MODEL MT-211232
RS-232 SWIPE READER, 3-TRACK, BUFFERED/UNBUFFERED MODES
INSTALLATION AND OPERATION MANUAL

Manual Part Number 99875051-7

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MAGTEK®

REGISTERED TO ISO 9001:2000
1710 Apollo Court
Seal Beach, CA 90740
Phone: (562) 546-6400
FAX: (562) 546-6301
Technical Support: (651) 415-6800
www.magtek.com

REVISIONS

Rev Number	Date	Notes
1	15 Oct 96	Initial Release
2	21 Nov 96	Safety Statement Deleted
3	13 Feb 97	Adds Buffered/Unbuffered modes to title and to product. Adds 19200 baud rate, deletes 1200. Adds 2 optional Y cables.
4	17 Mar 97	Changed Procom to Procomm
5	9 Apr 97	Sec 1. Clarified Power Adaptor statement P/N 21088045.
6	21 Jan 03	Editorial throughout; Sec 1: added Related Documents, added description to Table 1-5; Sec 2: added Help Desk Phone #; Sec 3: added paragraphs to Card Read, added Fig 3-2.
7	15 Apr 03	Front Matter: added ISO line to logo, changed Tech Support phone number, added new warranty statement.

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This equipment has been tested and found to comply with the limits for Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

FCC COMPLIANCE STATEMENT

This device complies with Part 15 of the FCC Rules. Operation of this device 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.

CANADIAN DOC STATEMENT

This digital apparatus does not exceed the Class B limits for radio noise for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de las classe B prescrites dans le Réglement sur le brouillage radioélectrique édicté par les ministère des Communications du Canada.

CE STANDARDS

Testing for compliance to CE and was performed by an independent laboratory. The unit under test was found compliant to Class B.

UL/CSA

This product is recognized per Underwriter Laboratories and Canadian Underwriter Laboratories 1950.

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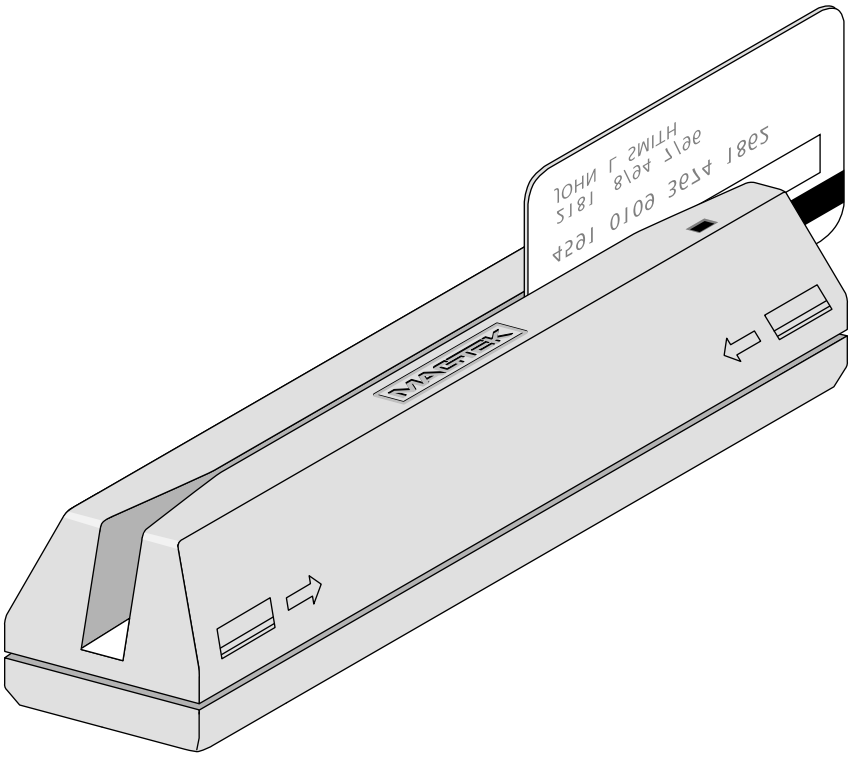


Figure 1-1. RS-232 Swipe Reader

SECTION 1. FEATURES AND SPECIFICATIONS

The Model MT-211232, 3-Track, RS-232 Swipe Reader, is a compact magnetic stripe card reader which conforms to standards of the following: ANSI (American National Standards Institute), ISO (International Standards Organization), CDL (California Drivers License), and AAMVA (American Association of Motor Vehicle Administrators).

The Reader is compatible with the PC AT/PS2 series of personal computers or any computer with an RS-232 interface. A card is read by sliding it, stripe down and facing the LED side, through the slot either forward or backward.

A block of eight switches selects the RS-232 communication parameters and the user protocol. A two-color LED (Light Emitting Diode) indicator on the Reader panel and an audible alarm inside the Reader provide the operator with continuous status of the Reader operations.

Part numbers for the Readers and a brief description of the differences are as follows:

21088045	Normal power adaptor - 115V, 60Hz, output 9VDC. This supply has the correct plug for MT211232.
21088047	Power adaptor 220V, 50Hz, output 9VDC (P/N64300065) has two round prongs, 4 mm in diameter and 17.5 mm apart (center to center) per standard TUV/VDE. This supply has the correct plug for MT211232.
21088048	No power supply

FEATURES

Major features of the Swipe Reader are as follows:

- Hardware Compatible with AT/PS2 or any computer or terminal with an RS-232 interface
- Software Compatible with ProComm (Customer provided - Windows version 3.0 or higher, or DOS version 2.0 or higher; or other RS-232 communications programs may be used)
- Switch Selectable Baud Rate
- Switch Selectable Parity
- Switch Selectable Buffered or Unbuffered Mode
- On/Off switch for STX (Start of Text) and ETX (End of Text), framing message characters

- On/Off switch for SS (Start Sentinel) and ES (End Sentinel) framing track characters
- On/Off switch for CR (Carriage Return)
- Two way card reading
- Generates an audible beep when reading is successful and three beeps when unsuccessful
- Reads encoded data that meets ANSI/ISO/CDL/AAMVA standards
- External power supply
- Power Supply Adaptor, 115VAC input, Part Number 64300021, included
- ASCII Message Format
- Two-color LED; green for ready to read, red for error

MODES OF OPERATION

The two modes of operation are unbuffered and buffered. The switch setting to select the mode is shown in Section 3. The Reader must be turned off when selecting either the buffered or unbuffered mode.

Unbuffered Mode

In the unbuffered operating mode, data from the Reader is automatically sent to the host without being requested. When a card is passed through the Reader, data is transmitted immediately and is not retained.

The Reader does not need to receive commands from the host in order to transmit data. However, the Reader does respond to an Inquiry Command by sending an ASCII "R". (See Host to Reader Commands and Reader to Host Commands in Section 3.) An example of the use of an Inquiry Command would be to determine whether the power is on at a remote MT-211232.

Buffered Mode

In the buffered operating mode, the Reader stores the card data in a memory buffer and does not transmit any data to the host until an Inquiry Command is received. Upon receipt of an Inquiry Command, data is transmitted to the host. If no data is present in the memory buffer, only the

ASCII "R" will be transmitted. Data is not cleared from the memory buffer until a Release Command is received. The Reader cannot read another card until the buffer is cleared, and the green LED is lit.

CONFIGURATION

The Reader, LED Indicator, RJ11 Jack, pin numbers for the 9-pin connector, and the Power Adaptor are shown in Figure 1-2. This Reader does not support PINPads.

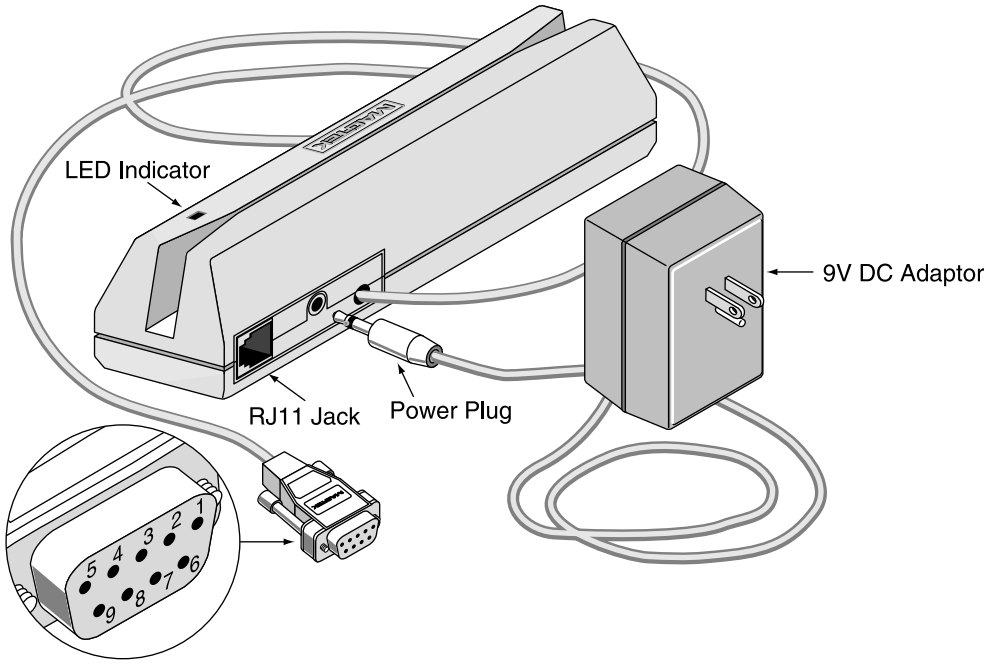


Figure 1-2. Reader Cable and Power Adaptor

RELATED DOCUMENTS

MagTek 99875125	The MagTek Device Drivers for Windows, Part Number 30037385, or 99510030 (Windows 9x/ME), or 99510031(Windows NT), 99510032 (Windows 2000/XP), or may be used with the Port Powered Insertion Reader. The title of the manual is *MagTek Device Drivers For Windows Programming Reference Manual*.
ISO 7810	ID Cards – Physical Characteristics
ISO 7811-2	ID Cards – Recording Technique – Low Coercivity
ISO 7811-6	ID Cards – Recording Technique – High Coercivity Available from ANSI; phone 212-642-4900; www.ansi.org

Pin numbers and signal descriptions for the 9-pin cable shown in the illustration are listed in Table 1-1.

Table 1-1. 9-Pin Connector Pin Numbers

Pin Number	Signal	Description
1		
2	TXD	Transmitted Data, RS-232 Signal. Transmits data from the Reader to the Host.
3	RXD	Received Data, RS-232 Signal. Receives data from the Host to the Reader.
4*	DTR	Data Terminal Ready, RS-232 Signal. Transmits a signal to the Host to indicate that the Reader is active, i.e., power is on.
5	GND	Ground
6*	DSR	Data Set Ready, RS-232 Signal. Receives a signal from the Host to indicate that the Host is active, i.e., power is on.
7*	RTS	Request to Send, RS-232 Signal. Sends a signal to the Host to indicate that the Reader is ready to transmit data.
8*	CTS	Clear to Sent, RS-232 Signal. Receives a signal from the Host that allows data to be transmitted.
9		

*The control signals on pins 4 and 6 and 7 and 8 are not supported in this unit and are wired as indicated, on the PCB Connector JP1.

OPTIONS

The optional cables and adaptor for the Reader are as follows:

Title	Description	Part Number
RS232 Y Cable	4-Pin RJ11 to 9-Pin DB Female 6 ft.	21083581
RS232 Y Cable	4-Pin RJ11 to 25-Pin DB Female 6 ft.	21083582
RS232 Y Cable	4-Pin RJ11 to 25-Pin DB Male 6 ft.	21083583
Adaptor	9-pin DE Male to 25-pin DB Female, 1.8 in.	78200018

The cables are shown in Figure 1-3. The 9-pin connector is shown on top and the 25-pin connectors are shown below. The installation is shown in Section 2.

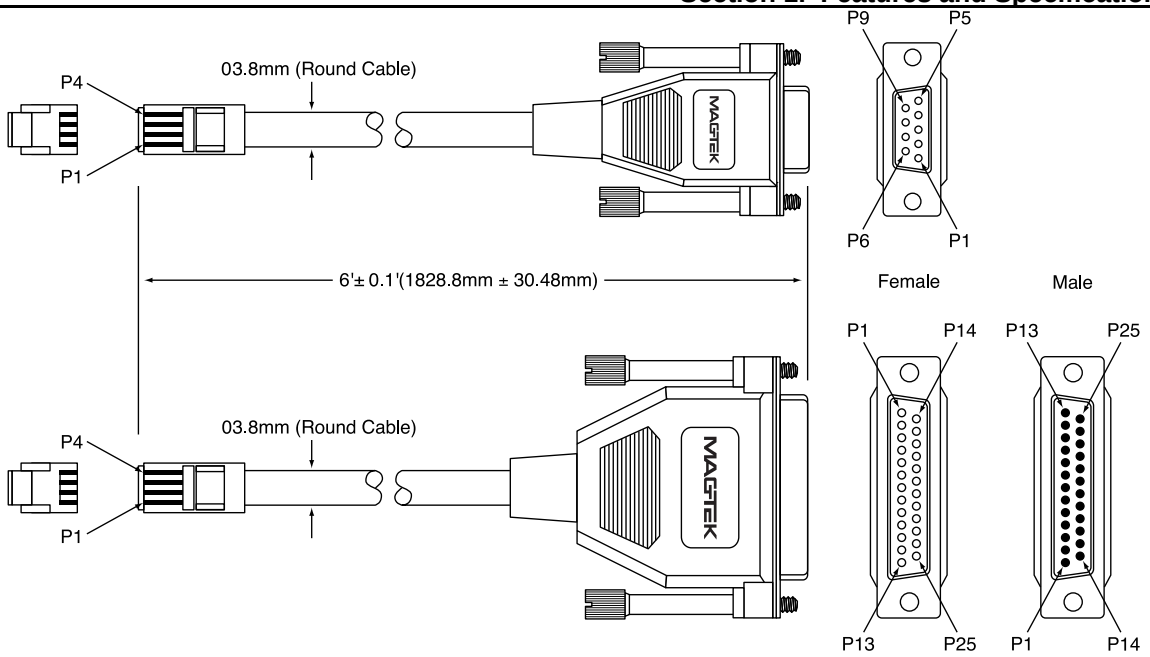


Figure 1-3. Cable Options

Pin numbers for the RJ11 9-pin connector (P/N 21083581) are shown in Table 1-2. This terminal uses Com Port 1.

Table 1-2. Optional 9-Pin Cable

Connector Wire	
4-Pin RJ11 Plug and Signal	**9-Pin DB Female and Signal**
1 RXD	3 TXD
2 GND	5 GND
3 TXD	2 RXD
	7 RTS
	8 CTS
	1 CD
	4 DTR
	6 DSR

*The control signals on pins 7 and 8 and 1, 4, and 6 are not supported in this unit and are wired as indicated.

Pin numbers for the RJ11 25-pin female connector (P/N 21083582) are shown in Table 1-3. This terminal uses Com Port 2 or PS2.

Table 1-3. Optional 25-Pin Female Cable

Connector Wire			
4-Pin RJ11 Plug and Signal		**25-Pin DB Female and Signal**	
1	RXD	2	TXD
2	GND	7	GND
3	TXD	3	RXD
		4	RTS*
		5	CTS*
		6	DSR*
		20	DTR*
		8	CD*

*The control signals on pins 4 and 5 and 6, 20, and 8 are not supported in this unit and are wired as indicated.

Pin numbers for the RJ11 25-pin male cable (P/N 21083583) are shown in Table 1-4. This is for a dumb terminal (for example, a WYSE terminal).

Table 1-4. Optional 25-Pin Male Cable

Connector Wire			
4-Pin RJ11 Plug and Signal		**25-Pin DB Male and Signal**	
1	RXD	2	TXD
2	GND	7	GND
3	TXD	3	RXD
		4	RTS*
		5	CTS*
		6	DSR*
		20	DTR*
		8	CD*

*The control signals on pins 4 and 5 and 6, 20, and 8 are not supported in this unit and are wired as indicated.

Figure 1-4 shows the Reader, cable and optional adaptor. Pin numbers and signals are listed in Table 1-5.

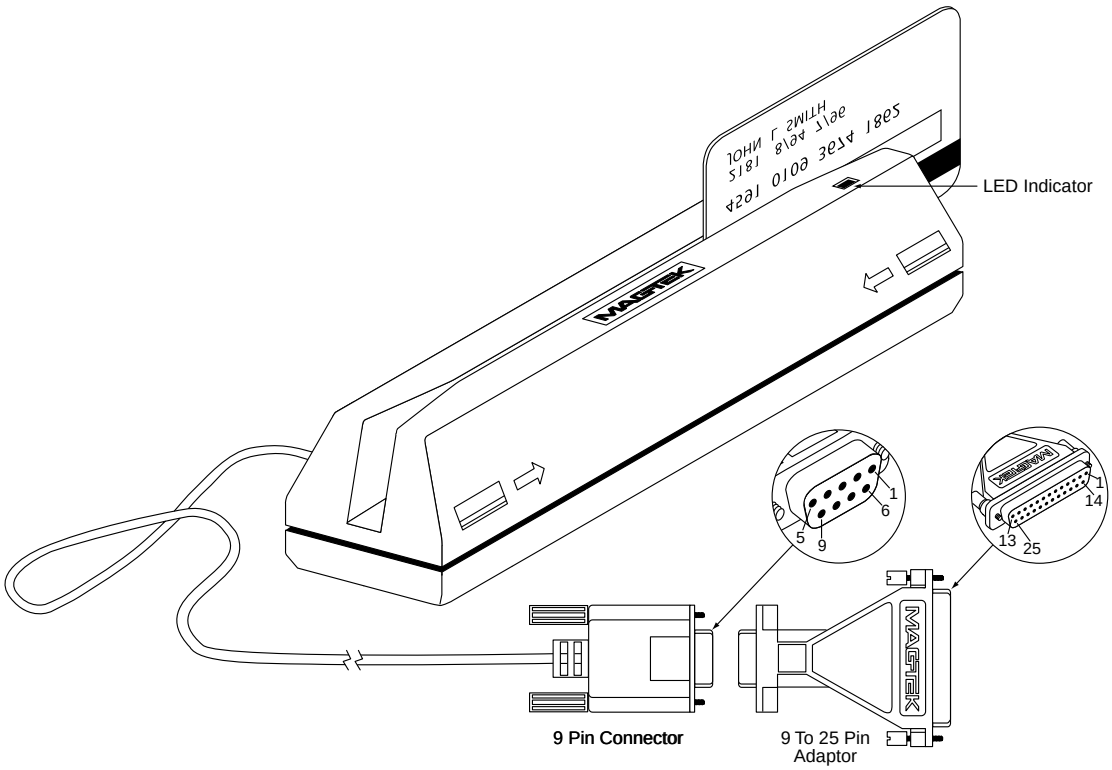


Figure 1-4. Reader, Cable, and Optional Adapter

Table 1-5. 9-Pin Connector and 25-Pin Adaptor

DE 9-Pin Connector	25-Pin Adaptor	Signal
1	8	NC
2	3	RXD
3	2	TXD
4	20	DTR*
5	7	GND
6	6	DSR*
7	4	RTS*
8	5	CTS*
9	22	NC

*The control signals on pins 4, 5, 6, and 20 are not supported in this unit and are wired as indicated.

SPECIFICATIONS

Table 1-6 lists the specifications for the MT211232, RS-232 Swipe Reader, 3 Track. Figure 1-5 shows the dimensions.

Table 1-6. Specifications

OPERATING	
Reference Standards	ANSI/ISO/CDL/AAMVA
Power Input	9 Volt, 300 mA DC Adaptor (Included), 115 VAC, 60 Hz
Power Consumption	115 mA at 9 VDC
Recording Method	Two-frequency coherent phase (F2F)
Message Format	ASCII
Card Speed	3 to 50 IPS at 75 BPI or 210 BPI (7.6 to 127 cms/sec)
MTBF	Electronics: 125,000 hours. Head: 1,000,000 passes
Flammability	Meets UL 94V-0
MECHANICAL	
Dimensions	Length 6 1/2", Width 1 3/4", Height 1 5/8"
Weight:	Reader 7 oz. Adaptor: 11oz.
Cable length	6' (1.82 meters) Maximum length is 50' (15 meters)
Connector	9 pin D female, (May require an optional 25-pin adaptor), P/N 78200018
ENVIRONMENTAL	
Temperature	
Operating	32 ^{o}F to 131 ^{o}F (0 ^{o}C to 55 ^{o}C)
Storage	-22 ^{o}F to 158 ^{o}F (-30 ^{o}C to 70 ^{o}C)
Humidity	
Operating	10% to 90% noncondensing
Storage	Up to 100% noncondensing
Altitude	
Operating	0-10,000 ft. (0-3,048 m.)
Storage	0-50,000 ft. (0-15,240 m.)

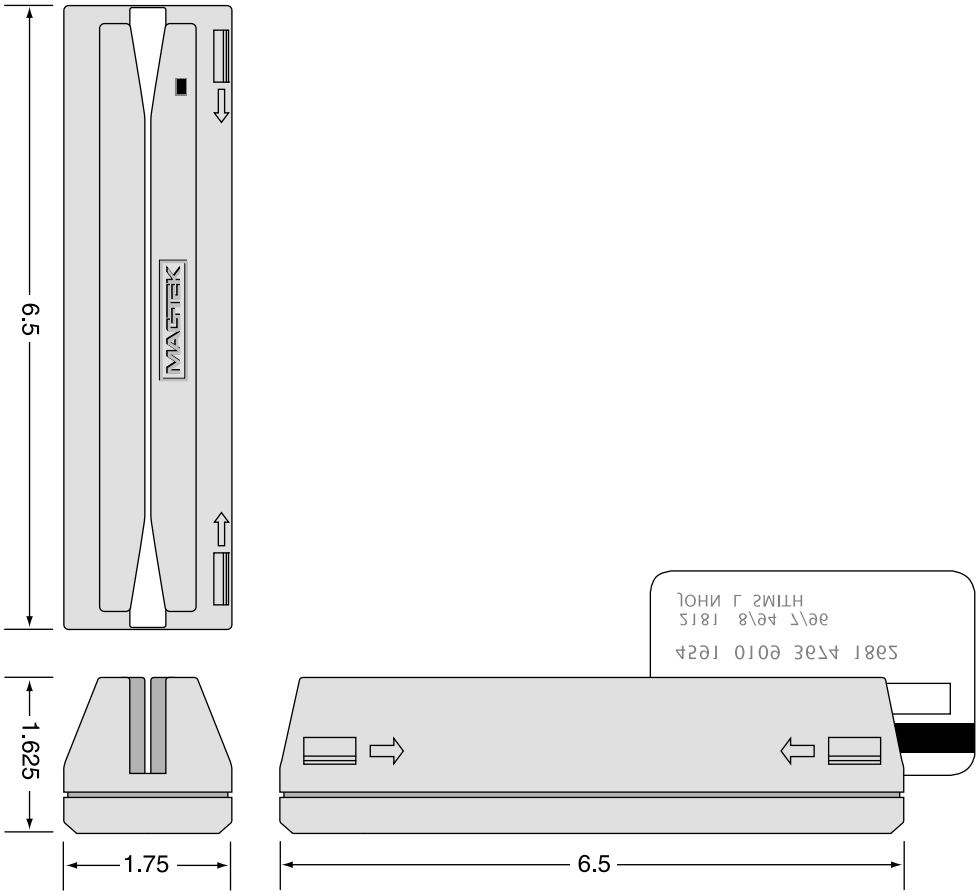


Figure 1-5. Dimensions

SECTION 2. INSTALLATION

The hardware installation consists of plugging in the appropriate cables for the selected configuration, setting the switches, and installing the required software.

HARDWARE INSTALLATION

The Reader is connected to a host computer and terminal as indicated in Figure 2-1. The RJ11 cable shown in the illustration is optional and may be either a 9- or 25-pin connection (see Section 1).

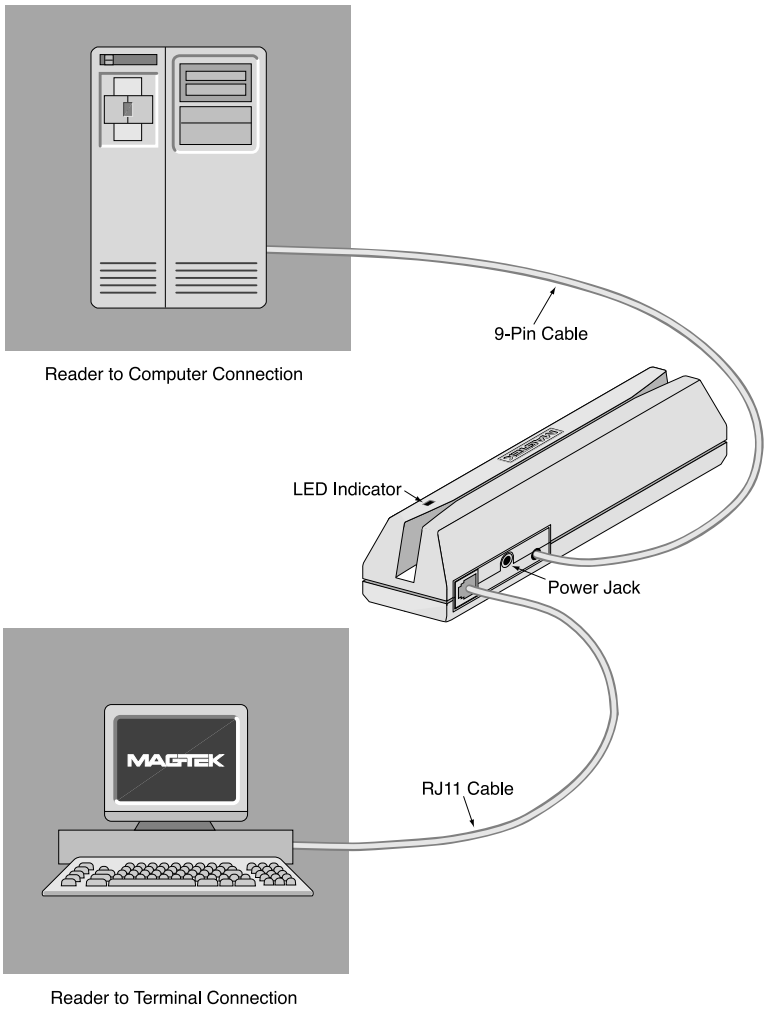


Figure 2-1. Reader Connections

Install the Reader as follows:

Caution

Ensure power is off to the computer until all connections are made. Ensure the power adaptor is not connected until the other connections to the Reader are made.

1. Connect the serial cable from the Reader to the PC serial port. A 9-pin to 25-pin adaptor may be required.

2. Connect the power plug to the Reader jack, and plug the adaptor into a 115 VAC wall socket. The green LED on the Reader should light and the alarm should beep once. If it does not, recheck the cable connections and if necessary, notify technical personnel, and if necessary, call MagTek Customer Assistance at 1-888-624-8350.

3. Turn on power to the computer.

4. Open ProComm, either the Windows or DOS version. Other communications programs may be used.

5. At the bottom of the ProComm screen, the parameters are given. Ensure the switch settings match the values on the screen. The default values of the switches are listed in Table 2-3. If PC Com Port 2 is used for the Reader, ensure the screen shows "direct connect-Com 1 or 2". The default value of the baud rate is 9600, and the default parity, (which should show on the screen as O-7-1) is Odd parity, 7 bit, 1 stop bit. If the switches are not set to the default values, ensure the ProComm screen reflects the values for the settings.

6. Use a known good, 3-track, magnetic striped, card, and swipe it through the reader.

7. If the Reader beeps once and the LED comes on green, it is working and properly connected; proceed to the next step. If the Reader beeps three times and the LED comes on red or orange momentarily, there is an error; the card was swiped incorrectly, or the unit is not working, or is not properly connected. Check the cabling, reset the unit by disconnecting and connecting the power plug, try another card, and call technical support if there is still an error, and if necessary, call MagTek Customer Assistance at 1-888-624-8350.

8. The Reader will respond with a green LED and one beep if only 1 track on the card is good. One or more bad tracks will be shown on the screen. Check the screen for each of the three tracks; Track 1 begins with "%", Track 2 begins with ";" and Track 3 begins with "+" or sometimes with "!".

9. If 3 tracks were encoded and none of the tracks are good, the red LED will light momentarily, three beeps will sound, and an “E” or “EEE” will appear on the screen.

Note

If the card is inserted backwards (mag stripe on the opposite side of the LED) or is not encoded, the LED will not go out and there will be no audio alarm.

10. If there were no errors during installation, test the red light and alarm by partially inserting the card approximately one inch, stop, then remove the card. The Red (or orange LED) should light momentarily and there should be three beeps.

11. Swipe another known good card. If the Reader responds with the green LED and one beep, the unit is ready for operation.

Switch Settings

The switch block is located on the bottom of the Reader. Figure 2-2 shows the switches and the ON/OFF positions. Ensure power is off before setting the switches to ensure the switch settings are properly loaded.

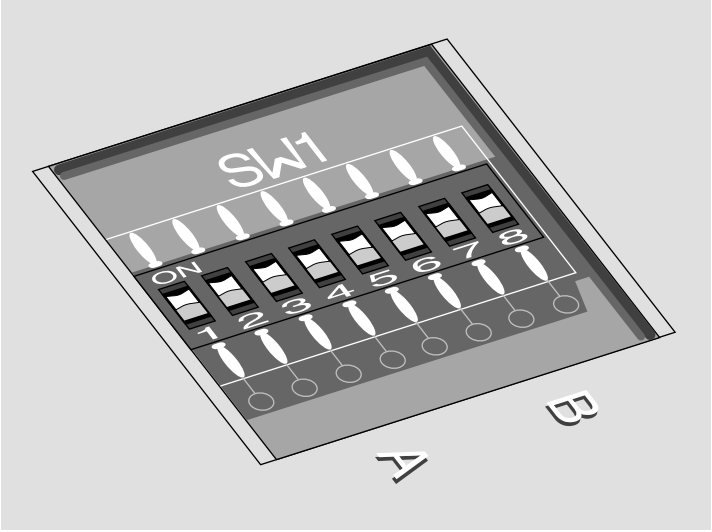


Figure 2-2. Switches

Switches 1 and 2: Table 2-1 shows the switch settings for the baud rate.

Switches 3 and 4: Table 2-2 shows the parity settings, and the other switches are described below.

Table 2-1. Baud Rate Settings

Baud Rate	SW1	SW2
2400	OFF	OFF
4800	ON	OFF
9600	OFF	ON
19200	ON	ON

Table 2-2. Parity Settings

Parity	SW3	SW4	Description
ODD	OFF	OFF	Parity Enabled
MARK	ON	OFF	Parity Disabled
EVEN	OFF	ON	Parity Enabled
SPACE	ON	ON	Parity Disabled

Switch 5: This is an option switch that sends Start of Text (STX) and End of Text (ETX) framing characters when set to the ON position. If framing characters are not desired, set Switch 5 to the OFF position.

Switch 6: This is an option switch that sends one Carriage Return (CR) after the last track when set to the ON position. If this control character is not desired, set Switch 6 to the OFF position.

Switch 7: This is an option switch that sends the Start Sentinel (SS) and the End Sentinel (ES) framing characters when set to the ON position. If the framing characters are not desired, set Switch 7 to the OFF position.

Switch 8: When Switch 8 is OFF, the unit is in the unbuffered mode, and data is automatically sent to the PC without being requested. When ON, the unit is in the buffered mode, and data is not sent to the PC until the Reader receives an Inquiry Command.

The switches are preset at the factory as shown in Table 2-3.

Table 2-3. Factory Settings

Switch Setting	Description
SW1 OFF SW2 ON	Baud Rate 9600
SW3 OFF SW4 OFF	1 Start Bit, 7 Data Bits Odd Parity, 1 Stop Bit
SW5 ON	Send STX and ETX
SW6 ON	Send CR
SW7 ON	Send SS and ES
SW8 OFF	Unbuffered Mode

SECTION 3. OPERATION

Included in this section are Indicators, Card Read, Reader to Host Message Format, Host to Reader Commands, a timing diagram of transmission, and the top assembly drawing of the Reader.

INDICATORS

A two-color LED indicator on the panel gives the operator the status of the Reader. An audio alarm inside the Reader provides a beep for the operator.

Green LED

The green LED is the ready indicator which lights when the Reader is ready to read a magnetic stripe or after a card was read without error.

Red LED

The red LED (or orange LED) lights when an error occurs after the card is swiped. This indicates that the card did not read a track(s) correctly. An "E" will be displayed in place of the card data for each track that had an error. If the card is swiped with the stripe facing away from LED side, or was not encoded, nothing will occur, no LED or alarm. The LED is out when the Reader is processing date or when no power is applied.

Audio Alarm

The Alarm will beep once if the installation is correct or when a magnetic card is read successfully and will beep three times if the installation is incorrect or when a read error is detected.

CARD READ

A card may be swiped through the Reader slot when the green LED is lit. The magstripe must face toward the front (the side with the LED and arrows) and may be swiped from either direction.

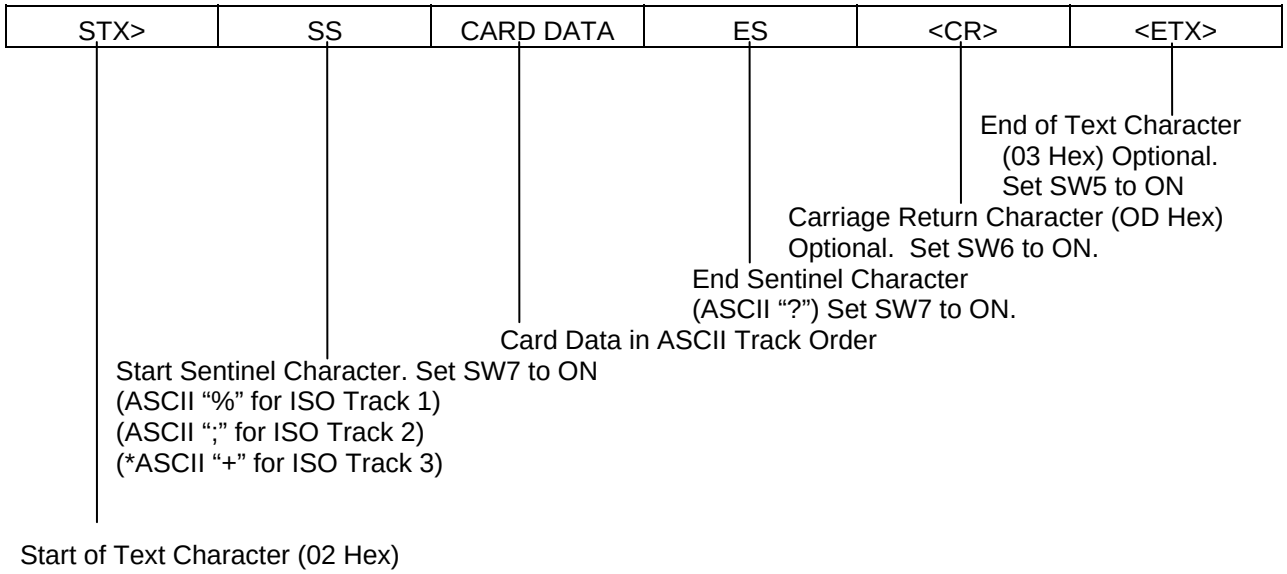
The green LED will go out momentarily when a properly encoded card is swiped through the Reader. The alarm will beep once and the green LED will reappear when all valid information is transmitted to the computer and the Reader is ready to accept another card.

The red LED lights momentarily and the alarm beeps three times when an error occurs during a card read. If the unit was installed correctly, the error will probably be caused by not swiping the card correctly or the problem may be with the encoding on the card.

If the Reader does not respond as described above, make a note of the prompts or error messages on the display and status of the LED on the Reader. Then call MagTek Customer Assistance at 1-888-624-8350.

READER TO HOST MESSAGE FORMAT

Figure 3-1 shows the format in which data is transmitted after a card with a single track is read successfully. Track data is sent in the following order: SS, Track Data, ES.



*"+" = Other symbols may be used for Track 3, e.g., "!" , ";", or "B".

Figure 3-1. Host Message Format for a Single Track

Figure 3-2 shows the format in which data is transmitted after a card with all three tracks is read successfully and switches 5, 6, and 7 are on. The output is as follows:

STX	SS TK 1	CD TK 1	ES TK 1	SS TK 2	CD TK2	ES TK2	SS TK 3	CD TK 3	ES TK 3	CR	ETX

Figure 3-2. Host Message Format for Three Tracks

Where:

STX = Start of Text Character (02 Hex)
SS = Start Sentinel (See above for ASCII symbol for track)
CD = Card Data (Card Data in ASCII Track Order)
ES = End Sentinel (See above for ASCII symbol for track)
CR = Carriage Return (OD Hex)
ETX = End of Text Character (03 Hex)

HOST TO READER COMMANDS

All commands transmitted from the host to the Reader must be preceded by an ASCII "Escape" <ESC> character. Characters that precede or follow the command sequence will not affect the Reader's command interpretation. All ASCII characters must be transmitted in UPPER CASE (for example, ASCII "I" and "R").

Buffer Mode Commands

Commands used in the buffer mode are as follows:

Switch 8	Command	Description
ON	<ESC> "I "	Inquiry Command: In the buffered mode, requests the Reader to Transmit data, or "E" for error, or "R" for empty buffer. In the unbuffered mode transmits an ASCII "R".
ON	<ESC> "R"	Release Command: In the buffered mode, requests the Reader to clear the memory buffer of any data present. This command has no effect in the unbuffered mode.

TIMING

Transmission timing is shown in Figure 3-3. Each ASCII character is transmitted with 1 start bit, 7 data bits, 1 parity bit, and 1 stop bit. Logic levels conform to standard RS-232 levels; logic levels are "true" or "1" if the level is low. The levels are quiescently low.

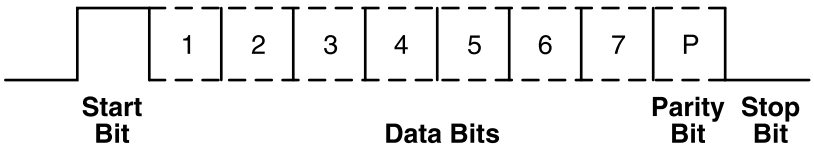


Figure 3-3. Transmission Timing

TOP ASSEMBLY DRAWING

The top assembly drawing is shown in Figure 3-4.

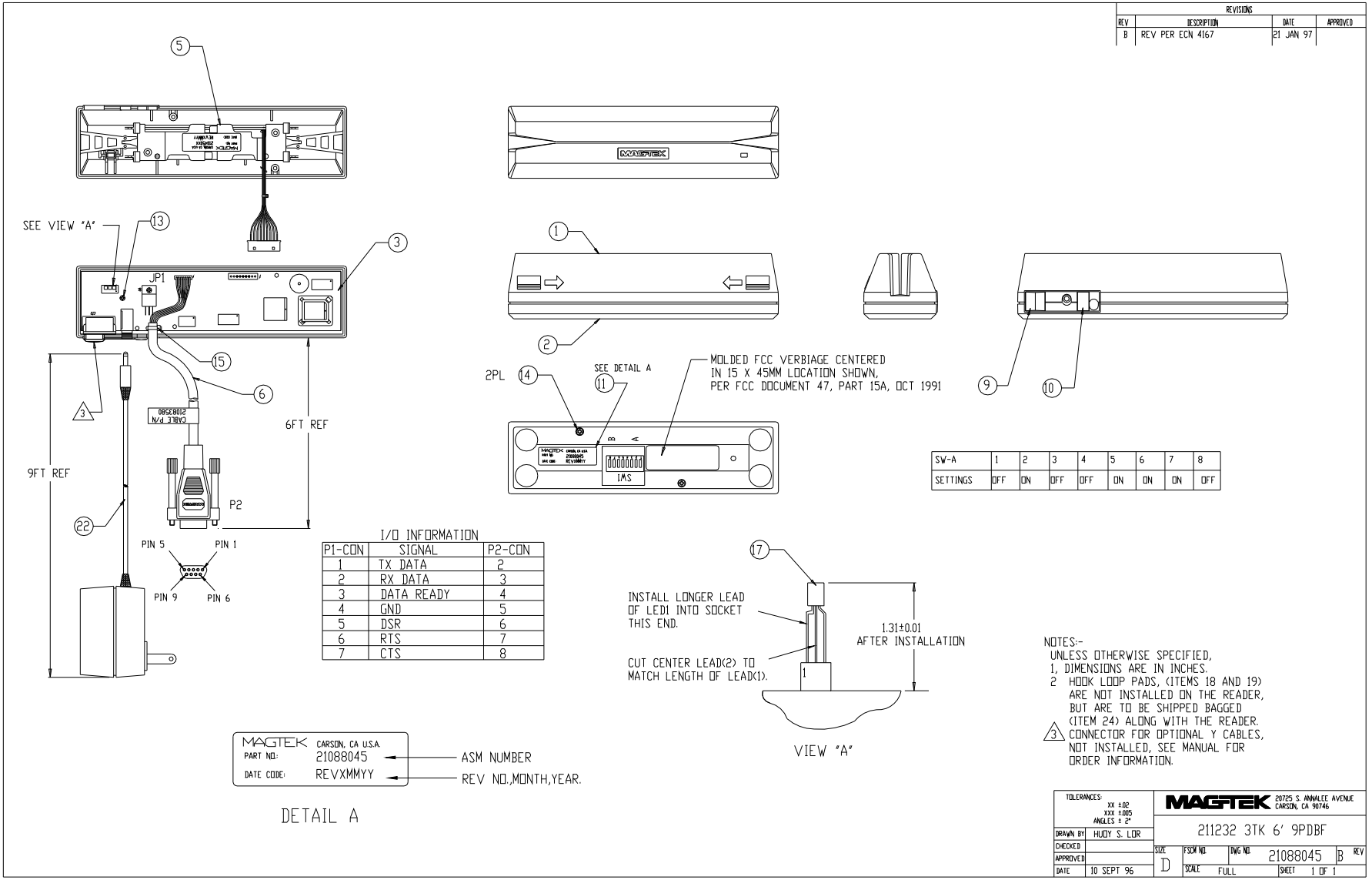


Figure 3-4. Top Assembly Drawing