

# **90-MILLIMETER COMPATIBLE SWIPE READER TECHNICAL REFERENCE MANUAL**

**Part Number 99831083-5**

**JULY 2003**

**MAGTEK<sup>®</sup>**

**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](http://www.magtek.com)*

Information in this document is subject to change without notice. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the express written permission of MagTek, Inc.

MagTek is a registered trademark of MagTek, Inc.

### REVISIONS

Rev Number	Date	Notes
1	Sep 92	Initial Release
2	22 Oct 99	Formatted manual; Added IEC requirements to Specifications; Changed values in Specifications; Clarified Connector information; Added correct drawings; Clarified Card Present Signal
3	25 Jul 01	Front Matter: Added to Agency page: FCC Class B, UL and CUL, CE Class B. Added Copyright 2001.
4	18 Apr 03	Front Matter: added ISO line to logo, changed Tech Support phone number, added new warranty statement, changed warranty from 90 days to 1 year; Sec 1: Configuration Table, changed P/N for 3 tracks from 21045019 to 21045034; Sec 2: changed Table 2-3 to reflect the new P/N.
5	16 Jul 03	Sec 1: added cable length to Configuration Table, added MTBF Electronics to Specification Table, changed power requirements to 2.7 VDC, and corrected units. Sec 2: Tables 2-1, 2-2, and 2-3 corrected P/N and added mating connectors.

## **LIMITED WARRANTY**

MagTek warrants that the products sold to Reseller pursuant to this Agreement will perform in accordance with MagTek's published specifications. This warranty shall be provided only for a period of one year from the date of the shipment of the product from MagTek (the "Warranty Period"). This warranty shall apply only to the original purchaser unless the buyer is authorized by MagTek to resell the products, in which event, this warranty shall apply only to the first repurchase.

During the Warranty Period, should this product fail to conform to MagTek's specifications, MagTek will, at its option, repair or replace this product at no additional charge except as set forth below. Repair parts and replacement products will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and products become the property of MagTek. This limited warranty does not include service to repair damage to the product resulting from accident, disaster, unreasonable use, misuse, abuse, customer's negligence, Reseller's negligence, or non-MagTek modification of the product. MagTek reserves the right to examine the alleged defective goods to determine whether the warranty is applicable.

Without limiting the generality of the foregoing, MagTek specifically disclaims any liability or warranty for goods resold in other than MagTek's original packages, and for goods modified, altered, or treated by customers.

Service may be obtained by delivering the product during the warranty period to MagTek (1710 Apollo Court, Seal Beach, CA 90740). If this product is delivered by mail or by an equivalent shipping carrier, the customer agrees to insure the product or assume the risk of loss or damage in transit, to prepay shipping charges to the warranty service location and to use the original shipping container or equivalent. MagTek will return the product, prepaid, via a three (3) day shipping service. A Return Material Authorization (RMA) number must accompany all returns.

**MAGTEK MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND MAGTEK DISCLAIMS ANY WARRANTY OF ANY OTHER KIND, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

**EACH PURCHASER UNDERSTANDS THAT THE MAGTEK PRODUCT IS OFFERED AS IS. IF THIS PRODUCT DOES NOT CONFORM TO MAGTEK'S SPECIFICATIONS, THE SOLE REMEDY SHALL BE REPAIR OR REPLACEMENT AS PROVIDED ABOVE. MAGTEK'S LIABILITY, IF ANY, TO RESELLER OR TO RESELLER'S CUSTOMERS, SHALL IN NO EVENT EXCEED THE TOTAL AMOUNT PAID TO MAGTEK BY RESELLER UNDER THIS AGREEMENT. IN NO EVENT WILL MAGTEK BE LIABLE TO THE RESELLER OR THE RESELLER'S CUSTOMER FOR ANY DAMAGES, INCLUDING ANY LOST PROFITS, LOST SAVINGS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF OR INABILITY TO USE SUCH PRODUCT, EVEN IF MAGTEK HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY ANY OTHER PARTY.**

### **LIMITATION ON LIABILITY**

**EXCEPT AS PROVIDED IN THE SECTIONS RELATING TO MAGTEK'S LIMITED WARRANTY, MAGTEK'S LIABILITY UNDER THIS AGREEMENT IS LIMITED TO THE CONTRACT PRICE OF THE PRODUCTS.**

**MAGTEK MAKES NO OTHER WARRANTIES WITH RESPECT TO THE PRODUCTS, EXPRESSED OR IMPLIED, EXCEPT AS MAY BE STATED IN THIS AGREEMENT, AND MAGTEK DISCLAIMS ANY IMPLIED WARRANTY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

**MAGTEK SHALL NOT BE LIABLE FOR CONTINGENT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES TO PERSONS OR PROPERTY. MAGTEK FURTHER LIMITS ITS LIABILITY OF ANY KIND WITH RESPECT TO THE PRODUCTS, INCLUDING ANY NEGLIGENCE ON ITS PART, TO THE CONTRACT PRICE FOR THE GOODS.**

**MAGTEK'S SOLE LIABILITY AND BUYER'S EXCLUSIVE REMEDIES ARE STATED IN THIS SECTION AND IN THE SECTION RELATING TO MAGTEK'S LIMITED WARRANTY.**

### **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 and FCC 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.

## TABLE OF CONTENTS

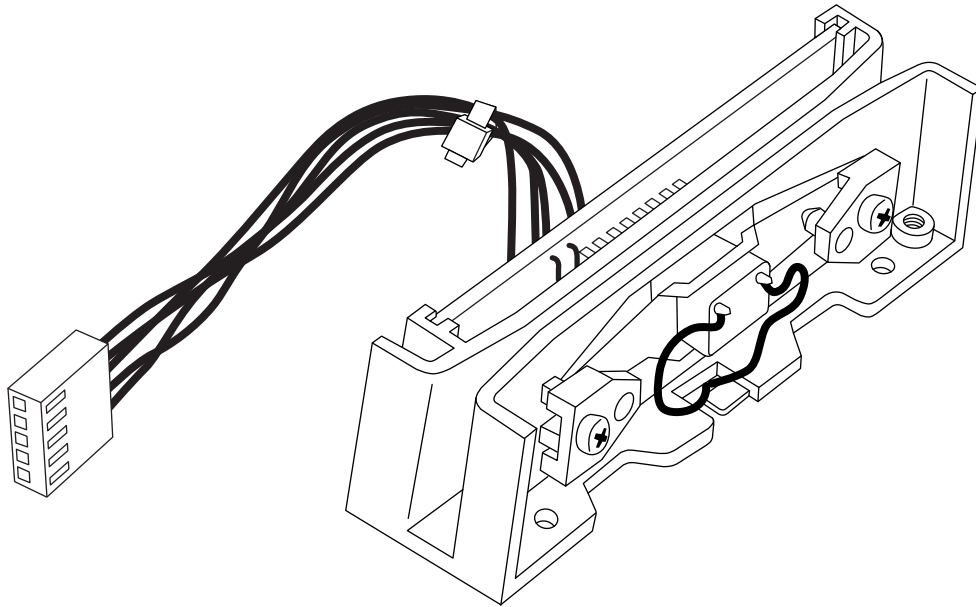
<b>SECTION 1. FEATURES AND SPECIFICATIONS</b> .....	<b>1</b>
CONFIGURATIONS .....	1
SPECIFICATIONS .....	1
REFERENCE DOCUMENT .....	2
<b>SECTION 2. INSTALLATION</b> .....	<b>3</b>
MOUNTING.....	3
CONNECTORS.....	4
TIMING.....	5
DATA.....	6
STROBE .....	6
CARD PRESENT .....	6

### FIGURES

Figure 1-1. 90-millimeter Compatible Swipe Reader.....	vi
Figure 2-1. Reader Mounting Dimensions .....	3
Figure 2-2. Timing .....	5

### TABLES

Table 2-1. I/O Connector for Single Track, 5 Pin.....	4
Table 2-2. I/O Connector for Dual Track, 7 Pin.....	4
Table 2-3. I/O Connector for 3 Track, 9 Pin .....	5



**Figure 1-1. 90-millimeter Compatible Swipe Reader**

## SECTION 1. FEATURES AND SPECIFICATIONS

The 90-millimeter OEM Swipe Reader has a TTL level interface and is designed for use in retail, access control, and time and attendance environments. This Reader is in compliance with industry specifications, including ANSI/ISO Standards 7810, 7811-1 through -6, 7812, 7813, and AAMVA. The Reader can be customized. Bidirectional read capability is available.

### CONFIGURATIONS

	Part Number	Read	Color	Cable Length
Integral Electronics, Single Track without Cover	21045001	Track 1	Black	6"
	21045002	Track 2	Black	6"
Integral Electronics, Dual Tracks without Cover	21045011	Tracks 1 & 2	Black	4"
Integral Electronics, 3 Tracks without Cover	21045034	Tracks 1,2, & 3	Black	5"

### SPECIFICATIONS

IEC: Meets or Exceeds Requirements for:	IEC 1000-4-2 ESD (Electro Static Discharge) IEC 1000-4-3 Radiated EMC Field (2X requirement) IEC 1000-4-4 Electrical Fast Transient Burst requirement (transmission on I/O cable)
Flammability	Meets UL94V-0
Recording Method	Two-Frequency Coherent Phase (F2F)
Speed	Card speed through the unit may vary from: 2 to 125 in/s at 75 bpi (5.1 to 318 cm/s at 29.5 b/cm) 2 to 60 in/s at 210 bpi (5.1 to 152.4 cm/s at 82.7 b/cm)
Power Requirements	Single Track: 2.7 to 5.5VDC at 1mA, typical Dual Track: 2.7 to 5.5VDC at 2mA, typical 3 Tracks: 2.7 to 5.5VDC at 3mA, typical
Output Signal Levels	$V_{ol} = 0.4V$ at 2mA $V_{oh} = V_{cc} - 0.5V$ at -2mA
Operating Temperature	-30°C to 70°C
Operating Humidity	10% to 90% relative humidity
Life	300,000 passes Single Track 1,000,000 passes Multi-Track
MTBF Electronics	125,000 h
Dimensions	Length: 3.54" (90.0mm) Height: 0.95" (24.13mm) Width: 0.88" (22.4mm)
Cable Length:	Single Track: 6" (150mm) Dual Track: 4" (101.6mm) 3 Track 5" (127mm)
Connector	See Section 2, Connectors
Colors available	Black, Standard

**REFERENCE DOCUMENT**

*I/O Interface for TTL Swipe Readers, Technical Reference Manual, P/N 99875148*



## SECTION 2. INSTALLATION

This section consists of installation and checkout of the Reader.

### MOUNTING

The dimensions for mounting without the cover are shown in Figure 2-1.

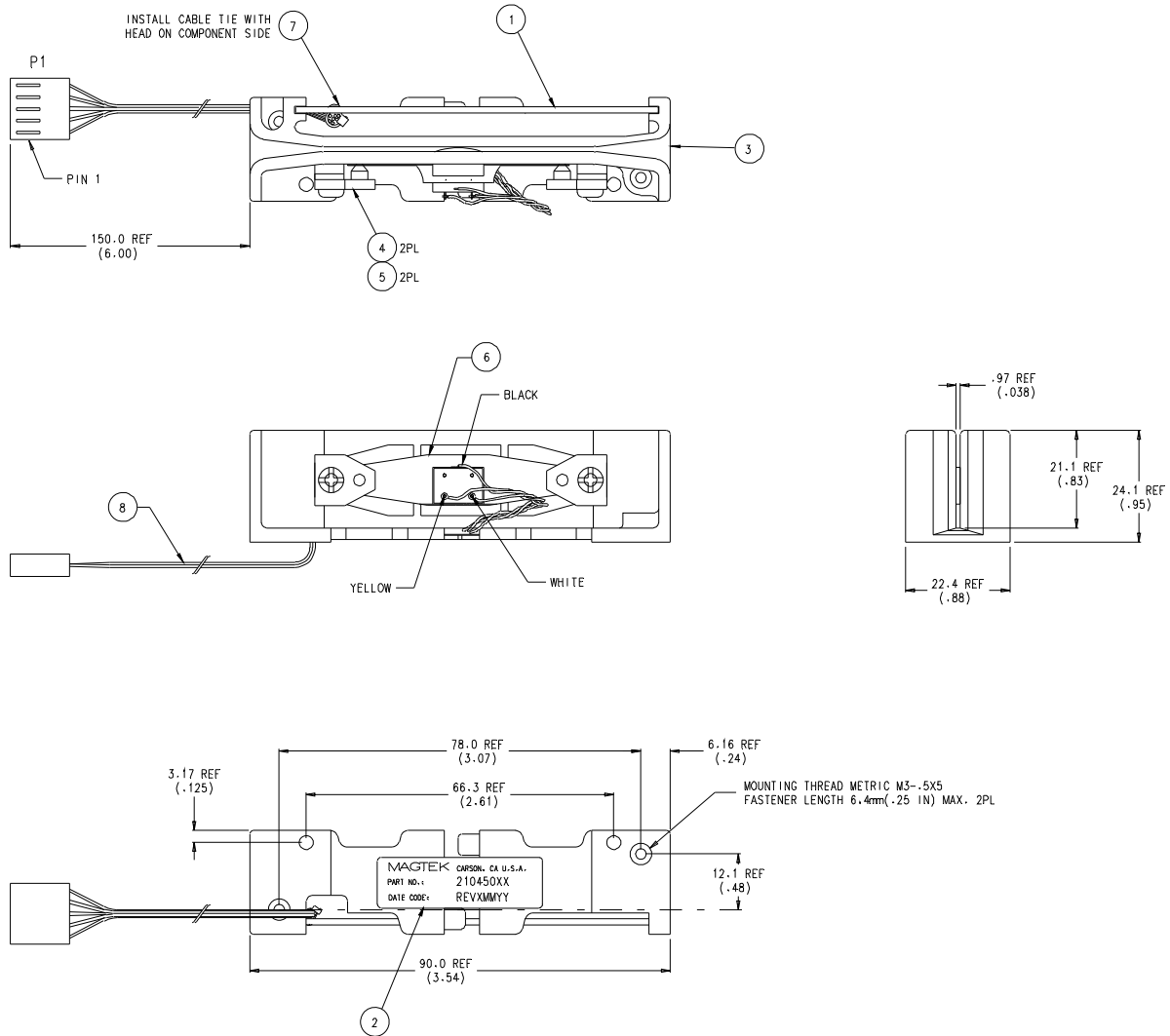


Figure 2-1. Reader Mounting Dimensions

## CONNECTORS

Single Track I/O Connector is shown in Table 2-1, and the Dual Track I/O Connector is shown in Table 2-2.

**Table 2-1. I/O Connector for Single Track, 5 Pin**

	Pin Number	Color	Signal
Connector for Single Track, 5 Pin Molex 5 Pin 22-01-2051 0.100 inch Contact Spacing Mates to Molex 22-05-2051	1	Red	$V_{cc}$
	2	Black	GND
	3	Orange	$\overline{\text{DATA}}$
	4	Brown	$\overline{\text{STROBE}}$
	5	Green	$\overline{\text{CARD PRESENT}}$

Note:  $V_{cc}$  = 2.7 to 5.5 VDC

**Table 2-2. I/O Connector for Dual Track, 7 Pin**

	Pin Number	Color	Signal
Connector for Dual Track, 7 Pin  Molex 7 Pin 22-01-2071 0.100 inch Contact Spacing Mates to Molex 22-05-2071	1	Red	$V_{cc}$
	2	Black	GND
	3	Orange	$\overline{\text{DATA (Tk 2)}}$
	4	Brown	$\overline{\text{STROBE (Tk 2)}}$
	5	Green	$\overline{\text{CARD PRESENT}}$
	6	Yellow	$\overline{\text{STROBE (Tk 1)}}$
	7	White	$\overline{\text{DATA (Tk 1)}}$

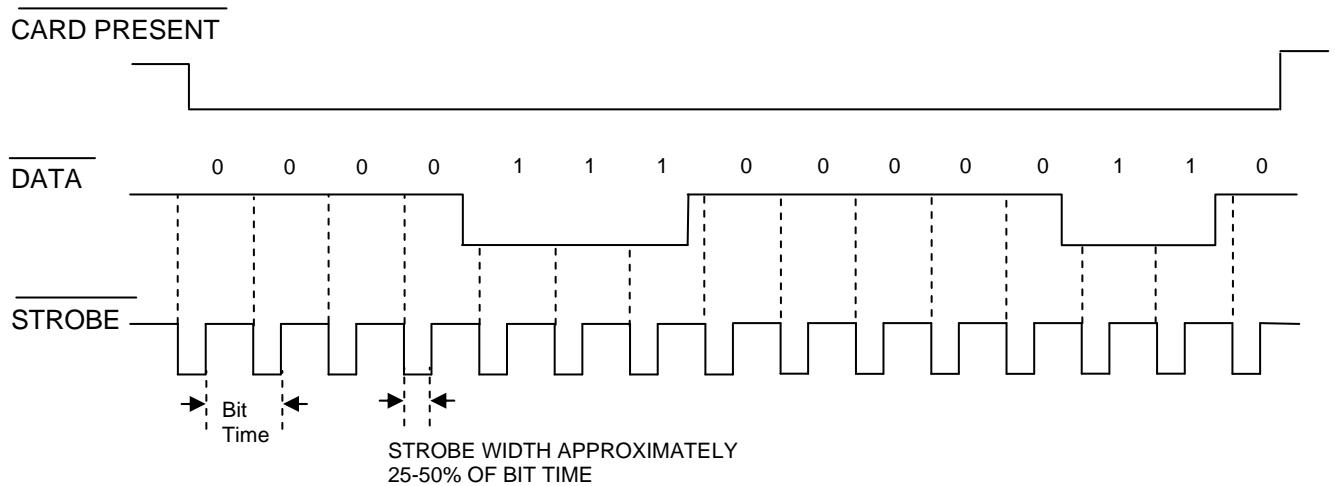
Note:  $V_{cc}$  = 2.7 to 5.5 VDC

**Table 2-3. I/O Connector for 3-Track, 9 Pin**

	Pin Number	Color	Signal
Connector for 3 Track, 9 Pin  Molex 9 Pin 51004-0900 2.0 mm Contact Spacing Mates to Molex 53014-0910	1	Red	+5V
	2	Blue	$\overline{\text{STROBE}}$ (Tk 1)
	3	Brown	$\overline{\text{DATA}}$ (Tk 1)
	4	Green	$\overline{\text{STROBE}}$ (Tk 2)
	5	Yellow	$\overline{\text{DATA}}$ (Tk 2)
	6	Gray	$\overline{\text{STROBE}}$ (Tk 3)
	7	Orange	$\overline{\text{DATA}}$ (Tk 3)
	8	White	$\overline{\text{CARD PRESENT}}$
	9	Black	GND

Note:  $V_{cc} = 2.7$  to  $5.5$  VDC

**TIMING**



Notes:

1. Time out of the  $\overline{\text{CARD PRESENT}}$  signal occurs approximately 150 ms after the last strobe transition.
2.  $\overline{\text{DATA}}$  is valid  $1.0\mu$  sec before the negative edge of  $\overline{\text{STROBE}}$ .
3. 16 or 17 head flux reversals for high density configuration.

**Figure 2-2. Timing**

## **DATA**

The Data signal is valid while the strobe is low. If the Data signal is high, the bit is a zero. If the Data signal is low, the bit is a one.

## **STROBE**

The Strobe signal indicates when Data is valid. It is recommended that Data be loaded by the user with the leading edge (negative) of the Strobe.

## **CARD PRESENT**

Card Present will go low after 14/15 flux reversals from the head. Card Present will return high 150 milliseconds after the last flux reversal.

When no card is being moved through the unit, the Data, Strobe, and Card Present signals are high. The signal timing diagram shown above represents the data along with other signals that are generated during the reading process.