

PORT POWERED SWIPE READER TECHNICAL REFERENCE MANUAL

Manual Part Number 99875094 Rev 13

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MAGTEK[®]

REGISTERED TO ISO 9001:2000

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REVISIONS

Rev Number	Date	Notes
1	11 Dec 97	Initial Release
2	18 Dec 97	Sec 1 Changed spec Dimensions; Sec 1, 3 Changed illustrations for clarity.
3	11 May 98	Sections 1, 2, and 3 revised to reflect latest firmware revisions. Sec 4 deleted.
4	15 Jun 98	Two part numbers added.
5	1 Mar 99	Sec 1, Added 3 part numbers, changed specs, Changed Dimensions Figure 1-3, removed Figure 1-4, Mounting Dimensions, added MagTek Windows Drivers; Added note to Table 1-1. Section 2, added mounting instructions and Figure 2-1, Mounting Dimensions. Section 3, added 3 track symbols to Table 3-1 and 3 sign-on configurations to 3-2.
6	14 Jun 99	Title change, Removed MT-211 and RS-232; Sec 1, Table 1-1, added Pin List for Cable 21040077, added RS-232 Communication; Sec 2, added Demo Program from Net; Sec 3, Clarified Fig 3-1, Described firmware P/Ns and revisions.
7	1 Dec 99	Section 1: Added P/N 21040084, Updated table for 9- and 25-pin connectors; Section 3: Added P/N 21040084 to Sign-on table.
8	21 Sep 00	Editorial changes throughout. Sec 1: Configuration list expanded and moved to Sec 3; Specification weight changed from 5.9 oz to 5.8oz, Converted symbols to Metric System [SI]. Sec 3: Added 5 new part numbers with firmware, tracks, and configurations.
9	09 Mar 01	Front Matter: Corrected Agency Approvals to include Class B for FCC and Class B for CE. Changed RMA Warranty address to 20801 S. Annalee. Section 3: Removed "Track 3 – 7 bit" line from Table 3-1. Added 094 and 096 configurations in Table 3-2.
10	25 Jul 01	Front Matter: Agency Approvals: Corrected Class B for CE and Corrected UL and CUL . Copyright 2001 added.

(Continued)

REVISIONS (Continued)

11	24 Apr 03	Front Matter: added ISO line to logo, changed Tech Support phone number, added new warranty statement; Sec 3: added 2 new part numbers at the end of Table 3-2.
12	23 Jun 03	Editorial throughout. Section 3: Removed the following parts from Table 3-2: 21040073, 21040077, 21040084, 21040089.
13	11 May 04	Sec 1: Specifications, corrected cable length.

Limited Warranty

MagTek, Inc. warrants that the Product described in this document is free of defects in materials and workmanship for a period of one year from the date of purchase where the date of purchase is defined as the date of shipment from MagTek. During this warranty period, MagTek shall, at their option, repair or replace without charge for either parts or labor, any failure, malfunction, defect or nonconformity which prevents the product from performing in accordance with MagTek's published technical specifications and manuals.

This warranty does not apply to wear of the magnetic read head. This warranty shall not apply if the product is modified, tampered with, or subject to abnormal working conditions. This warranty does not apply when the malfunction results from the use of the Product in conjunction with ancillary or peripheral equipment where it is determined by MagTek that there is no fault in the Product itself.

Notification by the Customer to MagTek of any condition described above should be directed to the Customer's MagTek Sales Representative or to MagTek's Help Desk at (651) 415-6800. If the Product is to be returned from the Customer to MagTek, a returned material authorization (RMA) will be issued by MagTek. The Customer shall be responsible for shipping charges to MagTek, (20801 S. Annalee Ave., Carson, CA 90746). MagTek shall be responsible for shipping charges back to the Customer.

Repair or replacement as provided under this warranty is the exclusive remedy. This warranty is in lieu of all other warranties, express or implied.

FCC WARNING STATEMENT

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 la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

CE STANDARDS

Testing for compliance to CE requirements 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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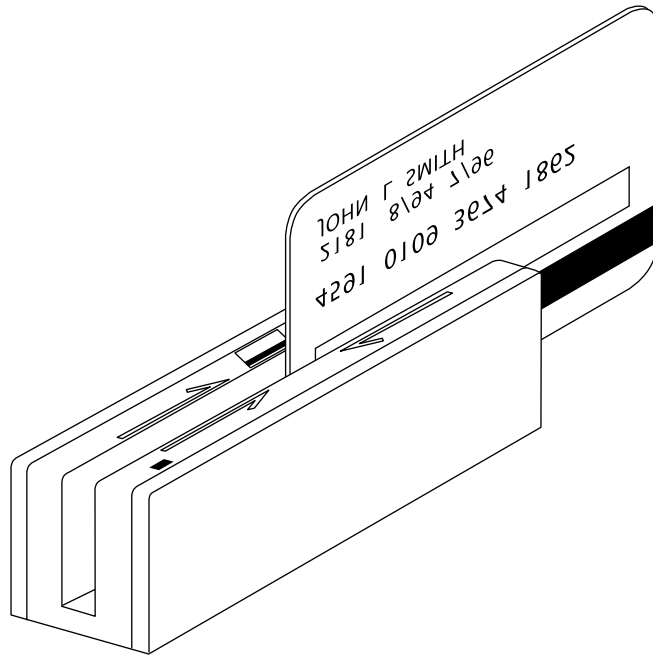


Figure 1-1. Port-Powered Swipe Reader

SECTION 1. FEATURES AND SPECIFICATIONS

The Port Powered Swipe Reader is a compact magnetic stripe card reader which conforms to ISO/ANSI standards. The Reader is compatible with the PC series of personal computers or any device with a serial 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 green LED (Light Emitting Diode) indicator on the Reader panel provides the operator with continuous status of the Reader operations.

When power is applied, the Reader transmits a sign-on ID message. About 150 milliseconds after DTR is applied, the Reader sends the part number of the firmware in the following form: 21088819A01 <CR>. The first 8 characters indicate the firmware number; the letter is the revision, which is followed by a revision sublevel of 01 to 99. The <CR> indicates carriage return (0x0D). The sign-on messages for part numbers are listed in Section 3. Timing is also shown in Section 3.

Since the input voltage is supplied by a relatively low source of power, the Reader depends on its input capacitor to maintain proper charge during all operations. In order to reduce the drain on this internal power source during data transmission, the output data is transmitted in 5 to 6 millisecond bursts with a 10-millisecond gap between bursts to allow the capacitor to recharge. The PC software should be able to tolerate this 10-millisecond space between characters. The Timing is shown in Section 3, Figure 3-1. Configurations, including part numbers, firmware, tracks, and unit configuration, are listed in Section 3, Table 3-2.

MAGTEK DEVICE DRIVERS FOR WINDOWS

The MagTek Device Drivers for Windows, Part Number 30037385, may be used with the Port Powered Swipe Reader. When this program is used, refer to *MagTek Device Driver for Windows, Programming Reference Manual*, Part Number 99875125.

FEATURES

Major features of the Swipe Reader are as follows:

- Powered through the RS-232 serial port – no external power supply required
- Hardware Compatible with PC or any computer or terminal with an RS-232 interface
- Software Compatible with Procomm, or any RS-232 communications program
- Bidirectional card reading
- Reads encoded data that meets ANSI/ISO/CDL/AAMVA standards
- Green LED for status

CONFIGURATION

The Reader, LED Indicator, pin numbers for the 9-pin connector, and the Adapter are shown in Figure 1-2.

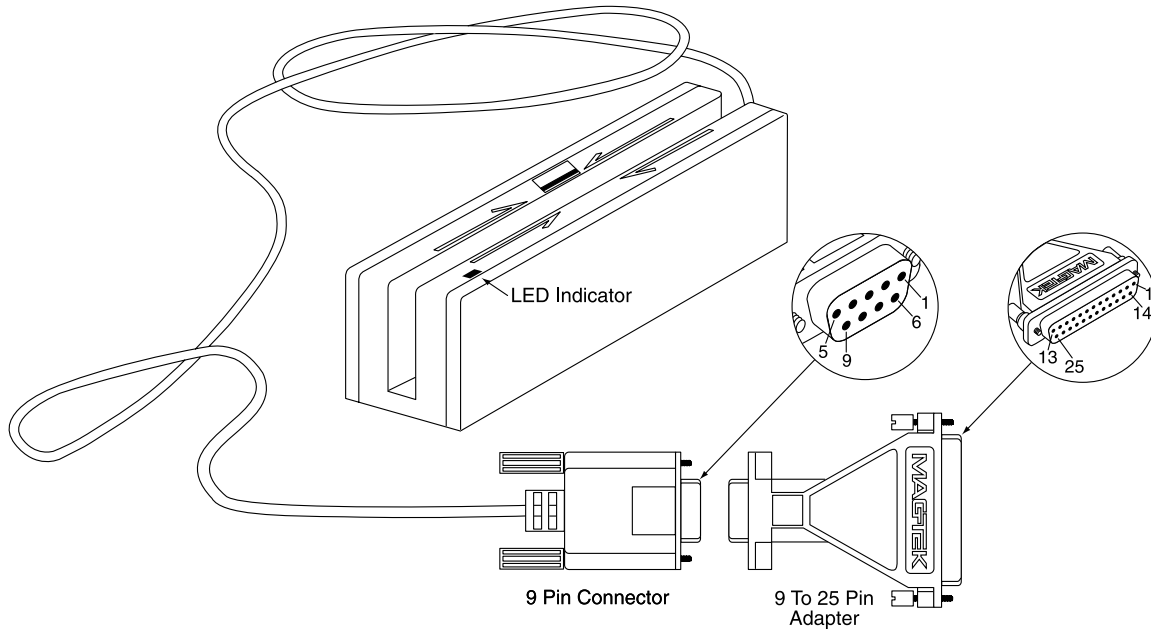


Figure 1-2. Reader Cable and Optional Adapter

Pin numbers and signal descriptions for the 9-pin (DE9) cable and 25-pin (DB25) adapter shown in the illustration are listed in Table 1-1. Also listed is the pin list OEM version, P/N 21040077.

Table 1-1. OEM and 9-Pin Connectors and 25-Pin Adapter

Connector for OEM Version 21040077 J2 on the PCB	25-pin Adapter	DE9-pin Connector	Signal
	-	1	NC*
1	3	2	RXD (to PC)
2	2	3	TXD** (from PC)
3	20	4	DTR (from PC)
4	7	5	GND
	-	6-9	NC*

* No Connection

** Pin must be connected to TXD (or DTR if TXD not available).

SPECIFICATIONS

Table 1-2 lists the specifications for the Port Powered Swipe Reader. Figure 1-3 shows the dimensions for the standard product. Other sizes are available by special order.

Table 1-2. Specifications

OPERATING	
Reference Standards	ISO/ANSI/ CDL/ AAMVA*
Power Input	From RS-232 interface
Recording Method	Two-frequency coherent phase (F2F)
Message Format	ASCII
Card Speed	3 to 50 IPS – forward or reverse
MTBF	Electronics: 125,000 hours. Head: 1,000,000 passes
ELECTRICAL	
DTR Voltage	5 to 15 VDC
Current	
Quiescent	1 to 2 mA typical (continuous)
Transmitting	8 to 9 mA typical (5 ms duration)
Peak at Power On	12 mA
RS-232 Communication	9600 bps, no parity, 8 data bits, 1 stop bit
MECHANICAL (STANDARD PRODUCT)	
Dimensions	Length: 3.94" (100.0 mm) Width: 1.28" (32.5 mm) Height: 1.23" (31.3 mm)
Weight	Reader 5.8 oz. (165 gr.)
Cable length	See Table 3-2
Connector	9 pin D female (May require a 25-pin adapter)
ENVIRONMENTAL	
Temperature	
Operating	32°F to 131°F (0°C to 55°C)
Storage	-22°F to 158°F (-30°C to 70°C)
Humidity	
Operating	10% to 90% noncondensing
Storage	Up to 100% noncondensing
Altitude	
Operating	0-10,000 ft. (0-3048 m.)
Storage	0-50,000 ft. (0-15240 m.)

* ISO (International Standards Organization), ANSI (American National Standards Institute), CDL (California Drivers License), and AAMVA (American Association of Motor Vehicle Administrators).

Port Powered Swipe Reader

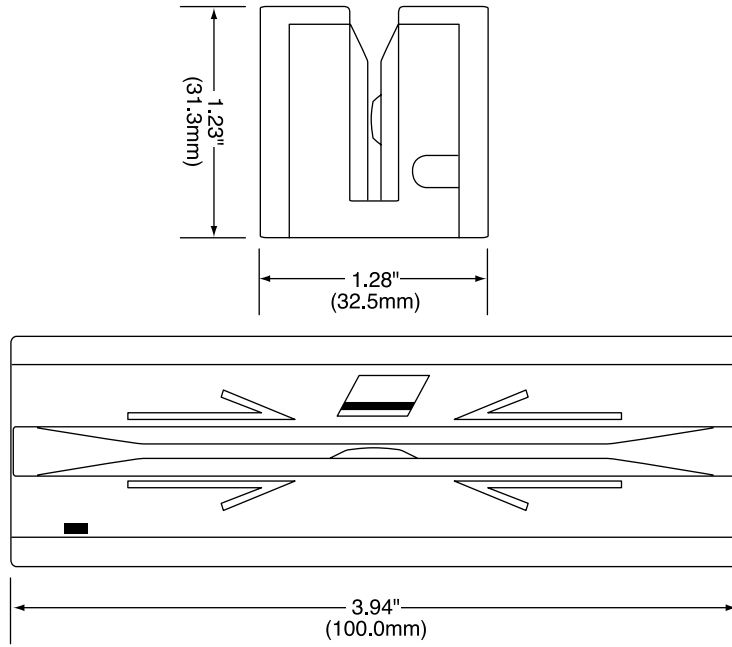


Figure 1-3. Dimensions

SECTION 2. INSTALLATION

The hardware installation consists of plugging the cable into the PC and optional adapter, if required, Com Port setup, and testing the Reader.

REQUIREMENTS

- Port Powered Swipe Reader
- Optional 9- to 25-pin Adapter, P/N 78200018
- PC with Com Port
- Procomm, Hyper Terminal, MagTek Windows Drivers, or other RS-232 communications program

MOUNTING

1. The Reader can be mounted on a surface in three ways:
 - By two screws through the surface attached to the bottom of the unit and running the cable on the top of the surface;
 - By two screws through the surface attached to the bottom of the unit and by drilling a hole in the surface for the cable and running the cable through the hole;
 - By attaching the unit to the surface with fastening tape and running the cable on the top of the surface.

Note

The two mounting inserts are 3 mm diameter; 0.5 mm pitch; 6.4 mm deep. The length of the screws used depends on the mounting surface thickness and the thickness of washers (if used).

The mounting dimensions are shown in Figure 2-1. Determine the method of mounting required.

2. Ensure the Reader is positioned on a flat, accessible surface with at least 4 inches clearance on either end for room to swipe a card. Orient the Reader so the side with the LED is facing the direction of intended use.

If fastening tape is to be used, clean the area that the Reader will be mounted on with isopropyl alcohol. Remove the adhesive protective cover on the fastening tape, and position the Reader and push down firmly.

6. Select 8 data bits, no parity, 1 stop bit.
7. With the LED on, swipe a card. The data on the screen will show Track 1 beginning with “%” and ending with “?”. Track 2 begins with “;” and ends with “?”. Track 3 begins with “+” (normal) or “!” (CDL) and ends with “?”. The following is an example:

%B123^Smith/Joann^9812101000?;1122223333334444444444?<0x0D>

If a track cannot be read, an **E** will appear in place of the track data; for example, if Track 2 is bad and Tracks 1 and 3 are good, the display will be similar to the following:

%11111111111111111111?;E?+33333333333333333333?<0x0D>

If Tracks 1 and 3 are bad and Track 2 is good, the display will be similar to the following:

%E?;22222222222222222222?+E?<0x0D>

8. If the data on the screen is not numeric or alphanumeric similar to the above, check the communications rate. If the alphanumeric characters are similar to the above, the unit is ready for operation.

SECTION 3. OPERATION

Included in this section are Indicator, Card Read, Reader to Host Message Format, and a timing diagram of sign-on ID.

LED INDICATOR

A green LED indicator on the panel gives the operator the status of the Reader. If the cabling is correct and the correct Com Port is selected, the indicator will be on. If the indicator does not come on, check the cabling and the Com Port. The LED is turned off during a card swipe and while the unit is transmitting.

CARD READ

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

READER TO HOST MESSAGE FORMAT

Track data is sent in the following order: SS, Card Data, ES.

The format in which data is transmitted (in track order) after a card is read successfully is as follows:

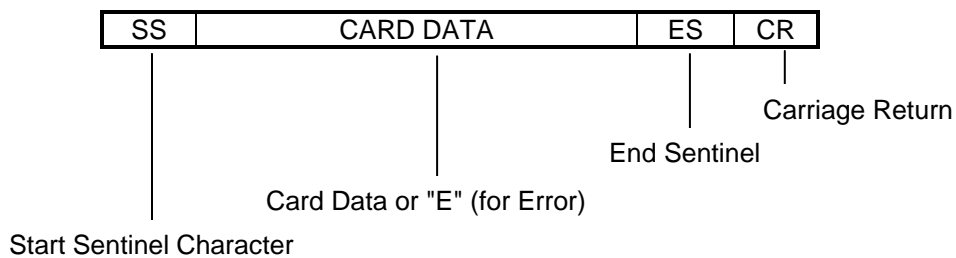


Table 3-1 lists Start Sentinel and End Sentinel symbols.

Table 3-1. SS and ES Track Symbols

Start Sentinel	End Sentinel	Description
%	?	Track 1
;	?	Track 2
+	?	Track 3 - ISO
#	?	Track 3 - AAMVA
!	?	Track 3 - CDL

TIMING FOR ID SIGN ON

Timing for the ID Sign-on and transmission bursts (5 ms with 10 ms between bursts) are shown in Figure 3-1.

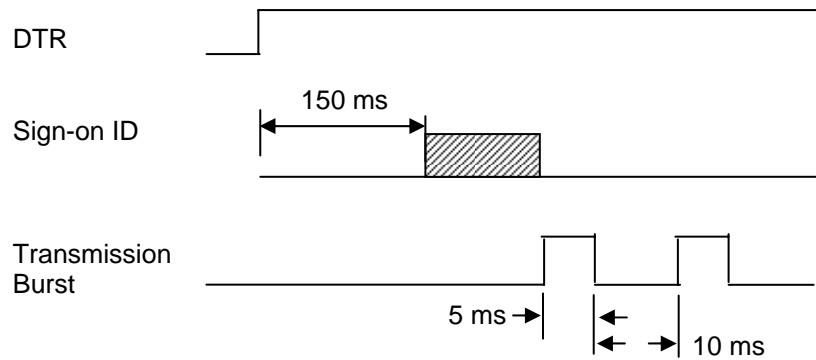


Figure 3-1. Timing For ID Sign-on and Transmission Bursts.

The firmware controls the operation of Sign-on ID and Transmission bursts in the following format:

210888xxLnn <CR>

Where:

the first 8 digits are the firmware part number (xx represents the Swipe Reader series),

L is the alpha revision,

nn is the number sub-revision.

<CR> is 0x0D.

Table 3-2 lists the available part number, firmware, and configuration.

Table 3-2. Sign-on ID for Configurations

Part Number	Firmware	Track Configuration	Configuration*
21040071	21088811	1,2	Pearl White
21040074	21088817	1,2,3	Pearl White
21040075	21088814	2	Pearl White
21040079	21088811	1,2	Black
21040080	21088814	2	Black
21040081	21088811	1,2	Black (150 mm)
21040082	21088817	1,2,3	Black
21040086	21088817	1,2,3	Pearl White, No Cover, 12" Cable, 6-pin
21040088	21088824	1,2,3	Pearl White, 4800/70, 10' cable
21040091	21088811	1,2	Black, No Cover, 5.9" Cable, 4-pin
21040092	21088817	1,2,3	Pearl White, 5 m cable
21040094	21088811	1,2	Pearl White, No Cover
21040096	21088811	1,2	Black, 4" Cable, 4-pin
21040097	21088811	1,2	Pearl White, 150 mm cable, 4-pin
21040226	21088817	1,2,3	Black (special label)

*All cables are 6' DE9 unless otherwise specified.

