K) MUST BE INSTALLED.
- 2) COMBINED DOOR LOCK POWER: D1 PWR (3+ AND 4-) + D2 PWR (5+ AND 6-) VOLTAGE RATING: 12VDC MAXIMUM CURRENT: 1.5A, 3A CURRENT LIMITED BATTERY STANDBY TIME: 1) IF JP3 IS NOT INSTALLED STANDBY = 0\* 2) IF JP3 IS INSTALLED REFER TO BATTERY STANDBY CHART IN W11221\*\*
- 3) READER 1 PWR: READER 1 PWR (17+ AND 18-) VOLTAGE RATING: 12.5VDC TO 11.7VDC WITH JP1 SET TO 12V, 5V WITH JP1 SET TO 5V. MAXIMUM CURRENT: 125mA, 750mA CURRENT LIMITED BATTERY STANDBY TIME: 1) IF JP3 IS NOT INSTALLED AND 4AH BATTERY IS USED = 4 HOUR\* 2) IF JP3 IS INSTALLED REFER TO BATTERY STANDBY CHART IN W11221\*\*
- 4) READER 2 PWR\*\*\*: READER 2 PWR (35+ AND 36-) VOLTAGE RATING: 12.5VDC TO 11.7VDC WITH JP4 SET TO 12V, 5V WITH JP4 SET TO 5V. MAXIMUM CURRENT: 125mA, 250mA CURRENT LIMITED BATTERY STANDBY TIME: 1) IF JP3 IS NOT INSTALLED AND 4AH BATTERY IS USED = 4 HOUR\* 2) IF JP3 IS INSTALLED REFER TO BATTERY STANDBY CHART IN W11221\*\*

- 5) SYSTEM MUST BE TESTED AT LEAST ONCE A WEEK IN THE AC / BATTERY MODE AND IN THE BATTERY ONLY-MODE (CONTACT CENTRAL STATION PRIOR TO TESTING). AC MUST BE RESTORED AFTER TEST.
- 6) CONTACTS 2A / 24VDC RESISTIVE.
- 7) UNIT INTENDED TO BE MOUNTED VERTICALLY.
- 8) RECOMMENDED BATTERIES: YUASA NP-4-12 AND NP7-12. BATTERIES MUST BE REPLACED EVERY 5 YEARS.
- 9) USE MOMENTARY N/O SWITCHES, THE CIRCUIT IS UNSUPERVISED.
- 10) USE N/C SWITCHES, THE CIRCUIT IS SUPERVISED.

### WIRING NOTES:

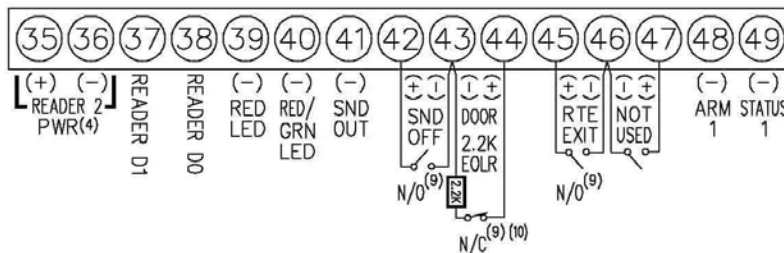
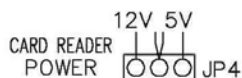
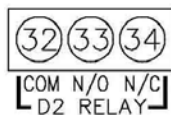
- 1) THIS SYSTEM MUST BE INSTALLED IN THE PROTECTED PREMISE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NFPA 70), LOCAL CODES AND THE AUTHORITY HAVING JURISDICTION.
- 2) ALL INTERCONNECTING DEVICES SHALL BE UL LISTED AND POWER LIMITED.
- 3) THE RED AND BLACK FLYING BATTERY LEADS AND THE TWO WIRES CONNECTING TERMINALS 1 AND 2 TO THE AC TRANSFORMER ARE THE ONLY NON-POWER LIMITED WIRES IN THE HOUSING. THESE FOUR WIRES MUST BE ROUTED AT LEAST 1/4 INCH AWAY FROM ALL OTHER WIRES IN THE HOUSING.

\* UL INSTALLATIONS REQUIRE JP3 TO BE REMOVED.  
 \*\* NOT EVALUATED BY UL.  
 \*\*\* REQUIRES GEM-2D TO BE INSTALLED.



# GEM-2D (OPTIONAL) WIRING DIAGRAM

(REFER TO W11239)



LA2180A

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NAPCO RECOMMENDS THAT THE ENTIRE SYSTEM BE COMPLETELY TESTED WEEKLY.

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