INSOMNIAC CIA K-500 Keypad

Installation Manual

P/N CIA-575-001

Revision 1.2

Date Code: 6-2-2021

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SPECIFICATIONS

ITEM	DESCRIPTION	FEATURES
1	ENCLOSURE	INDOOR / OUTDOOR, ALUMINUM, POWER COATED
2	KEYPAD	METAL / VANDAL RESISTANT
3	KEYPAD FEEDBACK	TACTILE AND AUDIBLE
4	FACEPLATE	ALUMINUM, POWDER COATED
5	LCD (OLED)	4-LINE (NON-GRAPHIC)
6	COMMUNICATIONS	RS485 OR WIRELESS (900 MHZ)
7	INTERCOM: • SPEAKER • CALL BUTTON	NON-INTEGRATED (AIPHONE)
8	TIME FORMAT	12 OR 24 HOUR
9	DATE FORMAT	SELECTABLE
10	FORM-C RELAY OUTPUTS	2
11	SECURE COMMUNICATIONS	YES
12	TAMPER	INTERNAL + (OPT. EXTERNAL)
13	AUXILIARY INPUTS	4 (OPTO-ISOLATED)
14	WIEGAND INTERFACE	1
15	BLE / IBEACON	OPTIONAL (COTS)
16	CAMERA OPTION	OPTIONAL (IP/ANALOG)
17	MAX OPERATING VOLTAGE	24VDC
18	MIN OPERATING VOLTAGE	12 VDC
19	MAX INPUT CURRENT	2A
20	MAX ACCESSORY CURRENT	.40 A @ 12VDC / .20 A @ 5VDC
21	OPERATING TEMP RANGE	-31 TO 150 DEG. F.
22	HUMIDITY	0-95% NON-CONDENSING
23	INGRESS RATING	UL294 – OUTDOOR EQUIPMENT
24	UL294 PERFORMANCE RATING	2 (II)

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INSTALLATION

General: The keypad is designed to request access to or from a secured area. It operates in conjunction with a controller that contains the list of access codes and areas these codes are valid for. The controller 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 controller 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 Keypad can be used to control gate access, building access, room access, elevator access, lighting and other security related functions that are relay driven, however, all the control logic must be configured in the central controller. Please refer to the user's manual for the controller in conjunction with this manual. Similarly mounting height and locations for keypads must match local codes regarding handicap access, emergency as well as other regulations. Please see Appendix A for details for common practice mounting diagrams and ADA driven mounting requirements.

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

1. Open the device by unlocking the security lock on the bottom of the keypad. Then remove the four stainless steel machine screws on the front of the keypad case using a 3mm hex key. The front plate will pivot down as it is hinged at the bottom.

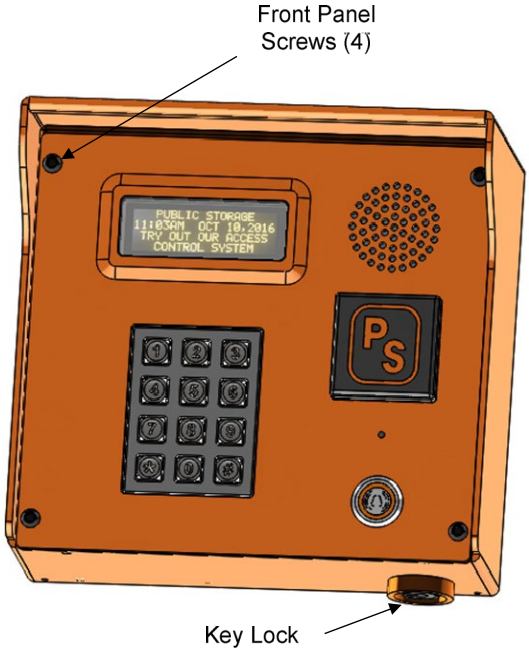

Figure 1

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Mount the back plate to the desired keypad location using the three-keyed holes in the back panel. If the keypad is being mounted on a factory provided gooseneck, use the provided gasketbetween gooseneck stand and keypad enclosure. If the keypad 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 anoutdoor silicone sealant after pulling the wires through.

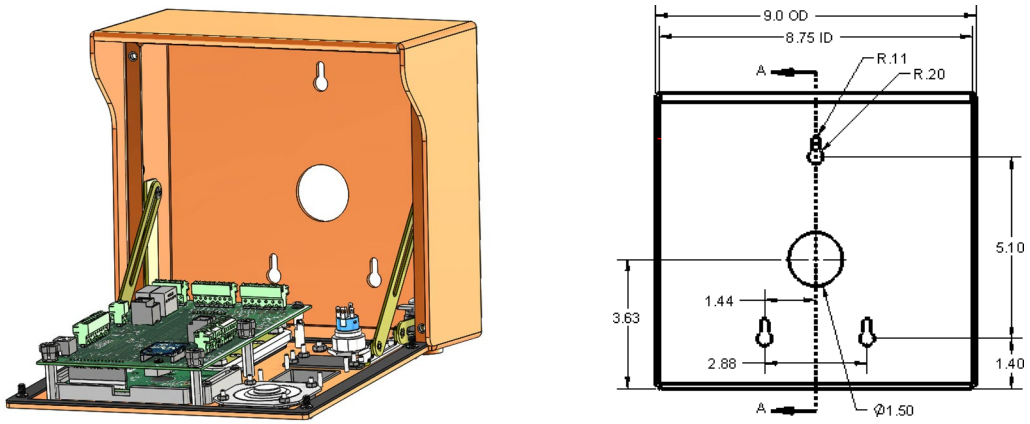

Figure 2 – Mounting Template

2. 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.

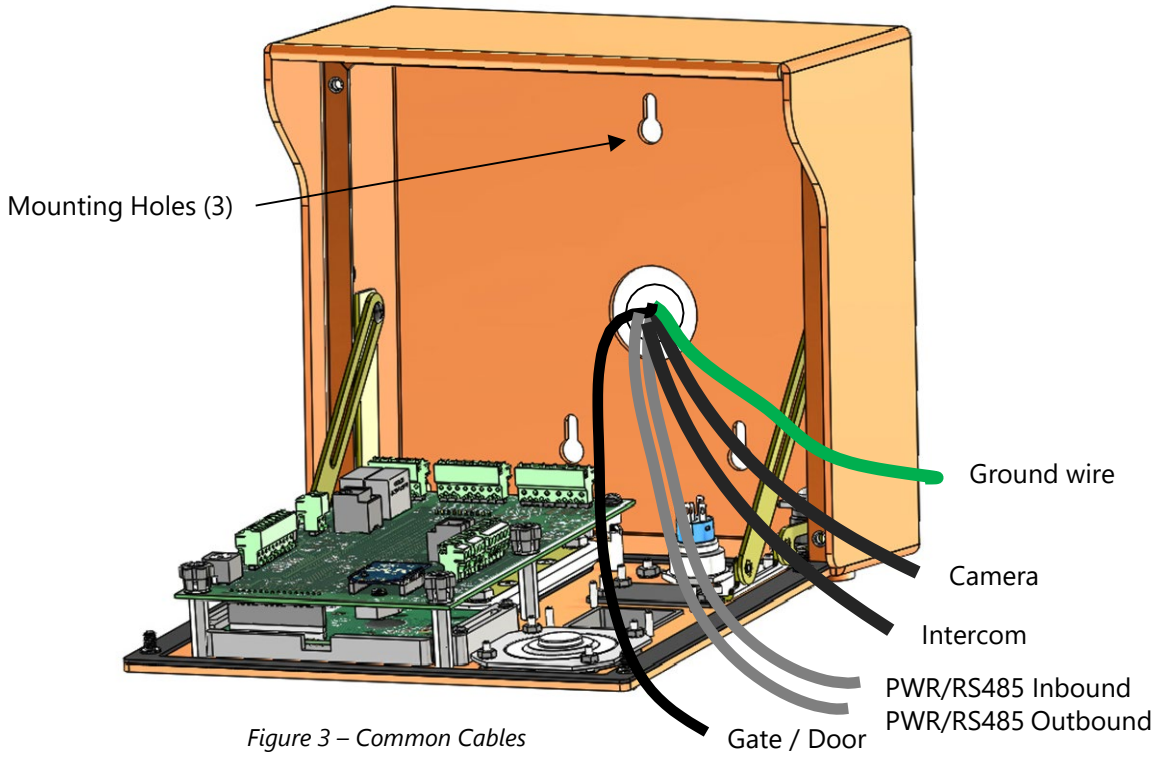

Figure 3 – Common Cables

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Wiring Connections: Below is a connection diagram for the Keypad 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. The R485 wires should be 18 gauge. Other wires must be between 16- and 26-Gauge wire.

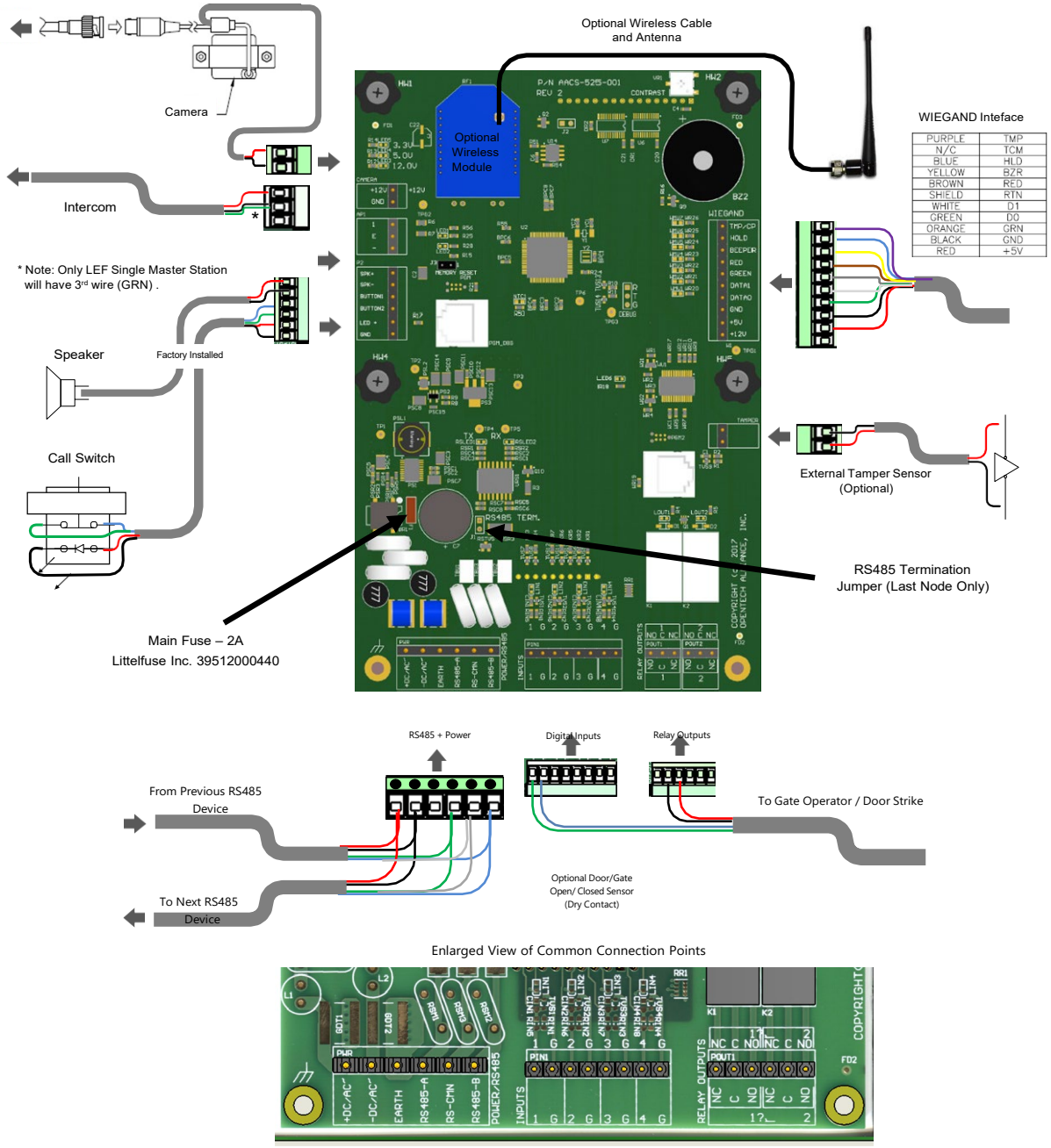

Figure 4

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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	Blk
Earth	Optional	
RS485-A	Required	
RS-CMN	Required	Can use Cable SHIELD
RS-458-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 thatthey are tightly held inside the terminal slot. Repeat this process with each of the remaining wire connections as shown in Figure 10.

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Wireless Communications (Optional): Wireless Communications (Optional): The Keypad can also function without the RS485 wiring. In this case the XBEE or XBEE Pro 900 MHZ wireless module and an RPSMA antenna must be installed on the system Gateway and on the Keypad to operate wirelessly. If the keypad or relay unit is within wireless range of the Gateway, the keypad will work in same fashion as with RS485 connections. The range depends on the wireless module used, the antenna used, the RFbackground level of the area (rural or urban) and the number of obstructions between devices. The XBEEbasic module range is up to 300ft unobstructed line of sight rural area. Typical obstructed range of XBEE in urban areas is 100 ft. The XBEE Pro module range is up to 1 mile w/unobstructed rural line of sight. 500ft obstructed line of sight in urban areas is common for XBEE Pro. XBEE Pro transmitter modules are recommended. 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 ground spikes 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)

Inputs: Each Input has a Ground Connection (G) and a Sense Connection (1). The sense connections are marked 1-4 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.

Speaker and Call Button: These cables are factory installed but are shown in the figure above for reference.

Intercom: The PCB provides a simple way to attach the intercom cable to the speaker and the call button. Typically, 2 wires are only present although a 3rd can be present. With two wires the interface supports both Aiphone LEF and NEM systems. The 3rd wire (green), if present, is to be wired to the E connection along with the black wire.

Pinhole camera Option. Video signal cable is part of the accessory device and not discussed herein. The keypad does have accessory power (12V as well as 5V) that can power a pinhole camera. This will give the best possible picture from the keypad camera. Pinhole camera power is supplied by the keypad circuit board. Depending on which camera is used a custom mounting bracket may be required.

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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 enclosures 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 the Keypad: Test the keypad by applying power to the PWR/RS485 connections. An "Offline" message will initially be displayed after power is applied. 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.

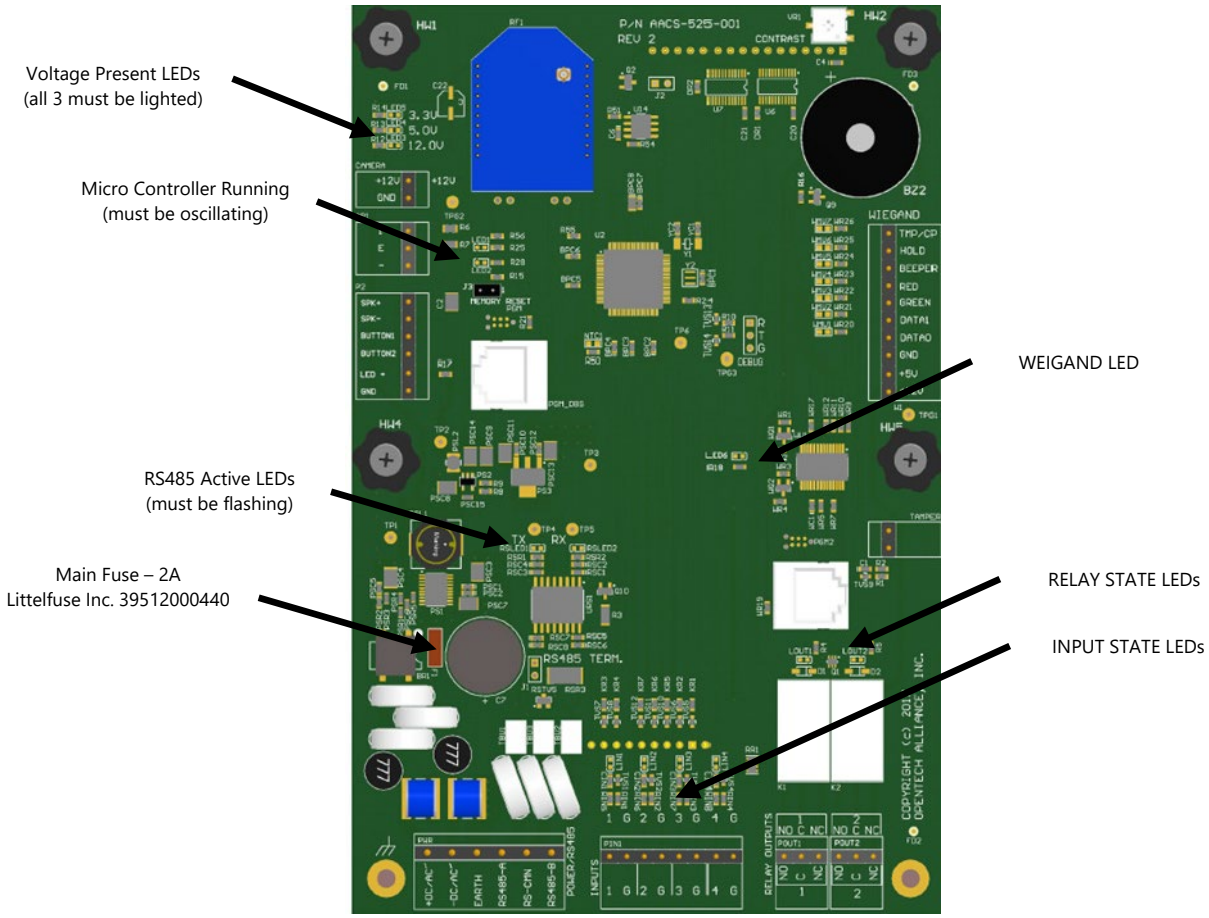

Figure 5

Check the 3 Power LEDs on the Keypad 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 main PCB.

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Accessing the Display PCB and Push Button Sub-assembly's: The main PCB is mounted on hinged standoffs. Loosening 4 thumb screws allows the PCB to be folded back in place to access the Display PCB and the metal push button assembly.

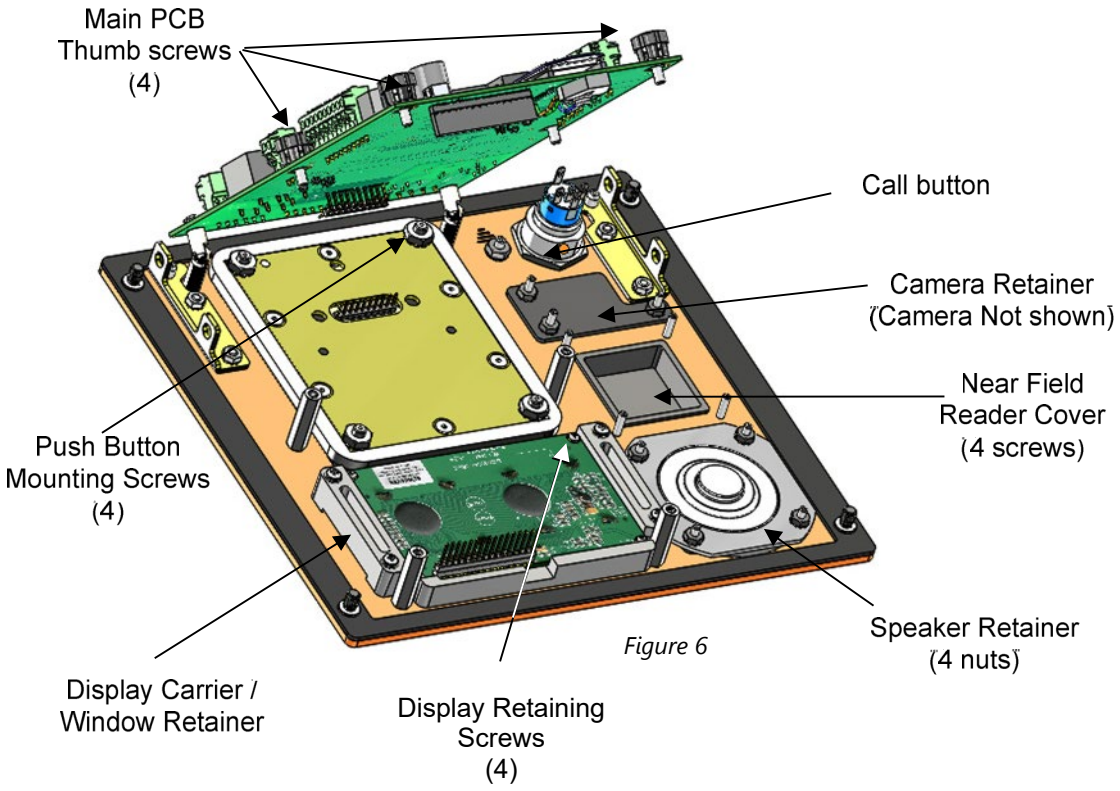

Figure 6

The push button assembly is a single part held in place by 4 nuts in the 4 corners of the unit. Similarly, the display PCB is held to its holder/retainer with 4 Philips head screws. Both can be easily changed after removing the ribbon cable that connects them to the Main PCB.

The Display PCB mounts to a plastic carrier that also acts to hold the display window in place. The carrier can be removed with 4 screws to access the window and the window seal gasket.

The Speaker is held in place with a retainer with 4 nuts. Its face is rubberized and does not need an additional seal.

A plastic cover is provided to allow a near field device such as an iBeacon to be added. While not intended to integrate into the keypad functionally, the separate module can be powered by the Main PCB using the power connections (+5V/+12V) available on the Wiegand connector.

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KEYPAD MAINTENANCE

Cleaning the Housing and Touchpad

Monthly**:** Inspect and clean the housing and touchpad on a regular basis (monthly). To clean spraythe unit with a mild soapy water solution then wipe it with a soft cloth. Do not use alcohol, harsh chemicals, abrasives, or petroleum-based products. Do not immerse the device in water or use a pressure washer.

Yearly**:** Open the keypad, 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.

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