

# **INSOMNIAC CIA R-700 Relay Module**

## **Installation Manual**

P/N CIA-775-001

Revision 1.2

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## SPECIFICATIONS

ITEM	DESCRIPTION	FEATURES
1	ENCLOSURE	INDOOR / OUTDOOR, ALUMINUM, POWER COATED
2	FACEPLATE	ALUMINUM, POWDER COATED
3	LCD	2-LINE (NON-GRAPHIC)
4	COMMUNICATIONS	RS485 OR WIRELESS (900 MHZ)
5	FORM-C RELAY OUTPUTS	8
6	SECURE COMMUNICATIONS	YES
7	TAMPER	YES
8	AUXILIARY INPUTS	8
9	MAX OPERATING VOLTAGE	24VDC
10	MIN OPERATING VOLTAGE	12VDC
11	MAX INPUT CURRENT	2A
12	OPERATING TEMP RANGE	-31 TO 150 DEG. F.
13	HUMIDITY	0-95% NON-CONDENSING
14	INGRESS RATING	UL294 OUTDOOR EQUIPMENT



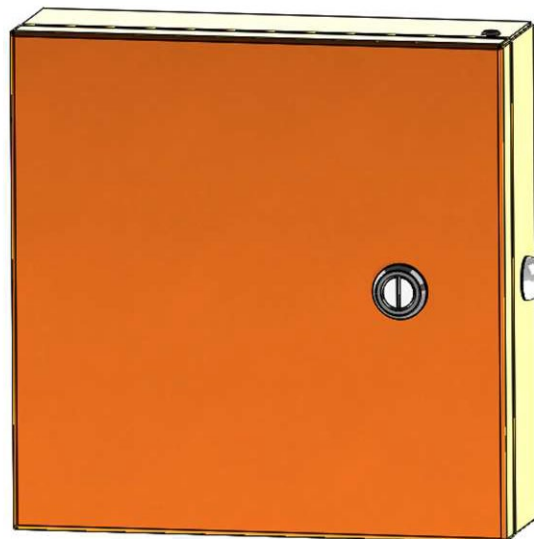
## INSTALLATION

**General:** The Relay Module is designed to switch devices based on access actions occurring remotely from the secured area. It operates in conjunction with a gateway that contains the list of access codes and areas these codes are valid for. The gateway communicates with a master database that exists centrally accessible via the internet. The central database is the source of the access code to access area and access time correlation as well as all configuration information. The gateway will operate standalone using cached data if internet connectivity is lost however no changes in access codes or configuration are possible until internet connectivity to the master database is restored.

The Relay Module is typically used to control elevator access by floor, lighting or other security related functions that are relay driven however all the control logic must be configured in the central database. The Relay module should be mounted inside a protected area. The Relay unit can also be paired with a Keypad providing additional security by wiring the door strike to the relay unit located inside the protected area rather than connecting the strike directly to the keypad which is outside the protected area.

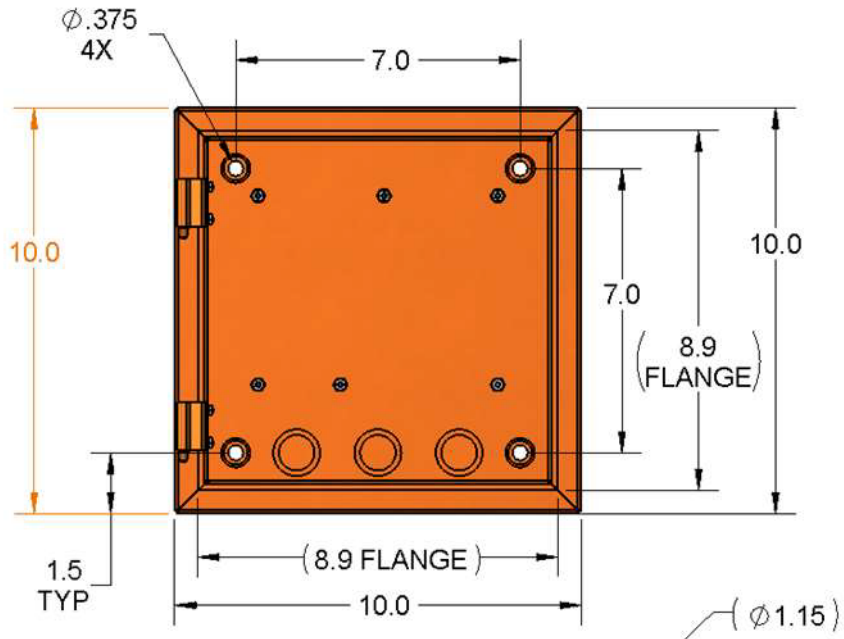
**Physical Installation and Mounting:** The following are instructions on installing a Relay Module and connecting the wiring run from the system controller:

1. Open the device by unlocking the Southco latch on the front of the unit. The front door will open as it is hinged at the left. The Key Switch at the right is for manually activating relays and should not be used to open the unit.

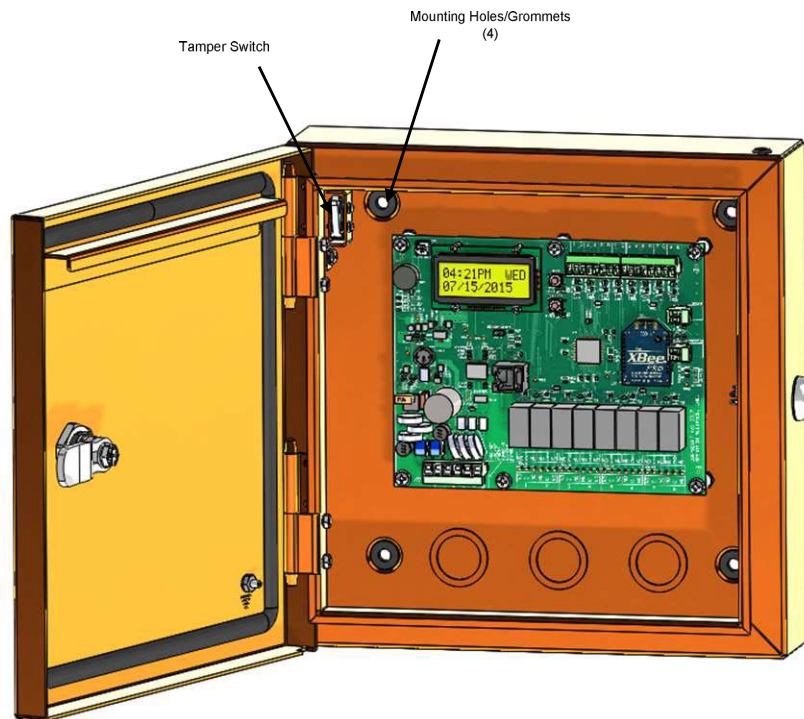


2. Mount the back plate to the desired keypad location using the 4 holes in the back panel that carry grommets. If the relay is being mounted on a wall, before mounting, run a bead of silicone in a square around the back of the keypad about ½ inch from the edge. Also, from the inside seal around each screw hole and the wire entry hole with an outdoor silicone sealant after pulling the wires through.

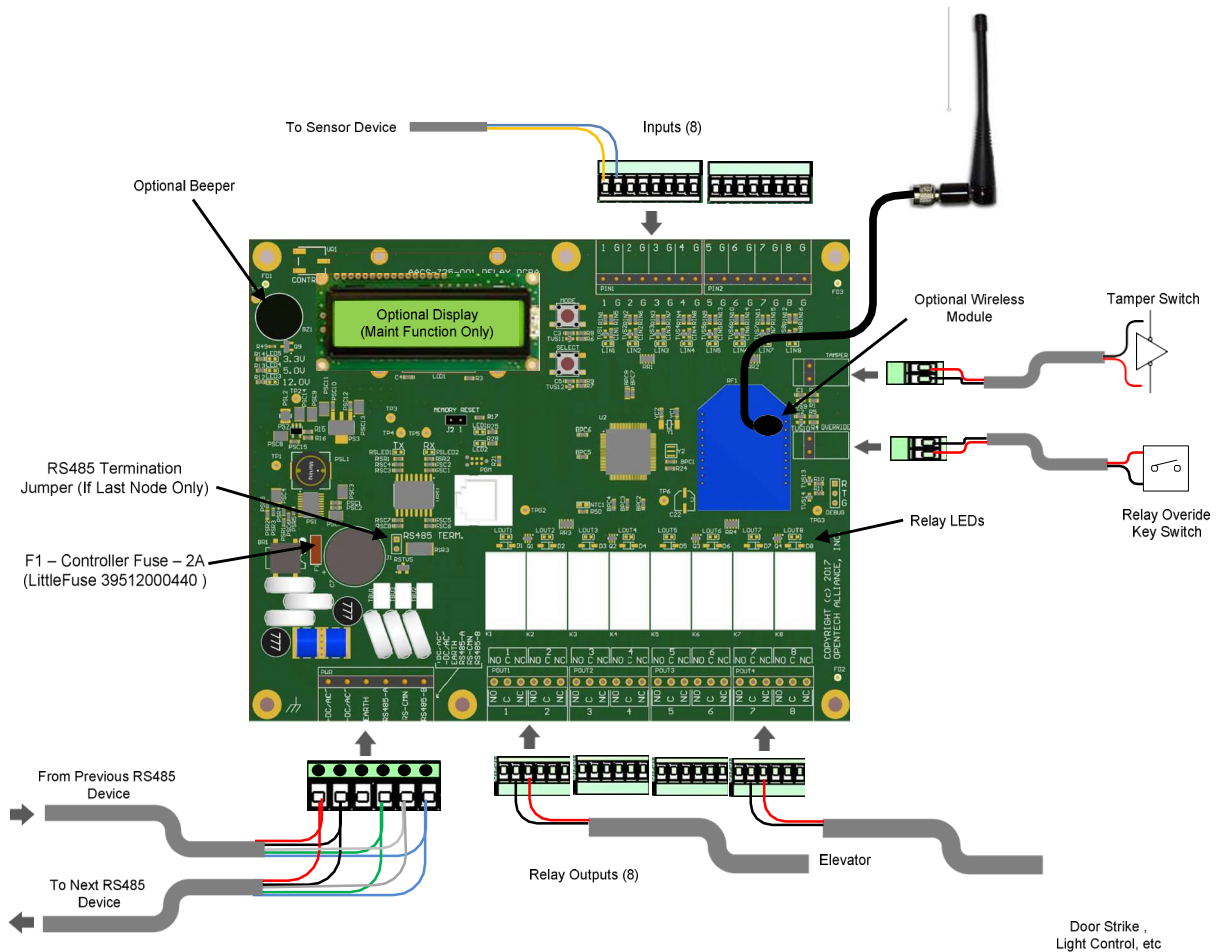




3. Pull the necessary wires through the wire hole on the back of the housing. Allow ample wire to remain inside the housing. After the wire connections are complete, excess wire can be pushed back into the gooseneck or wall or it can be carefully positioned inside the keypad housing for future maintenance and service.



**Wiring Connections:** Below is a connection diagram for the Relay PCBA. Note: All installations must conform to local building and electrical codes and shall be in accordance with the Nation Electric Code, ANSI/NFPA 70. When discrepancies exist between local codes and this manual, local code takes precedence. All cables entering the gateway should be insulated and shielded with drain wires connected to earth ground at one end. In addition, incoming cables other than the RS485 Cables must be less than 10 meters long.



**PWR/RS485:** Power and RS485 data communication is done with a single connector and should be the last connector to be attached as it may carry active power. We recommend that power and RS485 data communications be via a single 18 AWG, 4-conductor shielded cable. The shield drain wire can be used as the EARTH common wire. Do not connect more than two (2) RS485 cables to one PCB. All PCBs shall be connected as an inline chain beginning with the controller and ending with the last device. The last device shall have a "termination" jumper installed as shown in Figure 10. It is located next to the tall capacitor as marked. All other devices shall have this jumper omitted.

These connectors have 6 pins.

DC + V (12-24VDC)	Required	Red
DC V (DC Common)	Required	Black
Earth	Optional	
RS485-A	Required	
RS-CMN	Required	Can use cable shield
RS-485-B	Required	

**RS485 Limitations:** A wired keypad can be located up to 4000 feet from the controller given proper twisted pair cable with ground wire is used.

To properly terminate cables into connectors the following instructions apply.

1. Strip back the outer insulation and shield foil from both of the 18 AWG, 4-conductor, shielded cables (coming from the controller or previous AI device in line and going out to the next AI device in line), being careful not to cut the bare shield wire. Strip ¼ inch of insulation off the end of each of the individual-colored conductor wires.
2. Remove the terminal blocks from the keypad circuit board by sliding them up and off. The terminal blocks may be somewhat difficult to remove as a tight electrical connection is necessary. If they are tight, rock them slightly back and forth while lifting away from the board.
3. Insert wires into the desired connector. Where 2 wires are tied together ensure that both wires are seated all the way inside the slot. Use a flathead precision screwdriver to tighten down the terminal screw.
4. Verify that the terminal slot has tightened down on the copper wire and not on the rubber insulation. There should be no copper wire showing outside of the terminal slot. Gently tug the wires to verify that they are tightly held inside the terminal slot. Repeat this process with each of the remaining wire connections as shown in Figure 10.



**Wireless Communications (Optional):** The keypad can also function without the RS485 wiring. In this case the XBEE or XBEE Pro wireless module and an RPSMA antenna must be installed on the system controller and on the keypad. 12-24VDC power is all that is necessary on the PWR/RS485 connector for this option. If the keypad is within wireless range of the controller the keypad will work in same fashion as with RS485 connections. The range depends on the wireless module used. XBEE module range is typically 300ft. XBEE Pro range is typically 1 mile. This equipment option has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

This option has not been evaluated nor certified as part of UL294 level 2 nor CSA C22.2 No.205.

**Relay Outputs:** Each relay has a Normally Closed (NC), a Common and a Normally Open (NO) connection. Depending on the need, wire to the common and either the NC or NO. On board LEDs are provided to show if the relay is activated. Typical gate operators require a normally open contact. Some electric door strikes require a normally closed contact. If door strikes are used it is recommended that they be DC (typically 12V) so that a shunting diode must then be installed across the solenoid to prevent groundspikes from disrupting the keypad communication.

#### RELAY CONTACT RATINGS:

Item	Rating
Contact Type	Single Ag-Alloy (Cd Free)
Rated Load	5A (NO) / 3A (NC) @ 30VDC
Max Switching Voltage	30VDC
Max Switching Current	5A (NO) / 3A (NC)

**Warning:** Use recommended UL installation. Do not connect a gate operator or door strike to a keypad that is located outside the area it secures.

**Warning:** Wiring the relay to the operating device will introduce the operating device control voltage into the keypad housing. The keypad is not designed for the presence of high voltage within the keypad case. Relay voltage must not exceed 30 volts.

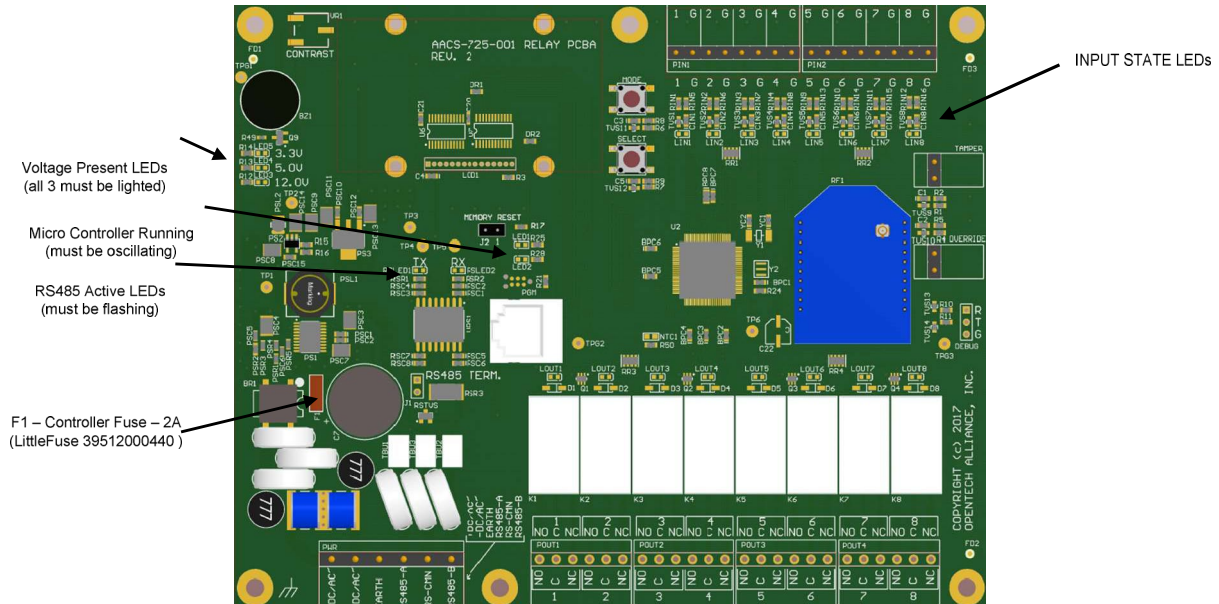
**Inputs:** Each Input has a Ground Connection (G) and a Sense Connection (1). The sense connections are marked 1-8 and will source a small voltage at high impedance. Wire any dry contact across a sense pin and a G pin. Closing the contact will energize the input. On board LEDs are provided to show if the input is activated.

**Earth Ground:** The earth ground wire should be. To connect the ground wire, run an insulated copper wire (preferably color green) from a grounded water pipe or from a copper rod in the ground to the keypad and connect it to the green earth ground wire using a wire nut. The enclosure earth wire is connected to the stud in the floor of the enclosure using a screw with a star washer. This installation must meet applicable code as the type of wire, depth of burial, and size of the rod may vary by municipality. **Note:** Uninsulated wires (Typically used for earth ground) cannot be located inside the unit's case. Make connections for an uninsulated ground wire outside the enclosure.





**Testing/Troubleshooting:** Test the Relay Unit by applying power to the PWR/RS485 connections. An "Offline" message will initially be displayed after power is applied if the optional display installed. Once the controller recognizes the device a standard welcome message will appear. There are also multiple LEDs as shown below that should be active as described for troubleshooting purposes.



Check the 3 Power LEDs on the PCB. If all are dark, check / replace the PCB fuse. If any single specific power LED such as the 3.3V or 5V LEDs are dark, replace the PCB.

**Pairing the Relay Unit:** Before the relay unit will function its Internal UID must be paired with the predefined logical device using a web browser screen. See the Gateway Configuration manual for a description of how to do pairing.

**Manual Operation Key switch.** The override key switch will activate all 8 onboard relays.



## KEYPAD MAINTENANCE

### Cleaning:

Yearly: Open the controller cabinet, inspect and clean the inside of the unit. Remove dirt or dust that has collected on the inside of the housing and the circuit board that could cause problems. Note any signs of water damage or corrosion caused by a leak in the enclosure seals. Replace any worn seals. A small can of compressed air can be used to remove insects and dust from the circuit board.

## NOTICES and DISCLAIMERS

**Liability Disclaimer:** While every effort has been made to ensure the accuracy of the information in this document, and we assume no liability for any inaccuracies contained herein. We reserve the right to change the information contained herein at any time and without notice.

**FCC Part 15 Notice:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment can generate and radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

