MODEL MT-215
TTL INSERTION READER
TECHNICAL REFERENCE MANUAL

Manual Part Number 99875042 Rev 4

APRIL 2003

MAGTEK®

REGISTERED TO ISO 9001:2000

20725 South Annalee Avenue
Carson, CA 90746
Phone: (310) 631-8602
FAX: (310) 631-3956
Technical Support: (651) 415-6800
www.magtek.com

REVISIONS

Rev Number	Date	Notes
1	5/2/96	Initial Release
2	4/28/98	Changed Warranty to 90 days. Added Tech Support Phone Number.
3	01/01/01	Front Matter: Added Magtek Web Address; Changed copyright date; Changed Warranty from 90 days to one year; Added agencies on Agency Page
4	15 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

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 (20801 S. Annalee Ave., Carson, CA 90746). 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 a Class A 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 commercial 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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 A 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 A prescrites dans le Réglement sur le brouillage radioélectrique édicté par les 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 A.

UL/CSA

This product is recognized per UL 1950.

TABLE OF CONTENTS

ILLUSTRATIONS

TABLES

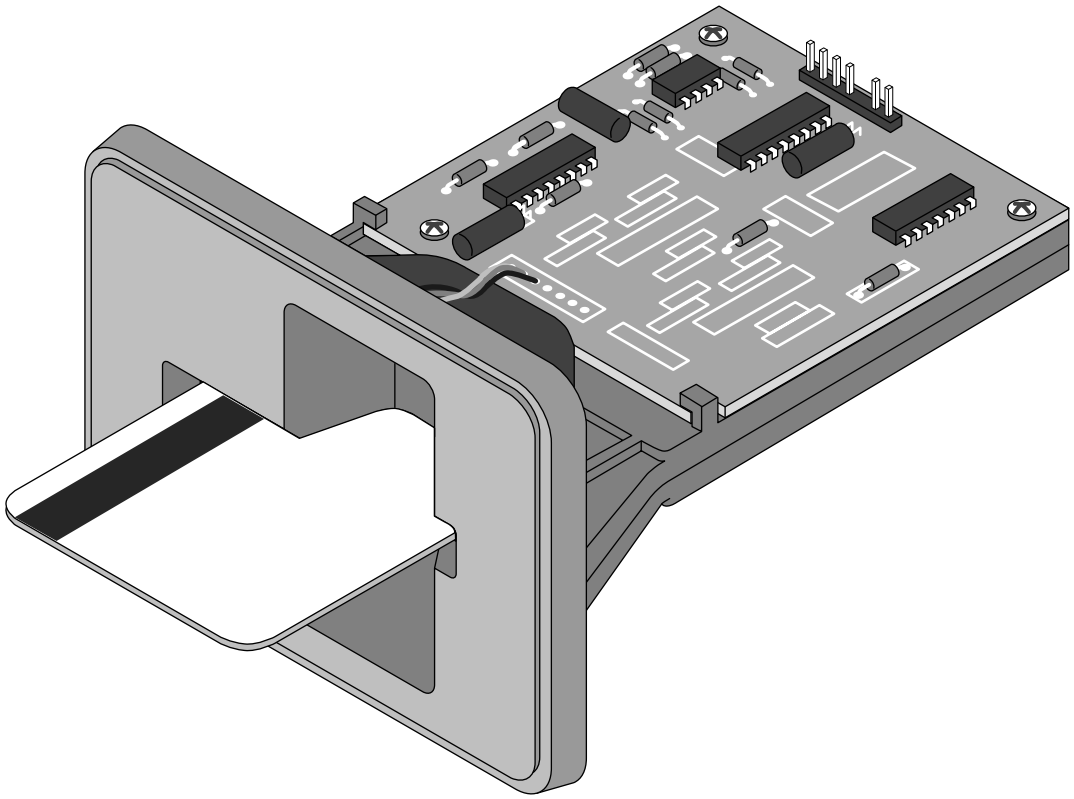


Figure 1-1. TTL Insertion Reader (P/N 21065004)

SECTION 1. FEATURES AND SPECIFICATIONS

The Model MT-215 is a manually operated insertion, or push-in, Reader. The orientation of the card is shown in Figure 1-1. The Reader can read the entire stripe in both the forward and reverse directions. The MT-215 will read cards that meet the standards defined by ISO (International Standards Organization) 7810, 7811-1, 7811-2, 7811-3, 7811-4, 7811-5, and 7811-6.

CONFIGURATIONS

Table 1-1 lists the track configurations, part numbers, and which tracks are read.

Table 1-1. Configurations

	Part Number	Read
Single Track	21065003	Track 1
	21065004	Track 2
	21065008	Track 3
Multiple Tracks	21065005	Tracks 1 and 2
	21065006	Tracks 2 and 3
	21065007	Tracks 1, 2, and 3

SPECIFICATIONS

The specifications for the Reader are listed in Table 1-2, and the dimensions are shown in Figure 1-2.

Table 1-2. Specifications

OPERATING

Reference Standards	ANSI/ISO/AAMVA
Power Requirements	Single Track: +5 VDC ±5% at 23 mA Two Track: +5 VDC ±5% at 28 mA Three Track: +5 VDC ±5% at 33 mA
Power Consumption	0.115 to 0.165 WATTS
Output Signal Levels (74HC365 Driver)	V_{ol} = 0.33 V at 6 mA V_{oh} = Vcc -0.2 V at 20 μA
Recording Method	Two-frequency coherent phase (F2F)
Speed	TRK 1 or 3: 3 to 50 ips (127 cmps) at 210 bpi. TRK 2: 3 to 125 ips (317.5 cmps) at 75 bpi
MTBF	Electronics: 30,000 hours Head: 500,000 insertions

MECHANICAL

Dimensions (with Bezel)	
Length	4.58 " (11.63 cm)
Width	4" (10.16 cm)
Height	3" (7.62 cm)
Bezel Thickness	0.31" (0.79 cm)
Weight	4.83 oz. (137.0 g.)

ENVIRONMENTAL

Temperature	
Operating	0° C to 70°C (32°F to 158°F)
Storage	-40°C to 80°C (-40°F to 176°F)
Humidity	
Operating	10% to 90% noncondensing
Storage	0% to 95% noncondensing
Altitude	
Operating	0-10,000 ft. (0-3,048 m.)
Storage	0-50,000 ft. (0-15,240 m.)

DIMENSIONS

The dimensions and the dimension for the cable connector clearance are shown in Figure 1-2

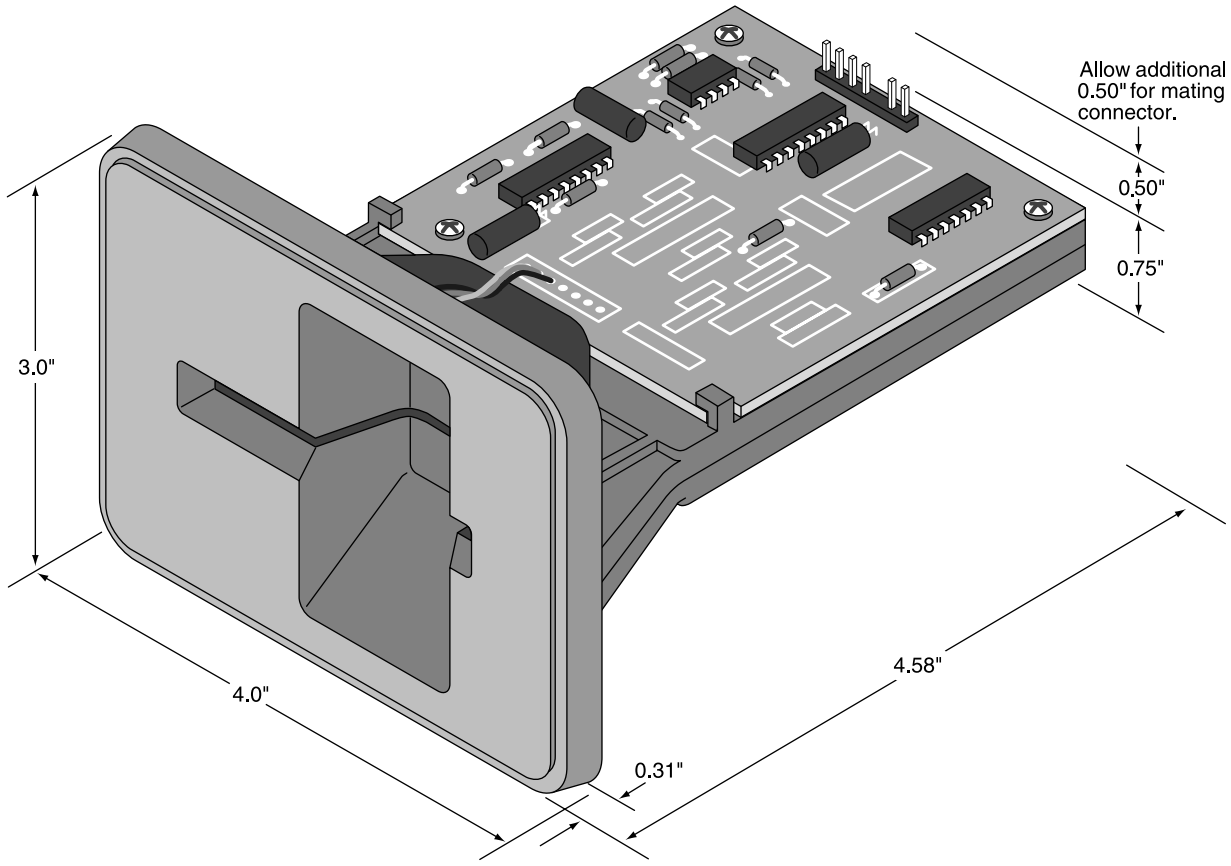


Figure 1-2. Clearance Dimensions

SECTION 2. INSTALLATION

This section describes cabling information, mounting dimensions and timing.

PIN LIST AND CONNECTORS

Table 2-1 lists the connector pins and the required mating connectors, and Figure 2-1 shows pin orientation for connector 22-01-2071. On the other connectors pins 8-11 are extended to the left.

Table 2-1. Pin List and Connectors

	Track Number and Description				
Pin Number	**TK 1, 2, 3**	**TK 1, 2**	**TK 2, 3**	**TK 2**	**TK 3**
1	Rear Sensor	Rear Sensor	Rear Sensor	Rear Sensor	Rear Sensor
2	Data TK 2	Data TK 2	Data TK 2	Data TK 2	Not Used
3	Card Present	Card Present	Card Present	Card Present	Card Present
4	Strobe TK 2	Strobe TK 2	Strobe TK 2	Strobe TK 2	Not Used
5	Key	Key	Key	Key	Key
6	+5V	+5V	+5V	+5V	+5V
7	GND	GND	GND	GND	GND
8	Strobe TK 1	Strobe TK 1	Not Used		Not Used
9	Data TK 1	Data TK 1	Not Used		Not Used
10	Strobe TK 3		Strobe TK 3		Strobe TK 3
11	Data TK 3		Data TK 3		Data TK 3
Mating Connector*					
	Molex 22-01-2111	Molex 22-01-2091	Molex 22-01-2111	Molex 22-01-2071	Molex 22-01-2111

*Molex Terminals 08-50-0114
*Molex Key 15-04-9209

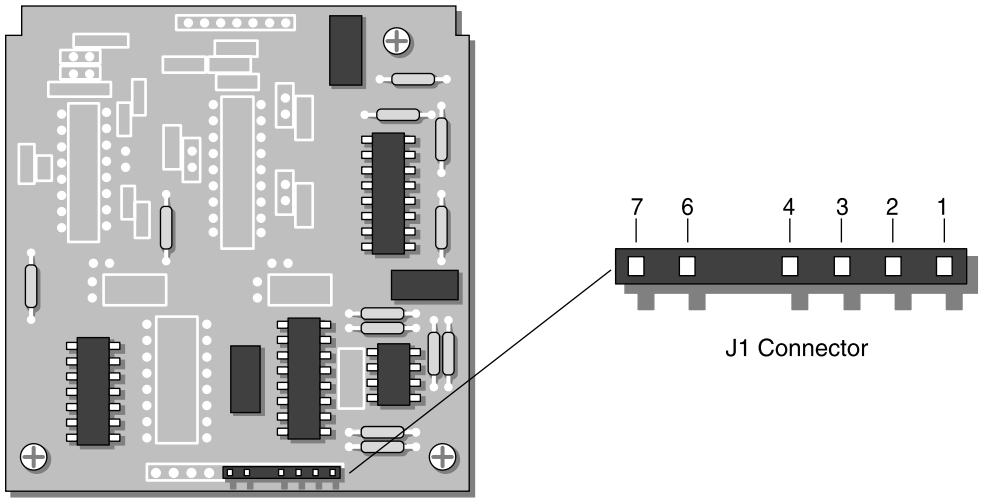


Figure 2-1. Pin Orientation

MOUNTING

Figure 2-2 shows the dimensions for mounting.

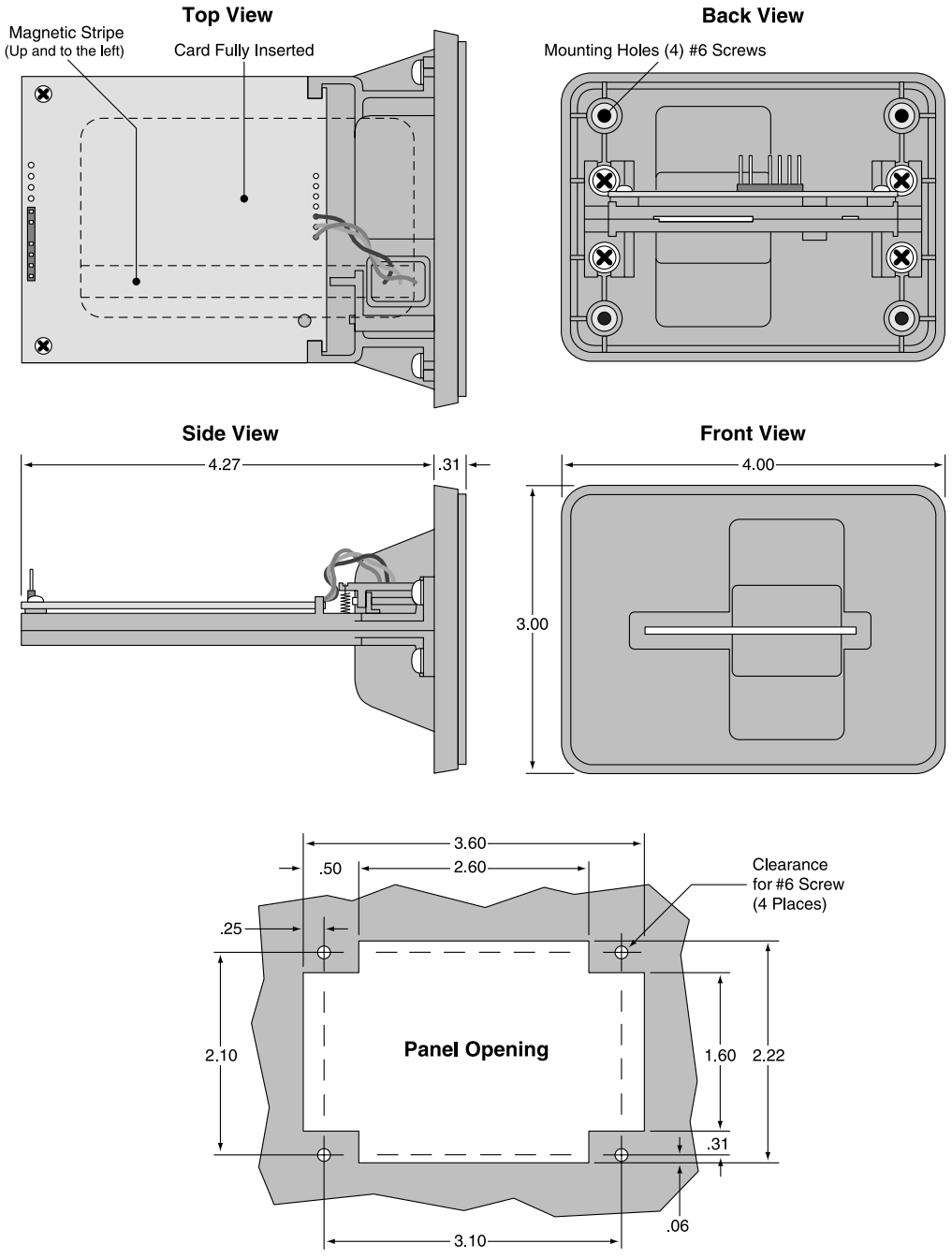
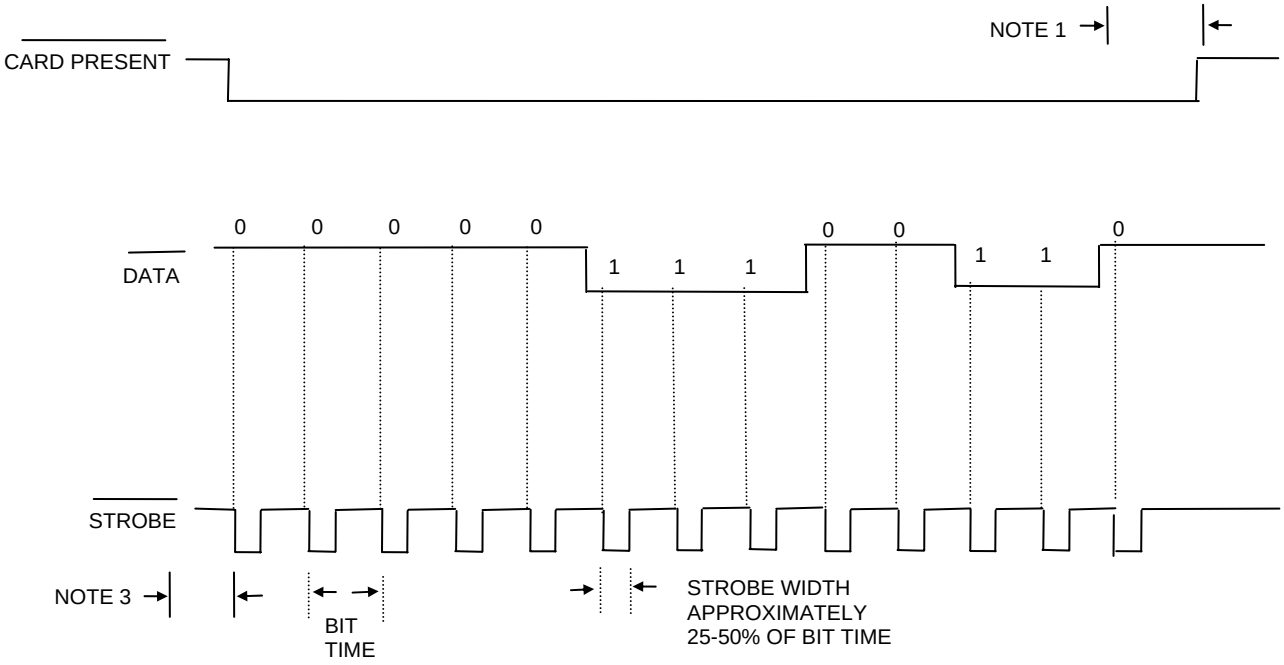


Figure 2-2. Mounting Dimensions

TIMING

Figure 2-3 shows the timing when a card is inserted or withdrawn.



NOTES

1. TIME OUT OF THE CARD PRESENT SIGNAL OCCURS APPROXIMATELY 50 MS AFTER THE LAST STROBE TRANSITION.
2. DATA IS VALID 1.0 μS (MINIMUM) BEFORE THE NEGATIVE EDGE OF STROBE.
3. 8 OR 9 HEAD FLUX REVERSES FOR LOW DENSITY CONFIGURATION AND 16 OR 17 FOR HIGH DENSITY CONFIGURATION.

Figure 2-3. Timing

Card Present

The Card Present signal is low when a recorded card is being moved across the read head. The Card Present signal is “Anded” with the rear sensor to ensure that Card Present will go high when the card is fully inserted into the Reader.

Data

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

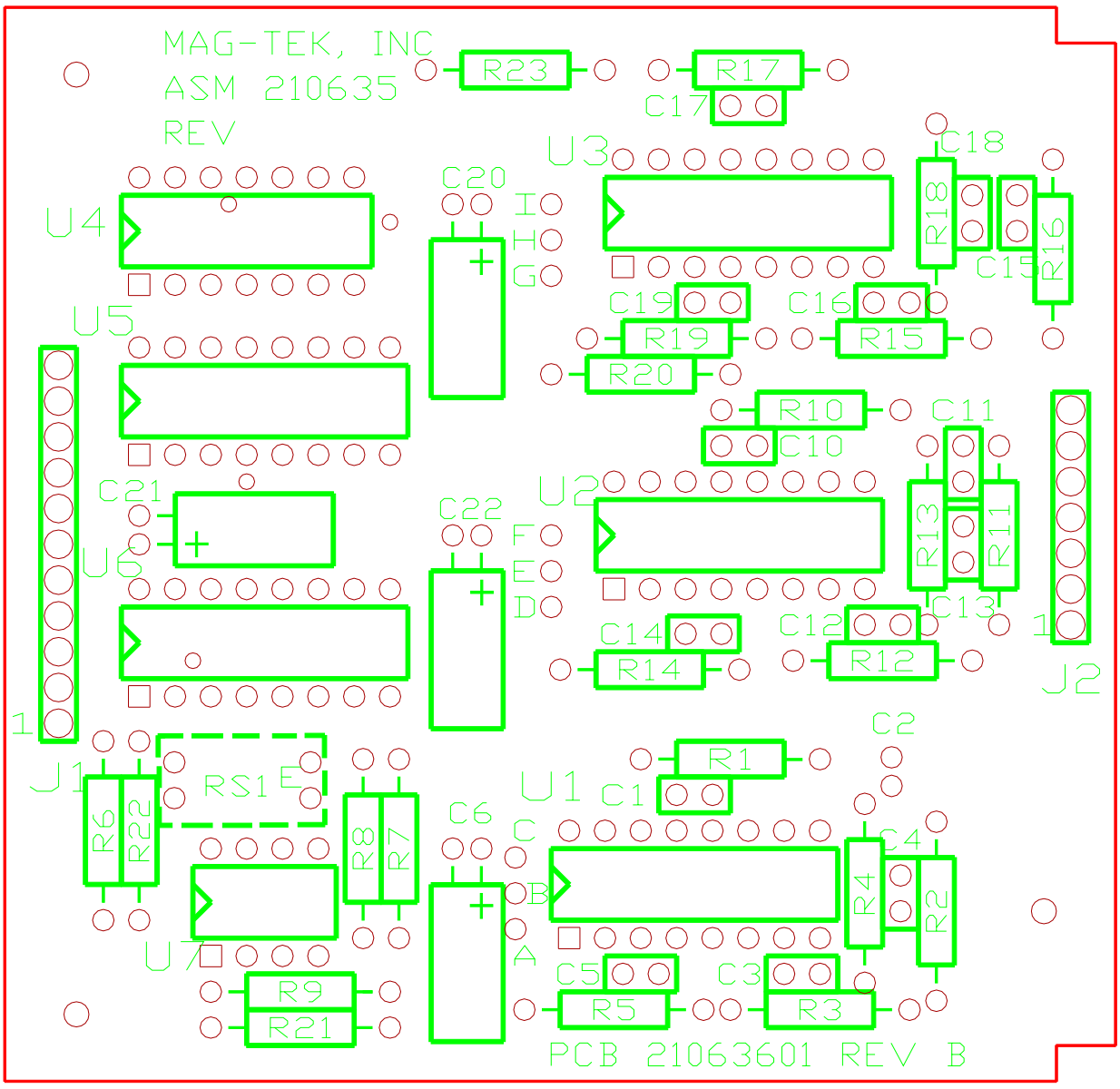
Strobe

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.

SECTION 3. DRAWINGS

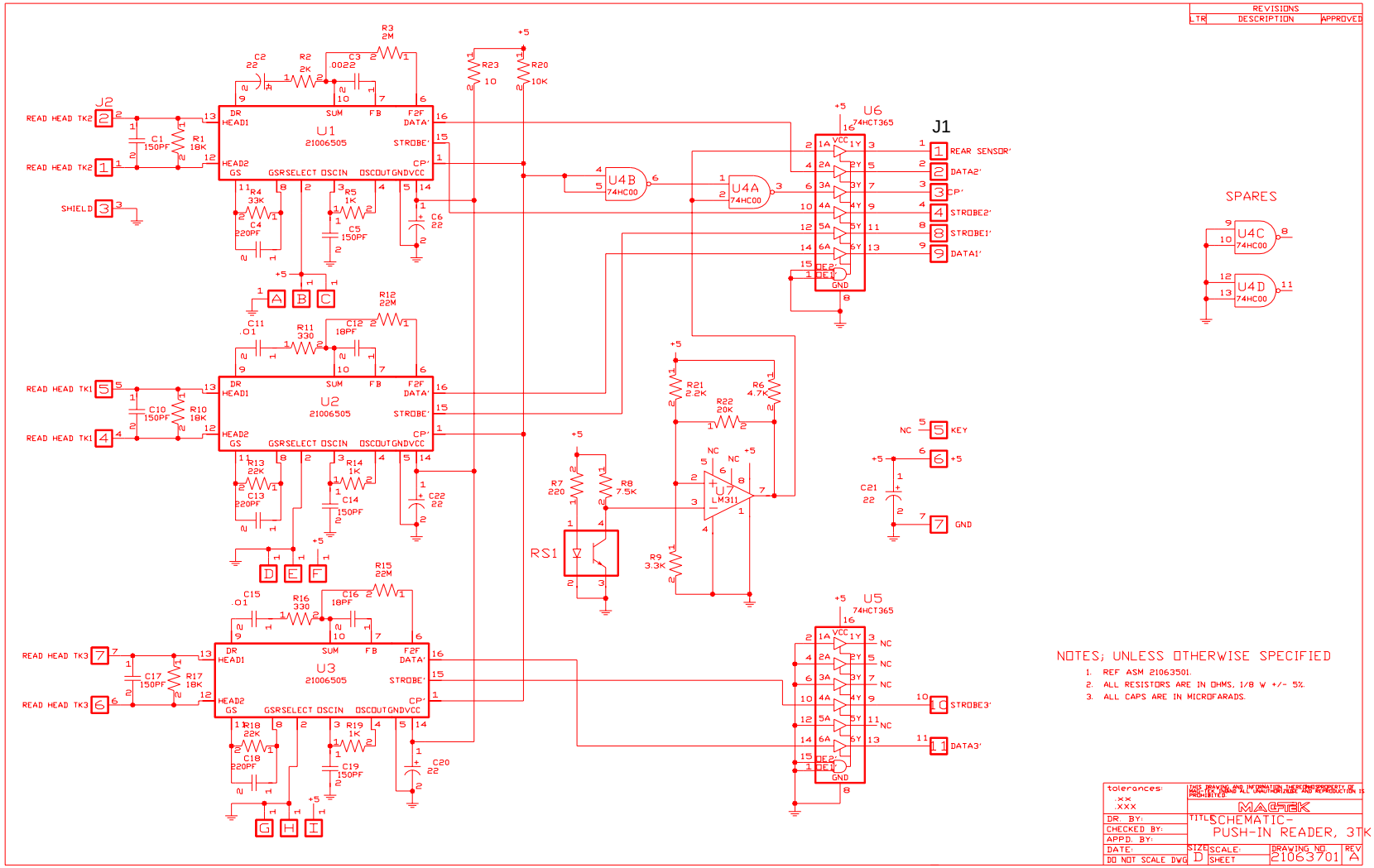
This section contains the following drawings:

Drawing	**Number**
PCB Layout	2106301 Rev B
Schematic - Push-in Reader, 3TK	2106701 Rev A



Note

Components will be omitted on unused tracks.



***Note**: Components will be omitted on unused tracks*