MICRImage
CHECK READER
TECHNICAL REFERENCE MANUAL

Manual Part Number: 99875173 Rev 8

OCTOBER 2008

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	20 Oct 00	Initial Release
2	27 Jun 01	Front Matter: Changed Limited Warranty to exclude Scan Bar. Sec 2: Added two cabling diagrams, Terminal and Auxiliary Device and PC and Net Connection. Moved Check Path Cleaning to Sec 3.
3	2 Aug 01	Front Matter, Agency page: Editorial changes to CE and UL/CUL.
4	12 Oct 01	Front Matter: New Figure 1-1, added MSR. Section 1: Added description and P/N of MSR. New Table 1-1, added list of cables. Table 1-2 changed document size from 9" to 8.5" max.. Editorial Changes. Section 2: New Figure 2-1, added MSR and editorial changes. Section 3: New Figure 3-2, added MSR orientation Modified Figures 3-3 and 3-4, added new procedure for opening and closing unit for imaging bar. New Figures 3-5 and 3-6 for new cleaning procedures. Modified Figure 3-7 for closing.
5	9 May 02	Sec 1: Added 2 more Configurations and clarified features; added 1 more Cable; clarified Spec for interface option. Sec 2: changed Fig 2-4 and 2-5 for clarification. Sec 3: Clarified Card Reading Procedure.
6	16 Jul 02	Front Matter: Added FCC, Part 68 Notice. Changed MagTek to MagTek throughout. Sec 2: Changed title of Fig 2-5 from "Net" to "Ethernet or Modem."
7	27 May 03	Front Matter: added ISO line to logo, changed Tech Support phone number, added new warranty statement
8	18 Aug 03	Sec 1, Features: Deleted "Horseshoe design…." Added "Horseshoe check path…" and "Configurable Enhanced Reading (ER) …"

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 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 requirements was performed by an independent laboratory. The unit under test was found compliant to Class A.

UL/CSA

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

FCC PART 68 NOTICE

The following refers to MICRImage readers with internal modem only:

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the bottom cover of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

The registration jack Universal Service Order Code (USOC) used by this equipment is RJ-11C. A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant modular plug is provided with this product. This equipment is designed to be connected to a compatible modular jack using a telephone cord that is also compliant. See installation instructions for details.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. The REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (*e.g.*, 03 is a REN of 0.3).

If the MICRImage with internal modem equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If you experience trouble with this equipment, refer to the page titled Limited Warranty near the front of this manual for contact, repair or warranty information. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

There are no user serviceable parts on the modem contained inside this equipment.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

If your business has specially wired alarm equipment connected to the telephone line, ensure the installation of the MICRImage with internal modem does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

TABLE OF CONTENTS

FIGURES

TABLES

Figure 1-1. MICRImage Check Reader with MSR

SECTION 1. OVERVIEW

The MICRImage™ Check Reader is both a MICR Reader (Magnetic Ink Character Recognition) and a check-imaging device. The MICRImage reads the MICR character set at the bottom of a check, and the Imager produces a digitized image of the entire check. The characters and the image can be transmitted to a Host device. The Host device then uses a specific authorization or verification process to validate a business transaction.

The MICRImage Reader improves accuracy and speed because there is no manual data entry; therefore there are no keying errors or unwanted delays.

Both the MICR Reader and the Imaging device will communicate with the Host system using a standard RS-232 interface (contact the factory for other interfaces). MICR data is transmitted as ASCII characters (See Appendix B). The MICRImage Reader has the capability of supporting some hardware handshaking signals.

An optional three-track MSR autodiscriminates different card formats: ISO (International Standards Organization), CDL (California Drivers License), or AAMVA (American Association of Motor Vehicle Administrators).

CONFIGURATION

Configurations are as follows:

Part Number	Description
22410002	MICRImage, RS-232
22410003	MICRImage, RS-232, with 3-Track MSR
22410004	MICRImage, RS-232, with Ethernet
22410005	MICRImage, RS-232, with Ethernet, 3-Track MSR
22410006	MICRImage, RS-232, with V. 34 Modem
22410007	MICRImage, RS-232, with V. 34 Modem, 3-Track MSR

FEATURES

The following is a list of features of the MICRImage Reader:

- Full MICR check reader compatible with existing applications
- Horseshoe check path design allows capture of MICR data and check image in a single pass
- Configurable Enhanced Reading (ER) feature allows for automated confirmation of MICR data by comparing the results of multiple MICR reads (up to 3 reads).

- Automatic parsing of MICR fields: transit, account, etc.

- Extensive list of formats to transmit MICR data.
- Capable of scanning 200 dpi image of entire front of check
- CCITT G4 Image Compression
- Ability to send complete image or user-specified portions
- Supports dual interface paths, one for MICR, one for image data
- Dual RS-232 Interface Support
- Models available with Ethernet or V. 34 Modem
- Optional 3-track MSR (Magnetic Stripe Reader)
- Reads E13-B and CMC-7 MICR fonts
- Dynamic Thresholding for image background removal

ACCESSORIES

Accessories available for the MICRImage Reader include:

- Host Interface Cables (See Table 1-1)
- AC Power Adapter with Cable, 120VAC to 12 VDC, 1.5 Amp, Part Number 64300090
- MICRbase Program, Part Number 22000021
- Sample Checks, Part Number 96530005
- Cleaning Cards P/N 96700004
- Cleaning Swabs P/N 97200078

Table 1-1. MICRImage Cables

Part Number	Description
22410302	RS232, DB9F, gray, 8 ft.
22410306	RS232, DB9F + RS232, DB9F, gray, 8 ft.
22410307	RS232, DB9F + Ethernet, RJ8 socket, gray, 8 ft.
22410308	RS232, PC-DB9F + RS-232-DB25M, gray
22410309	RS232, PC-DB9F + RS-232-DB9M, gray
22410310	RS232, PC-DB9F + Modem RJ-11 Socket

SPECIFICATIONS

Table 1-2 lists the specifications for the MICRImage Reader.

Table 1-2. Specifications

OPERATING	
Reference Standards	ANSI X9.27
Power Input	12VDC regulated, 1.5 Amp
Current (Idle) (Operating)	300 mA 1.5 A Max
MTBF	Electronics: 125,000 hours Check Read Head: 1,000,000 passes MSR Read head: 1,000,000 passes
Document Speed	10 ips
Document Size	4"x 8.5" Maximum
Image Resolution	200 dpi
MICR fonts supported	E13-B CMC-7
Interface Options	Primary: RS-232, RS-485, IBM 4683 Secondary: RS-232, Ethernet 10 Base-T, V.34 Modem
MECHANICAL	
Dimensions	Length 9.0”, Width 3.9”, Height 6.0”
Weight:	2.5 lbs. Adapter included
Connector: Power and Communication	DB25 female
ENVIRONMENTAL	
Temperature Operating Storage	 0°C to 50°C (32°F to 122°F) -30°C to 70°C (-22°F to 158°F)
Humidity Operating Storage	 10% to 90% noncondensing Up to 100% noncondensing
Altitude Operating Storage	 0 -10,000 ft (0 - 3,048m) 0 - 50,000 ft (0 - 15240m)

SECTION 2. INSTALLATION

The installation for the MICRImage Check Reader is described below. Figure 2-1 shows the unit with the MSR.

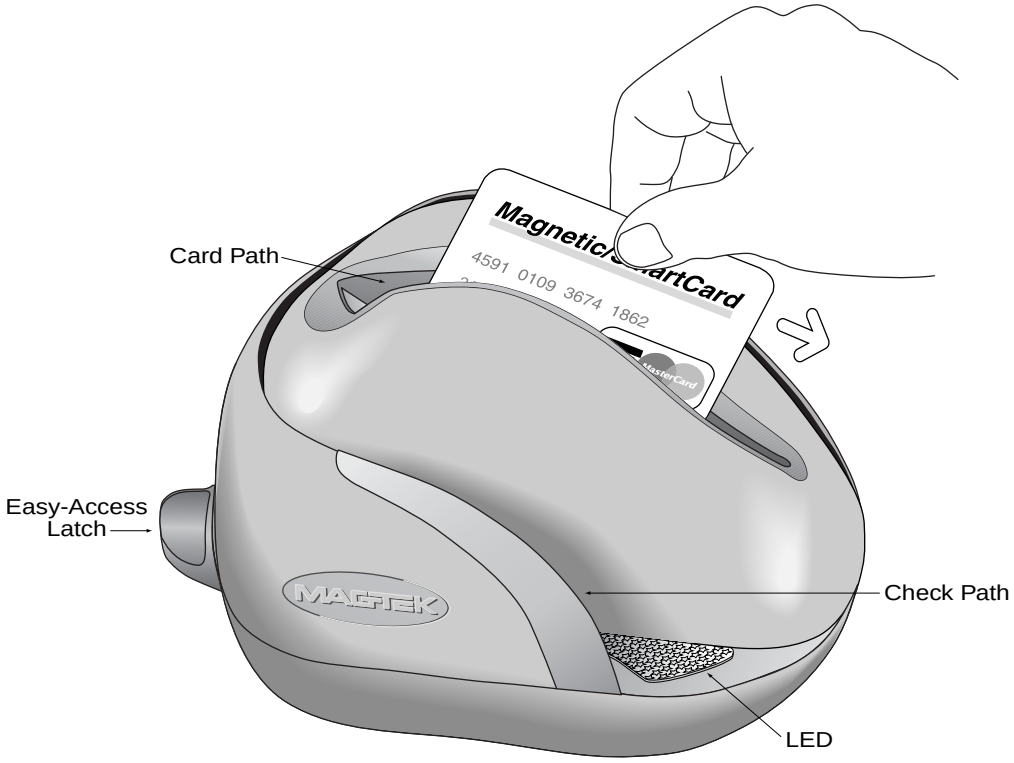


Figure 2-1. MICRImage with MSR

REQUIREMENTS

The following is required for the Installation:

- MICRImage
- Interface Cable,
- Power Adapter 12 VDC, 1.5 Amp

CABLING PROCEDURE

The pin lists for all connections are shown in Appendix A. Perform the following steps:

1. Connect the male DB25 connector to the MICRImage as shown in Figure 2-2.

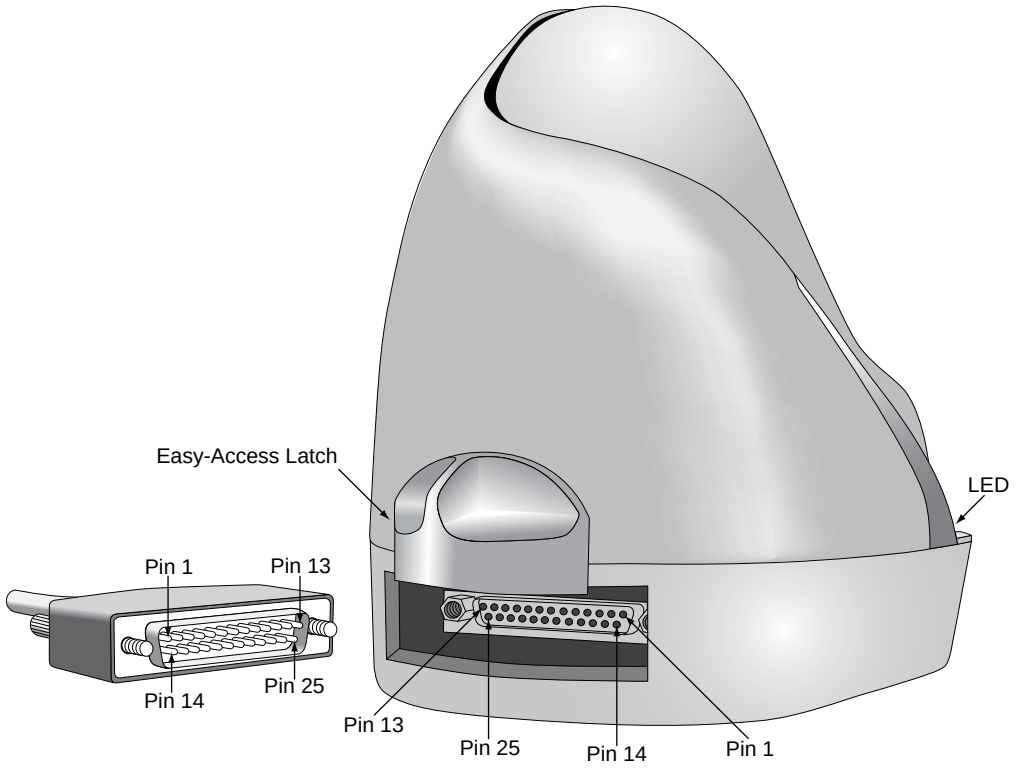


Figure 2-2. DB25 Connection

2. Connect the DB9 connector to the PC as shown in Figure 2-3, 2-4, and 2-5.

3. Connect RJ45 Jack to the network connection as indicated in Figure 2-5.

4. On the AC power adapter, connect the jack to the plug on the cable.

5. On the AC power adapter, connect the plug to the wall outlet.

6. The LED indicator on the MICRImage Reader should turn on to a steady green. The LED indicator is located on the slot where the check is first inserted for reading (see Figure 2-1).

Caution

Do not place the MICRImage Reader within 6 inches of a computer monitor or power supply. These devices may cause undesirable interference with the check reading operation.

For a single PC, install the MICRImage cables as shown in Figure 2-3.

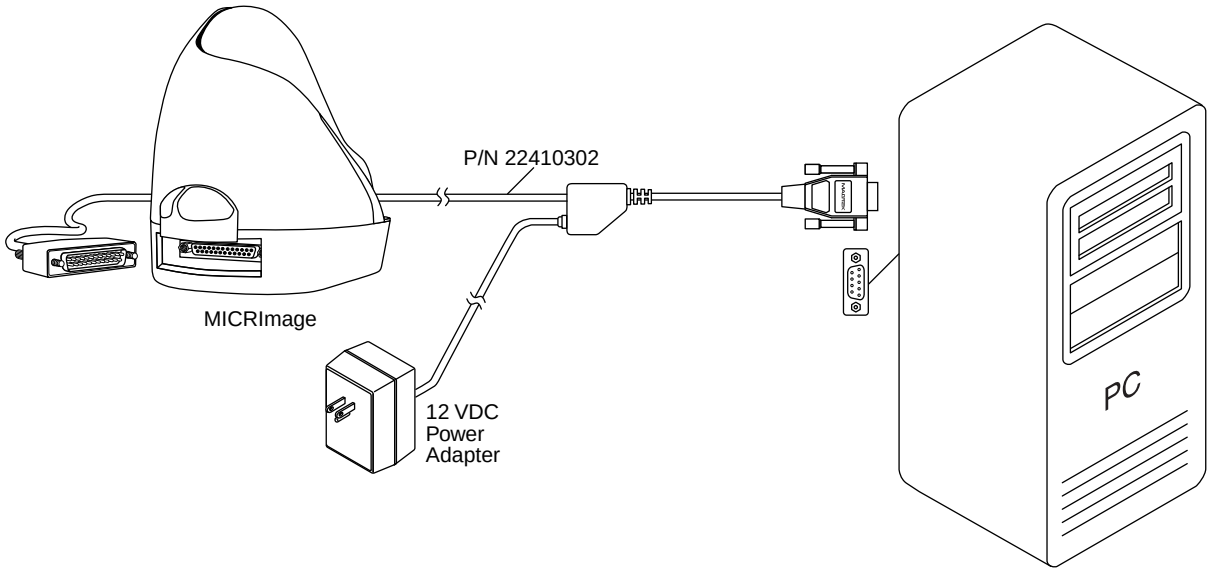


Figure 2-3. Cabling – Single PC

For a Terminal and Auxiliary Device, install the MICRImage cables as shown in Figure 2-4.

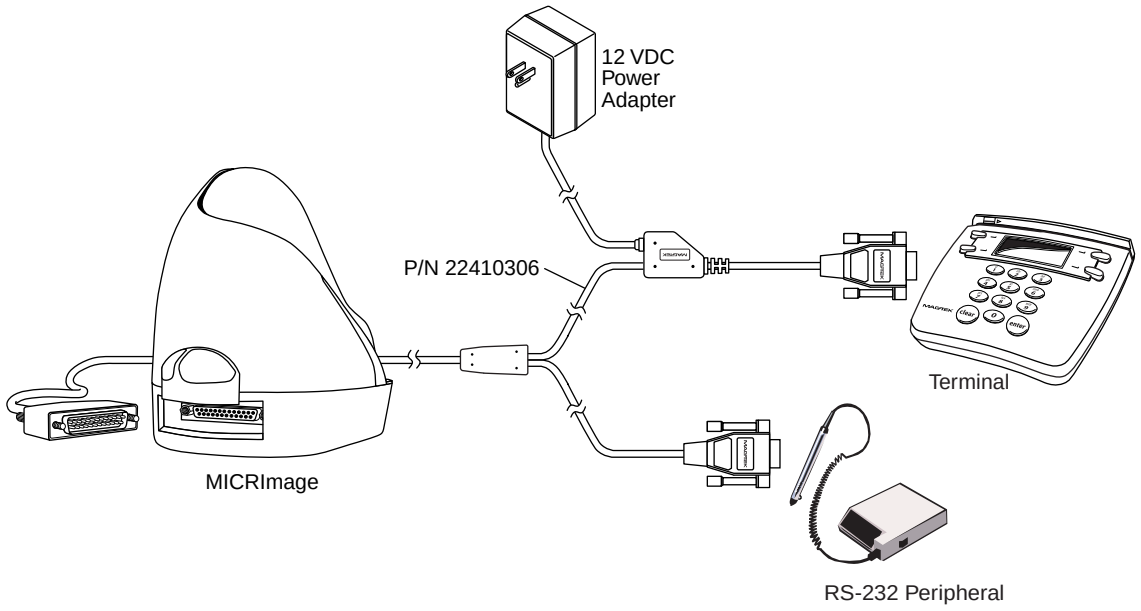


Figure 2-4. Cabling –Terminal and Auxiliary Device

For a PC and Network connection, install the MICRImage cables as indicated in Figure 2-5.

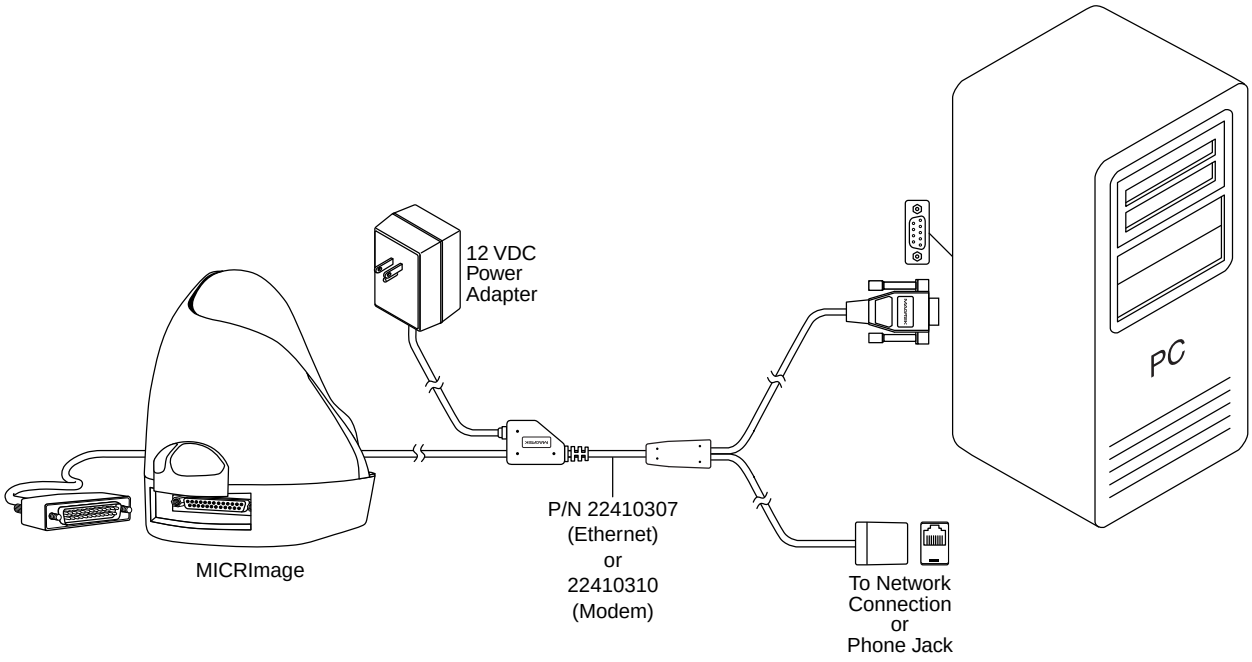


Figure 2-5. Cabling – PC and Ethernet or Modem Connection

SECTION 3. OPERATION

This section contains check and card reading and cleaning procedures and LED indicator states.

CHECK READING PROCEDURE

1. Orient the check so the MICR line is down and the printed side faces the center of the MICRImage as indicated in Figure 3-1.

2. Drop the check so the leading edge is in the open slot. Slide the check forward.

3. When the MICRImage detects the presence of the check, the motor will turn on. At this time gently urge the check forward until the unit grabs the check. When this happens, release the check. The check will then be transported around the check path and will exit through the other side.

4. After the check is read, the MICRImage will transmit the data as specified by the parameters.

5. Remove the check.

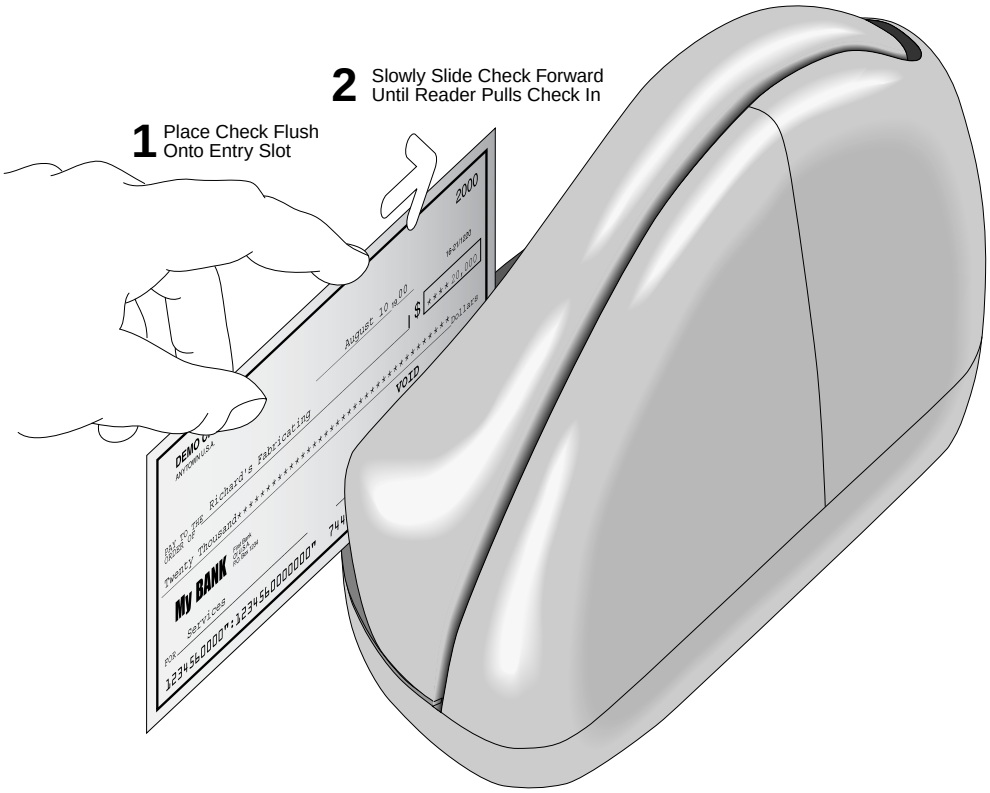


Figure 3-1. Check Orientation - Insertion

CARD READING PROCEDURE

1. Orient the card so that the magnetic stripe is down and facing away from the logo on the unit and toward the wide color stripe on the MRS, as indicated in Figure 3-2.

2. Slide the card in one motion from the top of the unit down through the slot as indicated in the illustration.

3. After the card is read, the MICRImage will transmit the data as specified by the parameters.

Figure 3-2. Optional Magnetic Swipe Reader Orientation

LED INDICATORS

Table 3-1 describes the LED indicator conditions for check and card reading operations. The LED indicator is located below the slot where the check is first inserted for reading.

Table 3-1. LED indicators

LED INDICATOR	DESCRIPTION
OFF	Power off
SOLID GREEN	Ready to read check or card
OFF→ SOLID RED	Check read error
OFF→ SOLID GREEN	Good read
FLASH GREEN	Needs initialization*
FLASH RED/GREEN	Magnetic Interference Detected
FLASH RED/GREEN	Data sensor blocked (motor does not run)*
FLASH RED	Motor sensor blocked (motor does not run)*

*Refer to "Section 4. Troubleshooting Guide."

CLEANING

Clean the outside of the MICRImage unit with a soft, damp cloth and wipe with a dry cloth.

Caution

To avoid damaging the read head, do not get the inside of the check or card paths wet.

Use the Cleaning Card, P/N 96700004, on the MSR as described below. Use the Cleaning Swab, P/N 97200078, to clean the Imager Scan Bar as shown and described below.

Opening the Unit

To open the check path and Imager, grip the access latch, and pull up and then back as shown in Figure 3-3.

MSR Cleaning Card

Orient the cleaning card similar to Figure 3-2. Swipe the card two or three times to clean the head.

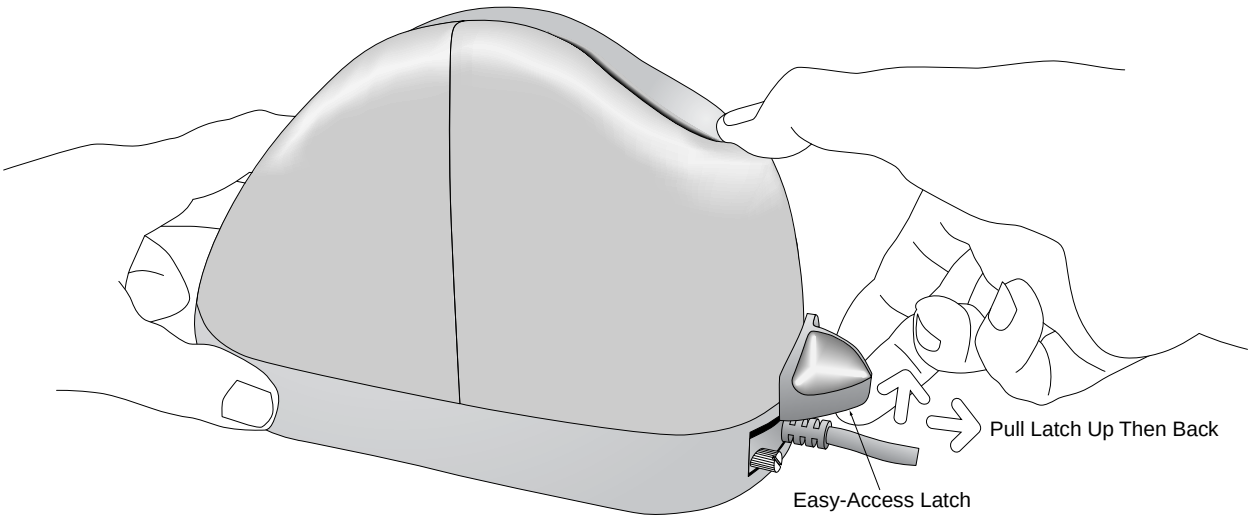


Figure 3-3. Opening the Unit

Cleaning Check Path and Imager

1. When the unit is open, as shown in Figure 3-4, check the path for debris. To clean, turn the unit over and tap gently on the bottom.

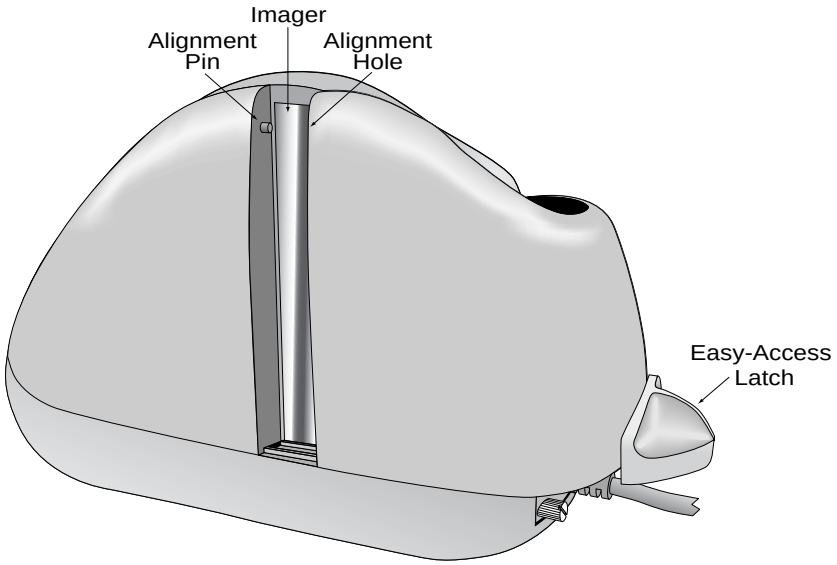


Figure 3-4. Cleaning Check Path and Imager

2. Check the Imager to ensure there is no build-up of ink or paper debris.

3. To clean the Imager, use the cleaning swab, shown in Figure 3-5. Activate the swab by bending the plastic tube until you hear a snap.

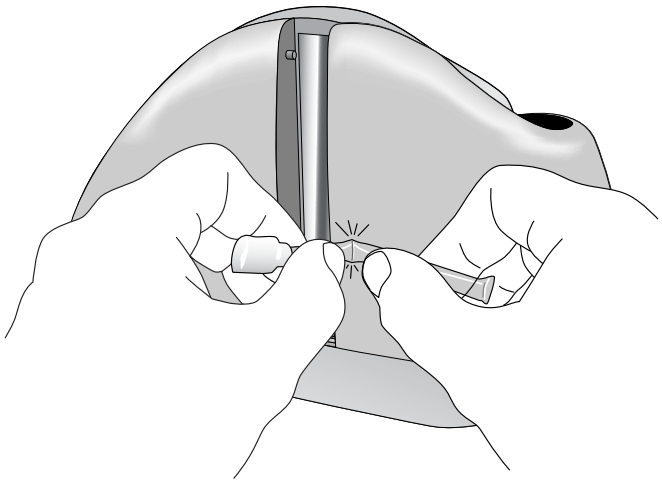


Figure 3-5. Activating the Cleaning Swab

4. Wait until the liquid moves into the sponge tip. It should be damp when touched.

5. When the tip of the swab is damp, clean the Imager by wiping the swab up and down the Imager as indicated in Figure 3-6.

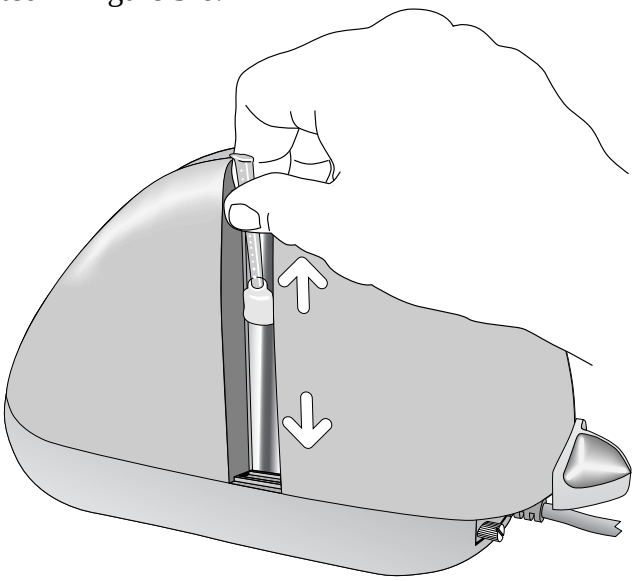


Figure 3-6. Cleaning the Imager

Closing the Unit

1. Hold the unit as shown in Figure 3-7. Push the covers together while ensuring alignment of the pin and hole.

2. The unit is properly closed when the two panels are flush and the latch has "**clicked**" into position.

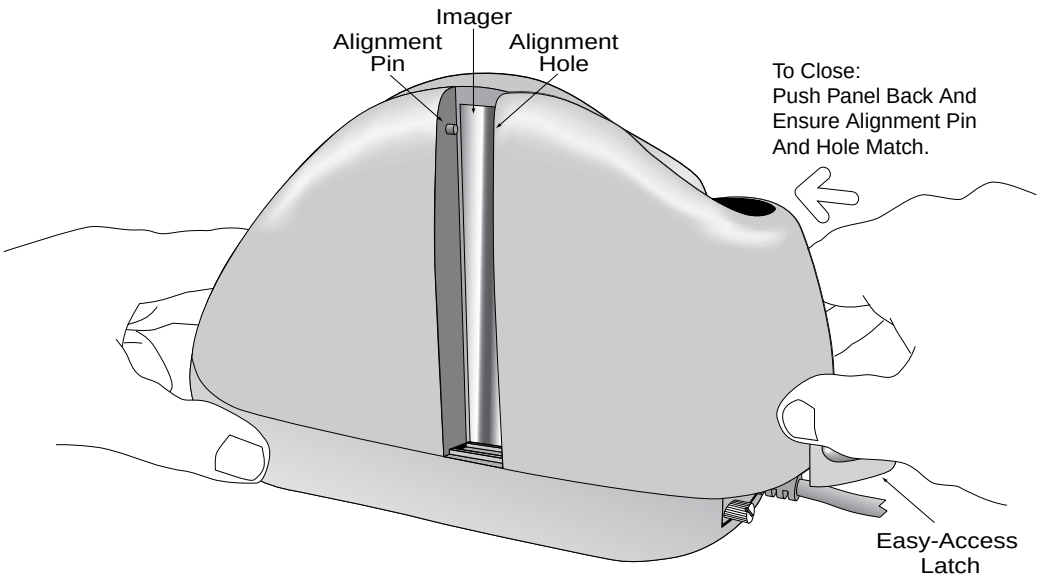


Figure 3-7. Closing the Unit

SECTION 4. TROUBLESHOOTING GUIDE

REQUIREMENTS

- Personal Computer.
- Interface Cable, Host End = DB9 female, Part Number 22410302.
- AC adapter, P/N 64300090.
- MICRbase Program, P/N 22000021
- Sample checks, P/N 96530005.
- A small bottle of compressed air.

SET-UP

1. Plug DB25connector of the RS232 cable into the MICRImage Reader.
2. Plug the DB9 connector of the RS232 cable into the PC.
3. Power on the MICRImage Reader.
4. Run the MICRbase program on the PC.
5. Start trouble-shooting procedure at Step 00.

00	**Check LED**

Check the status of the LED indicator:

◊ off, continue to step 01.
◊ green, continue to step 02.
◊ blinking red, continue to step 11.
◊ blinking green, continue to step 16.
◊ blinking red/green, continue to 12.
◊ red or orange, continue to step 17.

01	Check the Power to the MICRImage Reader

Possible causes for this problem are:

- AC adapter connection to outlet - make sure the AC adapter is securely connected to outlet on the wall or power strip.
- AC adapter connection to MICRImage Reader - make sure the AC adapter is securely connected to the power jack on the Cable.
- Power strip - if using a power strip, make sure the strip is connected to outlet on the wall and the switch on the strip is turned on.
- AC adapter is defective - replace the AC adapter.

Determine if any of the conditions described above are true:

◊ If yes, rectify and continue to step 00.
◊ If no, continue to step 17.

02	Read a check

Read a check through the MICRImage Reader:

◊ If the check is transported all the way around the check path, continue to step 03.
◊ If the check gets "stuck" in the check path, continue to step 10.
◊ If the motor does not turn on, continue to step 17.

03	Did PC receive data?

After the check is read, did the PC receive any data?

◊ If yes, continue to step 04.
◊ If no, continue to step 05

04	Analyze data

Analyze the data received by the PC:
◊ If the data is good, continue to step 15.
◊ If the data contains one or more '?', continue to step 06.
◊ If the data is missing characters, continue to step 07.
◊ If the data is garbled, continue to step 08.
◊ If the data is good but not what is expected, continue to step 09.

05	Verify parameters

Use MICRbase to verify the following parameters:
- "Send Data After Error" - if this option is set to NO, the MICRImage Reader will not send any data after a read error. Use SET-MICR to change this option to YES.
- "Use CTS/DSR" - if this option is set to USE, the MICRImage Reader will not send any data unless the CTS and DSR signals are enabled. Use SET-MICR to change this option to IGNORE.

Determine if any of the conditions described above are true:
◊ If yes, rectify and continue to step 02.
◊ If no, continue to step 13.

06	Read error

Possible causes for this problem are:
- Interference - the MICRImage Reader may be too close to a monitor, AC adapter or magnetic device. Move the MICRImage Reader away from the source of interference.
- Printing problem - the check being read may not meet the requirements of the ANSI Standards. Use one the sample checks provided by MagTek .
- Feeding the check - do not hold on to the check as it goes around the path. Release the check immediately after the MICRImage Reader "grabs" it. Also, make sure that the front end is not tilted up while the check is being read.

Determine if any of the conditions described above are true:
◊ If yes, rectify and continue to step 02.
◊ If no, continue to step 10.

07	Missing characters

Possible causes for this problem are:

- Character rate - the character rate at which the MICRImage Reader is transmitting data may be too fast for the PC. Use MICRbase to set the "Inter-character Delay" option to YES.
- Feeding the check - When feeding the check, make sure that the MICR line is at the bottom and the printed side of the check is facing the MagTek logo on the MICRImage Reader.

Determine if any of the conditions described above are true:

◊ If yes, rectify and continue to step 02.
◊ If no, continue to step 08.

08	Communication parameters do not match

Verify that the communication parameters of the MICRImage Reader match the parameters of the PC. Use MICRbase to verify/change the communication parameters.

Determine if the condition described above is true:

◊ If yes, rectify and continue to step 02.
◊ If no, continue to step 14.

09	Incorrect Format

Possible causes for this problem are:

- Incorrect Format Number - the current Check data format in the MICRImage Reader is not the desired format. Use MICRbase to verify/change the format.
- Incorrect Message Format - the current Message format in the MICRImage Reader is not the desired format. Use MICRbase to verify/change the Message format.

Determine if any of the conditions described above are true:

◊ If yes, rectify and continue to step 02.
◊ If no, continue to step 17.

10	**Path is obstructed**

Foreign debris is obstructing the check path:

- Loose debris - power off the MICRImage Reader and refer to Section 3, Check Path Cleaning.
- Wedged debris - the debris is wedged in and cannot be removed with the procedure described above.

Is the foreign debris removable?

◊ if yes, remove and continue to step 02.
◊ If no, continue to step 17.

11	**Motor sensor is blocked**

The Motor sensor may be blocked by dust build-up or foreign debris (see Figure 5-1). Use forced air to clean the sensor.

Power off the MICRImage Reader and then power on again, observe the LED indicator:

◊ If the LED indicator blinks red, continue to step 17.
◊ Any other LED indicator status, continue to step 00.

12	**Data sensor is blocked**

The data sensor may be blocked (see Figure 4-1). Refer to Section 3 for access and use forced air to clean the sensor.

Power off the MICRImage Reader and then power on again, observe the LED indicator:

◊ If the LED indicator blinks red/green, continue to step 17.
◊ Any other LED indicator status, continue to step 00.

13	No MICR data detected

Possible causes for this problem are:

- No MICR characters - the ink used to print the MICR characters does not have magnetic properties. Try one of the sample checks provided by MagTek.
- Feeding the check - When feeding the check, make sure that the MICR line is at the bottom and the printed side of the check is facing the MagTek logo on the MICRImage Reader.

Determine if any of the conditions described above are true:

◊ If yes, rectify and continue to step 02.
◊ If no, continue to step 14.

14	Cable problem

Possible causes for this problem are:

- Loose connection - the cable connector on the PC or the MICRImage Reader may be loose. Make sure that both connectors are tightly connected.
- Damaged cable - the connectors, pins or wires in the cable may be damaged. Replace cable.

Determine if any of the conditions described above are true:

◊ If yes, rectify and continue to step 02.
◊ If no, continue to step 17.

15	No problem found

The MICRImage Reader is operating properly. If you have additional concerns or requirements please contact your MagTek representative.

16	Read Insta-Change check

Read Insta-Change check with the appropriate settings. Return to step 00. If condition persists, continue to step 17.

17	Return MICRImage Reader to MagTek

The MICRImage Reader has a problem that needs further analysis, testing, and possibly repair. Please contact the MagTek Help Desk at (888) 624-8350, and make arrangements to send the unit back to MagTek. Include a detailed description of the problem.

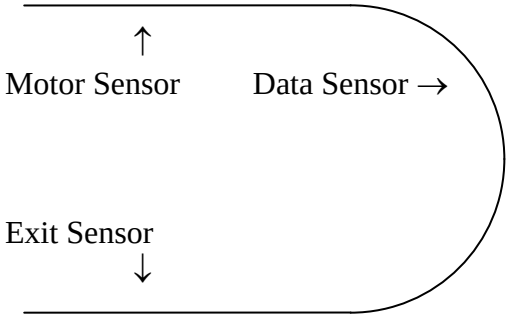


Figure 4-1. Sensor Location

APPENDIX A. INTERFACE CABLE PIN LISTS

The pin list for the DB9 and DB25 Interface Connectors are shown in Table A-1.

Table A-1. DB9, DB25 Interface Connector Pin List (P/N 22410302)

P1 PIN NUMBER DB-9	P1 SIGNAL (Host as Reference)	DESCRIPTION	P2 PIN NUMBER	P2 DB-25 SIGNAL
2	RXD	Received Data. Receives data from the MICRImage Reader to the Host.	11	TXD
3	TXD	Transmitted Data. Transmits data from the Host to the MICRImage Reader.	21	RXD
5	GND	Ground	16	GND
7	RTS	Request to Send. Sends a signal to the MICRImage Reader to indicate that the Host is ready to receive data.	10	CTS
8	CTS	Clear to Send. Receives a signal from the MICRImage Reader to indicate that the MICRImage Reader is ready to send data.	23	RTS
6 4	DSR DTR	Data Set Ready. Data Terminal Ready.		
			13	12V
			25	12V
			12	GND
			24	GND
			22 9	DTR DSR
SHELL (DRAIN WIRE)				SHELL (DRAIN WIRE)

APPENDIX B. ASCII CODES

The following is a listing of the ASCII (American Standard Code for Information Interchange) codes. ASCII is a 7-bit code, which is represented here with a pair of hexadecimal digits.

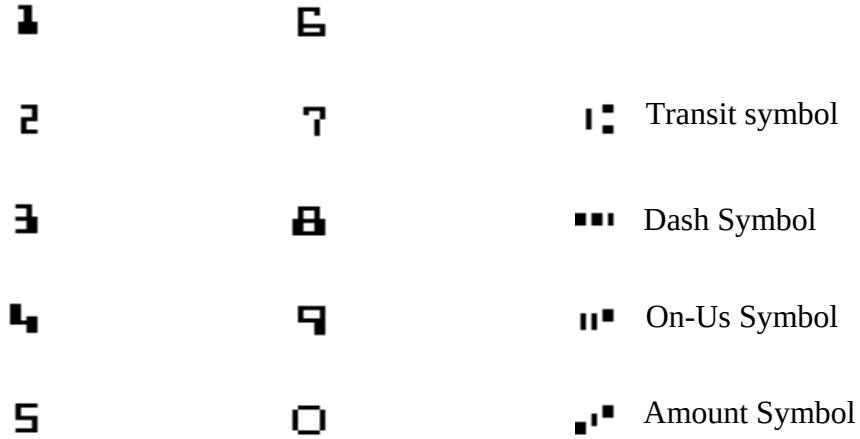
ASCII	Hex value	ASCII	Hex Value	ASCII	Hex Value	ASCII	Hex Value
NUL	00	SP	20	@	40	`	60
SOH	01	!	21	A	41	a	61
STX	02	"	22	B	42	b	62
ETX	03	#	23	C	43	c	63
EOT	04	$	24	D	44	d	64
ENQ	05	%	25	E	45	e	65
ACK	06	&	26	F	46	f	66
BEL	07	'	27	G	47	g	67
BS	08	(	28	H	48	h	68
HT	09	)	29	I	49	i	69
LF	0A	*	2A	J	4A	j	6A
VT	0B	+	2B	K	4B	k	6B
FF	0C	,	2C	L	4C	l	6C
CR	0D	-	2D	M	4D	m	6D
SO	0E	.	2E	N	4E	n	6E
SI	0F	/	2F	O	4F	o	6F
DLE	10	0	30	P	50	p	70
DC1	11	1	31	Q	51	q	71
DC2	12	2	32	R	52	r	72
DC3	13	3	33	S	53	s	73
DC4	14	4	34	T	54	t	74
NAK	15	5	35	U	55	u	75
SYN	16	6	36	V	56	v	76
ETB	17	7	37	W	57	w	77
CAN	18	8	38	X	58	x	78
EM	19	9	39	Y	59	y	79
SUB	1A	:	3A	Z	5A	z	7A
ESC	1B	;	3B	[	5B	{	7B
FS	1C	<	3C	\	5C	|	7C
GS	1D	=	3D	]	5D	}	7D
RS	1E	>	3E	^	5E	~	7E
US	1F	?	3F	_	5F	DEL	7F

APPENDIX C. CHECK READING

The characters printed on the bottom line of commercial and personal checks are special. They are printed with magnetic ink to meet specific standards . These characters can be read by a MICRImage Reader at higher speeds and with more accuracy than manual data entry. Two MICR character sets are used world wide; they are: E13-B and CMC-7. The E13-B set is used in the US, Canada, Australia, United Kingdom, Japan, India, Mexico, Venezuela, Colombia, and the Far East. The CMC-7 set is used in France, Spain, other Mediterranean countries, and most South American countries.

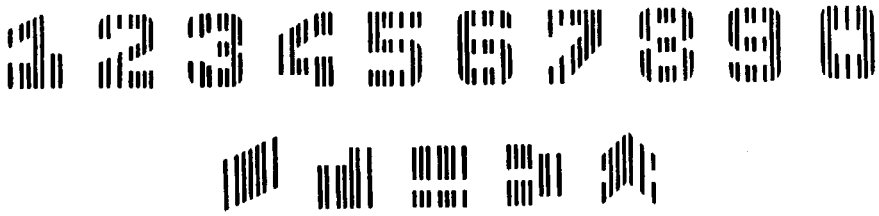
E13-B CHARACTER SET

The MICR font character set E13-B includes digits 0 through 9 and four symbols. The numbers found on U.S. checks are of the E13-B character set. The numbers and symbols of E13-B are as follows:



CMC-7 CHARACTER SET

The numbers and symbols of the CMC-7 character set are as follows:



SI SII SIII SIV S5

The nonnumeric CMC-7 characters are translated by the MICRImage Reader as shown in Table C-1.

Table C-1. CMC-7 Nonnumeric Characters

CMC-7 Character	MICRImage Reader Output
SI	A
SII	B
SIII	C
SIV	D
SV	E

CHECK LAYOUTS

Personal checks with MICR fields are shown in Figure C-1. Business checks are shown in Figure C-2. The digits 1 through 4 in the illustrations are described below under MICR Fields.

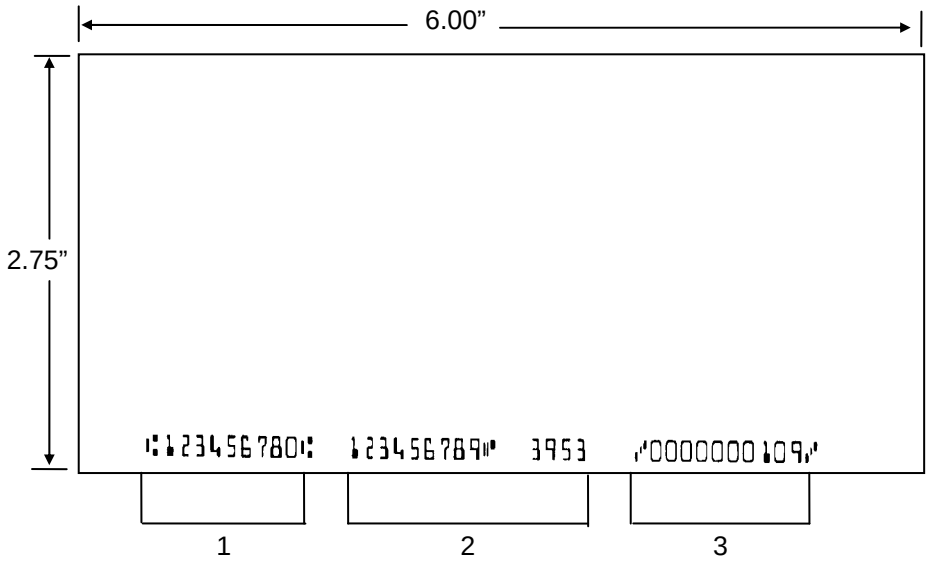


Figure C-1. Personal Checks

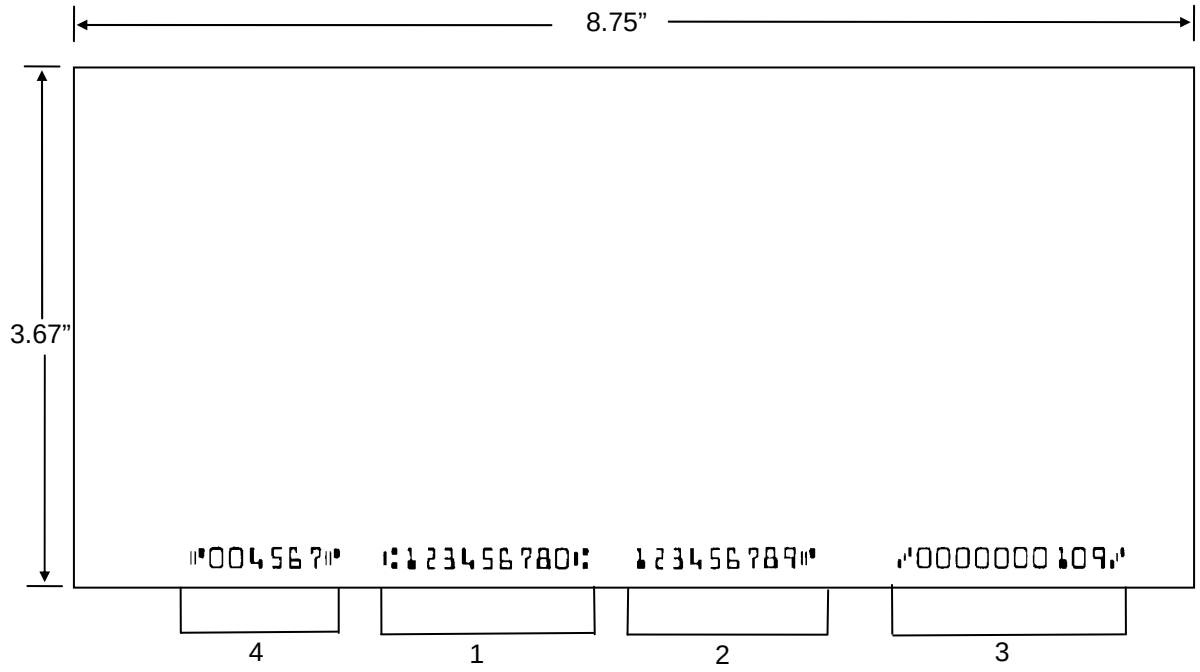


Figure C-2. Business Checks

MICR FIELDS

The numbers 1 through 4 refer to the numbers below the checks on the illustration and represent the 4 MICR fields.

1-Transit Field

The Transit field is a 9-digit field bracketed by two Transit symbols. The field is subdivided as follows:

- Digits 1-4 Federal Reserve Routing Number
- Digits 5-8 Bank ID Number (American Banking Association)
- Digit 9 Check Digit

2-On-Us Field

The On-Us field is variable, up to 19 characters (including symbols). Valid characters are digits, spaces, dashes, and On-Us symbols. The On-Us field contains the account number and may also contain a serial number (Check number) and/or a transaction code. Note that an On-Us symbol must always appear to the right of the account number.

3-Amount Field

The Amount field is a 10-digit field bracketed by Amount symbols. The field is always zero-filled to the left.

4-Auxiliary On-Us Field

The Auxiliary On-Us field is variable, 4-10 digits, bracketed by two On-Us symbols. This field is not present on personal checks. On business checks, this field contains the check serial number.