



MOTOROLA

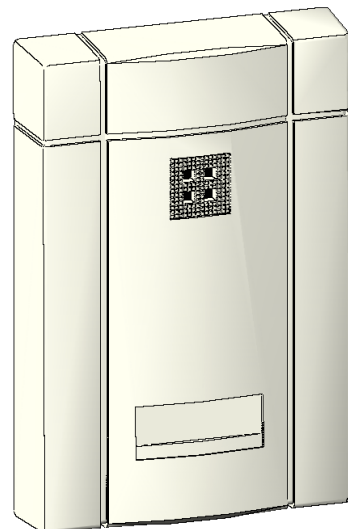
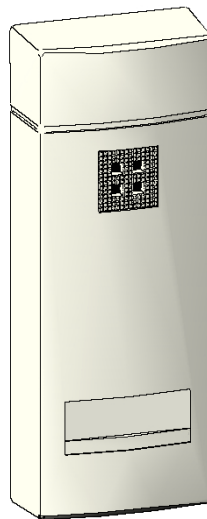
Indala Corporation

asp ***Advantage Series Proximity***

ASR-603 *SecureProx*TM I Reader

ASR-605 *SecureProx*TM II Reader

**Installation and
Operation Manual**



Welcome and thank you for choosing Indala's SecureProx™ I and SecureProx™ II proximity access control readers, the next generation of our very popular Advantage Series Proximity (ASP) product line.

Your choice of access control readers and credentials from Motorola's Indala Corporation, the proximity experts, says that you'll settle for nothing less than the highest quality proximity products on the market today. It says your readers have features to simplify installations, save time, and save money. It says your readers are easier and less expensive to maintain because they include crucial self-test and self-diagnostic technology. It says your readers can withstand harsh environments. And it says your readers are UL, FCC and European CE approved. Perhaps most importantly, it says you're a partner of Motorola's Indala Corporation, a company whose first name, Motorola, is virtually synonymous with quality.

FCC Compliance: This device has been tested and found to comply with the limits for Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the device is operated in a commercial environment. This device may not cause harmful interference and must accept any interference received, including interference that may cause undesired operation. This device uses and generates radio frequency energy and, if not installed and used in accordance with this manual, may interfere with radio communications.

CE Compliance: This product complies with the European Community Council Directive 89/336/EEC if the installer/user adheres to the instructions detailed in this manual. The standards specified under EN50081-1 emission standard and EN50082-1 immunity standard to which this product conforms are EN55022, IEC 801-2, IEC 801-3, IEC 801-4, and IEC 801-6.

Notice: The ASR-603/605 readers require the use of linear, series pass, regulated power supplies. Use of other types of power supply can result in reduced read range. The use of switching power supplies is not recommended.

Do not use the reader's power supply to power other equipment particularly when operating switched inductive loads such as motor control relays and solenoids (i.e., magnetic locks, latch or strike). Doing so will affect the reader operation. Use a separate dedicated power supply to power Indala proximity readers.

Because this technology is based on radio frequency and because nearby environmental sources of electrical interference may affect the performance of the reader, below is a list of precautions that should be considered when installing or wiring the reader:

- Metal affects radio signals. Do not cover the face of the reader with metal of any kind.
- Reduce or eliminate unwanted signals from external sources.
- Do not place the reader wiring bundled in conduit with AC power cables, lock power, or signal wiring.
- Maintain all reader wiring a minimum distance of 12" (30 cm) away from other wiring to include, but not limited to AC power, computer data wiring, telephone wiring, or wiring to electric locking devices, etc.
- Do not install the reader in areas where sources of broad spectrum EMI noise may be present. Examples of EMI broad spectrum noise producers are motors, pumps, generators, AC-DC converters, uninterruptable power supplies, AC switching relays, light dimmers, computer monitors, and CRTs.
- Do not install the reader within 3.5' (1.1 m) of computer CRTs (monitors).

The rules and regulations of the Federal Communication Commission (FCC) and other regulatory agencies in various countries limit the RF power level and frequency. The user is cautioned that changes and modifications made to the equipment without the approval of the manufacturer could void the user's authority to operate this equipment. It is suggested that the user use only shielded and grounded cables to ensure compliance with FCC Rules.

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1.0 Overview

1.1 Introduction.

The ASR-603 and ASR-605 readers are modular miniaturized and rugged low power radio frequency readers designed for applications such as identification systems, security systems, and data collection. The ASR-603 reader mounts on a metal door frame (mullion) or any flat surface. The ASR-605 reader mounts on any USA standard electrical gang box or on any flat surface. The reader electronics module is completely enclosed in an epoxy potting material, making it both vandal proof and weather resistant. The ASR-603 and the ASR-605 use the same reader electronics module. The readers' bezels can be interchangeably snapped on the common reader electronics module, enabling the installer to configure the reader as a wall switch or a mullion reader at the installation site.

The readers output data in Wiegand or Magnetic Stripe formats, making it easy to upgrade an existing site to proximity using the wiring already in place.

1.2 Features

- *QuickFlash™* for immediate user feedback.
- *SelfTest™* for installer assistance during installation.
- *WatchDog™* for increased supervisory control.
- Independently controlled audio tone and tri-color status LED.
- Field programmability via the use of option cards.
- Snap-on module construction, enabling configuration at installation site.
- Mounting on standard electrical box or on any flat surface.
- Indoor/outdoor operation.
- Attractive, contemporary styling.

1.3 Specifications

- Input Voltage: 4.0 VDC to 16 VDC
- Input Current/Power:
 - Typical, quiescent off metal Vin = 5.0 DC 86 mA 0.43 W
Vin =12.0 VDC 65 mA 0.78 W
 - Maximum with card present and reader mounted on metal 4.0 VDC ≤ Vin ≤ 16 VDC 100 mA 0.400-1.60 W
- Power Supply:
 - Recommendation Regulated linear power supply
- Read Range:
 - With ASC-121T *LifeTime*™ Card Up to 5.0" (12.7 cm)
 - With ASK-116T *KeyTag* Up to 3.0" (7.6 cm)
 - With AVC-132 *Image100*™ Up to 4.0" (10.2 cm)
- Frequency:
 - Exciter Field 125 KHz
 - Receive 62.5 KHz
- Operating Temperature Range: -35° C to +65° C (-31° F to +149° F)
- Color: Black and sand beige
- Material: UV resistant, ABS (UL 94V0) plastic
- Weight (typical): 5 oz. (142 g)
- Dimensions:
 - ASR-603 4.50"H x 1.72"W x 0.85"T (11.42 x 4.37 x 2.16cm)
 - ASR-605 4.50"H x 2.99"W x 0.85"T (11.42 x 7.59 x 2.16cm)
- Output Formats: Wiegand and ABA track 2 magnetic stripe
- Certification: UL-294 indoor and outdoor compliant, CE Mark, and FCC Class A Digital Device (Part 15) ID Numbers E9U503 and E9U505.

Read range is stated in an undisturbed electrical environment, with card presented parallel to reader, and reader installed in accordance with Indala instructions. Mounting the ASR-603/605 on metal slightly decreases the read range. Power supply, reader, and controller must be on the same ground, connected to earth.

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1.4 Theory of Operation

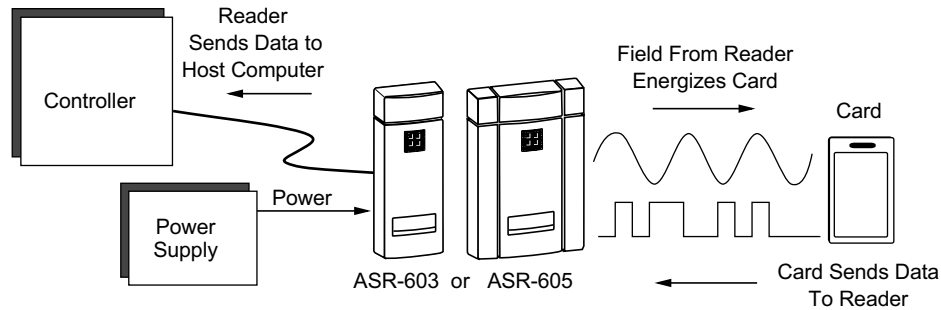


Figure 1. ASR-603/605 Block Diagram

When the reader is powered, a low-power radio frequency (RF) field is continuously transmitted by the reader (see figure 1). When a card is presented within the field of the reader, the microchip, embedded in the card, is activated and transmits a unique identification (ID) number back to the ASR-603/605 reader. The reader decodes and converts this data to the pre-determined Wiegand, or Magnetic Stripe compatible format and sends this code to an external controller through data cables. With this information, the controller determines what action is to be taken as a response to the card presentation.

1.5 Unpacking and Identifying Supplied Parts

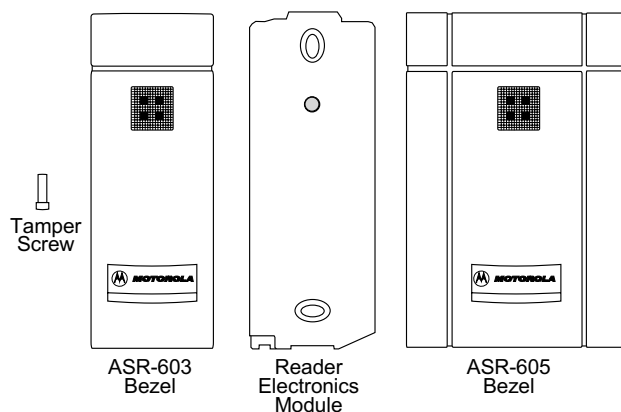


Figure 2. 603/605 Package Components

Unpack the equipment and become familiar with the components. The following list describes the content of the package (see Figure 2.):

ASR-603 Package: Tamper screw, reader electronics module, and ASR-603 bezel.

ASR-605 Package: Tamper screw, reader electronics module, and ASR-605 bezel.

1.6 Identifying the Reader Format

The reader format is typed on the ID label (see Figure 3.) on the reader electronics module.

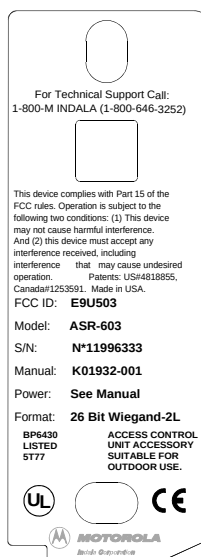


Figure 3. The Reader Label

1.7 Separating ASR-603 Bezel from Electronics Module

To remove the ASR-603 reader bezel, unscrew the tamper screw, pull metal latch, and pull the reader module up as shown in Figure 4.

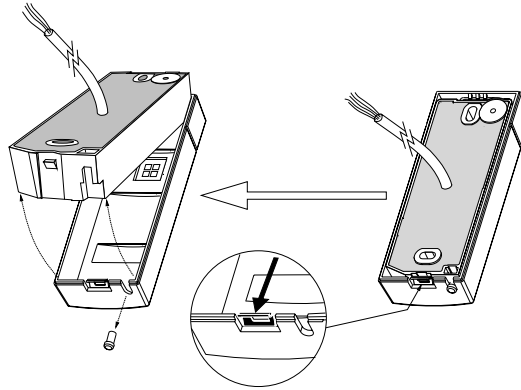


Figure 4. Separating ASR-603 Bezel From Module

1.8 Separating ASR-605 Bezel from Electronics Module

To remove the ASR-605 reader bezel, unscrew the tamper screw, pull metal latch, and pull the reader module up as shown in Figure 5.

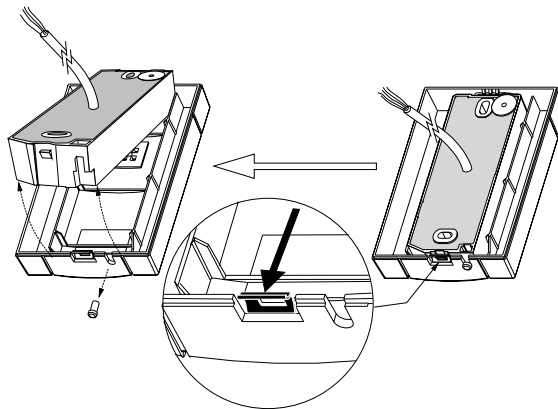


Figure 5. Separating ASR-605 Bezel From Module

2.0 Installation

2.1 Mechanical Installation

2.1.1 Mullion Mounting

To mount the ASR-603 to a mullion, drill two proper size holes (for 6-32 sheet metal or thread forming screws) 3.3" apart. At center of these two holes drill a 0.375" hole for the reader cable. Route the cable through the center hole to the controller. Using the two 6-32 screws attach the reader to the first two holes. Once the reader module is screwed in place, snap on the ASR-603 bezel then install the tamper screw as shown in Figure 6. For mechanical dimensions of the ASR-603 refer to section 5.0 "Additional Information".

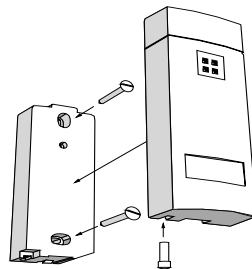


Figure 6. Mullion Mounting

2.1.2 Wall Mounting

To wall mount the reader there are two choices. The first choice is to mount the reader directly to the wall. This is similar to the mullion mounting described above. The second choice is to mount it on a gang box. When installing the reader on an electrical gang box, make sure the gang box mounting holes fit the reader mounting holes. Using two 6-32 screws, attach the reader to the gang box. Once the reader module is screwed in place, snap on the reader bezel then install the tamper screw as shown in Figure 7. For mechanical dimensions of the ASR-603 or ASR-605, refer to Section 5.0 (Mechanical Drawings).

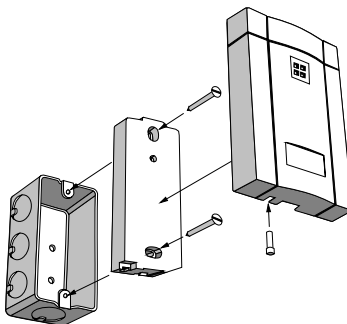


Figure 7. Wall Mounting

2.1.3 Mounting Near Metal

When mounting the ASR-603 or ASR-605, observe the near metal boundaries as shown in Figure 8.

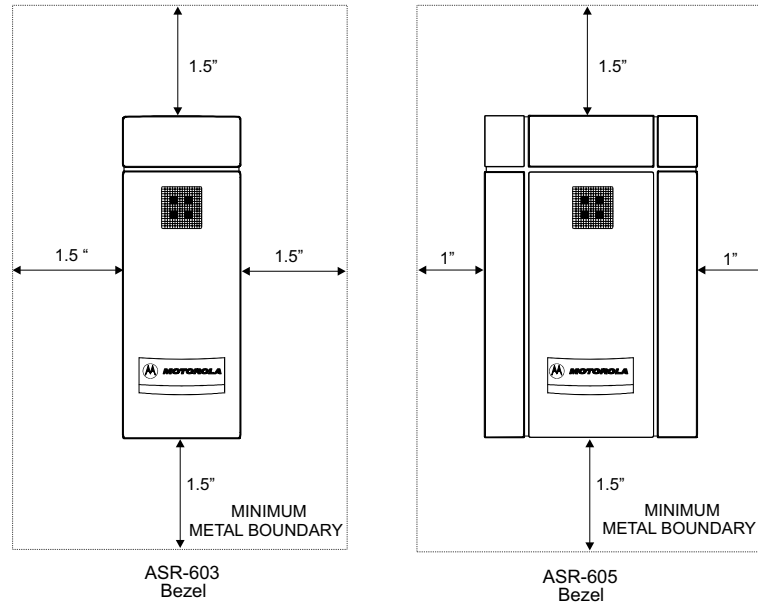
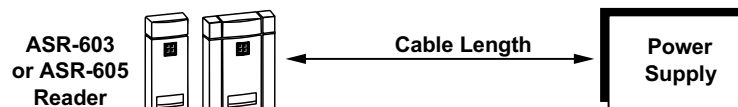


Figure 8. Mounting Near Metal Boundary

2.1.4 Power Supply Cable Types and Maximum Lengths

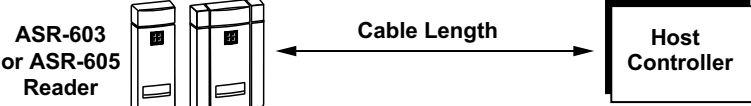
The ASR-603/605 reader requires a minimum voltage of 4.0 VDC. Voltage drops, caused by the cable resistance, can be made up by increasing the power supply voltage (DO NOT SET THE POWER SUPPLY VOLTAGE TO HIGHER THAN 16 VDC). In noisy environments, use shorter cable runs. The following are the recommended cable types and maximum cable lengths for cables connecting the power supply to the reader (**DO NOT USE CABLES WITH GAUGES SMALLER THAN 24 AWG**)



Cable Type	Maximum Cable Length
24 AWG (0.60 mm), three conductor, with an overall foil shield, Belden, 9533 or equivalent.	200' (61 m)
22 AWG (0.80 mm), two conductor, with an overall foil shield, Alpha 5192 or equivalent.	300' (91 m)
18 AWG (1.20 mm), two conductor, with an overall foil shield, Alpha 5386 or equivalent.	500' (152 m)

2.1.5 Reader to Host Interface Wire Types and Lengths

Refer to the table below to determine the recommended wiring type at various maximum distances. Variation in distance requires different wire gauges. Because of system data termination differences, contact your system manufacturer for its exact requirements. Installation to be in accordance with National Electric Code ANSI/NFPA 70.



Cable Type	Maximum Cable Length
22 AWG (0.80 mm), six or eight conductor, with an overall foil shield, Alpha, 5196, 5198 or equivalent.	500' (152 m)
18 AWG (1.20 mm), six or eight conductor, with an overall foil shield, Alpha 5386, 5388 or equivalent.	500' (152 m)

2.2 Electrical Installation

2.2.1 Grounding

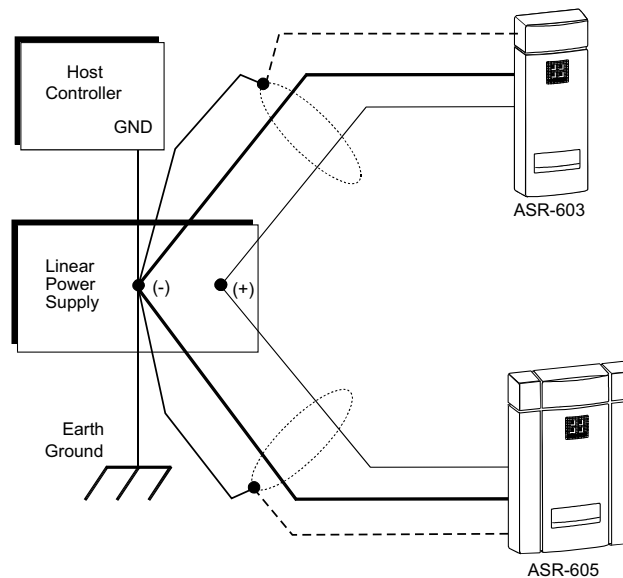


Figure 9. Grounding the Reader

Connect the power supply and the controller directly to an earth ground. An earth ground can be established by driving a copper clad ground rod into the earth. Make certain the DC resistance between your

established earth ground and the system ground is 50 Ohms or less. If direct connection to a ground rod is not possible, connect the reader to an earth grounded cold water metal pipe (do not connect to copper fire sprinkler system because it may have non-conductive couplings), or steel frames (building beams) that connect to earth.

Prevent ground loops by connecting both the cable shield and the negative line of the power supply to one common earth ground point. Connecting different points to separate earth grounds may result in a ground loop. Ground loops may cause poor read range and communication line interference resulting in no code or improper code being seen by the controller.

In a multiple reader installation, connect all readers to a single earth ground reference point (common ground).

2.3 Reader to Host Interface Wiring

Figure 10. shows all the possible interfaces. Chose the appropriate interface for your installation.

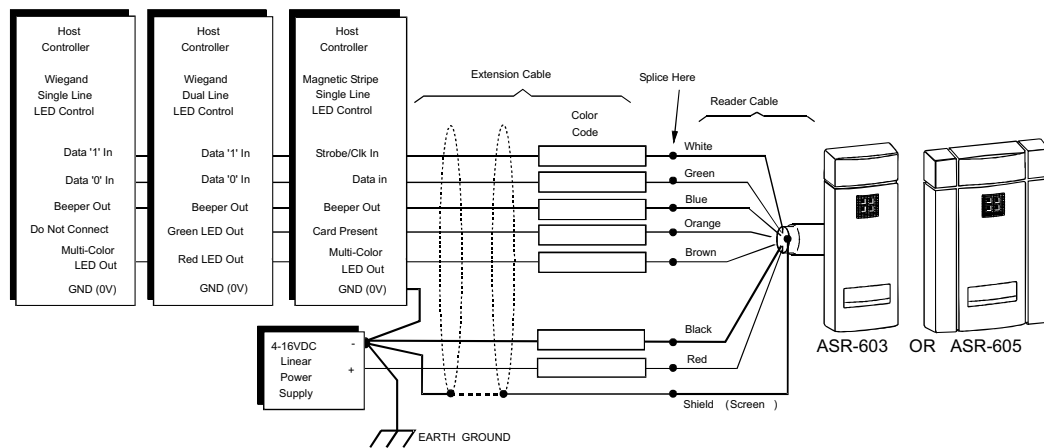


Figure 10. Reader to Host Interface Wiring

Notes:

- The system must have a single earth ground point.
- Connect screen (shield) wire at ASR-603/605 reader cable splice to a common earth ground as shown.
- For open collector (non-terminated output), consult your system manufacturer for correct cable length and type.
- The internal circuit configurations for the reader inputs and outputs are as shown in Figure 11.

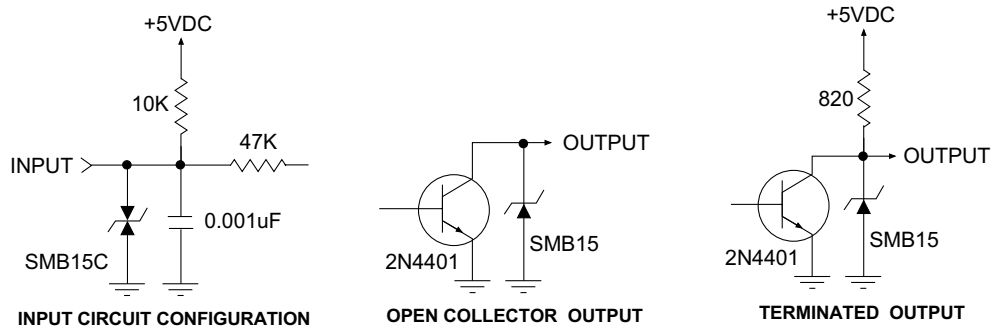


Figure 11. Reader Internal Circuit Input and Output Configurations.

3.0 Operation

When power is first applied to the reader, it performs an internal circuit *Self Test*[™]. If it appears to be functioning properly, the reader will flash the amber LED and beep twice. After the *Self Test*[™] is completed, the reader is in a READY status mode and you may present the card to the reader.

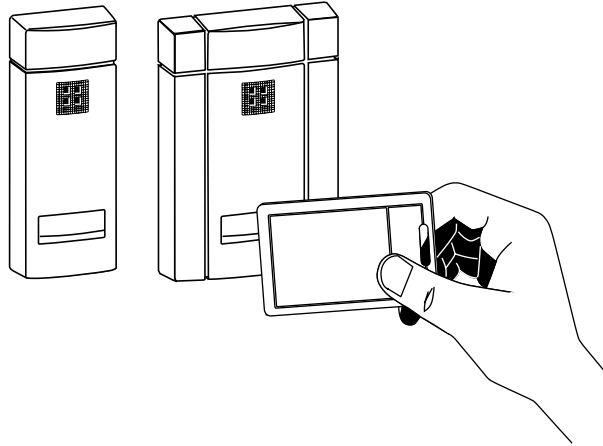


Figure 12. Presenting the Card

3.1 Presenting the Card

To obtain maximum read range, present the card to the reader as shown in Figure 12. Keeping the card parallel to the ASR-603 or ASR-605 reader, move it slowly toward the face of the reader until a *QuickFlash*[™] (refer to section 3.3) is obtained. This is the point at which the card is read and the data is transmitted to the controller. To read the card again, remove it from the antenna field and present it again. During normal use, the card can be presented to the antenna at any angle, although this will result in a reduced read range.

3.2 Data Output

Both ASR-603 and ASR-605 readers are capable of outputting in either Wiegand or magnetic stripe formatted data. For further information please call technical support at (800)646-3252.

3.3 *QuickFlash*[™]

When a valid card is presented, unless *QuickFlash*[™] is activated, the LED will flash and the audio tone (beeper) will be activated for 70 to 100 milliseconds, regardless of the card's access status. This gives the user immediate feedback that the card was read and the data was sent to the controller. After the 100 millisecond *QuickFlash*[™] period, the controller takes over the control of the LED and beeper.

3.4 *SelfTest*[™]

The readers have an internal diagnostic routine to assure reader operation at start-up, as well as a means to test the integrity of the data lines. When power is first applied to a reader, it will “beep and flash” twice to let the installer know that it has performed an internal check and appears to be function-

ing properly. If the reader start-up routine determines one of the critical memory devices inside the reader has failed, the reader will emit a “chirping” sound.

3.5 Verifying Data at Host

To verify that the controller can read the data, put the reader into “line test mode” by holding a SelfTest[™] card (Indala part number 07257-001) in front of the reader. The reader will respond with an alternately flashing LED in all three colors and an audio signal to let you know it is in the line test mode. The reader will remain in the line test mode until power is removed and reapplied or the SelfTest[™] card is presented again. While in this mode, the reader will send output pulses down the data lines at a 1 Hz rate, which can be measured at the controller end with a volt meter. If the pulses are not present, then there is probably a break or short in the line. If the pulses are present and the system is still not working, the reader may not be connected to the controller properly, the controller/system may be incorrectly programmed, or the controller may be broken.

3.6 Controls and Indicators:

3.6.1 Wiegand and Magnetic Stripe Single-Line Control LED Host to Reader Interface Wiring:

- There is no LED OFF state in this configuration. LED is red when the brown wire is high (above 2.2 VDC or not connected).
- Pull brown wire low to change LED color to green.
- Toggle brown line high-low at a rate of 100 Hz to 1 kHz, 50% duty cycle, to produce amber LED color.
- Pull blue beeper wire low to activate audio beep tone.

3.6.2 Wiegand Dual-Line Control LED Host to Reader Interface Wiring:

- The LED is OFF when both brown and orange wires are high (above 2.2 VDC or not connected).
- Pull brown wire low to activate red LED.
- Pull orange wire low to activate green LED.
- Pull orange and brown wires low simultaneously to activate amber LED.
- Pull blue wire low to activate audio “beeper” tone.

3.6.3 Option cards:

3.6.3.1 Single- and Dual-Line LED Control

This option card toggles the state of the LED control lines (Indala part number 07260-001). If one beep is heard when the card is presented, the reader is set to a single line LED control. If two beeps are heard, the reader is set to a dual line LED control.

3.6.3.2 *QuickFlash*TM Beep Enable/Disable

This option card toggles the state of the QuickFlashTM beep option (Indala part number 07259-001). If one beep is heard when the card is presented to the reader, the automatic beep is enabled. If two beeps are heard, the automatic beep is disabled.

3.6.3.3 *QuickFlash*TM LED Enable/Disable

This option card toggles the state of the QuickFlashTM LED option (Indala part number 07258-001). If one beep is heard when the card is presented to the reader, the automatic *QuickFlash*TM is enabled. If two beeps are heard, the automatic *QuickFlash*TM is disabled.

3.6.3.4 *SelfTest*TM Card

This option card enables or disables the SelfTestTM mode upon presentation (Indala part number 07257-001). Present the card once to enable the SelfTestTM mode. Present a second time to revert to normal operation.

3.6.3.5 *WatchDog*TM Enable/Disable Card

This option card toggles the state of the automatic WatchDogTM option (Indala part number 07508-001). If one beep is heard when the card is presented to the reader, the WatchDogTM output is enabled. If two beeps are heard, the WatchDogTM output is disabled. The WatchDogTM output will output an 8 bit “10101010” pattern approximately once per minute over the data lines. This option card is available with either wiegand or magnetic stripe interfaces.

4.0 Troubleshooting

If the reader does not function properly when installed according to instructions, please complete this form and fax it to (408) 434-7057 before calling (800) 646-3252 for technical assistance. International customers call (408)383-4000:

FAX

From: _____

To: Technical Support

Phone: _____

Model: ASR-603/605

Fax: _____

Fax: (408) 434-7057

Product S/N _____

Date: _____

Dead Reader

1. Is the reader wired according to instructions? ☐ Yes ☐ No
2. Is the recommended power supply being used? ☐ Yes ☐ No
3. Is the DC voltage correct? ☐ Yes, _____ volts ☐ No
4. Is the DC current correct? ☐ Yes _____ ma ☐ No
5. What is the cable length between the power supply and the reader? _____ feet
6. Is the cable type according to specifications? ☐ Yes ☐ No

Short Read Range

1. Is the reader wired according to instructions? ☐ Yes ☐ No
2. Is earth ground connected according to instructions? ☐ Yes ☐ No
3. Is the cable shield connected according to instructions? ☐ Yes ☐ No
4. Is the recommended power supply being used? ☐ Yes ☐ No
5. Is the DC voltage correct? ☐ Yes, _____ volts ☐ No
6. Is the DC current correct? ☐ Yes _____ ma ☐ No
7. Is there a CRT (computer monitor) nearby? ☐ Yes _____ feet ☐ No
8. Is the card presentation according to instructions? ☐ Yes ☐ No
9. What is the card/tag number? Card model number: _____

Data Incorrect or Non-existent

1. At reader power up, did reader exhibit *SelfTest*TM? ☐ Yes ☐ No
2. Upon card presentation, did reader exhibit *QuickFlash*TM? ☐ Yes ☐ No
3. If you answered Yes to question 1 and 2, put the reader into line test mode as detailed in section 3.5 "Verifying Data at Host".
4. Is the reader wired according to instructions? ☐ Yes ☐ No
5. Is earth ground connected according to instructions? ☐ Yes ☐ No
6. Is the cable shield connected according to instructions? ☐ Yes ☐ No
7. Is there a CRT (computer monitor) nearby? ☐ Yes _____ feet ☐ No
8. Is the card presentation according to instructions? ☐ Yes ☐ No
9. What is the reader format? Reader format: _____

5.0 Additional Information

5.1 Mechanical Drawings

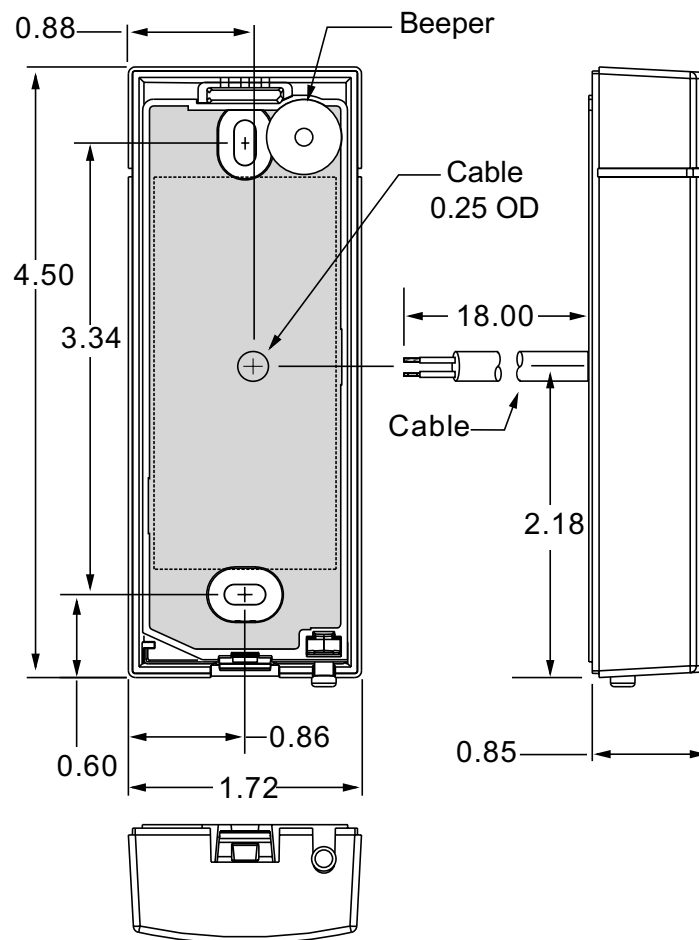


Figure 13. ASR-603 Mechanical Dimensions

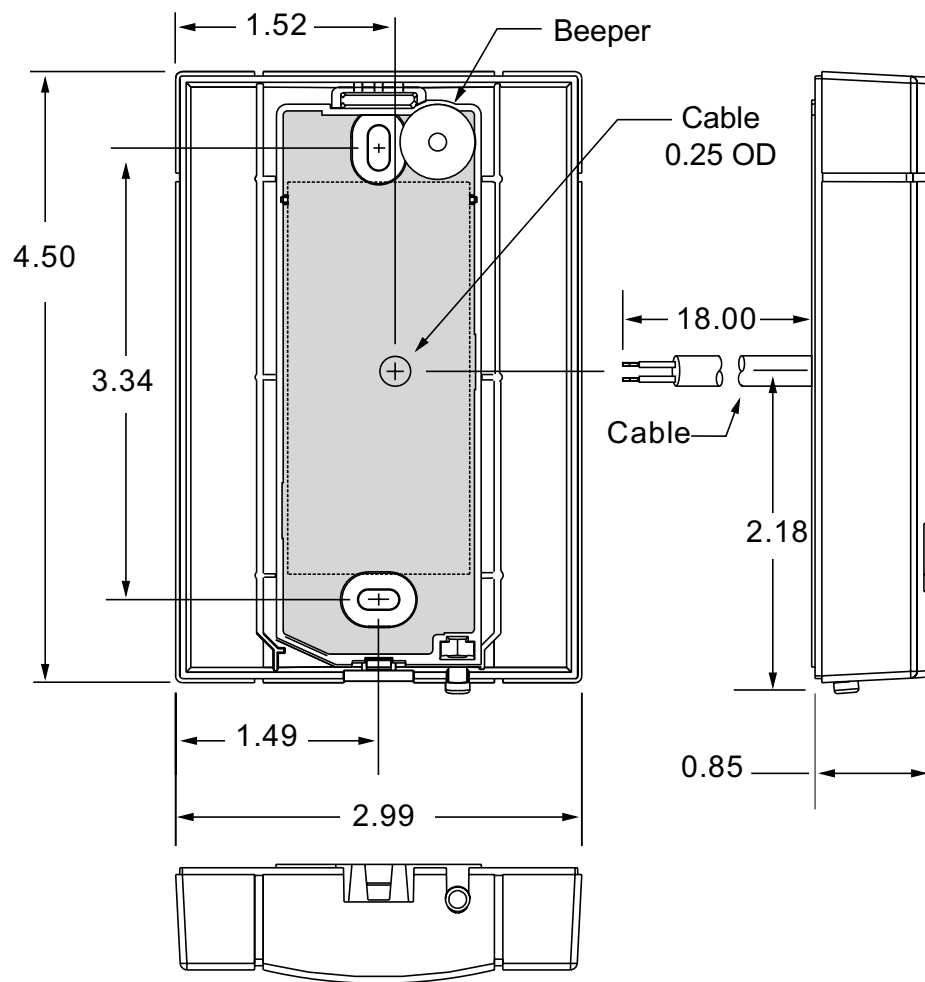


Figure 14. ASR-605 Mechanical Dimensions

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Products are covered by United States patent 4818855, Canadian patent 1253591, and other patents pending worldwide.

Motorola and the Motorola logo are registered trade marks of Motorola, Inc. ASP, *SelfTest*[™], *QuickFlash*[™], and *WatchDog*[™] are trade marks of Indala Corporation.

5.3 RMA (Return Material Authorization)

Goods returned for repair, warranty or non-warranty, must be assigned an RMA (Return Material Authorization) number. The customer is to provide a description of the specific problem. The customer is to include serial numbers, formats, card ID numbers, and correct facility codes with the items to be returned. If exact duplicates of returned cards or tags are requested, the customer must provide Motorola Indala with the exact format and ID numbers needed.

For readers returned and not covered by the warranty (due to age, misuse and/or damage), a quote for repairs will be issued, and no work will be performed until a valid purchase order is received. Readers left over 30 days without a repair authorization and a purchase order will be returned with evaluation charges and shipping costs applied.

5.4 Contacting Technical Support

Please answer all questions in section 4.0 "Troubleshooting" and have your answers ready before you call the technical support number listed below:

U.S.A. Office:

3041 Orchard Parkway
San Jose, CA 95134-2017
Tel (408) 383-4000, Main
Tel (800) 646-3252, Technical Support
Fax (408) 434-7057

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