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GEM-ACM1D Access Control Accessory INSTALLATION INSTRUCTIONS

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GENERAL DESCRIPTION

The GEM-ACM1D is an accessory that adds integrated access control to the burglary alarm functions of the GEM-X255 control panel. It 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. 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 tampers will be displayed as a **KEYPAD/ACM TAMPER** at the other keypads. GEM-X255 panel code version 5 or higher must be used for GEM-ACM1D module installations.

Although the GEM-ACM1D performs 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) 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"x12¹/₈"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 (factory default): Refer to battery standby chart on page 8**

Reader 1 PWR: READER 1 PWR (terminals 17+ and 18-)
Voltage Rating: 12.5VDC to 11.7VDC with JP1 set to 12V (default). 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 (factory default): Refer to battery standby chart on page 8**

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:

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

2. JP3 installed (factory default): Refer to battery standby Chart on page 8**

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* UL installations require JP3 to be removed.

** Not Evaluated by UL.

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

GEM-ACM1D Power Supply

The GEM-ACM1D has an integral power supply which 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 (factory default). 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.

LIST OF ACCESSORIES

HID Prox Point Plus Model 6005B

Any UL 294 Listed door lock

Proximity cards: Two card formats are supported:

- (1) NAPCO standard 36 bit format or
- (2) HID standard 26 bit format.

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.

PLAN YOUR INSTALLATION

Before installing your GEM-ACM1D access control accessory, give careful consideration to the design and physical layout of the system. Access control points, keypad zones, ACM zones and all other system components should be planned in advance to ensure an efficient and complete installation. It is recommended that you perform all installation steps in the same sequence as is listed in this manual.

After selecting all access locations, be sure to then locate the GEM-ACM1D as closely as possible to the selected access control doors, easily accessible for servicing, and within 1000 feet of the GEM-X255 control panel. Standard

22-24 gauge wire is recommended for all connections between the panel and the GEM-ACM1D, and 18 gauge wire for all door strikes. Avoid running wires parallel to other types of wiring that can cause electrical interference.

Typical Installations

There are two basic ways the GEM-ACM1D may be installed to provide access control, both are described below:

Option 1 uses a single card reader on the exterior of the restricted area and a "Request to Exit" button within the restricted area. This method only requires a single card reader for each access door. This method is limited in that only entrance via the card reader is logged or printed[§]. The use of the "Request to Exit" button is not logged (anyone can exit).

Option 2 uses 2 card readers (one reader mounted inside and another outside the restricted area); both connected in parallel to a single card reader interface. This method requires presenting the credential for both entry and exit from the restricted area. Although each presentation of the credential is logged and printed[†], whether the presentation was used to enter or exit the restricted area cannot be determined.

Integrating the Fire Alarm System

Before installing the access control system, be sure to consult with the authority having jurisdiction to be sure to comply with all local codes. NFPA requires that the Fire Alarm System has some control over the access doors. In the event of a Fire Alarm or the loss of primary power (typically AC), all access doors **must** be unlocked.

The "Emergency Free Access" zone is designed for this integration. The output(s) from the fire alarm system must be wired so that if there is a fire alarm or AC failure of the fire alarm system, the "Emergency Free Access Zone" is either shorted or opened. See page 3 for recommended programming and wiring information.

Keypad Placement

A keypad should be located near any access door that can be used to arm the system, so that the status of all the zones up to the door can be determined (UL grade A requirement).

Additional Accessory Requirements

Up to three GEM-X255 zones may be dedicated to each Access door. These three zones are the (1) Door, (2) Forced Entry Zone and (3) Door Ajar Zone. If used, each of these zones (up to 24 on a full system) will require either 1 of the 8 panel hardwire zones, a GEM-EZM8 zone or a Wireless zone. If the zone is not 1 of the 8 panel zones, then either (a) the zone will require the correctly addressed GEM-EZM8 to be physically wired to the system, or (b) a wireless receiver (GEM-RECVX 8/16/96/255) must be physically wired to the system.

[§] A GEM-PRINT is required on the system to print.

[†] A second GEM-ACM1D could also be used.

Access Groups

Useful when designing an access control system, an *Access Group* is a collection of users who all have similar attributes; they all enter and exit the same access door, and all keep to the same basic schedule when using the system. To keep the system organized and easier to manage, these users can be given a group name and assigned to a specific range of contiguous user numbers (total range is 1-195). Thus when deactivating and activating cards is required, errors as to scheduling and other attributes can be minimized. For new installations, we recommend that installers program several users into the system (all with similar attributes) to help reinforce the concept of Access Groups for future programming.

INSTALLATION/MOUNTING INSTRUCTIONS

After the mounting location and all access control doors are selected, install the GEM-ACM1D as follows:

1. **Install the GEM-ACM1D.** The GEM-ACM1D housing is designed for vertical surface mounting indoors in a dry, secure location. When selecting a mounting location, ensure that the housing is accessible when future servicing is required. Back-up battery must be located within the secure housing. Mount the housing using the two middle mounting holes and at least one bottom mounting hole. **Important Note:** The GEM-ACM1D is powered by a linear power supply which is the preferred power supply for card proximity readers due to their very low electrical noise (compared with switching power supplies). However, be aware that linear power supplies do generate moderate heat. Therefore mount the GEM-ACM1D in a location that provides air circulation around the unit, *particularly directly above the housing*. Do not install the GEM-ACM1D in confined locations. **Note:** For UL installations, the GEM-ACM1D must be mounted within a protected premises.
2. **Install Accessories.** Mount all devices for each controlled access door:
 - a. Mount all required keypads.
 - b. Mount access card readers.
 - c. Connect door strikes (mag locks). Recommended door strikes are "Fail Safe" locks which open when power fails. **Note:** Local jurisdictions may prohibit

- d. "Fail Secure" locks (which remain locked when power fails) for fire escape routes.
 - d. Door contacts must be hardwired directly to the GEM-ACM1D. Do not use wireless contacts.
 - e. Optional accessories such as an egress button, audible silence button, etc. should be mounted inside the restricted area.
3. **Install Tamper Switches.** J1 must be cut to enable tamper. Normally open tamper switches (not supplied) can be installed in the front and back of the cabinet to provide protection from unauthorized entry. The tamper switches are normally open switches used in a normally closed tamper circuit. The front tamper switch protects the cabinet door and the back switch protects against removal from the wall. The normally open tamper switches are connected in series between terminal 11 (positive +12V) and terminal 12 (ground). **Note:** UL requires that the unit is mounted inside the protected premises and therefore does not require tamper switches to be installed.
 4. **Remote AC On Indicator.** Dedicate a zone to each GEM-ACM1D in the system with the following features:
 - "Never Arm"
 - Do not program "Burg Output", "PulseBurg Output" or "Fire Output"
 - Program the zone for the area of the GEM-ACM1D and GEM-2D (if used).
 - Program the zone description "GEM-ACM1D X AC FAIL" where X= the number of the GEM-ACM1D.
 5. **Other Connections.** Wire earth ground to terminal 13 using a No. 16 AWG. or larger wire to a metal cold-water pipe. Do not use a gas pipe, plastic pipe or AC ground connections. **NOTE:** Grounding connections should avoid bends in the grounding wire whenever possible.
 6. **Connect Transformer.** Install a 16.5VAC/40VA transformer to provide power to the GEM-ACM1D. Connect the red battery lead (E200) to the positive battery terminal and the black battery lead (E201) to the negative battery terminal. Do not apply power until all wiring/connections are complete.

Table #1: Card Reader Connections

GEM-ACM1D Terminal Number	GEM-ACM1D Terminal Description	HID Prox Point Plus Model 6005B Wires
17 (+)	Reader Power	Red (+ DC)
18 (-)	Reader Power	Black (- Ground) & (Shielded Ground)
19	Reader Data 1	White (Data 1)
20	Reader Data 0	Green (Data 0)
21 (-)	Red LED	Brown (Red LED)
22 (-)	Red & Green LED	Orange (Green LED)
23 (-)	Reader Sounder	Yellow (Beeper)
(Not Used)	(Not Used)	Blue (Hold)
(Not Used)	(Not Used)	Violet (Card Present)

* Tamper Connection not available on HID 6005B

**Polaris Only

Be sure to place jumper JP1 in correct configuration for 5 volt of 12 volt reader operation. See "Card Reader Power Jumper" further in this manual for proper power configuration.

FOR UL INSTALLATIONS

The following is required in UL installations:

1. The GEM-X255 must be installed and programmed as required for the application.
2. A keypad must be located next to any access door, to provide an indication (at the time of arming the system) that all protection up to the egress door is set for duty and the status of the GEM-ACM1D primary power.
3. Follow procedure on page 3, INSTALLATION/MOUNTING INSTRUCTIONS, Step 4, "Remote AC On Indicator".
4. Install front and back tamper switches as described in the Installation Instructions provided (WI1278).
5. Use Prox Point Plus Model 6005B as card reader.
6. Use only UL Listed door locks.
7. Remove shunt connector from JP3 (remove battery standby from D1 PWR and D2 PWR) assuring minimum 4 hour battery standby of GEM-ACM1D burglar accessory functions.
8. Follow wiring notes on GEM-ACM1D Wiring Diagram.

WIRING/CONFIGURATION

All inputs and outputs, door strikes, card readers and all other accessories should first be installed as detailed above. Also, place all correct shunt connectors on jumpers. **Note:** Do not apply power until all wiring is complete. Both AC and battery connections must be made before the GEM-ACM1D will function properly. Always connect the AC power before connecting the battery to avoid system troubles.

Refer to the wiring diagram on page 23.

1. **Connect to the Remote Bus.** GEM-ACM1D Terminals 7-10 provide the control panel interface. Connect as per the table below:

GEM-X255 Terminals	GEM-ACM1D Terminals
9 (+)	7 (+)
10 (-)	8 (-)
11 (TX-Green)	9 (RX-GRN)
12 (RX-Yellow)	10 (TX-YEL)

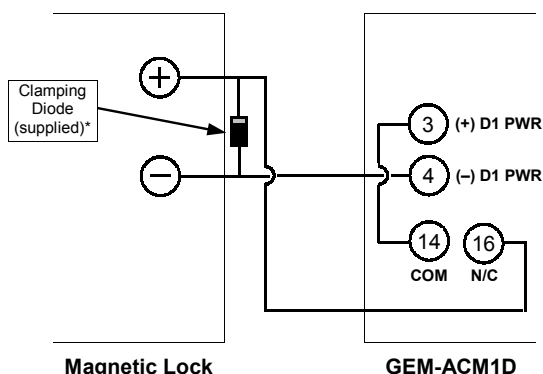


Fig. 1: Normally Energized Lock Wiring ("Mag Lock")

2. **Connect Electric Door Locks.**

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 lock outputs are controlled by schedules programmed into the panel. These door lock 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 de-energized door locks, connect ground to terminal 4, wire terminal 3 to terminal 14, then connect the positive door strike wire to terminal 16. See wiring diagrams (Figs 1 and 2 below) for both normally energized and de-energized door locks. The GEM-ACM1D can supply a constant combined maximum 12V output of 1.5A for D1-PWR and D2-PWR.

3. **Connect Door Contacts.** Supervised normally closed door contacts can be wired in series with a 2.2K end-of-line resistor between terminals 25 and 26 (place the supervisory resistor in series at the door contact).
4. **Additional Accessories.** Optional devices such as a Request to Exit button, an audible silence button, and a Request to Arm button are described below.
 - A **Request to Exit button** is mounted inside the secured area and is used to unlock the entry door without requiring a second card reader. The RTE button is a normally open momentary switch wired between terminals 27 and 28.
 - An **Audible Silence button** is mounted inside the secured area and is used to silence the card reader sounder during door ajar conditions, and kick-in conditions. The Audible Silence button is a momentary normally open switch wired between terminals 24-25 (SND OFF).
 - A **Request to Arm button** can be mounted inside

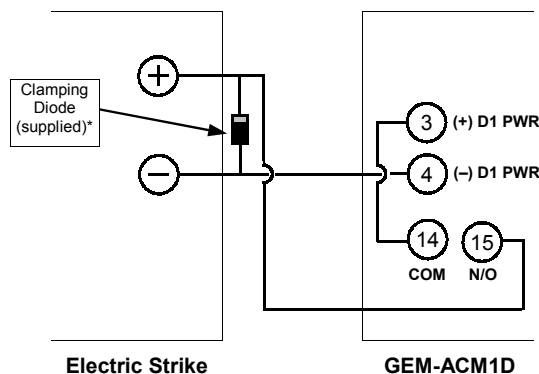


Fig. 2: Normally De-Energized Lock Wiring

* The diodes shown above are used to reduce the electrical noise produced when internal coils of the magnetic lock are de-energized.

or outside the secured area and is used in conjunction with a proximity card (enabled for arming) presented at a card reader. When the RTA button is pressed, a window of time is created during which a valid card must be presented to the card reader in order for arming to take place. This window of time is equal to six times (6x) the time programmed in the "Un-Lock" time (see pages 11 and 16) The RTA button is a normally open momentary switch wired between terminals 28 and 29. Before arming, the area to be armed must be secured (all protected doors closed, all motion sensors stable, etc.).

Note: Consult all installation instructions provided with each accessory before installation and connection to the GEM-ACM1D.

5. Connect Card Reader(s). Each GEM-ACM1D can control one access card reader and two when used with a GEM-2D module. Card readers can be installed on one door (to control both entry and exit) or when used with the GEM-2D on two separate doors (to control access in one direction only). Connect the Card Readers to the GEM-ACM1D as shown in the table below. **Note:** Connecting the power lead of a 5VDC reader to a 12VDC configured power terminal may damage the card reader. See "Card Reader Power Jumper" further in this manual for proper power configuration.

Each ACM will operate with any card reader that transmits data in a Weigand format, regardless of manufacturer. Two card formats are supported: (1) NAPCO standard 36 bit format or (2) HID standard 26 bit format. The "embossed" number printed on the face of the card, up to 6 digits, must be manually entered as the user code (see Programming pages 12 and 18). When this embossed number is entered and configured in the system, the number cannot be entered at a system keypad for access.

Reader LED Indications

Many card readers include an LED for visual feedback when access cards are presented to the reader. See Table 3 for the variety of LED indications and their meanings.

LED INDICATION	ACCESS CONDITION
Steady Red	Door Locked
Short Steady Green	Card Read--Invalid card or disabled user
Long Steady Green	Card Read--Valid card, user enabled (door unlocked)
Alternating Green and Red	(Downloading PCD-Windows Program to ACM)

Remote Status LED's (Optional)

Some card readers provide LED's that can be wired to indicate system status. For readers with a snap-on bezel and red and green LED's, wire to terminals 30 and 31 (door 1) and terminals 48 and 49 (door 2).

LED INDICATION	SYSTEM CONDITION
Steady Red	System Armed
Red LED is off	System Disarmed
Blinking Red	System in Alarm
Steady Green	System Ready to Arm
Green LED is off	System Not Ready to Arm

When Stealth Mode is enabled, the LED indications are displayed for one minute only. See Stealth Mode section on page 10 below. When Stealth Mode is disabled ("normal operation"), the LED's are always enabled and mimic the Keypad Status LEDs for the following functions only: Armed, Disarmed, Ready, Not-Ready and Alarm.

Card Reader Sounder Operation

Many card readers include a sounder for audible feedback. The sounder output can be connected to local warning devices for:

- **Access Door Kick-In.** Kick-In occurs when a locked access door is opened (the n/c circuit between terminals 25-26 or 43-44 opens). A "Kick-In" can also occur if either door circuit is shorted while locked (a supervisory resistor should be connected as close to the door contact as possible, as required for Grade A installations). The Sounder Out terminals 23 and/or 41 turns active low, and the local sounder activates and remains active until the access door is closed. Additionally the "Kick-In" condition will cause the GEM-X255 connected to the GEM-ACM1D to sense the zone programmed "Kick-In Zone" as faulted. Depending on the panel program, a faulted "Kick-In Zone" will generate an alarm or trouble. Typically, this zone would be programmed for 24-hour and Burglary output. The panel will continue to sense this zone as open until the door contact is restored.
- **Door Ajar.** The access door is open for 30 seconds or longer. The local sounder activates and remains active until the door is closed. A "Door Ajar" condition causes the GEM-ACM1D to turn the (-) SND OUT (terminal 23) active low. Typically, this activates the card reader sounder. A remote low current sounder may be wired to the SND OUT and (+) READER PWR (terminal 17), but be aware that the sounder will activate whenever the GEM-ACM1D uses the SND OUT terminal to generate sounds on the card reader (valid card, RTE button press, first swipe of double swipe arm, etc.). The SND OUT will remain on until the door is closed or until the SND OFF button is pressed. (The SND OFF button is a N/O momentary push button wired to terminals 24 and 25 of the GEM-ACM1D). Additionally the "Door Ajar" condition will cause the GEM-X255 connected to the GEM-ACM1D to sense the zone programmed "Door Ajar Zone" as faulted. Depending on the panel program, a faulted "Door Ajar Zone" will generate an alarm or trouble. The panel will continue to sense this zone as open until

the door contact is restored.

6. Other Connections and Jumpers

Card Reader Power Jumper (JP1). Determine the power requirements of the card reader in use and connect jumper JP1 as follows: If a 12V device, place the jumper on the top two pins (pins 1 and 2) and if a 5V device, place jumper on the middle and bottom pins (pins 2 and 3). **Note:** Jumper set to 12V from factory. See wiring diagram for details.

Keypad Address Jumper (JP2). Notice that JP2 has 5 pairs of pins, each pair forming a vertical "column". For JP2, the Access reader uses a keypad location in the system for communication (Keypad #1 must NOT be selected as an ACM type). The JP2 pin "columns" 1-4 must reflect (in hexadecimal) the keypad/ACM address to be selected in the panel programming. Therefore, if keypad address 2 is to be used for the ACM in panel programming, the shunt connector should be placed on the second "column" of pins marked "2" in JP2. If keypad address 3 is to be used, place jumpers on the first and second "column" of pins marked "1" and "2". See Fig. 3 and Table 4 below for jumper placement. **Note:** Panel programming is to be performed later, in the section below "Panel Programming". Pins marked "5" are used for the high security "Degradate Mode Off Jumper", see next section below.

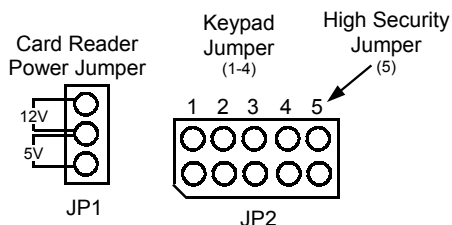


Fig. 3: Jumpers JP1 and JP2

Table 4 Keypad Jumper JP2 Configuration		
JP2: Pins "columns" 1 through 5 are depicted from left to right using the illustrations in the table below: Unconnected jumpers are white: □ Shorted Jumpers are black: ■		
Keypad Address	JP2 Jumper Pin "Column" Shorted	JP2 Illustration
1	Not used, must be a keypad. Do not configure ACM for Keypad #1	
2	2	□ □ ■ □ □
3	1 and 2	■ □ ■ □ □
4	3	□ □ ■ □ □
5	1 and 3	■ □ ■ □ □
6	2 and 3	□ ■ ■ □ □
7	1 and 2 and 3	■ □ ■ □ □
8	4	□ □ ■ □ □
9	1 and 4	■ □ ■ □ □
10	2 and 4	□ ■ ■ □ □
11	1 and 2 and 4	■ □ ■ □ □
12	3 and 4	□ □ ■ □ □
13	1 and 3 and 4	■ □ ■ □ □
14	2 and 3 and 4	□ ■ ■ □ □
15	1 and 2 and 3 and 4	■ □ ■ □ □

High Security--Degradate Mode Off Jumper (JP2 Pins #5). This pair of pins on the far right (5th "column") determines the operation of the GEM-ACM1D module when a bad checksum computation is encountered. From the factory, JP2's fifth "column" of pins are unpopulated, and therefore provides a lower security level for the system as follows:

- When the GEM-ACM1D detects a bad configuration data checksum computation and loses communication with the panel (unable to receive an update), the GEM-ACM1D will grant access to any user who has a SIA 26-bit Standard card or a NAPCO proprietary 36-bit card.

If higher security is desired, fifth "column" of pins in JP2 can be shorted using shunt provided and the GEM-ACM1D will not allow access.

Door Lock Power - Battery Backup Jumper. Placing a shunt connector on jumper JP3 (factory default) enables battery power backup for the D1 PWR and D2 PWR outputs. Jumper JP3 will not affect the battery standby operation of all other terminals on the GEM-ACM1D. Therefore if AC power is lost, the GEM-ACM1D will continue to function, but doors will not be powered unless powered by a separate circuit. When this jumper is not installed, the GEM-ACM1D fulfills the UL 4 Hour Standby requirement (and is allowed to remain a UL listed mercantile burglary accessory to the GEM-X255) even when drawing the maximum rated current (1.5A) from the door locking mechanism power, with the 4 amp-hour battery connected. If jumper is installed and AC is lost, doors will be powered by the battery, but batteries may be discharged quickly if the door locking mechanism requires power to operate. See the Standby Battery Calculation Worksheet on page 8.

SECOND DOOR INSTALLATIONS

The **GEM-2D** is a module that connects to the GEM-ACM1D. It allows the GEM-ACM1D to independently control a second access relay using a separate card reader.

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. In addition, readers connected to the GEM-2D do not provide Arm/Disarm capability. See "Typical Installations", Options 1 and 2 on page 2.

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 into the GEM-ACM1D. See Fig. 4 below illustrating the installation of the GEM-2D into the GEM-ACM1D.

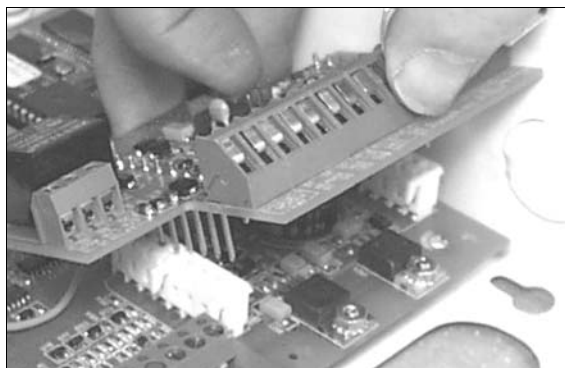


Fig. 4: Installing the GEM-2D. Before inserting, align all pins and receptacle sockets, then fully insert the GEM-2D into receptacles J4F and J5F located on top of the GEM-ACM1D.

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 6, wire terminal 5 to terminal 32, then connect the positive door strike wire to terminal 34. See Figs. 5 and 6 below. The GEM-ACM1D can supply a constant combined maximum 12V output of 1.5A for D1-PWR and D2-PWR.

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

Lock Wiring for the GEM-2D

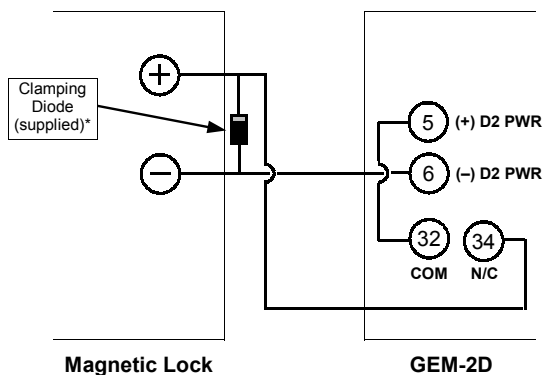


Fig. 5: Normally Energized Lock Wiring ("Mag Lock")

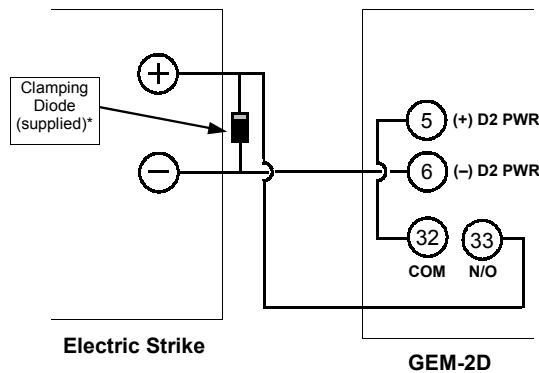


Fig. 6: Normally De-Energized Lock Wiring

* The diodes shown above are used to reduce the electrical noise produced when internal coils of the magnetic lock are de-energized.

STANDBY-BATTERY CALCULATION WORKSHEET

Use the procedure given below to determine the required standby battery capacity in Ampere-Hours (AH). NOTE: It is not totally accurate to merely divide the combined standby current (in amperes) by the battery amp-hour rating to obtain the standby time (in hours), since other factors (control-panel charging capabilities, temperature, battery condition, battery discharge rate, etc.) affect battery operation. The following calculations will yield the theoretical standby time of the 4AH and 7AH batteries at room temperature. **NOTE:** JP3 is used to provide standby power to D1 and D2 power output terminals. When AC power is removed, these terminals will not have battery standby voltage available. UL has only evaluated the system with JP3 removed. In addition, this Standby-Battery Chart has not been evaluated by UL.

1. STANDBY CURRENT

			STANDBY CURRENT (Amps)		
DEVICE	QTY		EACH	=	TOTAL
GEM-ACM1D	1	X	0.04	=	0.04
GEM-2D	1	X		=	
Reader 1 of 2		X		=	
Reader 2 of 2		X		=	
Door Strike 1*		X		=	
Door Strike 2*		X		=	
		X		=	
		X		=	
		X		=	
TOTAL STANDBY CURRENT →					Amps

*Not applicable if JP3 is not installed. JP3 must NOT be installed in UL installations.

7AH Battery Standby Time @ 20 degrees C		
Current	Capacity (AH)	Standby Time
0.35A	7.0 AH	20 Hours
0.70A	6.3 AH	9 Hours
1.4A	5.6 AH	4 Hours
1.8A	5.13 AH	2.85 Hours*

4AH Battery Standby Time @ 20 degrees C		
Current	Capacity (AH)	Standby Time
0.2A	4.0 AH	20 Hours
0.40A	3.6 AH	9 Hours
0.80A	3.2 AH	4 Hours
1.40A	2.8 AH	2 Hours
1.8A	2.61AH	1.45 Hours*

PROGRAMMING THE GEM-ACM1D

After all wiring and connections have been made (refer to all previous steps, above), first program the GEM-X255 via the PCD-Windows Quickloader* download software (use version 4.5 or later). The GEM-X255 will then transfer the access programming to the GEM-ACM1D. Direct Address Program Mode can also be used for programming via the keypad, with the exception of schedules. To schedule the ACM users, PCD-Windows MUST be used. See WI1035 for PCD-Windows installation and configuration instructions.

Note: The panel must not be programmed with an unattended remote download. The system must always be tested after programming or re-programming.

PCD Windows Screens

Several PCD-Windows screens* are used. After PCD-Windows is installed and running, create a new GEM-X255 account.

Note: A door contact on an ACM takes over for an existing Physical Zone. To add additional zones to a panel, use an EZM or an RF Wireless Receiver. Map the ACM door, Forced Door and Door Ajar to these zones.

1. Enable ACM Access

In PCD-Windows, click the **System Assignment** button, and select the *System Options* tab. In the System area at the right, check "Enable ACM Access" and click **OK** to save. This step should be performed first because it makes PCD-Windows* display the correct screens for access control.

This can also be performed in Direct Address Program Mode: Go to address 2423 and enable bit zero (press 1 on the keypad) to allow the GEM-ACM1D and GEM-2D accessories to function in the system.

2. ACM/Keypad Assignment

Click the **Keypad Assignment** button, and select the *ACM Assignment* tab. This screen allows you to associate the hardware (installed ACM modules) to areas, mapped zones, external relays, and other elements of the security system. An EZM or a GEM-RECV must be assigned to the zones programmed for each door. Up to 4 ACMs (each with 2 doors with 3 zones each) for a total of 24 out of a possible 255 zones in the panel can be programmed for access control. Configure the access control modules by entering or selecting the information in the areas provided:

ACM: Up to four GEM-ACM1D modules can be used in a system.

Keypad: Assign the physically installed ACM to a keypad location in the system. Keypad number 1 cannot be used, therefore select a keypad location 2-15.

Door: Two doors are allowed for each GEM-ACM1D module, when a GEM-D2 module is installed. The Door column simply displays these two doors to allow for further programming below.

Area: Assign an area to each ACM door. If the access

area is shared by both the GEM-ACM1D and GEM-D2, then the same area is used for each door. For each door programmed, there are three possible events that can occur and thus activate the zone specified. You MUST designate a separate zone number for each of the three possible events below.

- **Zone:** Assign a zone number to activate when the access door is opened. (wired to door contacts).
- **Forced Entry Zone:** Assign a zone number to activate when a door is opened, but not unlocked.
- **Door Ajar Zone:** Assign a zone number to activate when the door is opened, but not closed, for a specified period of time.

Note: These zones can be programmed into the control panel (via the keypad) using Direct Address Program Mode: Addresses 2740 -2779 correspond to the 4 possible ACM's and their zones. The Area # for Door 1 is controlled by the existing Keypad Programming table (Address 2425 to 2439). The assigned area for Door #2 for each ACM must be entered in addresses 2748, 2758, 2768 and 2778 and must not be left blank if Door 2 is to be used. See the Direct Address Programming Instructions on page 15 for more details.

Arm All Areas Allowed: Check to allow multiple arming of areas. However, in order for this feature to function, several other programming conditions must also be in effect: (1) The proximity card used must be programmed to allow for arming. (2) The card must be programmed to allow for arming multiple areas as specified in the User Assignment screen, "ACM Area" column (up to 8 areas).

Uncheck to restrict users to arming only those areas in which the card reader physically resides (and for which the card reader is programmed), and only among those areas specified in the User Assignment screen, "ACM Area" column.

For example, if a user is permitted to arm areas 1-5 (as specified by the User Assignment screen "ACM Area" column), and this feature is checked, that user will be permitted to arm areas 1-5 at any specified reader. If unchecked, then the user will be permitted to arm only the area in which the card reader resides--area 2 will arm if using an area 2 reader, or area 3 will arm if using an area 3 reader, and so on.

Corresponds to GEM-X255 Direct Address Program mode addresses 2784-2791. See also step 5, "Configure Areas" on page 12.

Disarm All Areas Allowed: Check to allow multiple disarming of areas. However, in order for this feature to function, several other programming conditions must also be in effect: (1) The proximity card used must be programmed to allow for disarming. (2) The card must be programmed to allow for disarming multiple areas as specified in the User Assignment screen, "ACM Area" column (up to 8 areas).

Uncheck to restrict users to disarming only those areas in which the card reader physically resides (and for which the card reader is programmed), and only among those areas specified in the User Assignment screen,

* For local programming or downloading only.

"ACM Area" column. For comparison, see previous "Arm All Areas Allowed". Corresponds to GEM-X255 Direct Address Program mode addresses 2784-2791.

Stealth Mode: The card reader armed and status LED's are designed to provide system feedback to users. If this feedback is not desired (such as for card readers located outside the protected premises), Stealth Mode can be enabled for each card reader assigned to active ACM areas. Check to enable and uncheck to disable Stealth Mode. When enabled, the armed and ready status card reader LED's are normally off but are turned on for 1 minute by any of the following events:

- Press a request to exit button
- Press a request to arm button
- Present a valid ARM/DISARM or ARM card to the card reader

When the system is in alarm, Stealth Mode is disabled. "Access Only" cards do not affect the status of Stealth Mode.

Scheduled Free Access Index: An external relay can be programmed to activate (via a schedule) to allow the protected door to unlock and allow "free access" for the scheduled time. This column links the enabled ACM's to that external relay. If you wish to create a space of time to allow free access through the access door (for example 1 hour during lunch every day), first program a 1 hour lunch time schedule for the relay to activate (in the **Schedule Assignment** screen, *External Relay Control* tab). Then add the relay number to the **Scheduled Free Access Index** column for the ACM you wish to control during that scheduled 1 hour time period.

Note: If an existing external relay exists on the system, use the next available relay number. This selection corresponds to addresses 4072-4079 in the control panel Direct Address Program Mode.

Other aspects of the installed access modules are configured using this screen, including:

Enable Two-Swipe Arming: If checked, allows arming by presenting a proximity card twice. The proximity

card used must be enabled for arming/disarming functions, and must be presented twice within the time specified in the "Two-Swipe Arm Time" detailed on page 11. Corresponds to GEM-X255 address 2780, bit 0 (press 1 on the keypad).

Enable Napco Proprietary Access Format: The GEM-ACM1D or GEM-2D supports two proximity card formats: (1) NAPCO standard 36 bit proprietary format or (2) HID standard 26 bit format. Check to allow the GEM-ACM1D or GEM-2D to recognize this standard 36 bit card format. Corresponds to GEM-X255 address 2780, bit 1 (press 2 on the keypad).

Enable Facility Code: Not all proximity cards contain a facility code. If the cards used contain a facility code, and you wish to allow the code to be used within the system, check this feature. When enabled, the least significant digit of the facility code must be used as the most significant digit of the card access Code. See the Code section within "**Create an ACM User & Enter User Codes**" (item 3) on page 12. Corresponds to GEM-X255 address 2780, bit 2 (press 3 on the keypad).

Enable Access Logging Into Burg Log: This feature allows the viewable keypad log to display a limited number of access control events. When unchecked, the system will log access events in the access log, which cannot be displayed at the keypad (limited to 800 events); when checked, access events will be logged only in the burg log. **Note:** When configuring the event logs, consideration should always be given to various factors: (1) the size of the two event logs; (2) how many events might be logged within a given time; (3) the possible loss of event data due to excess events causing the log to overwrite itself. This feature corresponds to GEM-X255 address 2780, bit 3 (press 4 on the keypad).

The following are new ACM related new events:

1. Access Granted
2. Access Denied
3. ACM Power Trouble, includes ACM Low Battery

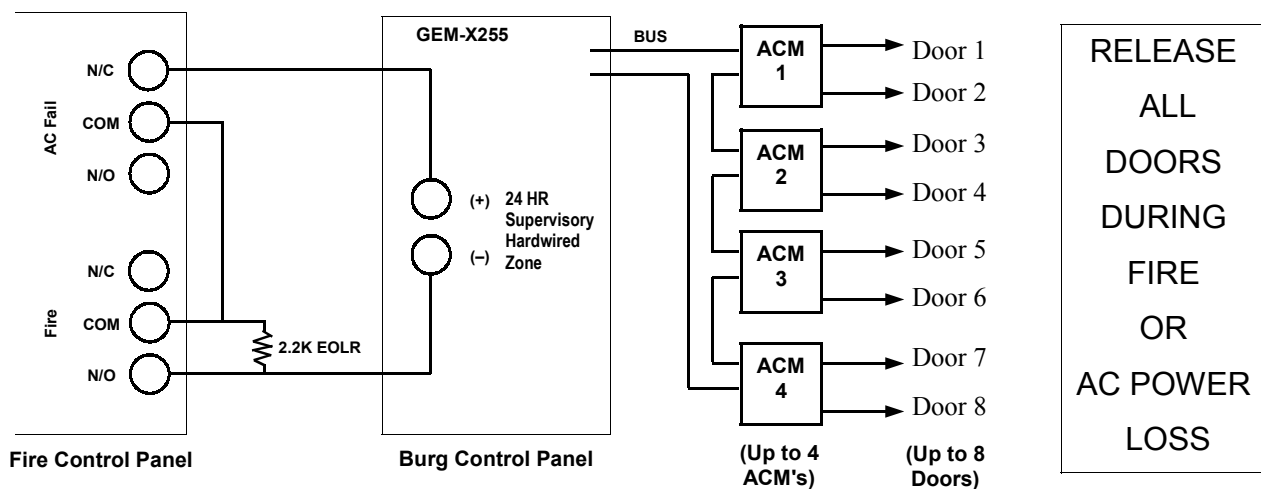


Fig. 7: Integrate an Existing Fire Panel into the Access Control System

and ACM AC Power Failure

4. ACM Power Trouble Restore

The General Format, as printed by GEM-PRINT is as follows:

Date – Time – ACM# – Event – User # – UserCode – Door #

Example:

10/14/2003 04:50PM ACM2: Access Granted to User 4 : 903466 via Door 1

10/15/2003 05:35AM ACM1 Trouble: Power

10/15/2003 05:40AM ACM1 Trouble Restore: Power

These same 3 events viewed through a keypad appear as:

AccessGrnt 10/14 04:50PM **A2D2U004**

ACMPwrTrb 10/14 05:35AM **ACM1**

ACMPwrTrbR 10/14 05:40AM **ACM1**

Note: Characters in bold are built into panel default program (English only) and Quickloader's language download.

The following are ACM related events that are mapped to the existing Keypad events

1. Panel/ACM# communication failure is logged using the existing Panel/Keypad# communication failure.
2. ACM# Tamper is logged using Keypad# Tamper.

Text now reading "Keypad" will be changed to "KP/ACM".

Enable Printing Access Events: If you have GEM-Print and compatible printers with the correct versions, the Access Event log can be printed as they occur. Corresponds to GEM-X255 address 2780, bit 4 (press 5 on the keypad). The GEM-PRINT version 4 is required.

Enable card presentation beep and green LED flash:

Controls the card reader sounder and LED's. Many types of card readers can be used with the GEM-ACM1D, and each may behave differently depending on its design. The recommended HID card reader is the HID *Prox Point Plus Model 6005B-00*, and this reader will operate with regard to this feature as follows:

- Disabled: Will beep and flash green when card is read, door ajar sound is enabled.
- Enabled: Will beep twice and green LED will display twice when card is read, door ajar sound is enabled.

This feature corresponds to GEM-X255 address 2780, bit 5 (press 6 on the keypad).

Un-Lock Time: Specifies the amount of time the user is given to open the door after the card credential is verified. A full explanation is presented below. Panel address 2783 is used, and the value entered is defined in seconds. **Note:** When the system is programmed for "Two-Swipe Arming", the first time a card (programmed for arming) is swiped, the door unlocks for the standard "Un-Lock Time". The second time the card is swiped, the door access "Un-Lock Time" is extended to four (4) times this programmed "Un-Lock

Time" value. Default is 5 seconds.

When a card credential is presented to the card reader and is verified by the GEM-ACM1D to be a valid and enabled user, the GEM-ACM1D energizes the D1 Relay (which either removes power or supplies power to the door lock) unlocking the lock. The lock will remain unlocked for the programmed "Un-Lock Time". If the door is not opened (as sensed by the door contact) by the end of the "Un-Lock Time", the lock power is reapplied/removed, re-locking the door until another programmed card credential is presented. If the door is opened during the "Un-Lock Time", power is immediately reapplied/removed such that as soon as the door is closed, the door is immediately locked. Once the door is closed, another programmed credential must be presented for it to re-open, even if "Un-lock Time" has not expired from the initial presentation of the programmed credential. Once the door is unlocked and opened, a 30 second "Door Ajar" time begins. If the door is not closed after thirty seconds the GEM-ACM1D initiate a "Door Ajar" condition. See page 9 for more information about "Door Ajar".

Two-Swipe Arm Time: Allows arming by presenting a proximity card twice within this time period (the card used must be enabled for arming/disarming functions). Panel address 2782 is used and the value entered is multiplied by 100 milliseconds (1/10th of a second). Default is 40 (40 x 1/10 = 4 seconds).

Emergency Free Access: Panel address 4080 is used. NFPA requires that all doors must be unsecured ("unlocked") during a fire alarm and/or a primary power (typically AC) failure. Using outputs of the fire alarm panel and wiring them to the zone input, existing fire alarm systems can be integrated into the access control system. See below for programming and wiring information.

Programming the GEM-X255 Emergency Free Access Zone Features:

- a. 24 Hour Zone. This will cause the GEM-ACM door relay to energize on a short and on an open.
- b. No Alarm output. The Fire alarm system is required to generate a temporal alarm with all the sounding appliances in synchronization. The additional supplementary alarm output of the panel may confuse the people inside the protected premises.
- c. Do not program "Report on Alarm". The GEM-X255 panel is not listed as a Mercantile Fire Alarm and should not report fire alarm data to the central station. Additionally this panel may interfere with the more specific fire panel alarm report depending on the telephone wiring.
- d. Program "Keypad Sounder on Alarm" to the mapped Emergency Free Access zone to enable the keypad to display the emergency condition.
- e. Use the correct Zone Descriptions to properly inform the user of the condition (i.e. "Access Door Release").

The output(s) from the fire alarm system must be wired so that if there is a fire alarm or AC failure of the fire alarm system, the "Emergency Free Access Zone" is either shorted or opened. See Figure 7 for recommended wiring.

Wiring the Fire Panel to the Emergency Free Access Zone:

- Wire a 2.2K EOLR across the Common and N/O terminals of the dry fire panel alarm relay.
- Wire "Emergency Free Access" zone (-) to Common of Fire panel dry AC ON relay.
- Wire Fire panel AC ON relay N/C to Common of fire panel alarm relay.
- Wire Fire panel alarm relay N/O to "Emergency Free Access" zone (+).

3. Create an ACM User & Enter User Codes

Click the **User Assignment** button, and select the *User Assignment* tab. Configure a user (1-255) by entering or selecting information in the areas provided:

Description: Enter a description of the user, such as their name.

Code: Enter the code of the proximity card assigned to that user. Enter all numbers embossed on the card itself, and if there is a Facility Code, use the least significant digit as the first number of the Code. For example, if the embossed card number is 78799 and the Facility Code is 12, enter 278799 in the Code column for the user selected.

AL (Authority Level): Select an Access Level (assigned to the proximity card) from the drop down list. 0=No Access, 1=Disarmed Access, 2=Always Access. For example, if you wish to give the user assigned to this card the ability to enter the premises while armed (and then disarm via a keypad inside the premises), select level "2". This selection corresponds to address 0013 in Direct Address Program Mode where bits 01 and 1 are used (00= No Access, 01= Disarmed Access, 10= Always).

Code Type: Determines the category assigned to the code (and thus to the specific proximity card). The types include "No Arming", "Arm/Disarm", "Arm Only". This selection corresponds to address 0013 in Direct Address Program Mode where bits 2 and 3 are used (00= No Arming, 01= Arm/Disarm, 10= Arm Only).

User Options: The IO ("Initially Off") column indicates whether the user is initially "On" or "Off". For example, if a user is "Off", then this user will always be disabled unless there is a "User On" schedule programmed to enable him (see step 6 "Create an ACM Schedule" below). The default state for each user is "On" (unchecked). If a user has a "User On" event schedule, that the state for the user be "Off" (checked). The remaining options are not used for ACM Programming, and will be grayed-out when a valid ACM area is selected in the "ACM Area" column.

Area: The Area column and the ACM Area column are mutually exclusive--either can be used but not both with

one user (row). The Area column assigns the keypad user code to an area. To assign the user to an ACM Area, see *ACM Area* section (below). Click the drop-down box to display the areas, and click each area to highlight and select.

ACM Area: Assign a user (and their assigned proximity card) to an ACM area. Click the drop-down box to display the areas, and click each area to highlight and select. See also step 2 **ACM/Keypad Assignment** ("Arm All Areas Allowed") and step 5 **Configure Areas (Area Assignment)** button).

4. Edit Zones (Zone Assignment)

In section 3 above, zones were selected to possess certain properties. For example, you may have assigned zone 1 to activate when the access door is opened (wired to door contacts). You may wish to edit each assigned zone with respect to how the system is intended to be used.

For example, if the system is designed to allow a user to access an armed system, then enter a disarm code at an interior keypad, you would need to program the zone as an Entry/Exit zone. However, if the system is designed to be disarmed before entry, you may wish to program the zone as a Perimeter zone. To edit zones, proceed as follows:

Click the **Zone Assignment** button and the list of programmed zones appears. Double-click the zone you wish to edit and the *Zone Edit* window appears. Click to select a **Zone Label**, or double-click the Zone Label to edit (*Edit Zone Label* window). A Zone Description can be added, and Reporting Codes can be configured. When complete, click **OK** to save.

5. Configure Areas (Area Assignment)

As previously explained in step 2 (**Keypad Assignment** button, *ACM Assignment* tab), the **Arm All Areas Allowed** attribute is associated with the User Assignment screen. In addition, **Arm All Areas Allowed** is also associated with the Area Assignment screen. The Area Assignment tabs describe how different areas function with relation to each other. Press the **Area Assignment** button, and view the three tabs:

Area Description tab: Type in text descriptions of areas and messages as required.

Area/Disarm tab: Select areas that when disarmed will silence the corresponding outputs located in the selected areas.

Area Priority tab: Not to be used with "**Arm All Areas Allowed**".

See also step 3 ACM Area on page 12.

6. Create an ACM Schedule

Note: PCD-Windows download software MUST be used to program schedules*.

Note: When the GEM-ACM1D loses communication with the control panel, the user access schedule will be abandoned and any user that has been programmed in the system will be granted access.

Users are controlled by assigning them to a schedule.

By default all users (i.e. their proximity cards) are active; the schedules *restrict* user card access. For example, if an employee works 9AM through 5PM, program the schedule to turn off starting at 5PM for the next 16 hours (until 9AM the next day). This schedule can also be programmed as follows: Set user to be "Initially Off" (see step 3 "User Options" above), then schedule to turn on at 9AM for the next 8 hours.

To create an access schedule, click the **Schedule Assignment** button and select the *Schedule* tab. For the first user, enter as follows:

Description: Enter text in the Description column (such as the name of the user).

Event: Enter a description of the event in the Event column (such as "User off" to restrict access during a period of time). The following is a partial list of events for the GEM-X255 panel associated with access control:

- External Relay On (RB3000)
- User On (Enable)
- User Off (Disable)

Index: The Index column is used to associate an event to another "object" configured elsewhere in the system. In access control systems, the object typically is a specific user/access card number or a specific External Relay number.

Normal Time: Since users are always enabled unless restricted, the Normal Time will reflect the (a) the time the period of restriction begins and (b) the length of time the period of restriction will remain in effect. For example, if you wish to allow a user access only between their working hours of 9AM through 5PM, enter (a) the time of day (in 24-hour military time) the period of restriction will begin (enter "17:00"), and (b) the length of time, in hours, this period of restriction will remain in effect (enter 16 hours). Therefore the entry will be: "17:00-16:00".

Holiday Time: Used to restrict a recurring block of time. For example, if you wish to restrict access every year during the "Thanksgiving" holiday (which always occurs on the 4th Thursday of November), enter as follows: (a) Click the *Holiday Dates* tab; (b) Type in a description of the holiday and click in the Date column to open the **Holiday Scheduler** window. In the Date field, all that is needed is November, therefore enter "11/**/****" (*=wildcard). In the Day-of-Week field, enter "Th", and in the Week Number field, enter "4" to designate the 4th week. Press **OK** to save the data and press **Apply** to save the holiday. (c) Program a time span for all scheduled holidays: Select the Schedule tab, click in the Holiday Time column of the schedule you are changing (the "Time Schedules" window opens). Click to highlight a blank time schedule and click **Edit**. In the **Time Scheduler** dialog, enter "0:01" in the Start Time field to signify 12:01AM, and enter 24 in the Time Length Field. Press OK three times to save all data. Scheduled restricted time can overlap with other scheduled restricted time if needed.

Date: Enter the dates of the week you wish to include with the previously programmed "Normal Time". For

example, the user who works 9AM-5PM, Monday through Friday, click in the Date column of the schedule you are changing (the Date Schedules window opens). Click Day of Week drop down box and click to highlight the days you wish to include.

IMPORTANT: After adding, changing or removing a scheduled event, you must restart the control panel to ensure that all new or existing scheduled events will occur properly and without delay. **To restart the panel locally:**

Remove jumper JP5 from the top two pins ("Normal") and place the jumper on the bottom two pins ("Config"); then replace the jumper on the top two pins.

To restart the panel remotely via PCD-Windows*: Click the **Status/Control** button and click **Restart Panel**. Note that the remote connection to the panel will be lost.

7. Download to Control Panel

Before proceeding, save your work (File, Save Work). Press the **Panel Communication** button. In the **Select Transfer Operation** drop-down box, select *Download to Panel*. Check **User Program Area**, **Dealer Program Area** and **Description Area**. Click **OK** to initiate the data transfer to the control panel. In UL installations, you must disable remote downloading (no unattended downloading allowed) and after changing the program, you must verify panel operation at the panel site.

APPLYING POWER

Before applying power, it is recommended to first download the panel program using PCD-Windows Quickloader download software. See the section "Programming the GEM-ACM1D" on page 9. Once the program is downloaded, applying power to the system will initiate communication from the control panel to the GEM-ACM1D. When communication is complete, cards can then be programmed, tested and distributed to users.

After downloading the panel program, first apply power to the control panel by first inserting the transformer into a standard 120V household duplex receptacle, then connect the flying battery leads. System troubles will appear at the keypad (due to the lack of ACM power, a keypad/ACM trouble will appear). The zones associated with the doors will be open, and press <RESET> to silence/acknowledge the Keypad/ACM trouble.

Next, apply power to the GEM-ACM1D (and GEM-2D if installed) by inserting the transformer into a standard non-switched 120V duplex receptacle, securing the transformer via the center duplex receptacle screw. Connect the flying battery leads to battery. There are three LEDs on the face of the GEM-ACM1D module which will light as follows: When power is applied, the green AC ON LED on the module will turn on (steady). Within the first 30 seconds of applying power to the GEM-ACM1D / GEM-2D modules, the red polling LED will flash rapidly (indicating it is uploading the panel program). After a few seconds, this red polling LED will

* For local programming or downloading only.

then blink once per second (indicating it is communicating with the panel). The third Low Battery LED should be off unless it detects a low battery.

Confirm all connections are correctly wired, all system troubles are cleared, and all zones are closed. Test all aspects of the system including access (use a programmed proximity card), all wired accessories (such as the Request to Exit (RTE) button), all keypads and zones (such as door ajar, etc.).

GEM-ACM1D System Troubles

A keypad ACM System Trouble display will be followed by one or more of the following error codes:

E11-NNN - KEYPAD/ACM TAMPER. GEM-ACM1D accessory cover opened or removed. NNN is keypad number.

E10-NNN - KEYPAD/ACM TROUBLE. ACM no response to poll, buss not communicating with panel. NNN is keypad number. Zones mapped to the access doors will indicate faulted.

E54-000 - LOW BATT NO/AC. Power failure for ACM #1. Check power transformer. Check for blown fuse or circuit breaker; general power outage. Also may indicate battery below 11 volts. If battery not recharged within 24 hours, replace it.

E55-000 - LOW BATT NO/AC. Power failure for ACM #2. Check power transformer. Check for blown fuse or circuit breaker; general power outage. Also may indicate battery below 11 volts. If battery not recharged within 24 hours, replace it.

E56-000 - LOW BATT NO/AC. Power failure for ACM #3. Check power transformer. Check for blown fuse or circuit breaker; general power outage. Also may indicate battery below 11 volts. If battery not recharged within 24 hours, replace it.

E57-000 - LOW BATT NO/AC. Power failure for ACM #4. Check power transformer. Check for blown fuse or circuit breaker; general power outage. Also may indicate battery below 11 volts. If battery not recharged within 24 hours, replace it.

DIRECT ADDRESS PROGRAMMING

Direct Address Programming allows you to go directly to the address locations (up to 4095) and change the data entries manually in order to customize your control panel options. The data entry location accepts data in one of three formats: Binary, Decimal and Hexadecimal. For more information, see the GEM-X255 Programming Instructions (W11092).

KEYPAD #1: For ease of programming, it is recommended that a GEM-K1CA (Version 8) be used as Keypad #1. (Regardless of which keypad is selected, all *new* keypads are configured as Keypad #1 out of the box). The instructions below are depicted using the GEM-K1CA keypad.

ACCESSING DIRECT ADDRESS PROGRAM MODE

1. Enter the panel's Dealer Security Code, then press **[MENU]**.
2. Answer NO to all questions until "ACTIVATE PROGRAM Y/N" is displayed; then press YES. **NOTE:** If you pass "ACTIVATE PROGRAM", scroll backward using **[BYPASS]**.
3. Press **[RESET]** to enter the Address Program Mode. Address "0000" will display.
4. Press the 4 digits of the address (listed below). *The existing data will display and the cursor will advance to the data field.*
5. Program the address as required.
6. Press **[ENTER]** to save.
7. Enter another 4-digit address to continue programming or press **[RESET]** to exit and resume normal keypad operation.

ACM ZONE OPTIONS (ADDRESS 2740-2779)

ACM ZONE OPTIONS:

Enter the Zone numbers (in decimal 1-255 format) for each option in the table below. Press **[ENTER]** or **[OK]** to save.

NOTE: Dark shaded data value box shows option not available. **Note:** The Area # for Door 1 is controlled by the existing Keypad Programming table (Address 2425 to 2439). The assigned area for Door #2 for each ACM must be entered in the table below (addresses 2748, 2758, 2768 and 2778) and must not be left blank if Door 2 is to be used.

ACM1 Zone Options	ADDR	Door 1	ADDR	Door 2
Door Contact	2740		2745	
Forced Entry Zone	2741		2746	
Door Ajar Zone	2742		2747	
Area # for Door 2			2748	
Reserved	2743		2749	
Reserved	2744			

ACM3 Zone Options	ADDR	Door 1	ADDR	Door 2
Door Contact	2750		2755	
Forced Entry Zone	2751		2756	
Door Ajar Zone	2752		2757	
Area # for Door 2			2758	
Reserved	2753		2759	
Reserved	2754			

ACM2 Zone Options	ADDR	Door 1	ADDR	Door 2
Door Contact	2760		2765	
Forced Entry Zone	2761		2766	
Door Ajar Zone	2762		2767	
Area # for Door 2			2768	
Reserved	2763		2769	
Reserved	2764			

ACM4 Zone Options	ADDR	Door 1	ADDR	Door 2
Door Contact	2770		2775	
Forced Entry Zone	2771		2776	
Door Ajar Zone	2772		2777	
Area # for Door 2			2778	
Reserved	2773		2779	
Reserved	2774			

ACM GLOBAL FLAGS (ADDRESS 2780)

2780	ACM Global Flags	
Default		Option
OFF	1	Enable Two-Swipe Arming
OFF	2	Enable NAPCO Proprietary Access Format
OFF	3	Enable Facility Code
OFF	4	Enable Access Logging into Burg Log
OFF	5	Enable Printing of Access Events
OFF	6	Enable Card Presentation Beep and Green LED Flash
OFF	7	RESERVED
OFF	8	RESERVED

ACM GLOBAL FLAGS:

- ☞ 1. Select the desired option entering the option number (1-8) for each digit.
- ☞ 2. Enter corresponding option number in address location.

NOTE: Dark shaded data value box shows option not available. Press or to save.

ACM TIMEOUTS (ADDRESS 2782-2783)

Maximum Two-Swipe Arm Time (x100ms)	ADDRESS 2782		

Unlock Time (sec.)	ADDRESS 2783		

[Default = 030 = 3 seconds.]

[Default = 5 sec.]

Address 2782 determines the maximum time allowed for the double swipe (x100ms). Address 2783 determines the door unlock time, in seconds, after a successful entry.

- ☞ 1. Select timeout (1-255).
- ☞ 2. Enter in corresponding address locations above and right. Press or to save.

ACM DOOR AREA OPTIONS (ADDRESS 2784-2791)

ACM DOOR AREA OPTIONS:

- ☞ 1. Select the desired option entering the option number (1-3) for each address.
- ☞ 2. Enter corresponding option number in address location.



NOTE: Dark shaded data value box shows option not available. Press or to save.

ACM Door Number	ADDR	ACM DOOR AREA OPTIONS							
		Arm All Areas Allowed	Disarm All Areas Allowed	Stealth Mode	RSRVD.	RSRVD.	RSRVD.	RSRVD.	RSRVD.
		1	2	3	4	5	6	7	8
ACM 1 - Door 1	2784								
ACM 1 - Door 2	2785								
ACM 2 - Door 1	2786								
ACM 2 - Door 2	2787								
ACM 3 - Door 1	2788								
ACM 3 - Door 2	2789								
ACM 4 - Door 1	2790								
ACM 4 - Door 2	2791								

[Default = blank (•) blank (•) from address 2784-2791]

ACM SCHEDULED FREE ACCESS (ADDRESS 4072-4079)

ACM SCHEDULED FREE ACCESS:



- ☞ 1. Enter the Scheduled Free Access Index (1-96) (Relay #1-96) for each option in the table below.
- ☞ 2. Press  or  to save.

Scheduled Free Access Index		
ADDR	Relay Number	
ACM 1 – Door 1 – 4072		
ACM 1 – Door 2 – 4073		
ACM 2 – Door 1 – 4074		
ACM 2 – Door 2 – 4075		
ACM 3 – Door 1 – 4076		
ACM 3 – Door 2 – 4077		
ACM 4 – Door 1 – 4078		
ACM 4 – Door 2 – 4079		

[Default = blank (*) blank (*) from address 4072-4079]

ENABLE PANEL OPTIONS (ADDRESS 2423)



ENABLE PANEL OPTION:

- ☞ 1. Select the Panel Option from the table shown and enter in the corresponding address location above.
- ☞ 2. Press  or  to save.

ADDRESS 2423	
PANEL ENABLE OPTION	
DATA ENTRIES RIGHT	OPTION
1	Enable ACM Access
2	Enable TCP/IP Communications
3	TCP/IP Panel/Site Initiated Functions

EMERGENCY FREE ACCESS (ADDRESS 4080)

ENABLE ACM OPTION:

- ☞ 1. Select the Emergency Free Access Zone Number (1-255) and enter corresponding address location below.
- ☞ 2. Press  or  to save.

Emergency Free Access Zone Number	ADDRESS 4080		

[Default = 000]

ENTER PROXIMITY CARD USERS

Example: Enter a code of "123456" as "123456" (from left to right).

USER OPTIONS									
USER CODE (UP TO 6 DIGITS)						USER LEVEL	ACM AREA		

DATA ENTRIES	ACCESS LEVEL	CODE TYPE
blank (*)	0	NONE
1	1	NONE
2	2	NONE
4	0	ARM/DISARM
5	1	ARM/DISARM
6	2	ARM/DISARM
8	0	ARM ONLY
9	1	ARM ONLY
0	2	ARM ONLY

Note: These entries are only available when address 3905 bit 7 is enabled.

ACM AREA				
DATA ENTRIES	A5	A6	A7	A8
blank (*)	NONE			
1	Y			
2		Y		
3	Y	Y		
4			Y	
5	Y		Y	
6		Y	Y	
7	Y	Y	Y	
8				Y
9	Y			Y
0		Y		Y
B	Y	Y		Y
C			Y	Y
D	Y		Y	Y
E		Y	Y	Y
F	Y	Y	Y	Y

Note: "Y" indicates option is enabled.

ACM AREA				
DATA ENTRIES	A1	A2	A3	A4
blank (*)	NONE			
1	Y			
2		Y		
3	Y	Y		
4			Y	
5	Y		Y	
6		Y	Y	
7	Y	Y	Y	
8				Y
9	Y			Y
0		Y		Y
B	Y	Y		Y
C			Y	Y
D	Y		Y	Y
E		Y	Y	Y
F	Y	Y	Y	Y

Note: "Y" indicates option is enabled.

KEYPAD HOME AREA / ACM DOOR #1 AREA (HEX) (ADDRESS 2740-2779)

ACM ZONE OPTIONS:

- 👉 Enter the Zone numbers (in two-digit hexadecimal format) for each option in the table below.
- 👉 The left digit (nibble) determines the type of device: "•" for Keypad and "1" for ACM.
- 👉 The right digit (nibble) determines the home area (1-8) of the specified device.
- 👉 Press or to save.

KEYPAD HOME AREA / ACM DOOR #1 AREA (HEX) (ADDRESS 2740-2779)		
ADDRESS	DEVICE TYPE (•) or 1	AREA # (1-8)
2425		
2426		
2427		
2428		
2429		
2430		
2431		
2432		
2433		
2434		
2435		
2436		
2437		
2438		
2439		

[Default = blank (*) blank (*) from address 2425-2439]

Events Log and Keypad Display Examples

Events are displayed in a variety of different locations--in logs, on the keypad, and when using GEM-PRINT--and each display may vary according to its location. Listed below are the many new events associated with the GEM-ACM1D:

Event	Access Granted
Burg Log	01/08/04 09:45 PM Access Granted: ACM 1 Door 1 User 195 User Code
ACM Log	01/08/04 09:45 PM Access Granted: ACM 1 Door 1 User 195 User Code 903466
KP Log	AccessGrnt 01/08 09:45PM A1D1U195
KP Display	NONE
GEM-PRINT	01-08-04 21:45 ACM 1: Access Granted to User 195: 903466 via Door 1

Event	Access Denied
Burg Log	01/08/04 09:45 PM Access Denied: ACM 1 Door 1 User 195 User Code
ACM Log	01/08/04 09:45 PM Access Denied: ACM 1 Door 1 User 195 User Code 903466 *
KP Log	AccessDeny 12/01 09:45AM A1D1U195
KP Display	NONE
GEM-PRINT	01-08-04 21:45 ACM 1: Access Denied to User 195: 903466 via Door 1

* If the card is not in database, the user will be logged as "User 0".

Event	AC Fail/Low Battery
Burg Log	01/08/04 09:45 PM ACM Power Trouble: ACM 1
ACM Log	01/08/04 09:45 PM ACM Power Trouble: ACM 1
KP Log	ACMPwrTrb 01/08 09:45PM ACM1
KP Display	*SYSTEM TROUBLE* ACM1 TROUBLE E54-00 SERVICE *
GEM-PRINT	01-08-04 21:45 ACM 1: Trouble: Power

* ACM 1,2,3,4 displayed as E54,55,56,57 respectively.

Event	AC Fail/Low Battery Restore
Burg Log	01/08/04 09:45 PM ACM Power Restore: ACM 1 Power Trouble
ACM Log	01/08/04 09:45 PM ACM Power Restore: ACM 1 Power Trouble
KP Log	ACMPwrTrbR 01/08 09:45PM ACM1
KP Display	NONE
GEM-PRINT	01-08-04 21:45 ACM 1: Trouble Restore: Power

Event	ACM Tamper
Burg Log	01/08/04 09:45 PM Trouble: Keypad / ACM 3 Tamper
ACM Log	NONE
KP Log	KP: Tamper 09/08 09:45PM KP003
KP Display	*SYSTEM TROUBLE* KPD/ACM TAMPERS E11-003 SERVICE
GEM-PRINT	01-08-04 21:45 Trouble: Tamper, Keypad / ACM 3

Event	ACM Tamper Restore
Burg Log	01/08/04 09:45 PM Trouble Restore: Keypad / ACM 3 Tamper
ACM Log	NONE
KP Log	KP: TamperR 01/08 09:45PM KP003
KP Display	NONE
GEM-PRINT	01-08-04 21:45 Trouble Restore: Tamper, Keypad / ACM 3

Event	ACM Fail
Burg Log	01/08/04 09:45 PM Trouble: Keypad / ACM 3 Fail
ACM Log	NONE
KP Log	KP Failure 01/08 09:45PM KP003
KP Display	*SYSTEM TROUBLE* KPD/ACM TRBL E10-003 SERVICE
GEM-PRINT	01-08-04 21:45 Trouble: Fail, Keypad / ACM 3

Event	ACM Fail Restore
Burg Log	01/08/04 09:45 PM Trouble Restore: Keypad / ACM 3 Fail
ACM Log	NONE
KP Log	KP Restore 01/08 09:45PM KP003
KP Display	NONE
GEM-PRINT	01-08-04 21:45 Trouble Restore: Fail, Keypad / ACM 3

Event	ACM Prox Card Arming
Burg Log	01/08/04 09:45 PM Close: Area 1 User 195
ACM Log	NONE
KP Log	Close 01/08 A1 U010
KP Display	NONE
GEM-PRINT	01-08-04 21:45 Close: Area 1 User 195

Event	ACM Prox Card Disarming
Burg Log	01/08/04 09:45 PM Open: Area 1 User 195
ACM Log	NONE
KP Log	Open 01/08 A1 U010
KP Display	NONE
GEM-PRINT	01-08-04 21:45 Open: Area 1 User 195

Event	Scheduled Free Access Activated
Burg Log	01/08/04 09:45 PM External Relay 1 ON *
ACM Log	NONE
KP Log	Relay On 01/08 09:45PMR001
KP Display	NONE
GEM-PRINT	01-08-04 21:45 External Relay 1 ON

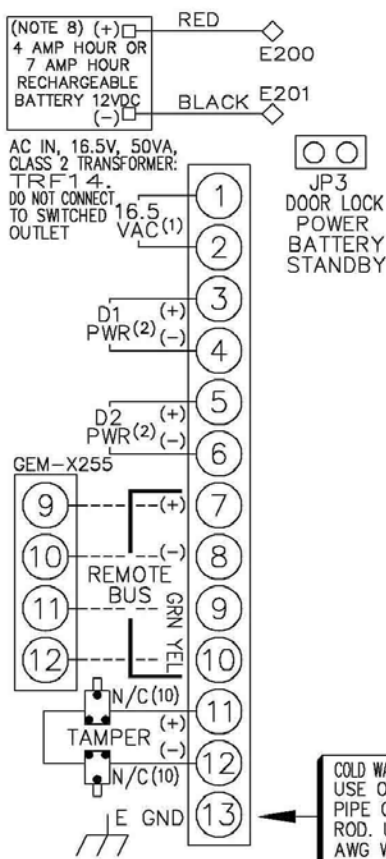
* This event occur even when no external relay board present on the system.

Event	Emergency Free Access
Burg Log	01/08/04 09:45 PM Alarm: Area 1, Zone 6 [006- zone description]
ACM Log	NONE
KP Log	Alarm 01/08 07:45 PM A1 Z006
KP Display	*****ALARM***** 006- "zone description"
GEM-PRINT	01-08-04 21:45 Alarm: Area 1, Zone 6 006- "zone description"

NOTES

GEM-ACM1D WIRING DIAGRAM

(REFER TO W11221)



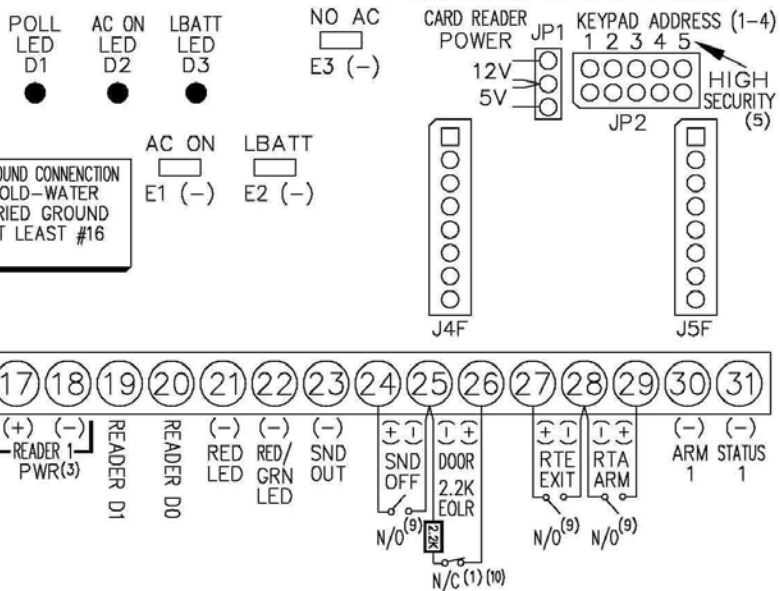
- 1) END-OF-LINE RESISTOR, 2200 OHMS, RED, RED, RED, 5%, 1/2W, (EOL2.2K) MUST BE INSTALLED.
- 2) COMBINED DOOR LOCK POWER: D1 PWR (3+ AND 4-) + D2 PWR (5+ AND 6-) VOLTAGE RATING: 12VDC MAXIMUM CURRENT: 1.5A, 3A CURRENT LIMITED BATTERY STANDBY TIME: 1) IF JP3 IS NOT INSTALLED STANDBY = 0* 2) IF JP3 IS 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.

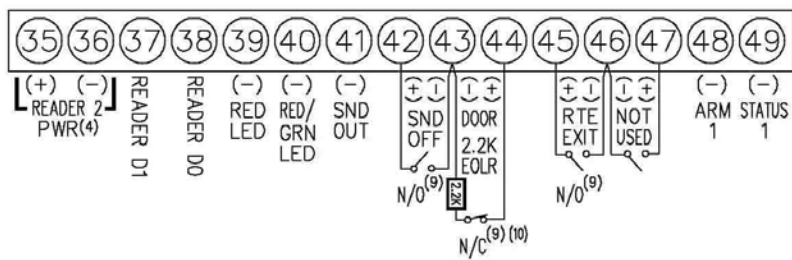
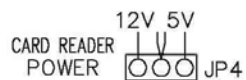
* UL INSTALLATIONS REQUIRE JP3 TO BE REMOVED.
** NOT EVALUATED BY UL.
*** REQUIRES GEM-2D TO BE INSTALLED.



COLD WATER GROUND CONNECTION USE ONLY COLD-WATER PIPE OR BURIED GROUND ROD. USE AT LEAST #16 AWG WIRE

GEM-2D (OPTIONAL) WIRING DIAGRAM

(REFER TO W11239)



LA2180A

NAPCO LIMITED WARRANTY

NAPCO SECURITY SYSTEMS, INC. (NAPCO) warrants its products to be free from manufacturing defects in materials and workmanship for thirty-six months following the date of manufacture. NAPCO will, within said period, at its option, repair or replace any product failing to operate correctly without charge to the original purchaser or user.

This warranty shall not apply to any equipment, or any part thereof, which has been repaired by others, improperly installed, improperly used, abused, altered, damaged, subjected to acts of God, or on which any serial numbers have been altered, defaced or removed. Seller will not be responsible for any dismantling or reinstallation charges.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. THERE IS NO EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. ADDITIONALLY, THIS WARRANTY IS IN LIEU OF ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF NAPCO.

Any action for breach of warranty, including but not limited to any implied warranty of merchantability, must be brought within the six months following the end of the warranty period.

IN NO CASE SHALL NAPCO BE LIABLE TO ANYONE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR BREACH OF THIS OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, EVEN IF THE LOSS OR DAMAGE IS CAUSED BY THE SELLER'S OWN NEGLIGENCE OR FAULT.

In case of defect, contact the security professional who installed and maintains your security system. In order to exercise the warranty, the product must be returned by the security professional, shipping costs prepaid and insured to NAPCO. After repair or replacement, NAPCO assumes the cost of returning products under warranty. NAPCO shall have no obligation under this warranty, or otherwise, if the product has been repaired by others, improperly installed, improperly used, abused, altered, damaged, subjected to accident, nuisance, flood, fire or acts of God, or on which any serial numbers have been altered, defaced or removed. NAPCO will not be responsible for any dismantling, reassembly or reinstallation charges.

This warranty contains the entire warranty. It is the sole warranty and any prior agreements or representations, whether oral or written, are either merged herein or are expressly canceled. NAPCO

neither assumes, nor authorizes any other person purporting to act on its behalf to modify, to change, or to assume for it, any other warranty or liability concerning its products.

In no event shall NAPCO be liable for an amount in excess of NAPCO's original selling price of the product, for any loss or damage, whether direct, indirect, incidental, consequential, or otherwise arising out of any failure of the product. Seller's warranty, as hereinabove set forth, shall not be enlarged, diminished or affected by and no obligation or liability shall arise or grow out of Seller's rendering of technical advice or service in connection with Buyer's order of the goods furnished hereunder.

NAPCO RECOMMENDS THAT THE ENTIRE SYSTEM BE COMPLETELY TESTED WEEKLY.

Warning: Despite frequent testing, and due to, but not limited to, any or all of the following: criminal tampering, electrical or communications disruption, it is possible for the system to fail to perform as expected. NAPCO does not represent that the product/system may not be compromised or circumvented; or that the product or system will prevent any personal injury or property loss by burglary, robbery, fire or otherwise; nor that the product or system will in all cases provide adequate warning or protection. A properly installed and maintained alarm may only reduce risk of burglary, robbery, fire or otherwise but it is not insurance or a guarantee that these events will not occur. CONSEQUENTLY, SELLER SHALL HAVE NO LIABILITY FOR ANY PERSONAL INJURY, PROPERTY DAMAGE, OR OTHER LOSS BASED ON A CLAIM THE PRODUCT FAILED TO GIVE WARNING. Therefore, the installer should in turn advise the consumer to take any and all precautions for his or her safety including, but not limited to, fleeing the premises and calling police or fire department, in order to mitigate the possibilities of harm and/or damage.

NAPCO is not an insurer of either the property or safety of the user's family or employees, and limits its liability for any loss or damage including incidental or consequential damages to NAPCO's original selling price of the product regardless of the cause of such loss or damage.

Some states do not allow limitations on how long an implied warranty lasts or do not allow the exclusion or limitation of incidental or consequential damages, or differentiate in their treatment of limitations of liability for ordinary or gross negligence, so the above limitations or exclusions may not apply to you. This Warranty gives you specific legal rights and you may also have other rights which vary from state to state.