



FlexPass™
Advantage Series Proximity Plus™
ASR-620++ PowerProx™ Reader
User Manual



FCC Compliance: 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 generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

UL Listing: The ASR-620++ has been evaluated by UL to UL-294 standard and is listed under file BP6430.

CE Compliance: This product complies with the European Community Council Directive 89/336/EEC and the standards specified under IETS-300-683 and IETS-300-330, if the installer/ user adheres to the instructions detailed in this manual.

Notice: The ASR-620++ reader requires the use of linear, series pass power supplies. Switching power supplies are not recommended because the use of these supplies may reduce the read range.

The unit is intended to be powered from a current limited power source such as an IEC/EN 60950 approved power supply.

Do not use the reader's power supply for 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 for 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, the following 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 such as 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.**

1.0 Overview

1.1 Introduction

The ASR-620++ reader is a rugged radio frequency reader designed for applications such as identification systems, security systems and data collection. The ASR-620++ reader mounts on most flat surfaces. The reader electronics are enclosed with a gasket sealed cover to provide weather resistance.

The reader outputs data in Wiegand or ABA Track II (Mag Stripe) format. An optional RS-232 interface requires the use of a BIL-422/232 Signal Conditioning Module which is sold separately.

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 LEDs.
- Field programmability via ProxSmith™ software toolkit (available separately) and option cards.
- Mounting on most flat surfaces.
- Indoor/outdoor operation.
- Attractive, contemporary styling.

1.3 Specifications

- Input Voltage: 12.0 VDC to 24 VDC.
- Input Current/Power
 - Typical, quiescent off metal

Vin = 12.0 VDC	1.0 A	12 W
Vin = 24.0 VDC	750 mA	18.0 W

 - Maximum, quiescent off metal

Vin = 12.0 VDC	1.2 A	14.4 W
Vin = 24.0 VDC	920 mA	22.1 W

 - Maximum Power

12.0 VDC ≤ Vin ≤ 24.0 VDC	22.1 W
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- Recommended Power Supply: Regulated linear power supply
 - 12 VDC at 1.5 A (per reader)
 - 24 VDC at 1.0 A (per reader)
- Read Range with the Indala FlexCard™ Card: Up to 28.0" (71.7 cm)
- Operating Temperature Range: -35°C to +65° C (-31°F to +149°F)(See Note 2.)
- Color: Black
- Material: UV resistant, ABS /polycarbonate (UL94V0) plastic.
- Weight (Typical): 3.2 lbs (1.45 kg)
- Dimensions: 11.2" H x 11.2" W x 1.8 "T (28.4 x 28.4 x 4.6 cm)
- Output Formats: Wiegand, ABA track2 Magnetic Stripe. (Contact Factory for other formats.)
- Certification: UL-294 indoor and outdoor compliant, CE Mark, and FCC Class B Digital Device (Part 15) ID Numbers E9U620.

Note 1 Read Range is stated in an undisturbed electrical environment, with card presented parallel to reader, and reader installed in accordance with Indala instructions. The power supply, reader and controller must be on the same ground, connected to earth.

Note 2. At temperatures below -20°C the beeper output may not be audible, except at short distances.

Note 3. The ASR620++ reader is tuned for mounting on non-ferrous surfaces. If the reader must be mounted on, or near, a ferrous surface a minimum 3 inch (7.6cm) non-ferrous spacer must be used.

Note 4. There is no longer a need for the CT-620 power conditioner with the ASR-620++. The CT-620 was necessary in earlier versions of the ASR-620 to meet European emissions standards, but is not needed with the ASR-620++.

1.4 Unpacking and Identifying Supplied Parts

Unpack the equipment and become familiar with the components (see Figure 2,). The ASR-620++ package contains the ASR-620++ reader electronics module, the ASR-620++ cover, and a tuning tool.

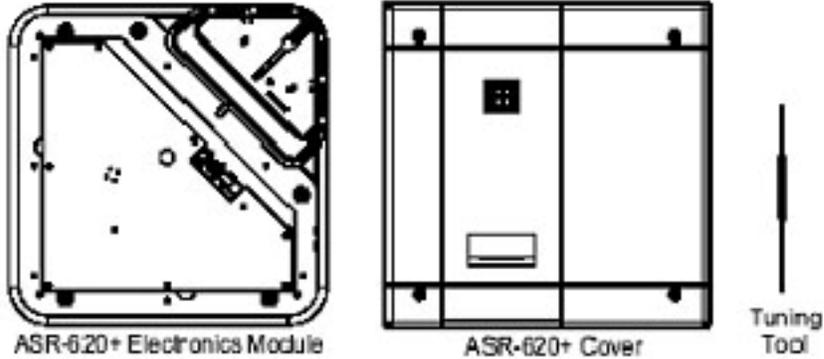


Figure 1. ASR-620++ Reader and Cover

1.5 Identifying the Reader Format

The reader format is printed on the ID label (see figure 3) located on the rear of the base assembly, and under the cover on one of the two metal shields.

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. Patents: See Manual.
Made in Philippines.

FCC ID: **E9UASR620**
CAN ID: **4296A-ASR620**
Model: **ASR-620+/10022**

S/N: **N*00106278** 
Manual: **K01943-000 REV G**
Power: **12-24 VDC** ---
Format: **26BitWiegand-1L**
S/O: **14003515-1**
Color: **Black** 


R-LEAD: **R-LPD1-04-0065** **Technical Support**
800-646-3252



Figure 3. The Reader Label

2.0 Installation

2.1 Mechanical Installation

Proper operation of the reader requires mounting it on a vertical surface with the LEDs located in the top left corner.



2.1.1 Wall Mounting

Figure 3. Wall mounting the ASR-620++ reader

Drill the mounting holes to a #8 clearance and drill the cable hole to at least 13/16" (0.813") diameter. Remove the cover from the base and feed the cable through the cable clearance hole. Attach the reader to the wall using #8 screws. Insure the O-rings are installed between the mounting screw heads and the base housing (do not over tighten the screws). Route the reader cable to the controller. For mechanical dimensions, cable and hole location of the ASR-620++, refer to Section 5.1 (Mechanical Drawings, page 15).

NOTE: The ASR620++ reader is tuned for mounting on non-ferrous surfaces. If the reader must be mounted on, or near, a ferrous surface a minimum 3 inch (7.6cm) non-ferrous spacer must be used.

2.1.1 Power Supply Cable Types and Recommended Lengths

The ASR-620++ reader requires a minimum voltage of 12.0 VDC at the reader. 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 28 VDC!** In noisy environments, use shorter cable runs. The data in Table 1, shows the recommended cable types and cable lengths for cables connecting the power supply to the reader **DO NOT USE CABLES WITH GAUGES SMALLER THAN 24 AWG.**

Table 1. Power Supply to Reader Cable Types and Recommended Lengths

<i>Cable Type</i>	<i>Recommended Cable Length 12V</i>	<i>Recommended Cable Length 24V</i>
24 AWG (0.60 mm), three conductor, with an overall foil shield, Belden 9533 or equivalent.	20 ft (6.1m)	30 ft (9.1m)
22 AWG (0.80 mm), two conductor, with an overall foil shield, Alpha 5192 or equivalent.	30 ft (9.1 m)	44 ft (13.7 m)
18 AWG (1.20 mm), two conductor, with an overall foil shield, Alpha 5386 or equivalent.	80 ft (24.4 m)	120 ft (36.6 m)

2.1.2 Reader to Host Interface Wire Types and Lengths

Refer to Table 2 to determine the recommended wiring type at various maximum reader to host distances. Variation in distance requires different wire gauges. Because of system data termination differences, contact your system manufacturer for exact requirements. Installation should be in accordance with National Electric Code ANSI/NFPA 70.



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

Note: To insure an active low level that is less than 0.6 V, the total ground resistance from the reader to the controller must be less than 0.5 ohms. Use larger guage wire if necessary.

Table 2. Reader to Host Interface Wire Types and Lengths

2.2 Electrical Installation

2.2.1 Grounding

Connect the reader directly to an earth ground as shown in figure 4. 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 very low. If direct connection to a ground rod is not possible, connect the reader to an earth-ground (do not connect to fire sprinkler system), or to steel frames (building beams) that connect to earth.

Prevent ground loops by connecting the controller ground 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 data transmission to the controller.

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

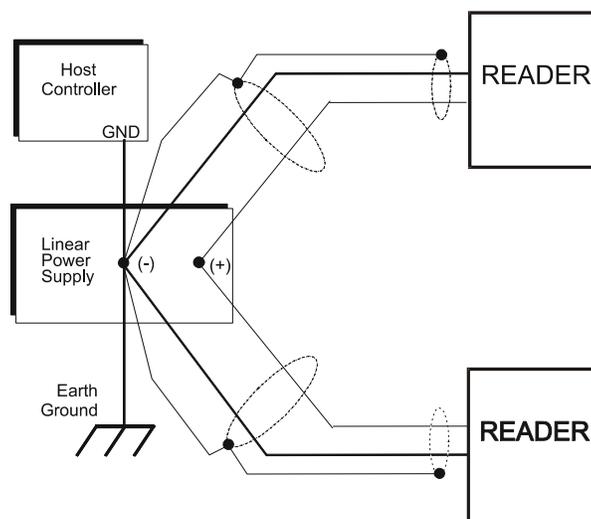


Figure 4. Grounding the Reader

Note: A multiple reader installation requires a higher maximum current rated power supply. See specifications" on page 2.

2.2.2 Reader to Host Interface Wiring

Figure 5 shows interfaces for Magstripe and Wiegand Host controllers. Choose the appropriate interface for your installation.

(RS-232 configuration requires a BIL-422/232 Signal Conditioning Module which is sold separately.)

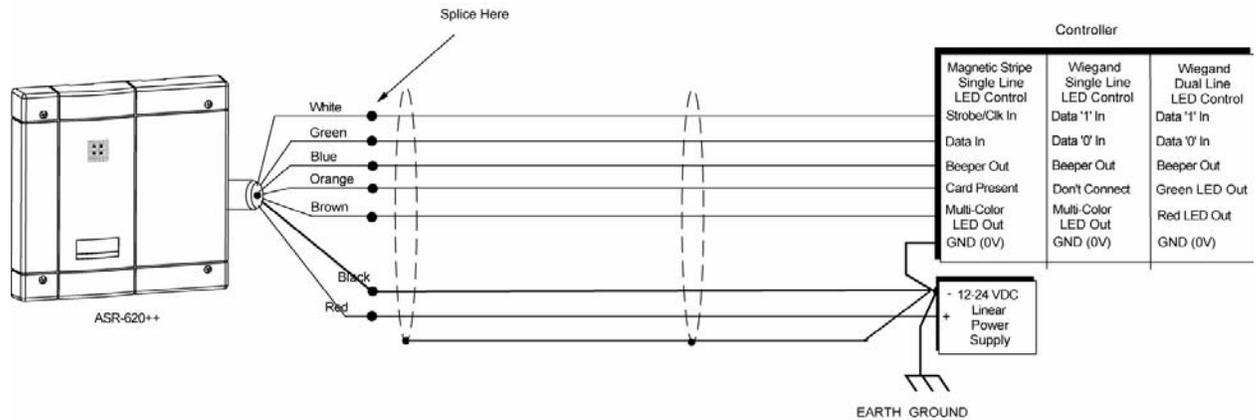


Figure 5. Magstripe and Wiegand Reader to Host Interface Wiring

Please observe the following:

- The system must have a single earth ground point.
- 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 6

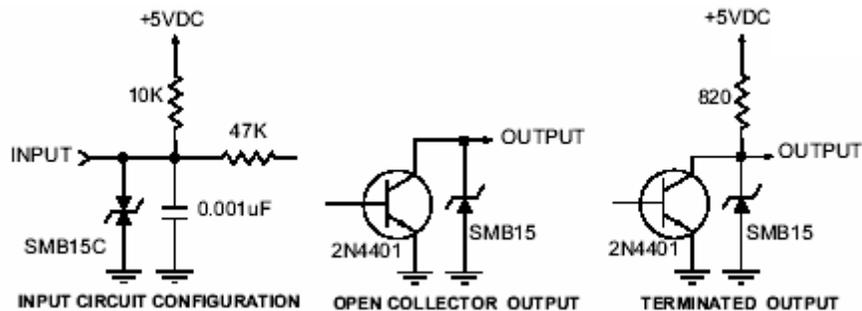


Figure 6. Internal Circuit Configurations

2.3 Tuning the Reader

Tuning the reader is not necessary in most installations. The reader should be mounted and tested for read range and host output function prior to attempting an adjustment of the reader. Before attempting to tune the reader, call Indala Technical Support at (800) 646-3252 or (408)361-4700 for instructions. The installer should be familiar with the adjustment procedure and be able to correctly complete the adjustment in a controlled environment prior to attempting to make adjustments at the installation location.

Tuning the reader should not be attempted without the required tools and equipment. Improper or incomplete tuning of the reader will significantly degrade reader performance and may invalidate the Warranty.

3.0 Operation

When power is first applied to the reader, it performs internal power up diagnostics. If it is functioning properly, the reader will flash the LED and beep twice. After the power up diagnostics are completed and the reader is in a READY status mode you may present a standard or option card to the reader.

3.1 Startup Diagnostic

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 is functioning properly. If the reader start-up routine determines one of the critical memory devices inside the reader has failed, the reader will alternately flash the LED red and green.

3.2 Presenting the Card

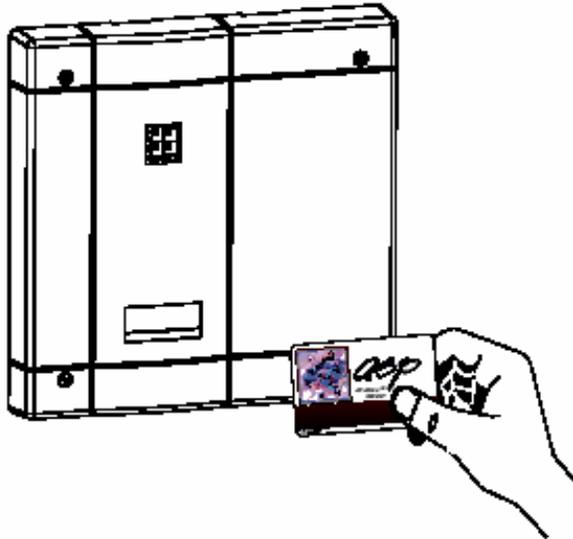


Figure 7. Presenting the Card

To obtain maximum read range, present the card to the reader as shown in Keeping the card parallel to the ASR-620++ reader and move it slowly toward the face of the reader until a *QuickFlash* 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 reader field and present it again. During normal use, the card can be presented to the reader at any angle, although this will result in a reduced read range.

QuickFlash

When a valid card is presented 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 that data was sent to the controller.

After the quickFlash period, the controller takes over control of the LED and beeper.

3.3 Data Output

The ASR-620++ reader is capable of outputting Wiegand, Magstripe, or RS-232 format (RS-232 requires additional hardware). For further information please call technical support at (800) 646-3252 or (408)361-4700

3.4 Verifying Data at Host

To verify that the data lines are good, 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*, or any other applicable, 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 or the controller/ system may be incorrectly programmed or the controller may be broken.

3.5 Controls and Indications

3.5.1 Wiegand and Mag 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.

3.5.2 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.

3.5.3 Option Cards

3.5.3.1 Single-Line 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.

3.5.3.2 QuickFlash Beep Enable/Disable

This option card toggles the state of the *QuickFlash* 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 QuickFlash beep is disabled.

3.5.3.3 QuickFlash LED Enable/Disable

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

3.5.3.4 SelfTest Card

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

3.5.3.5 WatchDog Enable/Disable Card

This option card toggles the state of the automatic WatchDog option (Indala part number 07508-001). If one beep is heard when the card is presented to the reader, the WatchDog output is enabled. If two beeps are heard, the WatchDog output is disabled. The WatchDog will output an 8-bit “10101010” pattern (hexadecimal “AA”) approximately once every minute over the data lines.

4.0 Troubleshooting

If the reader does not function properly when installed according to instructions, please call (800) 646-3252 for technical assistance. International customers call (408) 361-4700:

5.0 Additional Information

5.1 Mechanical Drawings

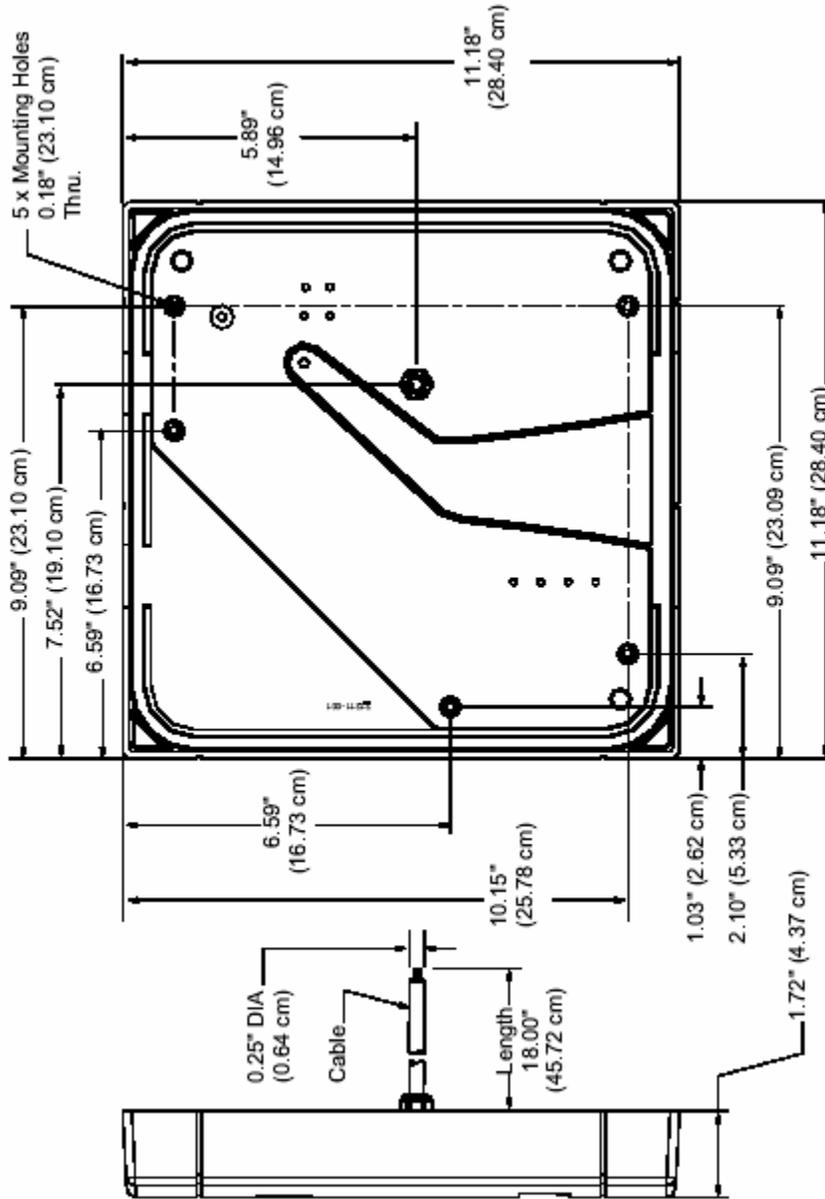


Figure 8. ASR-620++ Mechanical Dimensions

5.2 Copyrights, Patents, and Trademark Credits

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

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

U.S.A. Office:

6850 B Santa Teresa Blvd.
San Jose, CA 95119-1205
Tel (408) 361-4700, Main
Tel (800) 646-3252, Technical Support
Fax (408) 361-4701

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