

iSmartSE User's Guide



1. Description

The iSMART is a combination keypad, (26 bit Wiegand, or 8 bit Wiegand) and SE Card reader that is compatible with HID Global iSmartSE cards.

The following card formats are supported;

iClass

iClass SE/SR

iClass Seos

Mifare Classic 1K/4K & SE

Mifare Desfire EV1

Plus a number of other formats contact Essex Electronics for details.

The basic housing contains the reader, and a keypad.

The reader portion may be purchased as a Wiegand only format, or with OSDP converter. If OSDP conversion is provided, this will also convert the keypad to this format.

Keypad options;

Standard 26 bit Wiegand, Essex Electronics model K1-34x (configured for option 1, 26 bit Wiegand).

Standard 8 bit Wiegand, Essex Electronics model K1-34x (configured for option 2, 8 bit Wiegand).

2. Specifications

Description	Specification
Voltage	12 VDC +/-10%, or 5 VDC +/-10%
Input	
Current	300mA, or 600mA with illumination.
RFID	ISH-IRO-H = 13.56MHz, ISH-IRO-D = 13.56MHz = 125kHz
Minimum	At least 1" for SeoS
Read Range	
Output	Wiegand output interface, D0 & D1, or if equipped, RS-485 for OSDP interface format. Keypad is 26 bit Wiegand or 8 bit Wiegand. Other keypad formats are available, contact Essex for details.
Operating	IP66 Rated, -40°C to +70°C [-40°F to +160°F],
Environment	100% Relative humidity.

Dimensions 7 ¼"[18.4cm] X 3 5/8" [9.2cm] X 1 ½"[3.8cm]
Weight 25 oz[709gm]

3. Precautions

- 3.1. Essex Electronics keypads & card readers are electronic devices and are sensitive to electrostatic discharge. Standard precautions should be taken to protect these devices from electrostatic discharge events.
- 3.2. Essex Electronics does not manufacture the control panels & power supplies that may be connected to these keypads & readers. Care should be taken to select operating characteristics of the external devices before connecting Essex Electronics manufactured devices. See Essex Electronics warranty policy at; <https://www.keyless.com/wp-content/uploads/2018/11/Warranty.pdf>
- 3.3. Our keypads and readers are only part of an access control system. Essex Electronics has designed these products to work with most access control systems & power supplies. The installer is cautioned to avoid operating these devices outside of the recommended specifications.
- 3.4. The supplied keypad, the K1-34, is a multi-format keypad that is by default in the 26 bit format. If another format is required see the following paragraphs, and the supplied instruction sheet for the Multi-Format. The wiring harness & hardware kit that comes with the keypad is not required for installation on to the reader. The wiring harness that comes with the reader is used in place of this harness & hardware kit.

4. Settings

- 4.1. Select the style of keypad required. Default output of the K1 Series Keypad is 26 bit Wiegand.
 - 4.1.1. For two factor authentication of so called “pin and code”, set the keypad to the 8-bit Wiegand output;
 - 4.1.2. Remove power from the keypad.
 - 4.1.3. On the keypad, jumper the two pins above the connector labeled “CONFIG”.
 - 4.1.4. Apply appropriate power, (you should hear four beeps and the red LED will flash, and the green LED will be solid.
 - 4.1.5. Select the 8-bit Wiegand mode by entering “2” & then “#”.
 - 4.1.6. The keypad will respond with three beeps, indicating successful configuration. If you hear a long error beep, re-enter the configuration “2” & then “#”.
 - 4.1.7. Remove power.

4.1.8. Remove configuration jumper.

4.1.9. Keypad is now in the 8-bit Wiegand output mode.

4.1.10. Other modes are available; see K1 Series Multi-format installation & instruction manual, supplied with the keypad.

4.2. Setting 26 bit Wiegand keypad site code, only required for 26 bit Wiegand style keypads;

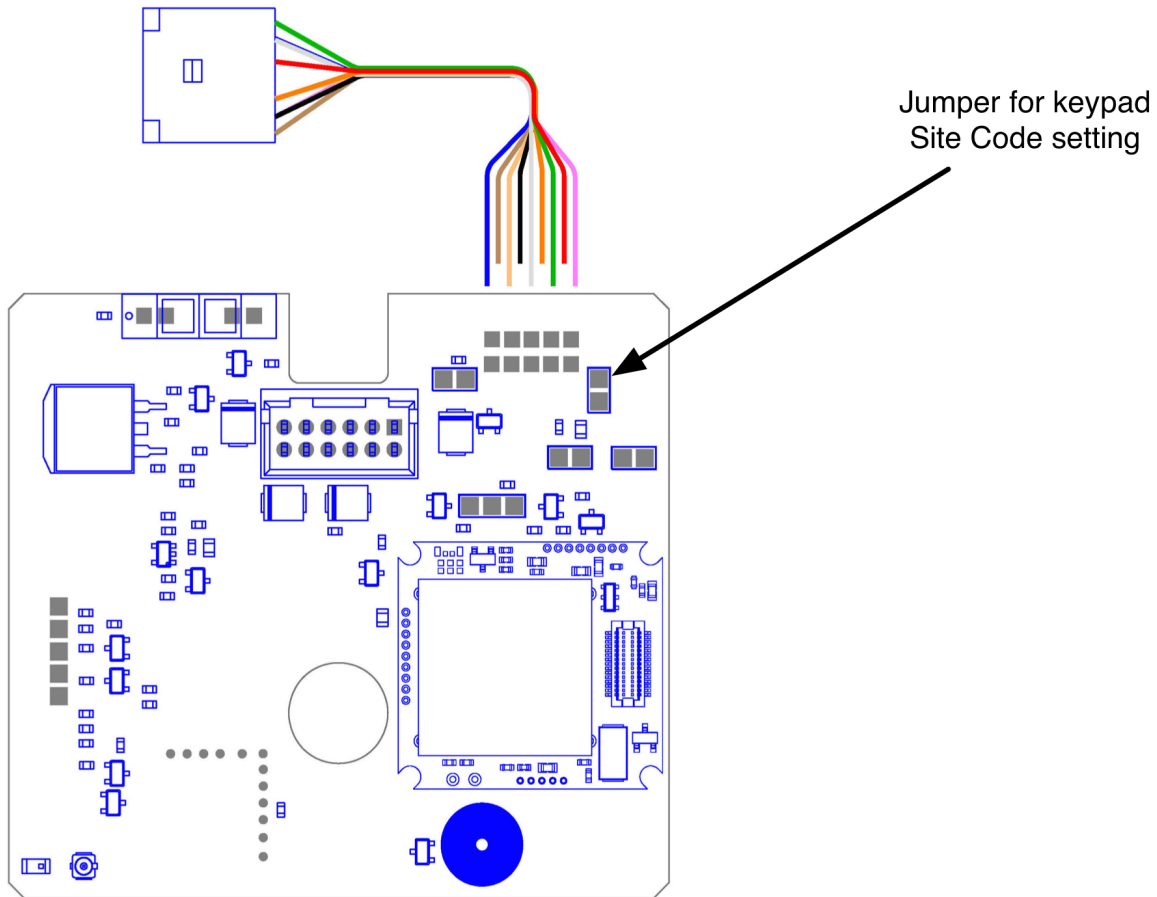


Figure 1 Jumper for Keypad site code.

- 4.2.1. With keypad off or unplugged, install jumper as shown in figure 1.
- 4.2.2. Apply power to keypad, through the reader.
- 4.2.3. There will be 4 audible beeps, from the keypad, along with the both the red & green LEDs on the keypad flashing at the same rate.
- 4.2.4. On the keypad, enter the desired site code, 0 to 255, & press # to enter, factory default is 0.
- 4.2.5. The keypad will respond with 4 rapid beeps & not accept any more entries.
- 4.2.6. If the incorrect key is pressed during this sequence, pressing the * key will clear the entry. Two rapid beeps & both LEDs will flash.
- 4.2.7. The keypad will generate an error tone if the entered site code is greater than 255.
- 4.2.8. Disconnect power from the keypad, & remove the jumper indicated in figure 1 above.
- 4.2.9. The keypad will now generate a site code as part of the 26-bit Wiegand sequence sent by the keypad.

4.3. Setting 8-bit keypad LED control, only available when in the 8 bit mode;

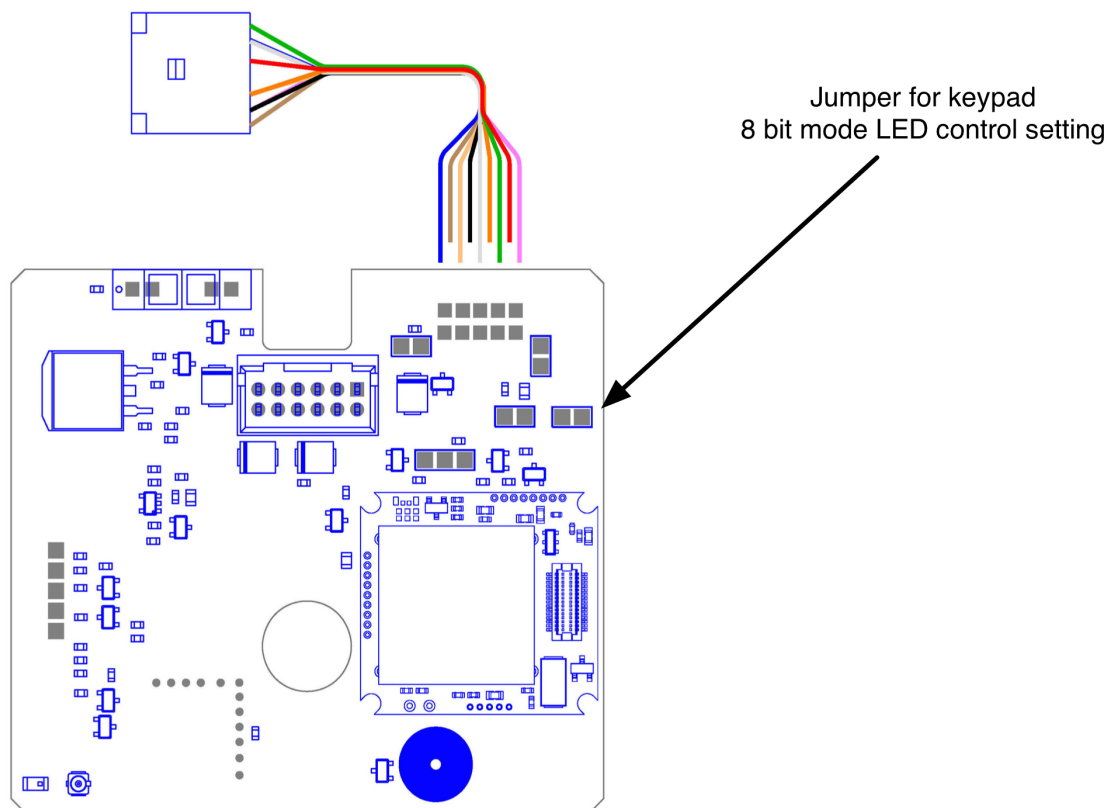


Figure 2 Keypad in 8 bit mode LED Control Jumper Location

4.3.1. When a keypad is installed, (in the 8-bit mode), its' LEDs may be controlled in two ways; independently, where grounding the yellow wire will only turn on the red LED, & grounding the brown wire will only turn on the green LED. Or, with the jumper installed as shown in figure 2, grounding the brown wire will toggle the LEDs on the keypad from red to green. Whichever LED is currently illuminated will blink with every keypress.

4.4. Setting Red LED on/off;

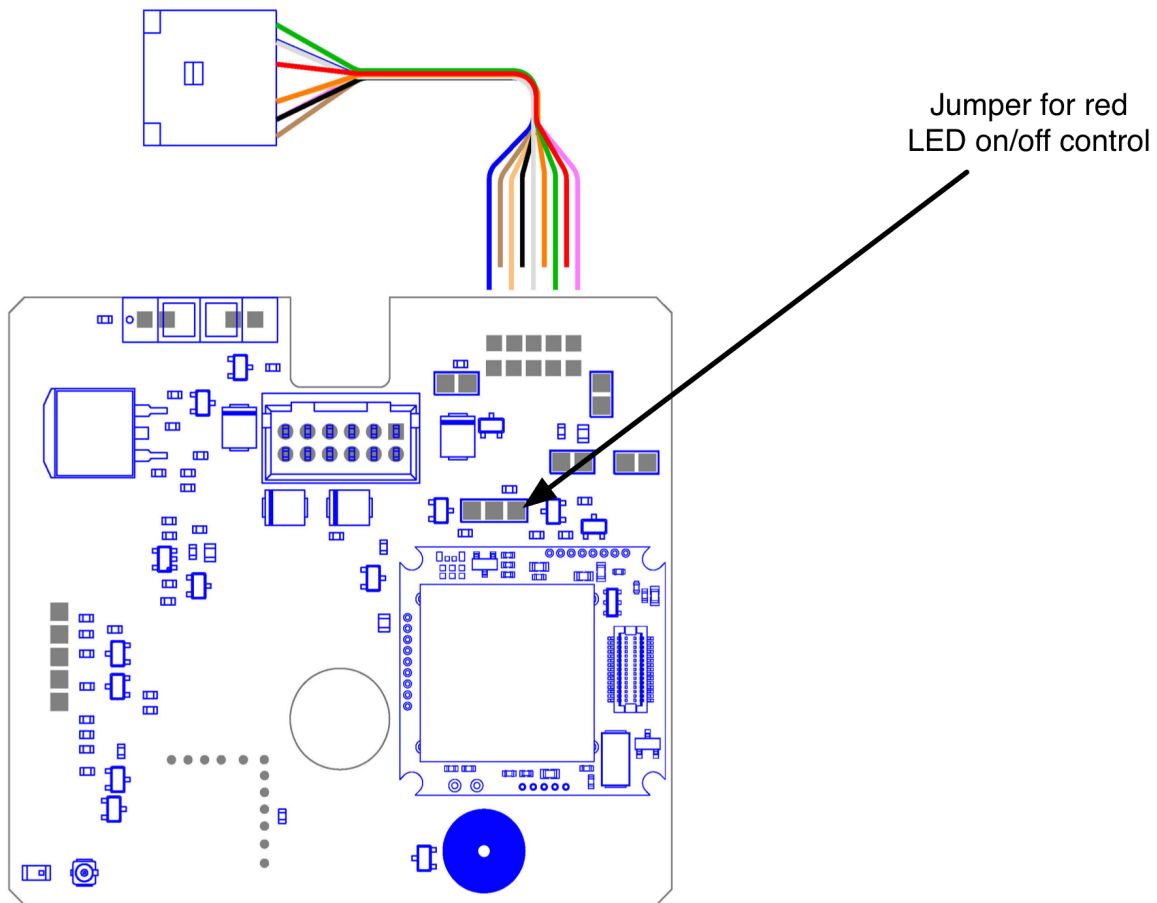


Figure 3 Red LED On/Off Jumper Location.

- 4.4.1. This jumper only is functional for the Wiegand model reader.
- 4.4.2. The indicated jumper selects whether the reader LED will have the red led on or off in standby.
- 4.4.3. Place the jumper from the center to the right to have the LED off in standby, or place the jumper from the center to the left to have the LED on in standby.
- 4.5. Setting OSDP RS-485 bus termination resistor;

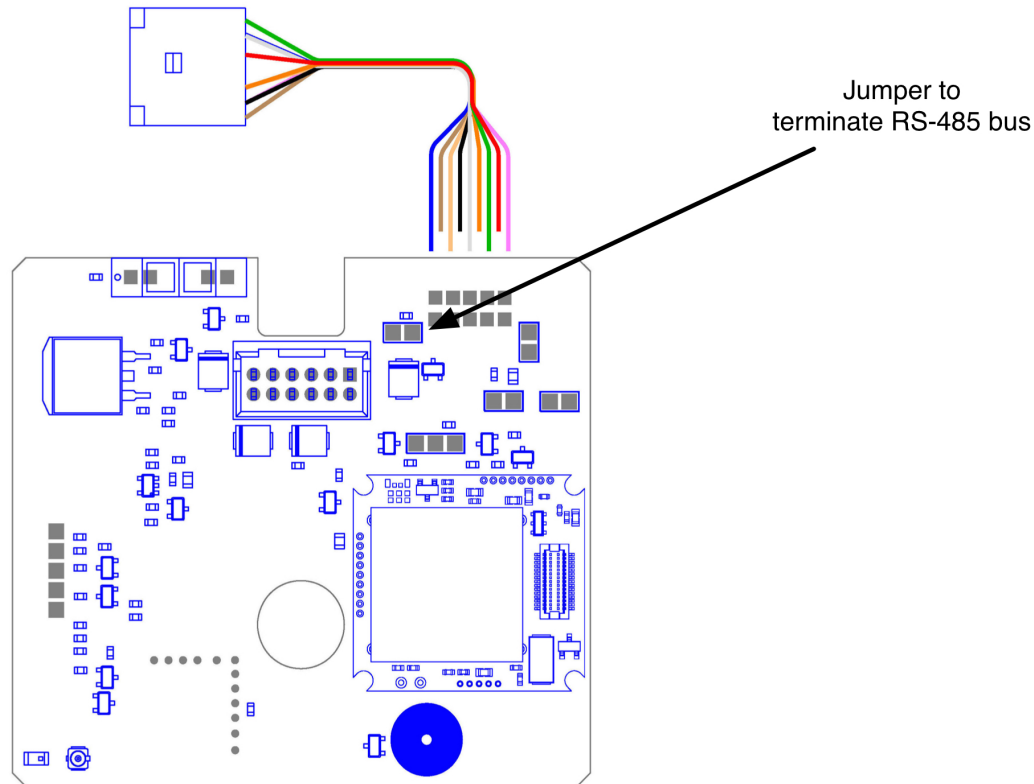


Figure 4 RS-485 Termination Jumper Location.

- 4.5.1. This jumper is only for the OSDP model reader. The indicated jumper will terminate the RS-485 bus with a resistor. It is recommended to install this jumper if the reader is at the end of the RS-485 bus, or otherwise requires this line to be terminated.

5. Installation

5.1. Wiring;

Wire Color;	Signal Name;
Red	+Vin
Black	-Vin
White	D1, Wiegand data, if equipped, pulled up to internal +5V
Green	D0, Wiegand data, if equipped, pulled up to internal +5V
Orange	OSDP RS-485, "A", if equipped
Pink	OSDP RS-485, "B", if equipped
Brown	LED control, toggles keypad from red to green, & reader from red to amber.
Gray	LED control, toggles reader from red to green.
Tan	Earth ground, connects to keypad face plate, connect to facility earth grounding, do not tie to -Vin or black.
Violet	Beeper control, tying to -Vin will sound reader beeper.
Blue	Tamper output, >5V if in tamper, <2V no tamper.
Yellow	Direct input to keypad, only used for LED control on 8-bit keypads.

- 5.1.1. Splice the supplied, 12 inch long, reader harness into the cable connected to the control panel, using the wiring list above for the signals. It is recommended that 18 awg stranded multi-conductor cable be used to connect the reader to the panel, at least 6 wires will be required for most panels.
- 5.1.2. It is suggested that in addition to the standard red, black, white, green, & brown signals used, but that also can be connected to the local facility earth connection, to avoid damaging static discharge events. Optional connections for tamper, 2nd LED control, & beeper control are at the integrator/installer discretion.
 - 5.1.2.1. For Tamper detection: Connect the blue wire to the control panel to indicate to the panel that the reader has been removed from its' mounting. On the back of the reader, there is an IR sensor with a target mounted opposite to the wall, within approximately 5mm of the sensor.
 - 5.1.2.2. For 2nd LED Control: Connect gray wire to the control panel 2nd LED control to indicate amber LEDs as a secondary indication on the reader. This will not affect any other condition in the reader, other than LED color.
 - 5.1.2.3. For audio control: Connect the violet wire to the control panel audio control or other output so when this line is grounded the reader audio will sound.
 - 5.1.2.4. Connect the yellow wire, only if an 8-bit keypad is installed, to control the red LED on the keypad, grounding will illuminate the red LED. In this case the brown wire will also illuminate the green LED, when grounded. See paragraph 4.2 to toggle these LEDs, rather than control them separately.
- 5.1.3. The supplied four inch long harness, as well as the keypad mounting hardware, with the keypad will not be required for this installation.

5.2. **Mounting;**

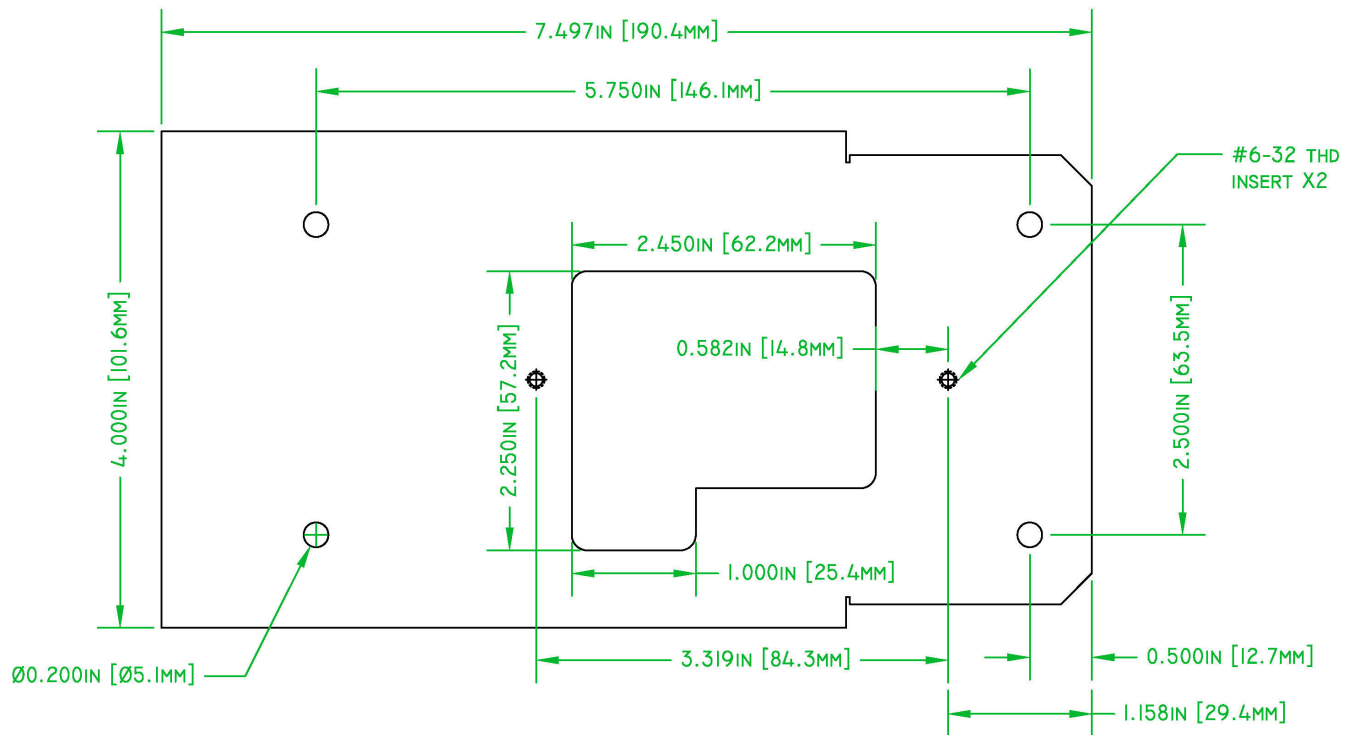


Figure 5 Illuminated Spy Proof Housing Mounting Points

5.2.1. Illuminated Spy Proof Housing, if equipped;

- 5.2.1.1. Mark the mounting holes on wall surface, at the suggested mounting height, using the 0.200" [5.1mm] hole mounting points. Also mark the suggested cut out opening. This may be a 1" diameter hole, top center, for the connecting harness.
- 5.2.1.2. Outline a cable clearance hole, as shown in figure 5 above, & cut a large enough hole to clear cable connectors & splices to the control panel.
- 5.2.1.3. If equipped with the optional SH-34W illuminated shroud, connect the two-wire harness from the reader, terminated in a two-prong Molex style connector to the illumination light bar harness. These are keyed to fit in only one way.
- 5.2.1.4. If the reader is being supplied only 5V for its' operation, the jumper on the illumination light bar should be removed, or cut.
- 5.2.1.5. Do not use the threaded inserts for mounting hardware as these are used to mount the reader to the housing.
- 5.2.1.6. Use anchor bolts or screws to mount the housing onto the wall or gooseneck.

5.2.2. Reader Housing

- 5.2.2.1. If the spy proof housing is not required, the reader may be mounted directly to the wall or j-box using mounting hardware supplied with the reader. There are also mounting hardware to mount the keypad to the reader, use only hardware from the reader kit, **do not use the keypad supplied hardware**.
- 5.2.2.2. Temporarily connect the keypad to the reader. [Do not install the voltage jumper, the keypad will operate on +12V normally].
- 5.2.2.3. Configure the keypad, as desired, as outlined in paragraph 4 above.
- 5.2.2.4. The reader may now be mounted, optionally, to the shroud, using supplied hardware, or directly to the J-Box, by screwing the reader housing into threaded inserts, on the shroud, or alternately directly into the J-Box or wall, using #6-32 screws.
- 5.2.2.5. The keypad may then be mounted to the reader housing, using supplied hardware, screw the keypad onto the reader housing. Install the label overlays onto the keypad & reader.

5.2.2.6.

6. Operation

6.1. Wiegand Mode

- 6.1.1. The Wiegand data stream to the control panel is automatic, data will be present after a card is read, and in the case of the 26-bit Wiegand keypad, data will be sent by the keypad, on “#” press. If an incorrect pin on the keypad is entered, it may be cleared by pressing “*”, or letting the keypad time out, a single beep, after 10 seconds of inactivity. In the case of the 8-bit keypad is installed, data will be sent with each keypress.
- 6.1.2. The LED & beeper controls are asserted when those lines are connected to the reader circuit ground, the black wire from the reader, or –Vin.
- 6.1.3. The reader data contains the CSN, or, if enabled, the card data contents.
- 6.1.4. If the keypad is configured for 26 bit Wiegand output, the keypad data contains the programmed site or facility code, plus the entered pin number. There are 255 different site codes, & 65535 different pins possible. If the entered pin is greater than 65535, this will result in all 1s being transferred in place of the pin, (the site code will remain the same).
- 6.1.5. If the keypad is configured for 8 bit it will output 8 bit binary data with each keystroke, the LSB to bit 3 will be the binary number of the key pressed, bits 4 to MSB will be the complement of that number. If the “*” key is pressed, the data will be 0x5A & for the “#” key, the data will be 0x4B.
- 6.1.6. The keypad & reader data conform to the Wiegand open standard H10301, for timing and format.

6.2. OSDP Mode

- 6.2.1. The OSDP (Open Supervised Device Protocol) format conforms to version 2.1.5, as provided by a third party converter module.
- 6.2.2. The RS-485 bus may be connected to other devices, in a daisy chain. This bus may be terminated at the reader with a load resistor, see paragraph 4.4 above to the location of the jumper that will do this.
- 6.2.3. Communication with the OSDP adapter;
 - 6.2.3.1. Communication speed with this adapter may be changed using the “osdp_COMSET” command.

- 6.2.3.2. The adapter may be restored to the factory default settings, including the SCBK, by issuing the appropriate manufacturer specific commands at power up.
- 6.2.3.3. The command must be issued by the control panel, by sending “osdp_MFG” command with the payload 0xCA446C05 ten times. The adapter will reply with an “osdp_ACK” until the final command, to which it will reply with an “osdp_NAK” with a payload 0x09.

7. Company Contact

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