SENTINEL-PROX KP-6840

SWITCHPLATE PROXIMITY READER

Installation & Operation Manual - 005-98-A

Your best option for Proximity Access Control

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AWID
APPLIED WIRELESS ID

Applied Wireless Identifications Group, Inc.

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NOTE: READ AND USE THIS MANUAL.

FAILURE TO DO SO MAY RESULT IN POOR READER PERFORMANCE OR EVEN PERMANENT DAMAGE TO READER, WHICH COULD VOID THE READER WARRANTY.

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1.0 INTRODUCTION:

AWID's Sentinel-Prox KP-6840 Reader is one of the best performing Switchplate Proximity Readers in the industry. This Reader will output both Wiegand and RS-232 format. Its primary applications are Access Control and Time & Attendance applications.

1.1 General Descriptions:

- Thin-line switchplate mounting
- Indoor or outdoor installation
- Tactile keyboard
- LED visual indicator
- Audible feedback
- Field programmable

1.2 Special Features:

- Simultaneous Wiegand (Access Control) and RS-232 (Time & Attendance) outputs
- Slim housing designed for single gang box
- Flexible code entry
- UV stabilized plastic housing

1.3 Suggested Applications

- Access Control
- Asset Management
- Time & Attendance
- RFID

2.0 PRINCIPAL OF OPERATION

This Radio Frequency Identification (RFID) reader or proximity reader uses radio frequency to identify, locate and track people and objects that carry the appropriate transponders. Proximity readers can work in none line-of-sight situations and in darkness, bright sun light or through dirt, grime and smudges.

A typical proximity system consists of three components – an interrogator or a reader, a transponder or a card and a data processing panel and/or computer combination. Most RFID readers have an internal micro-controller, a transmitter, a receiver and a shared transmit/receive antenna. The card is usually passive (without an internal battery) and consists of an antenna and an RFID ASIC (Application Specific Integrated Circuits). During operation, the transmitter sends out an electromagnetic wave to establish a zone of surveillance. When a card enters this zone, the electromagnetic energy from the reader begins to energize the IC in the tag. Once the IC is energized, it goes through an initialization process and begins to broadcast its identity. This process utilizes a low energy back-scattering technology that selectively reflects or back-scatters the electromagnetic energy back to the reader. The receiving circuits in the reader senses and decodes this back-scattered signal and hence determines the identity of the tag.

3.0 SPECIFICATIONS

- Input voltage.....+5V to +12V
- Input current.....60 to 120 mA typical
- Read range:
  - Prox-Linc-GR.....Up to 7.5 inches (20 cm)
  - Prox-Linc-CS.....Up to 7.5 inches (20 cm)
  - Prox-Linc KT..... Up to 5.5 inches (15 cm)
- Transmit frequency.....125KHz (CW)
- Receiver frequency.....125KHz (Amplitude Modulated)
- Operating temperature range.....-30° C to +65° C
- Color.....Dark Gray
- Output formats available.....Wiegand & RS-232 (Standard)
  (Others are available upon request)

3.1 Measuring Read Distance

To measure the read range between Reader and card, grasp the card by the corner or near the slot and move the card slowly toward the Reader, with the card surface parallel to the Reader, until a BEEP occurs. The BEEP indicates that the Reader detects and reads the card. In order to read again, the card must be fully withdrawn from the Reader's field of surveillance and then re-approached again. During normal operation, the card can be presented at any angle relative to the Reader, however this will result in slight variation of read range.

Note: Do not "wave" the card in front of the Reader. "Waving" the card in front of the Reader will result in a diminished read range.

NOTE: FAILURE TO FOLLOW THE INSTALLATION GUIDE MAY RESULT IN POOR PERFORMANCE OR EVEN CAUSE PERMANENT DAMAGE TO THE READER, THUS VOIDS THE PRODUCT WARRANTY.

4.0 PREPARATION FOR INSTALLATION

4.1 Site Survey:

Always conduct a site survey before starting installation, avoid any possible sources of interference. If the Reader is not installed properly, the performance will be degraded or more seriously the Reader may be damaged. The following is a list of installation procedures that should be followed during installation:

- Do not install the Reader in an area where sources of broadband noise may exist. Examples of broadband noise sources are motors, pumps, generators, DC-AC or DA-AC converters, non-interruptible power supplies, AC switching relays, light dimmers, CRT's, induction heater, ultrasonic welder etc.
- Do not bundle the reader wires together in one conduit with the AC power cables, lock power, and other signal wiring.

- Keep all the Reader wiring at least 12 inches (30 cm) away from all other wiring, which includes but not limited to, AC power, computer data wiring, telephone wiring and wiring to electrical locking devices.
- Do not install the reader within 24 inches (60 cm) of a computer CRT terminal.

4.2 Preferred Reader Installation Practices

- Make sure that the supply voltage of the Reader is within specification. As a rule of thumb, higher supply voltage results in longer read range but at the expense of higher power consumption.
- Use cables with over-all shield (Screen).
- For best results, run the cable in an individual conduit with at least 12 inches distance from the AC power, computer data cables and cables for electrical locking devices.
- Use recommended cable. Do not use any un-shield "Twisted Pair" type cable.
- Use the largest wire gauge possible.
- Use dedicated and linearly regulated power supply, where applicable.
- Use Single Point Grounding (Earthing). No ground loops.

4.3 Metal Mounting

The Reader is pre-compensated for mounting on metal utility boxes.

4.4 General Wiring Requirements

All the Reader wiring must be continuously shielded. AWID recommends using #22 AWG up to #18 AWG, six or seven-conductor shielded cables. Longer distances and higher current consumption on the power supply line will require larger gauge wires. Refer to Table 4.4-1 and Figure 5.2-1 and Figure 5.2-2 on the following pages to determine your data lines' wiring requirement. Due to system data termination differences, contact your panel manufacturer for their specific requirements.

TABLE 4.4-1: Data Line's Wiring Requirement

WIRE SIZE	#22 AWG (0.6mm Dia)	#18 AWG (1.2mm Dia)
WEIGAND	500 ft (152 meters)	980 ft (300 meters)
RS-232	55 ft (15 meters)	45 ft (15 meters)

4.5 Power Supply

The operating frequency of a typical switching power supply ranges from 15 kHz to 50 kHz. It will usually generate wideband switching noises plus some of its harmonics may fall on or near 125 kHz, the operating frequency of the Reader. Therefore, avoid using a switching power supply at all times. **AVOID** using a single power supply for Reader and the magnetic lock. Doing so will affect the Reader operation and can damage the Reader.

NOTE: WHEN USING AN EXTERNAL POWER SUPPLY, ALWAYS USE A LINEAR POWER SUPPLY, DO NOT USE A SWITCHING POWER SUPPLY.

4.6 Grounding

Grounding is critical for proper operation of the Reader. When installing the Reader, it is crucial to assure that the earth ground is the best ground available. If you elect to use the AC main power ground, conduct a test by measuring its resistance relative to a known good ground, such as a cold water pipe or a structural steel that is in direct contact with the ground. This resistance should be less than 50 ohms. If you find that the AC main power does not provide adequate earth ground, try using a solid connection to a cold water pipe or for best results drive your own copper clad ground rod into the earth for the ground point.

For multiple Reader installations, it is critical that all Readers are connected to a single ground point. Using multiple ground points will create secondary current paths or ground loops that can affect the performance and cause damage to the Reader.

4.7 Wiring Diagrams

The Reader is designed for Wiegand and RS-232 standard communication formats; use Figure 5.2-1 for Wiegand format installation and Figure 5.2-2 for RS-232 format installation, and Figure 5.2-3 for combined Wiegand and RS-232 installation. If an external power supply is being used, leave the Panel's Ground and Power terminals open and connect the Reader's Ground (Black) and 5-12VDC (Red) terminals to the external power supply.

5.0 INSTALLATION PROCEDURE

Check to verify that every item listed under Section 5.1 of this manual is present before starting the installation.

5.1 Parts List

a. Installation sheet, P/N: 005-99-A	QTY=1
b. Sentinel-Prox KP-6840 Reader, P/N: 005-20-A	QTY=1
c. #6-32x1" Machine screw P/N: 0616MPP	QTY=2

5.2 Installation Steps

a. Prepare the single-gang electrical wiring box for Reader mounting. Observe ADA requirements.
b. If double-gang electrical box are used, drill through the four blind mounting holes on the four corners of the Reader.
c. Guide the open end of the Panel's control cable through the access hole on the electrical junction box. Secure the cable by tightening the cable clamp.
d. Remove the Snap-On open frame cover of the Reader (item b. of the parts list).
e. Connect the Reader and the Panel together according to Figure 5.2-1 for Wiegand format, Figure 5.2-2 for RS-232 format and Figure 5.2-3 for Wiegand/RS-232 format.
f. Setup for the RS-232 is: 9600 baud rate, 1 start bit, 1 stop bit, no parity.

5.3 Verification

a. Power up the PANEL, the LED on the Reader should show RED, and the reader will give one long and three short Beeps, to indicate the software revision level, which is B.
b. Place a "good" card in front of the Reader. The reader will give out "ONE" audible BEEP and the LED will change from RED to AMBER to wait for key press. At the end of the three seconds waiting period, the reader will double BEEP and LED return to RED. If a key is pressed within the three-second, the reader respond with a BEEP and the three-second timer restarts to wait for the next key press. Always end the key press with a "#" entry. The reader will response with the "#" key press with a double BEEP as acknowledgement.
c. The KP-6840 reader is designed to accept variable number PIN-code ended with the "#" key. If you hear double-BEEP before the end of the key press sequence, the timer expires and you must re-start the process by presenting the card.

Fig. 5.2-1 Wring Diagram for Wiegand Output Format

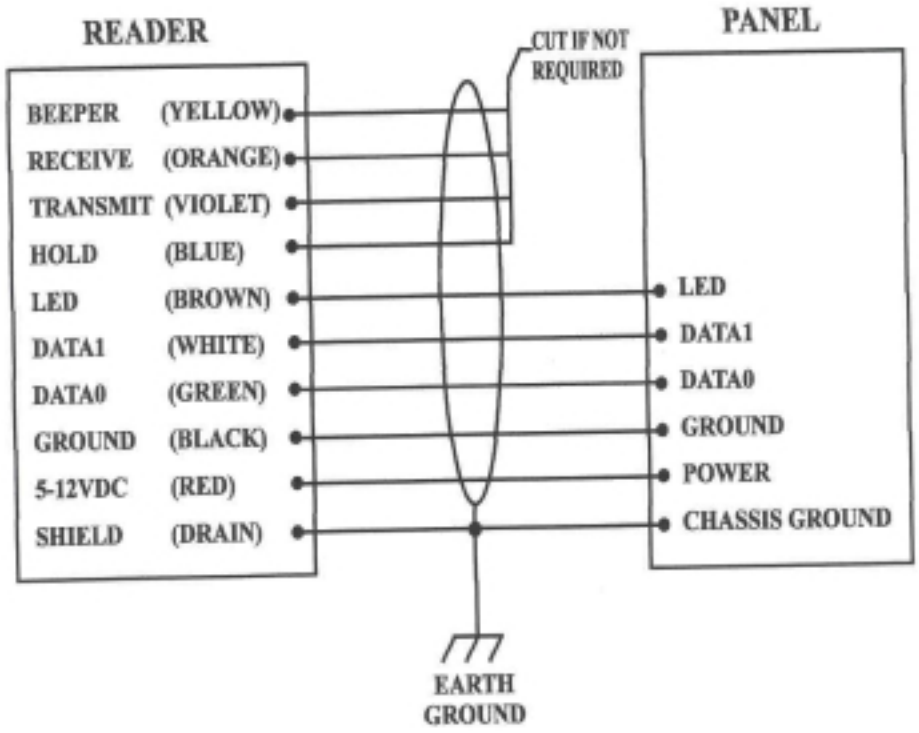


Fig. 5.2-2 Wiring Diagram For RS-232 Output Format

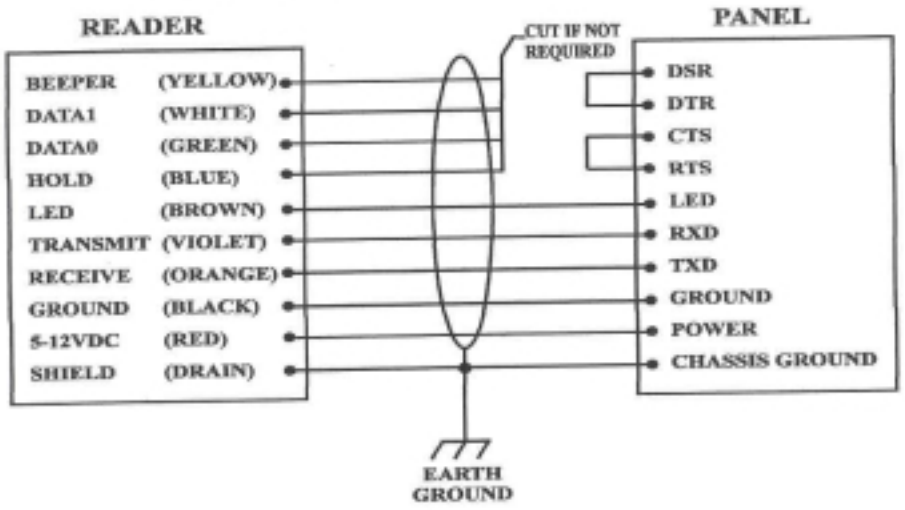
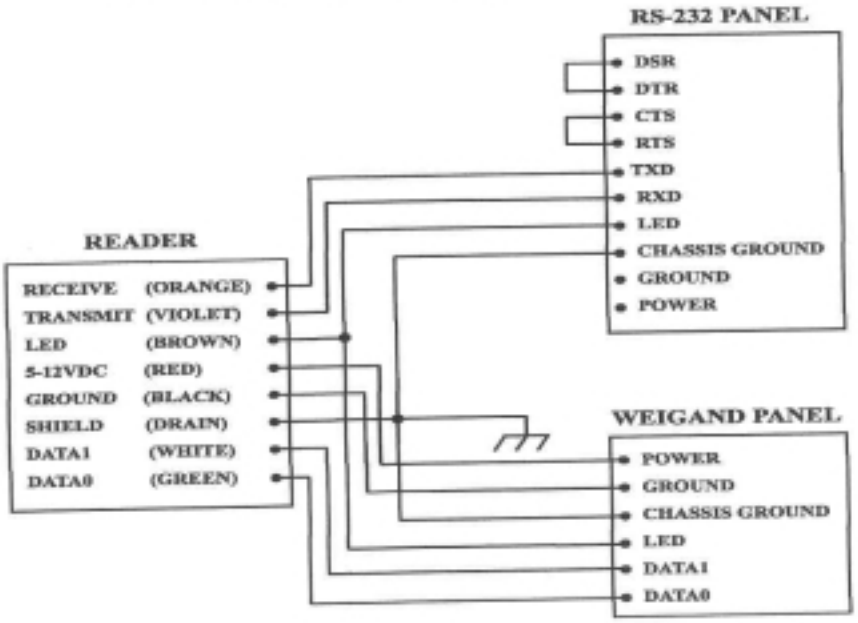


Fig. 5.2-3 Wiring Diagram For RS-232 & Wiegand Output Format



5.4 Mounting

a. Connect the remaining wires to the PANEL.
b. Mount the Reader securely to the electrical junction box with #6-32x1 machine screw, (Item c on Parts List).
c. Install the Snap-On cover.

6.0 WARRANTY

AWID's products are warranted to the original purchaser to be free of defects in material and workmanship for the life of the product. Any tampering or modification to the product will void this product warranty. AWID does not warrant any product as to its merchantability or suitability of use. AWID's sole and complete responsibility under this warranty is expressly limited to repair or replacement of the warranted product.

7.0 RETURN MATERIAL AUTHORIZATION (RMA)

AWID monitors and tracks the life cycle performance of our product through our RMA system. All customers must obtain a RMA number from AWID Customer Service Department prior to returning the merchandise. After the customer provides AWID Customer Service Department with the serial number and a description of the returning item, a RMA number will be issued. **This RMA number must be clearly marked on the outside of the returned package and noted on the paperwork attached to the returned merchandise.**

When obtaining a RMA number for RFID tags, please provide AWID Customer Service Department with the serial numbers, card identification numbers, facility codes and etc. If exact duplicates of returned cards or tags are requested, the customer must provide AWID with the numbers needed. AWID reserves the option to replace or repair returned merchandise.

Items returned to AWID without the proper authorization will be returned to the originators at their own expense.

8.0 TROUBLESHOOTING

This unit, if not installed in strict compliance with AWID's installation instructions, may not function to specifications. Use the checklist below to identify the problem:

- Is the card valid and working? - Try some different cards!
- Is the reader wired correctly? - RED-BLK :5-12V, reader should work
- Is the unit grounded properly? - DRAIN-EARTH: less than 50 Ohms
- Is the card presented correctly? - Card face parallel to reader face
- Is a power supply correct? - No switching power supply please!
- Is reader voltage/current correct? - 5-12V @ 80-100mA typical
- Is the environment free from electromagnetic interference? - Run cable away from other data carrying cables, reader away from electromagnetic interference sources!

When troubleshooting, try to identify the source of the problem to a unit level. "Is the problem originating from the panel?" Or "is the problem originating from the Reader? " Maybe the problem "is the power supply?"

All AWID's readers will need only a power supply and a valid card to work properly. If the reader is only connected with RED (+5-12V) and BLACK (Ground), and presented with a valid card, the reader will BEEP and momentarily turned AMBER. If the Card stays within the reader zone of surveillance, the LED on the remain AMBER at the end of the three-second, it double BEEP. When the card is removed, the LED will return to RED after the three-second timer expires. When the reader works according to the tests above, the reader is working properly.

If the keypad section is removed from the reader, the reader will continue to BEEP until the keypad is placed in its proper location.

To check the validity of the output data in the absence of a panel, you will need to build a patch cable between the reader and a PC. Call AWID's Technical Support for details.

If problem persists, consult the system manufacturer. If problem is the reader, consult AWID's Technical Assistance Department. AWID help desk is opened from 8:00 AM to 8:00 PM Eastern Standard Time, and can be reached by dialing 1-800-369-5533.

9.0 PATENTS AND APPROVALS

AWID products are covered by United States patent #5594384.

AWID logo is a registered trademark of Applied Wireless Identifications Group, Inc.

Where required, AWID's products are approved by the appropriate regulatory agencies:

U. S. Federal Communications Commission:	Part 15 – Pending
Underwriter Laboratory:	UL 294 – Pending
Designed to Comply with:	CE, UL, VDE, BZT, DTI & PTT

Information to the User

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.