

MSR42 / MSRK42 MAGNETIC SWIPE CARD READER SERIES

TECHNICAL MANUAL

WSE *an ISO 9001 certified
company*

47102 Mission Falls Court,
Fremont, CA 94539-7818
(510) 360-7800
FAX (510) 360-7820

P/N 66109102001, Rev. B

LIMITED WARRANTY

WSE warrants to the original user the equipment manufactured by WSE as described herein to be free from defects in material and workmanship for a period of one year from the date of purchase by such user or fifteen (15) months from the date of shipment from the factory, whichever is sooner, (command key / magnetic stripe card warranties differ, see below *), provided:

- I WSE has been notified within such period by return of any alleged defective equipment, free and clear of any liens and encumbrances to WSE or its authorized dealer at the address specified, transportation prepaid; and
- II the equipment has not been abused, misused or improperly maintained and/or repaired during such period; and
- III such defect has not been caused by ordinary wear and tear; and
- IV such defect is not a result of voltage surges/brownouts, lightning, water damage/flooding, fire, explosion, earthquakes, tornadoes, acts of aggression/war, or similar phenomena; and
- V accessories used as integral to WSE systems have been approved by WSE (e.g., coax, batteries, etc.); and
- VI the equipment has been installed, the installation supervised, or installation tested by an authorized WSE dealer.

WSE MAKES NO OTHER WARRANTY, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THE EXPRESSED WARRANTY PERIOD AS SET FORTH ABOVE.

WSE'S MAXIMUM LIABILITY HEREUNDER IS LIMITED TO THE PURCHASE PRICE OF THE EQUIPMENT. IN NO EVENT SHALL WSE BE LIABLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, OR SPECIAL DAMAGES OF ANY NATURE ARISING FROM THE SALE OR USE OF THE EQUIPMENT.

Some states do not allow limitations on incidental or consequential damages or how long an implied warranty lasts, so the above limitations may not apply. This warranty gives specific legal rights; however, other rights which vary from state to state, may pertain.

* Analog command keys are warranted for 5 years; digital command key / magnetic stripe card warranties vary. See product literature.

NOTICE

The MSR42 and MSRK42 series of Magnetic Card Swipe Readers sold by WSE have 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 herein, 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 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.

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SECTION 1

INTRODUCTION

This manual provides basic information on the installation and operation of the WSE MSR42 and MSRK42 Series Magnetic Swipe Card Readers. This information includes specifications, a brief description of the operation, controls and indicators, relevant installation data, and a troubleshooting guide.

NOTE: Changes or modifications to the equipment described herein which are not expressly approved by WSE can invalidate regulatory approvals, and may void statutory authority of the user to operate the system.

1.1 PURPOSE

The purpose of this manual is to provide the information required for installing, operating, and troubleshooting MSR42 and MSRK42 Series Magnetic Swipe Card Readers.

1.2 SCOPE

The information provided in this manual is intended for personnel who will be installing MSR42 and MSRK42 Series Magnetic Swipe Card Readers, placing the units in operation, and performing the troubleshooting procedures described herein. No repairs to the units other than cleaning and switch settings are possible.

The information contained in this manual assumes that the person reading it is familiar with access control and alarm monitoring technology and standard installation practices. Thus, the manual is not intended to be a complete system installation guide or system service manual for dealers or end-users. As such, the manual is a supplementary guide, providing only information and data which is unique to MSR42 and MSRK42 Series Magnetic Swipe Card Readers.

The information provided in this manual is not intended to either conflict with or supplement the specific building codes, electrical codes, or safety codes to which any given installation must conform.

This manual is organized as follows:

| | |
|------------------|------------------------|
| Section 1..... | INTRODUCTION |
| Section 2..... | DESCRIPTION |
| Section 3..... | INSTALLATION |
| Section 4..... | MAINTENANCE |
| Appendix A | SPECIFICATIONS |
| Appendix B | PRODUCT IDENTIFICATION |

SECTION 2

DESCRIPTION

2.1 GENERAL INFORMATION

The MSR42 and MSRK42 family of magnetic card readers are designed for reading standard or high-coercivity magnetic stripe cards. Each reader will operate at up to 28 volts DC and is supplied in a die-cast metal housing resistant to corrosion, abrasion, and tampering. Other features include: Two high brightness red/green status indicators, a tamper detection switch, address switches, WSE proprietary S-Net protocol, and an RS-485 interface. MSRK42 readers also provide a 12-key keypad for PIN entry, (hence the "K" in MSRK42).

Figure 1, below, gives the basic block diagram of the key components in the MSR42 and MSRK42 series readers.

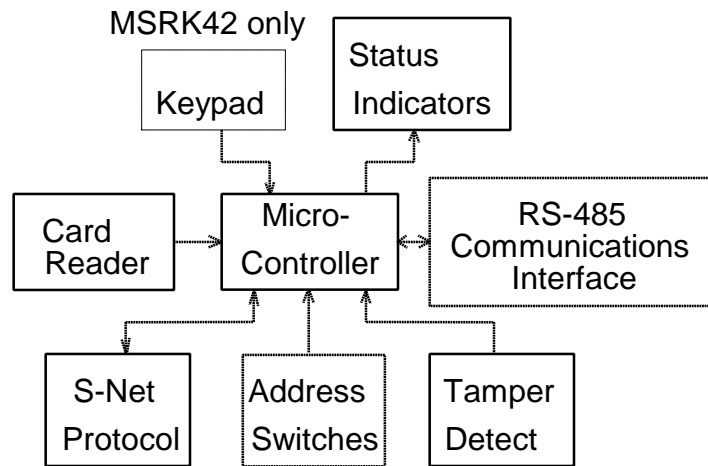


Figure 1-1. MSR42, MSRK42 Functional Block Diagram.

2.2 CONFIGURATIONS

The MSR42 and MSRK42 Series Magnetic Swipe Card Readers are each available in two configurations (weatherized and non-weatherized) as shown in Table 1-1 below.

Table 1-1. MSR42 and MSRK42 Configurations.

| Model | Part Number | Description |
|-----------|-------------|--|
| MSR42-G | 92422201000 | Swipe-style magnetic stripe card reader. |
| MSR42-GW | 92422211000 | Swipe-style magnetic stripe card reader with weatherization. |
| MSRK42-G | 92422203000 | Swipe-style magnetic stripe card reader with integral keypad. |
| MSRK42-GW | 92422213000 | Swipe-style magnetic stripe card reader with integral keypad and weatherization. |

SECTION 3

INSTALLATION

3.1 LOCATION AND MOUNTING

3.1.1 Mounting the reader:

Find a suitable location to anchor the reader mounting bracket. The mounting of the reader does not require a junction box. However, rigid conduit is required for outdoor application. A single gang junction box may be used to provide transition to rigid conduit. If a single gang junction box is used, a wall plate (optional) may be used to cover the junction box. The reader is then secured to the mounting bracket using a screw. Refer to figures for reader dimensions and typical junction box usage.

3.1.2 Weatherproofing the Reader:

The reader is rated for operation over extended temperature. However, if the reader is expected to be exposed to weather, the weatherizing option (-GW) must be ordered. The option is implemented in two parts. With the weatherizing option, the electronics are conformally coated against moisture. A tube of dielectric grease is supplied for the installer.

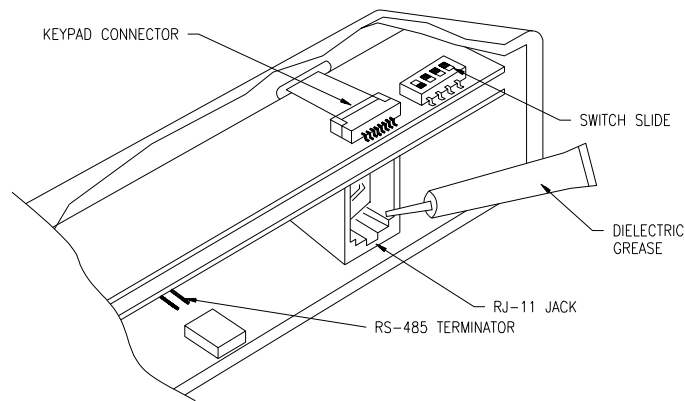


Figure 3-1. Reader weatherization. Also shows key component locations. (shown is the MSRK42-GW; the MSR42-GW does not have a keypad connector)

3.2 WIRING REQUIREMENTS

3.2.1 Reader Wiring:

The reader provides an RJ-11 modular jack for easy field connection. A small piece of pre-terminated cable is supplied with each standard reader for field wiring. The pre-terminated cable has non-standard colors. Refer to the pin numbers if the pre-terminated cable is not used. The signal/wire assignment is different for each electrical interface. In any case, cable with wires of 24AWG or larger diameter are recommended for field wiring.

3.2.2 RS-485 Interface:

The RS-485 interface is two-wire half duplex. An on-board "End-of-Line" cable termination is provided. If the reader is the last device on the bus, install a jumper to activate the terminator. Refer to Figure 3-1. for the location of the terminator jumper. For communication reliability, a low capacitance cable of 24AWG, twisted pair of wires, with 120 ohm characteristic impedance must be used. Observe the following signal pairing: power/ground and TR+/TR-.

Figure 3-2 shows a typical RS-485 device wiring. Maintaining signal ground connection between devices is essential for reliable communication.

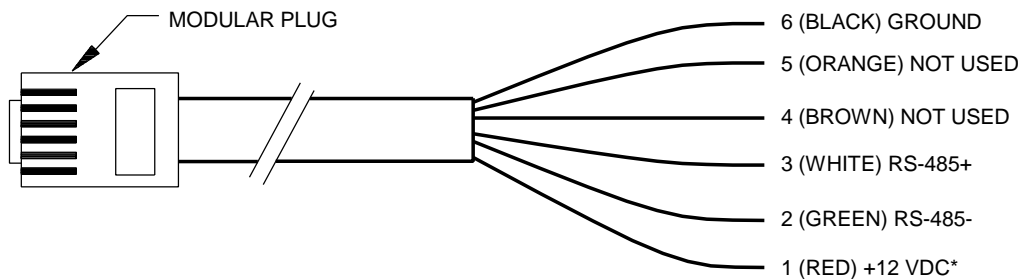


Figure 3-2. Detail Showing The Modular Plug

3.2.3 12 or 24 Volt Operation:

The MSR42 and MSRK42 series readers can be operated from either 12 or 24 volt supplies by using a special dropping resistor (pre-attached to the mounting plate at the factory). If 24 volt operation (16-28 VDC) is required, consult Figure 3-3. If 12 volt operation (8-14 VDC) is required consult Figure 3-4 instead.

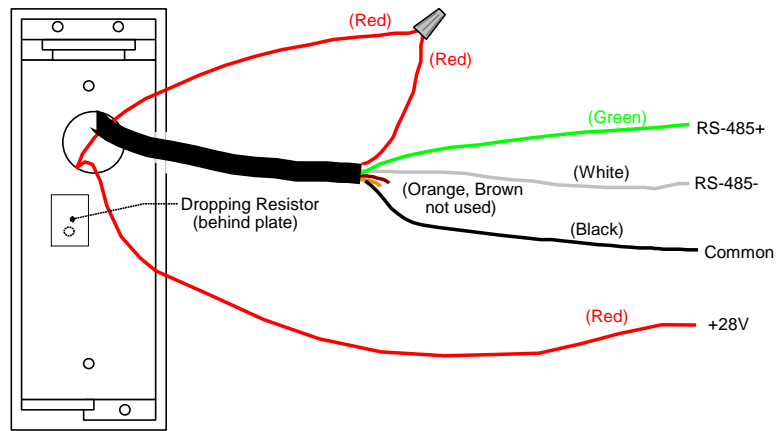


Figure 3-3. Connecting the reader to 24 volt supplies.

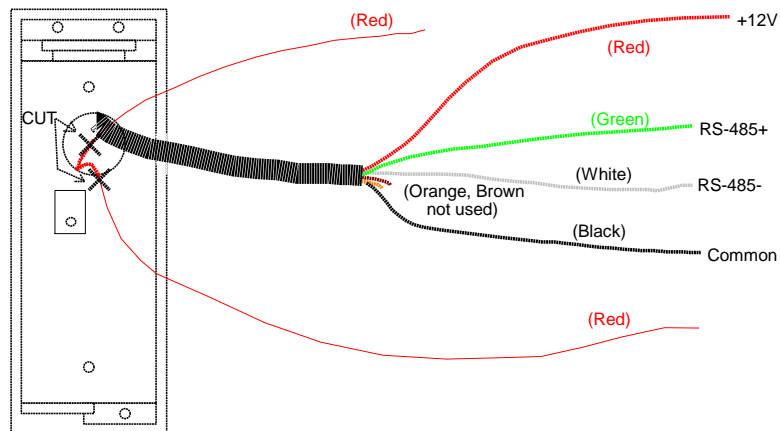


Figure 3-4. Connecting the reader to 12 volt supplies.

3.2.4 Grounding the Reader:

To avoid having ESD (electro-static discharge) interfering with the operation of the reader, the reader casing must be grounded. This can be accomplished by tying the mounting bracket to earth ground locally (e.g. grounded conduit). Please consult Figure 3-5, below.

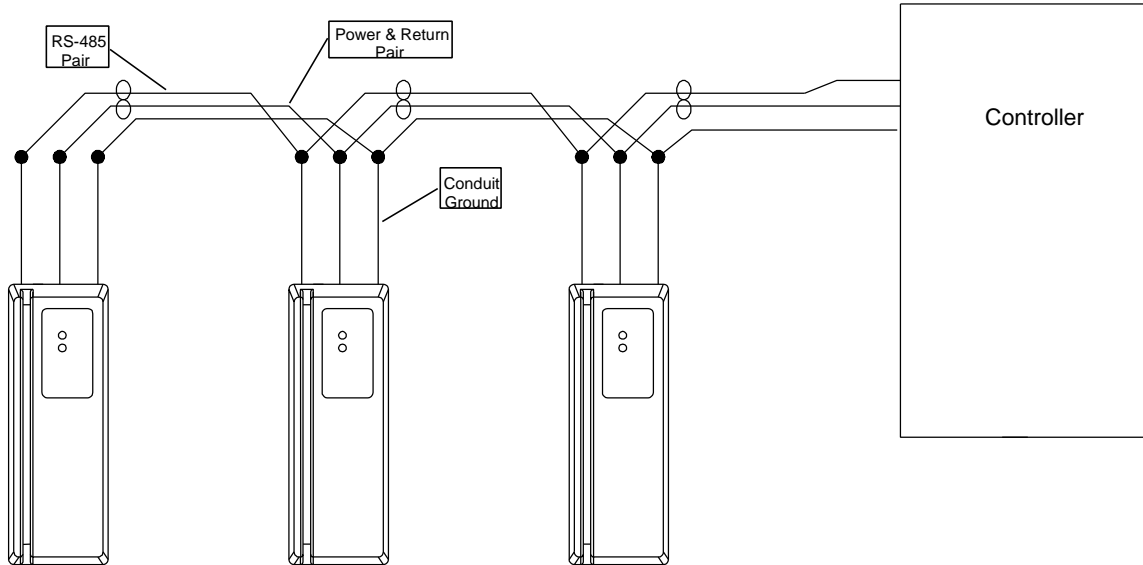


Figure 3-5. System Connections Diagram.

3.2.5 DIP switch setting:

The DIP switch on the MSR42, MSRK42 series readers is used to set the device address.

Each reader is equipped with DIP switches used to set a physical address. Refer to software manuals for a detailed description of the address switches and their use. DIP switches are set by moving the slide to on/off position using a small tool. (may be made from a paper clip). Remove the top bracket to access the DIP switches.

Switch/Jumper Position

| 4 | 3 | 2 | 1 | Device address |
|-----|-----|-----|-----|----------------|
| off | off | off | off | 0 |
| off | off | off | on | 1 |
| off | off | on | off | 2 |
| off | off | on | on | 3 |
| off | on | off | off | 4 |
| off | on | off | on | 5 |
| off | on | on | off | 6 |
| off | on | on | on | 7 |

Switch/Jumper Position

| 4 | 3 | 2 | 1 | Device address |
|----|-----|-----|-----|----------------|
| on | off | off | off | 8 |
| on | off | off | on | 9 |
| on | off | on | off | A |
| on | off | on | on | B |
| on | on | off | off | C |
| on | on | off | on | D |
| on | on | on | off | E |
| on | on | on | on | F |

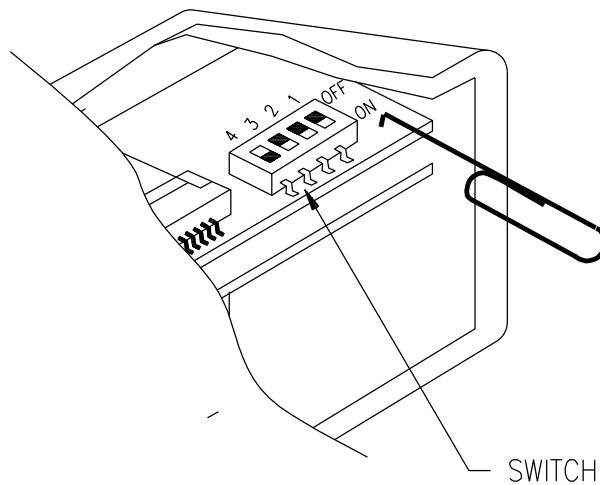


Figure 3-6. Setting the Address Switch

SECTION 4

MAINTENANCE AND TROUBLESHOOTING

4.1 MAINTENANCE

The readers are designed to provide continuous service with minimal routine maintenance. However, contaminants (such as magnetic oxides from badges and dirt) tend to accumulate on the read head. Without regular cleaning, these contaminants will shorten the read head life and increase the probability of card read error. A maintenance schedule should be developed based on the card reader environment (dirty or clean) and the usage frequency (light traffic or heavy traffic). Readers placed in extremely dirty environments may require daily cleaning.

Head cleaning may be done by using disposable, pre-saturated magnetic head cleaning cards. These cards are readily obtainable from a number of sources (e.g. Clean Team Co. 805/581-1000).

The reader exterior surface is covered with a high strength polymer and polyester membrane. It may be cleaned with a soft cloth and mild detergent if required.

4.2 CUSTOMER SERVICE

4.2.1 PRODUCT IDENTIFICATION

If a problem with the reader occurs which might require consulting WSE Customer Service, please note the model and serial numbers contained on the Product ID label. This label is located on the rear of the reader behind the mounting plate, (and contains other useful information).

| | | | |
|---|-----|-------------|------------|
| WSE <i>an ISO 9001 certified company</i> | PIN | FUNCTION | WIRE COLOR |
| | 1* | +12 VDC IN | RED |
| MODEL: MSR42-G P/N: 92422201000 REV: A RATED: 25VDC-0.25W. SERIAL NO. _____ | 2 | RS-485(+) | GREEN |
| | 3 | RS-485(-) | WHITE |
| | 4 | NOT USED | BROWN |
| | 5 | NOT USED | ORANGE |
| | 6 | COMMON | BLACK |
| | R1 | +24 VDC | RED |
| | R2 | +12 VDC OUT | RED |

MADE IN U.S.A.

 ACCESS CONTROL 294 UNIT ACCESSORY LISTED 5627

*FOR 24 V OPERATION, CONNECT PIN 1 TO PIN R2; 24 V IS SUPPLIED TO PIN R1.
*FOR 12 V OPERATION, CONNECT PIN 1 DIRECTLY TO 12 V; R1 AND R2 ARE NOT USED.

REFER TO MANUAL FOR INSTALLATION INSTRUCTIONS

4.2.1 PRODUCT RETURN POLICY

If the problem can not be rectified by the replacement of a faulty cable or interface wiring, call WSE Customer Service for a Return Authorization. Units returned without a Return Authorization will be refused.

Return faulty units to the following address:

WSE
47102 Mission Falls Court
Fremont, CA 94539-7818

If you need to talk to a WSE Customer Support Technician for assistance, call the following phone number:

1-800-227-1667

4.3 TROUBLESHOOTING GUIDE

Troubleshooting of the MSR42 and MSKR42 series readers in the field is limited to checking continuity of the conductors in the interface cables, and analyzing probable fault conditions from the status of the LEDs. Be sure to consult software documentation.

A troubleshooting guide is provided in Table 4-1.

Table 4-1. MSR42, MSKR42 Troubleshooting Guide

| Symptom | Possible Cause | Remedy |
|----------------------------------|--|---|
| No Status LEDs are on; | No power is getting to the reader. Low power at reader terminals. | Check power connections. Observe polarity. Verify that reader is wired for correct voltage. |
| Reader doesn't come on line. | Unit not being addressed properly. RS-485 lines not connected properly. | Check Address Switch. Make certain software is properly initialized. Check RS-485 wiring |
| Reader misreads cards | Dirty reader. Bad power, incorrect wiring | Clean read head. Check power, wiring. |
| Reader functions but not keypad. | Software not correctly initialized. | Initialize software. |

Table 4-1 Cont'd. MSR42, MSRK42 Troubleshooting Guide

| Symptom | Possible Cause | Remedy |
|----------------------------|--|---|
| Reader seems to run hot. | Reader is being operated at a voltage which is too high. | Verify unit is wired for the correct voltage. |
| Reader blinks every minute | No problem. | Normal Indication. |

APPENDIX A

SPECIFICATIONS

The MRS42 and MSRK42 series readers are for use in low voltage, class 2 circuits.

| | |
|-----------------------|--|
| Power: | |
| Voltage - | +12 VDC |
| Current - | 80mA (50mA typical) |
| Data: | |
| Interface - | RS-485, two wires multidrop |
| Bit rate - | 9600 bps |
| Card: | |
| Format - | 75bpi, ANSI x4.16, Speed 3 to 50 ips |
| Mechanical: | |
| Dimension - | 1.95" (50mm)W x 1.30" (33mm)H x 5.50" (140mm)L |
| Weight - | 10oz (284 g) nominal |
| Environmental: | |
| Temperature - | -55 to +85 degrees C, storage -40 to +75 degrees C, operating |
| Humidity - | 0-95% RHNC, standard 100% (-GW options) |

APPENDIX B DIMENSIONS

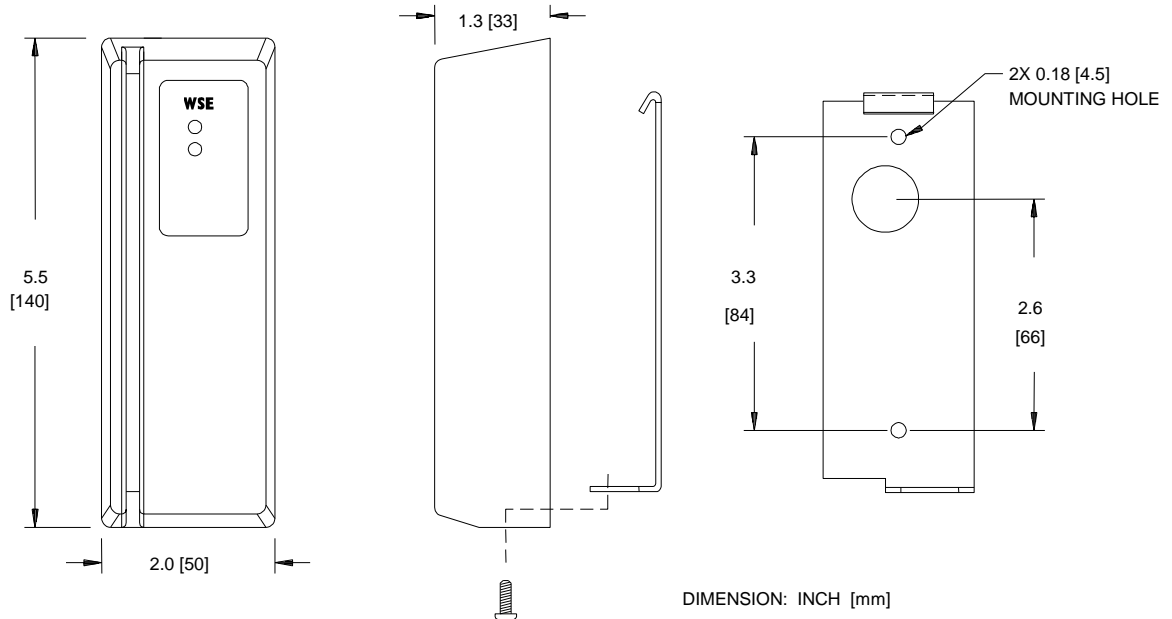


Figure B-1. Reader Mounting Dimensions

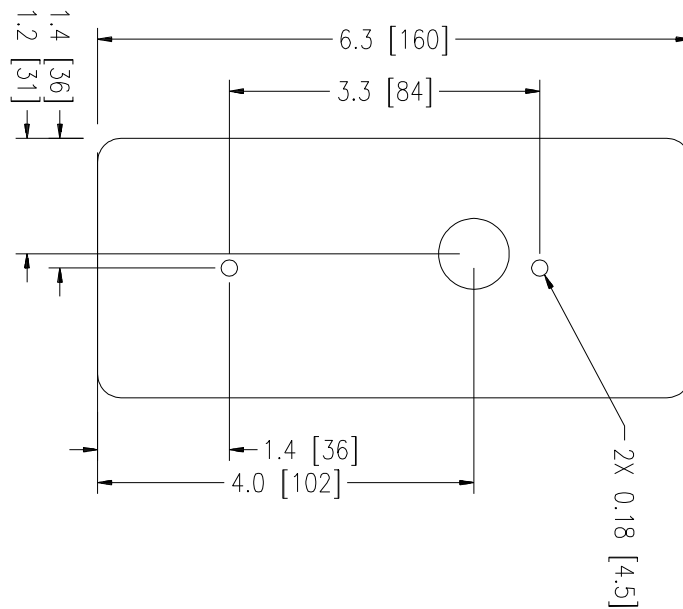


Figure B-2. Optional Wall Plate Dimensions

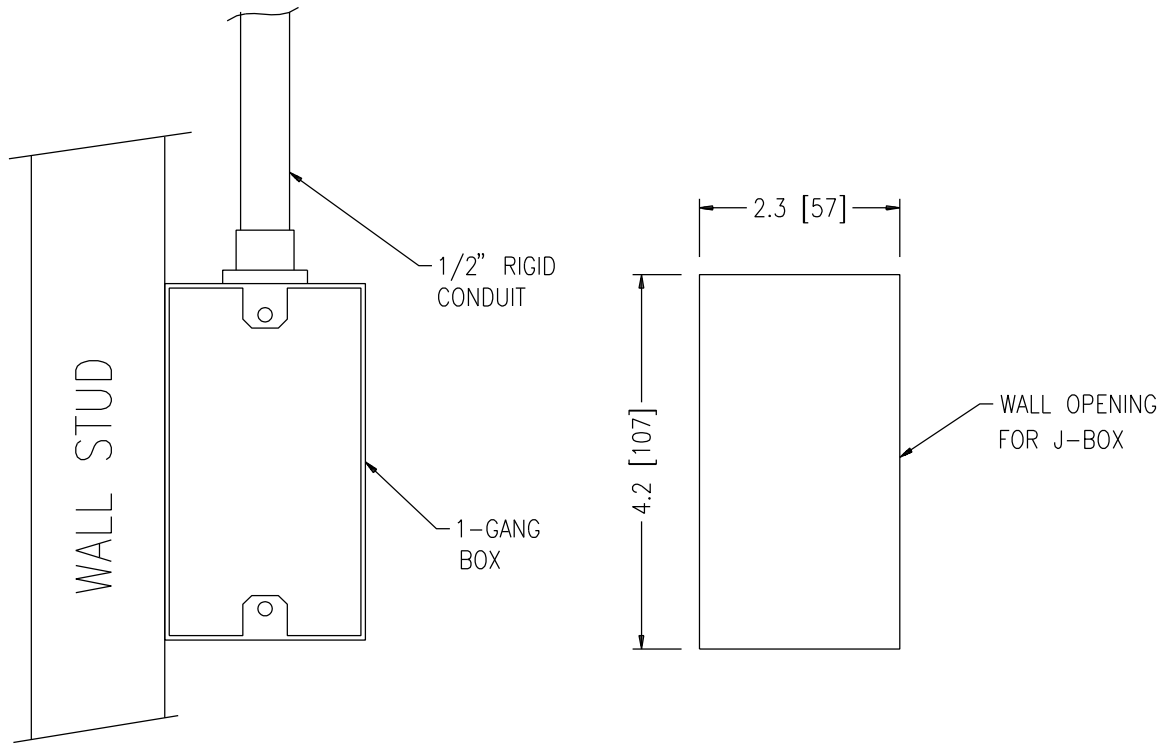


Figure B-3. Fitting Rigid Conduit to Junction Box.