SERVICE MANUAL



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Previous issue	Subjects covered in the new issue	New pages introduced or amended

FOREWORD

This manual is meant for technicians servicing the MCR33xx card reader/recorder.

NOTE:

The machine must be used solely for the purposes for which it was designed. Any intervention modifying its original operating configuration must be authorized and certified beforehand by the manufacturer.

Custom is not liable for any damages caused by the use of non-original spare parts.

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INTRODUCTION AND FUNCTIONAL DESCRIPTION

The MCR33xx card reader/writer is a compact, versatile peripheral, suitable for the most widely disparate applications, even in the hardest environmental conditions.

In accordance with ISO standards, the MCR33xx can record both low and high coercivity cards, by means of a simple software-driven selection.

Available in different versions depending on the installed options, the MCR33xx can be used manually (in desktop configuration), or in self-service applications (open frame configuration). The desktop version is available with the external 110/230 Volt power supply unit.

Connection with the system is through an RS-232 serial interface.



MCR33xx IN THE SYSTEM



GENERAL CHARACTERISTICS

Fully controlled function by software with autotests, FW download, no jumper or setting. Specific software and driver to test, demo, work and troubleshoot.

Shutter

The shutter (installed only in the self service configuration) is activated by an electromagnet; its open or shut position is detected by a microswitch located on the right side of the electromagnet. On the left side of the inlet is installed a microswitch that detects the presence of the card, while a reading head positioned on the lower side checks the incoming card for the presence of written magnetic tracks, to prevent objects other than written magnetic cards from being inserted into the peripheral.

Card Transport

A stepped motor controls the transport of the card inside the MCR33xx. Three conveyor rollers, moved by three positive drive belts, move the card over the read/write head.

Card Reading/Writing

High and/or low coercivity head mounted on a special support fastened by means of a leaf spring. The head can read and write the tracks through a software selection; there are no jumpers or dip switches.

High precision mechanics let the card slide over special bearings.

Power Supply

Only the desktop version is equipped with an external power supply unit. The self service version is fitted with a 4-way connector, whose specifications are described in the figure that follows. Electronic Board

3

Power supply

MOLEX

Connector

- 1 DC +24V
- 2 gnd
- 3 gnd
- 4 DC +24V (aux)



FUNCTIONAL ASSEMBLIES

- 1 Shutter position microswitch
- 2 Stepper motor
- 3 Chip card contact activation electromagnet
- 4 Chip card contacts
- 5 Electronic board
- 6 Shutter opening electromagnet
- 7 Card presence microswitch
- 8 Reading head to detect incoming written magnetic band
- 9 Inlet photo two (standard)
- 10 Reading/writing photo
- 11- Reading/writing head
- 12 End of path photo
- 13 Inlet photo one (installed only on the version without the shutter)
- 14 Chip card photo



right side



EXTERNAL CONTROLS AND INDICATORS

- 1 ON/OFF switch (only on DESKTOP version)
- 2 LED



3 - RS232 serial connection (male - db9)



BLOCK DIAGRAM



INSTALLATION AND USE

POWER SUPPLY

The MCR33xx is normally factory programmed to the Customer's orders. Any modifications to its programming must be performed by specially qualified personnel.

Power Supply (desktop version)

- Check the power supply transformer to ensure it corresponds to the mains voltage and power supply voltage of the MCR33xx.
- Connect the transformer to a wall outlet.
- Connect the transformer cable to the MCR33xx plug.
- Connect the serial cable RS232

Power Supply (Open Frame version)

• Power with +24V direct current between pins 1 and 2 on the 4-way connector mounted on the electronic board (see the diagram on page 7).

fastening



To fix the MOR33xx use the bench mark described in the picture below

PLEASE NOTE:

TheMCR33xx has been designed to be installed horizontally, as shown in the picture. To install the MCR33xx in a different way please contact the manufacturer first.

IC card interface cable

Pin No	Signal name	I/O	Function
1	C8		IC Contact C8
2	C4		IC Contact C4
3	СЗ		IC Contact C3
4	G (NC)		Connect to the signal ground
5	C7		IC Contact C7
6	C6		IC Contact C6
7	G (NC)		Connect to the signal ground
8	C2		IC Contact C2
9	C1		IC Contact C1
10	C5		IC Contact C5



IC contact connection

Upper position contacts and lower position contacts are being located in serial as shown in the figure below.



SERIAL CONNECTION RS 232

Pin No.	Signal Name	I/O	Function
1	NC	-	
2	RXD(RD)	I	Receive Data
3	TXD(SD)	0	Transmit Data
4	DTR(ER)	0	Data Terminal Ready
5	SGN	-	Signal Ground (0V)
6	DSR(DR)	I	Data Set Ready
7	RTS(RS)	0	Request To Send
8	CTS(CS)	I	Clear To Send
9	NC	-	



Transmission And Control Specification

- 1. Synchronous method : Asynchronous
- 2. Transmission method : Half duplex
- 3. Baud rate: 4800 Bps or 19200 Bps (autodetected)
- 4. Data length : 7 bit + 1 parity
- 5. Stop bit; 1 bit
- 6. Character Code: ASCII
- 7. Parity check method : Even



Transmission Control Method

MCR33xx executes particular operation according to text (command) received from HOST, then reports result of execution to HOST.



NOTE:

BBC & CR are omissible according to initialize command.

STX (02H)	Indicate start of text.
ETX (03H)	Indicate end of text.
ENQ (05H)	Request to send response.
ACK (06H)	Send positive response.
NAK (15H)	Send negative response.
DLE, EOT (10H) (04H)	Clear the line and Reset MCR33xx
CR (0DH)	Carriage return.

Control Characters



I

Comunication Timing Chart

• Ordinary Operation.



COMMUNICATION PROTOCOL DESCRIPTIONS

Command Text Format

"C"	cm	pm	Data		
The first character shall be "C"(-124)					

The first character shall be "C"(=43H). cm : Command code

pm : Parameters

Positive Response Format

"P"	cm	pm	st1	st0	Data

The first character shall be "P"(=50H). cm : Command code pm : Parameters St1, st0 : Status code

Negative Response Format

"N" cm	pm	e1	e0
--------	----	----	----

The first character shall be "N"(=4EH). cm : Command code pm : Parameters e1, e0 : Error code

COMMAND LIST

Cm : Command code pm: Parameters					
Command	cm	Function	pm	Details of operation	
	30H	Initialize MCR33vv	30H	If the card is inside MCR33xx, eject card	
	5011		31H	If card is inside MCR33xx, capture card	
			32H	If card is inside MCR33xx, retain card inside of MCR33xx	
STATUS	31H	Inquire status	30H	Report presence of card & its position	
REQUEUT			31H	Report precence of sensor status in detail	
	32H		30H	Does not refer to Pre-Head	
	5211	Card entry	31H	Pre-Head detects ISO Tr. 2 or Tr. 3 (only desktop)	
EIECT	331	Eject	30H	Move card to Gate from inside MCR33xx	
	5511	Capture	31H	Capture card to rear back of MCR33xx	
			32H	Card in read/write position	
RETRIVE	34H	Retrive	30H	Retrive card which is in Gate position	
		Move card	30H	Only card movement	
		MS#1 read	31H	ISO #1 Track reads Transmit read data	
READ	36H	MS#2 read	32H	ISO #2 Track reads Transmit read data	
		MS#3 read	33H	ISO #3 Track reads Transmit read data	
		All track read	35H	Transmit All channels data	
		Clear memory	36H	Clear out all the stored data for reading and writing	

·		· · · · · · · · · · · · · · · · · · ·		
Command	cm	Function	pm	Details of operation
		Write data	31H	ISO #1 Track writes received data
WRITE	37H		32H	ISO #2 Track writes received data
			33H	ISO #3 Track writes received data
		Cleaning card	30H	Accepts cleaning card
ENB/DIS	ЗАН	Disable	31H	Disable
		Enable	32H	Enable with referring pre-head (only desktop)
			30H	Test motor /solenoid
DIACNOSTIC	3DH		31H	Read sensor and photo
DIAGNOSTIC			32H	Read buffer acquisition tracks
			33H	Read counter
CHIP			30H	Move card to CHIP CARD contact position
CONTACT	40H	H CHIP contact set	32H	Reset CHIP contact
IDENTIFY	41H	Revision	30H	Release PROM revision (firmware)
			31H	Release (download)
		LOW	30H	Low coercivity
COERCIVITY	45H	HIGH	31H	High coercivity
DISABLE RETRY	46H		30H	Only for diagnostic - disable retries on R/W tracks

Status Code

st1, st0 : ICRW status code

ICRW status	Meaning
"00"	No card detected (including card gate)
"01"	Card locates at card Gate
"02"	Card locates inside(Transport)

ERROR CODE

E1, e0 : error code

Error code	Meaning
"00"	A given command code is unidentified
"01"	Parameter is not correct
"02"	Command execution is impossible
"03"	Line error
"04"	Command data error
"05"	Tried to card feed commands before the CHIP contact release command
"06"	
"07"	Retry on R/W disabled
"08"	
"09"	Other command errors
"10"	Card jam
"11"	Shutter failure
"12"	Sensor failure
"13"	Irregular card length (LONG)
"14"	Irregular card lenght (SHORT)
"15"	EEPROM error
"16"	Card position Move
"17"	Jam error at retrieve
"18"	MISHU MIPRE error
"19"	Other mechanical irregularities
"20"	Read error (Parity error)
"21"	Read error (Other errors)
"22"	Write error
"23"	Read error (Only STX-ETX-LCR Card)
"24"	
"25"	

E1, e0 : error code

"26"	
"27"	
"28"	
"29"	
"30"	Power Down
"31"	DSR signal was turned to OFF
"32"	
"33"	
"34"	
"35"	
"36"	
"37"	
"38"	
"39"	
"40"	Card was removed during capture
"41"	Failure at CHIP contact solenoid or sensor
"42"	
"43"	
"44"	
"45"	
"46"	
"47"	
"48"	
"49"	
"50"	
"51"	
"52"	

COMMAND

INIZIALIZE : cm=30H

On power up,MCR33xx needs to be inizialize with INITIALIZE command.

• COMMAND

"C"	30H	pm	33H*	32H*	34H*	30H*	fm	Pd	Wv	Sh	Ds	Ту	Ср

• POSITIVE RESPONSE

"P"	30H	pm	st1	st0

• NEGATIVE RESPONSE

"N" 30H	pm	e1	e0	-
---------	----	----	----	---

NOTE 1* :

These are the parameters to specify the tracks and the format 3(IATA), 2(ABA), 4(MINTS), 1(JIS II) and 0 (Nothing).

• Pm :

30H	Move card to Gate portion (eject position) and complete the command even if the card is not taken out.
31H	Capture card to rear back of MCR33xx.
32H	If card is inside MCR33xx, detain the card inside of MCR33xx.

• Fm :

30H	CR none	BCC none
31H	CR add	BCC none
32H	CR none	BCC add
33H	CR add	BCC add

• Pd :

30H	At power down, MCR33xx eject the card
31H	At power down, MCR33xx eject the card except Write mode
32H	At power down, MCR33xx does not eject the card in any case

• Wv :

30H	At power down, MCR33xx stops the operation during the Write operation
31H	At power down, MCR33xx continues the operation of the Write

• Sh :

30H	Testing shutter operation (open-close) - only desktop
31H	No testing shutter operation

• Ds:

30H	Only at POWER ON, line control signal is checked.
31H	Line control signal is checked, always. If the status is detected as OFF, the card staying inside of the transport is ejected to the entrance gate.
32H	Line control is checked, always. If the status is detected as OFF, the card staying at the entrance gate is carried into the transport.

• Ty :

30H	No type recognizing code in the response
31H	Type recognizing codes (4byte) in the response

		"P"	30H	pm	st1	st0	Ty1	Ty2	ТуЗ	Ty4	
--	--	-----	-----	----	-----	-----	-----	-----	-----	-----	--

ISO Track1 ISO Track2 ISO Track3 Reserved

Value recognizing code Tyn : 30H - none; 31H -read only; 32H read/write;

• Cp :

30H	Default

Wv, Sh, Ds, Ty and Cp are not always specifie

STATUS REQUEST : cm=31H

• COMMAND

"C"	311	nm
C	SIL	рш

POSITIVE RESPONSE

Status only

"P"	31H	pm	st1	st0	se0	se1
-----	-----	----	-----	-----	-----	-----

Detailed sensor in form of Se

• NEGATIVE RESPONSE

"N" 31H	pm	e1	e0
---------	----	----	----

• Pm:

30H	To return status only (st1, st0).
31H	To return detailed sensor in form of Se in addition to status.



ENTRY : cm=32H

• COMMAND

0 <u>32</u> 11 pm	"C"	32H	pm
-------------------	-----	-----	----

• POSITIVE RESPONSE

"P"	32H	pm	st1	st0
		-		

• NEGATIVE RESPONSE

"N" 32H	om e	1 e0
---------	------	------

• Pm:

30H	To accept the card neglecting pre-head signal status.
31H	To accept the card refering the pre-head signal status.

NOTE:

send DLE+ EOT from HOST in order to cancel this command.

EJECT : cm=33H

• COMMAND

```
"C" 33H pm
```

• POSITIVE RESPONSE

"P"	33H	pm	st1	st0
-----	-----	----	-----	-----

•	NEGATIVE	RESPONSE

"N" 33H pm e1 e0	
------------------	--

• Pm:

30H	To carry the card to the card gate (eject position).
31H	To carry the card to the rear end of the transport (capture).
32H	To carry the card to the read position

RETRIEVE : cm=34H

• COMMAND



• POSITIVE RESPONSE

"P" 34H 30H st1 s	st0
-------------------	-----

NEGATIVE RESPONSE

This command move the card to the card gate (eject position) inside MCR33xx.

READ : cm=36H

• COMMAND

"C" 36H pm

• POSITIVE RESPONSE

"P" 36H pm	st1	st0	Data	
------------	-----	-----	------	--

• NEGATIVE RESPONSE

"N"	36H	pm	e1	e0	(Data)
-----	-----	----	----	----	--------

• Pm: Specifies the track to read.

30H	Card movement only
31H	Read track1
32H	Read track2
33H	Read track3
35H	Read all track simultaneously *
36H	Clear the read/ write buffer memory

NOTE:*

Track 1 Data7EHTrack 2 Data7EHTrack 3 Data
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WRITE : cm=37H

• COMMAND

"C" 37H pm Data	"C"	37H	pm	Data
-----------------	-----	-----	----	------

• POSITIVE RESPONSE

"P"	37H	pm	st1	st0	(Vf)
-----	-----	----	-----	-----	------

• NEGATIVE RESPONSE

"N" 37H	pm	e1	e0
---------	----	----	----

• Pm: Specifies the track to write

31H	Write track 1
32H	Write track 2
33H	Write track 3

ENABLE / DISABLE COMMAND: cm 3AH

• COMMAND

"C"	ЗАН	pm
-----	-----	----

POSITIVE RESPONSE

"P" 3AH pm st1 st0

NEGATIVE RESPONSE

"N" 3AH	pm	e1	e0	
---------	----	----	----	--

• Pm

30H	Enable to accept non-encoded card (mainly for cleaning card).
31H	Disable to accept card.
32H	Enable to accept encoded card.

DIAGNOSTIC MODE: cm 3DH

• COMMAND

"C"	3DH	pm	d0

• POSITIVE RESPONSE

• NEGATIVE RESPONSE

"N" 3D	H pm	e1	e0	
--------	------	----	----	--

• Pm: This command is to check the diagnostic mode of MCR33xx.

30H	To set actuator (motor, solenoids).
31H	Read sensor
32H	Read buffer



	MOTOR STEP TRANSPORT	FORWARD	BACKWARD	BLOCK
b1		1 — FWD	0 — BWD	0-BRAKE
b2	1	0 –	1 –	0_





CHIP CARD CONTACT : cm=40H

• COMMAND

"C" 40H pm	
------------	--

POSITIVE RESPONSE

"P"	40H	pm	st1	st0
-----	-----	----	-----	-----

• NEGATIVE RESPONSE

"N" 4	40H	pm	e1	e0
-------	-----	----	----	----

• Pm:

30H	Set CHIP CONTACT
32H	Reset CHIP CONTACT

HIGH AND LOW COERCITIVITY COMMAND: cm 45H

• COMMAND

"C"	45H	pm
-----	-----	----

• POSITIVE RESPONSE

"P" 45H pm st1 st0

• NEGATIVE RESPONSE

"N"	45H	pm	e1	e0

• Pm:

30H	LOW COERCITIVITY
31H	HIGH COERCITIVITY

IDENTIFY COMMAND : cm=41H

• COMMAND

"C"	41H	pm
-----	-----	----

POSITIVE RESPONSE

"P"	41H	pm	St1	St0	NAME-RELEASE
-----	-----	----	-----	-----	--------------

NEGATIVE RESPONSE

"N" 411	l pm	e1	e0
---------	------	----	----

Pm : 30H
 Firmware

NAME & DATE	"MCR33xx"
RELEASE	"R.x.x."
CONFIG.	

Pm : 31H
 Download

NAME & DATE	"DLCRW xx/xx/xx"
RELEASE	"R.1.xx"

- Disable Retry : cm=46H
- Pm : 30H, only for diagnostic, disable number of retries to 0

Software Diagnostics & DEMO of MCR33xx

Before runnning the INITIALIZE Command, set the correct COM 1-2-3-4 port and relative in the OPTION parameters

GET STATOS	ENABLE	ENTRY
 Status only (st1. st0) Detailed sensor in form of Se in addition to CPS RW status 	 Enable to accept non-encoded card Disable to accept card Enable to accept encoded 	C Neglecting pre-head signal status C Refering the pre-head signal status
Manual STATUS	Manual ENABLE	Time Out (seconds): 1
E JE C T To carry the card C To the card gate (eject position) To te read end of the transport (capture) C To the read position	C Track1 C Track2 C Track3 chers: 0 F Al	READ Card movement only Read Track1 Read Track2 Read Track3 Read all track simultaneousply Clear the read function in film
ABORT RETRIEVE	Manual WRITE	Manual READ

INITIALIZE:

this command initialize the MCR33xx at Power On, with this command it's possible to enabled the check of Power-Failure and line (rs232), see the parameters written following. The send command TX send the String Send 'C' as COMMAND and the response RX String Received can be 'P' positive or 'N' negative.

- (PM) =30H move CARD in gate Eject position
- (PM) =31H capture the CARD
- (PM) =32H detain the CARD in the MCR33xx
- (FM) =30H CR none BCC none
- (FM) =31H CR add BCC none
- (FM) =32H CR none BCC add

- (FM) =33H CR add BCC add
- (PD) = 30H at Power Down move the CARD in Eject position
- (PD) = 31H at Power Down Eject the CARD except Write
- (PD) = 32H at Power Down detain the CARD inside of MCR33xx
- (WV) = 30H at Power Down stops the operations during Write mode
- (WV) = 31H at Power Down run the WRITE
- (SH) = 30H testing SHUTTER operations (open/close)
- (SH) = 31H no test SHUTTER
- (DS) = 30H check line DSR only at Power-On
- (DS) = 31H always check line DSR and the CARD stay inside of MCR33xx
- (DS) = 32H always check line DSR and move the CARD in gate position.
- (TY) = 30H no type of track recognize
- (TY) = 31H type of codes (ISO Track 1-2-3 read/write 32H
- (CP) = 30H default 'P' positive response:
- St=00 no CARD detected
- St=01 CARD gate position
- St=02 CARD on photo FOTRW / FOING

'N' negative response:

Error Code:

Negative=00:Parameter is unidentified Negative=01:Parameter is not correct Negative=02:Command execution impossible Negative=03:Line error rs232 Negative=04:Command data error Negative=05:Tried to card feed commands before the CHIP contact Negative=10:Card Jam Negative=11:Shutter Failure Negative=12:Sensor failure Negative=13:Card Irregular (LONG) Negative=14:Card Irregular (SHORT) Negative=15:EEPROM error Negative=16:Card position move Negative=17:Jam error at retrive Negative=18:Micro gate and prehead error Negative=19:Mechanical irregularities Negative=20:Read error (Parity) Negative=21:Read error Negative=22:Write error Negative=23:Read error STX-ETX Negative=30:Power Down Negative=31:DSR (rs232) signal Off

Negative=41: Failure at CHIP contact

To run the DEMO application click on OPTION and select DEMO, this application manage same functions automatically.

Emulate the INITIALIZE Command with standard parameters, ENABLED the MCR33xx to Read and Write CARD with the Command WRITE all tracks or READ all tracks, with the botton Track 1-2-3 is possible to run the Read/Write Command only for one track.

Emulate the EJECT Command, move the CARD in gate position.

Emulate the CAPTURE Command move the CARD outside MCR33xx

	Ready
Read	Track 1 "MCR33xx"
<u>Ej</u> ect <u>Capture</u>	Track 2 22222222222222222222222222222222222
Track 1 Track 2 Tra Read Read Re Write Write W	ck 3 ad htte
Start End	Cjose



STATUS REQUEST:

return status on MCR33xx (JAM CARD, MECHANICAL ERROR, line DSR off, power down...)

- (PM) =30H return only the status of foto
- (PM) =31H return detailed sensor in addition to the status

ENTRY:

this Command enabled the entry of CARD

- (PM) =30H accept the CARD neglecting pre-head signal status
- (PM) =31H accept the CARD after read the pre-head signal status

EJECT:

move the CARD in gate position

- (PM) =30H move the CARD in EJECT position
- (PM) =31H move the CARD outside
- (PM) =32H move the CARD inside of MCR33xx

RETRIVE:

move the CARD in R/W position

• (PM) =30H move the CARD inside MCR33xx

READ:

- (PM) =30H move the CARD in R/W position
- (PM) =31H Read Track 1
- (PM) =32H Read Track 2
- (PM) =33H Read Track 3
- (PM) =35H Read Track 1-2-3 all
- (PM) =36H Clear buffer Read/write

WRITE:

- (PM) =31H Write Track 1 (ISO 78XX)
- (PM) =32H Write Track 2 (ISO 78XX)
- (PM) =33H Write Track 3 (ISO 78XX)

ENABLE/DISABLE:

enable the entry CARD in MCR33xx

- (PM) =30H enable to accept non-encoded CARD
- (PM) =31H DISABLE to accept CARD
- (PM) =32H enable to accept encoded CARD

DIAGNOSTIC MODE:

this command check motor, solenoids, etc.

- (PM) =30H tests motors and solenoids
- (PM) =31H read sensor

		C Bead Sensor Lo set atuator (motor, solenoids) Motor Solenoids C Motor forward C Motor backwards C Led C Shuttle
	-	□ <u>M</u> anual ?
тх: [
RX:		

CHIP CARD CONTACT:

- (PM) =30H set chip contact
- (PM) =31H reset chip contact

Chip Card Contact	
	C <u>S</u> et CHIP CONTACT C <u>R</u> eset CHIP CONTACT ☐ <u>M</u> anual ?
TX:	
RX:	
Reply Code:	
<u>Execute</u>	

COERCIVITY:

- (PM) =30H low coercivity
- (PM) =31H high coercivity

HI/LOW Coercività	
	 ● Low Coercivity ● High Coercivity ■ Manual ?
TX:	
RX:	
Reply Code:	
<u>Execute</u>	

IDENTIFY:

- (PM) =30H Release of MCR33xx program
- (PM) =31H Release of down-load MCR33xx program

Identify		
		Eirmware Down Load Manual CPS50 01/03/1999 Rel. 1.02
TX:	STX C A 30 ETX	
BX:	STX P A 30 30 30 BLK C P S 35 30 BLK 30 31 2F 30 33	3 2F 31 39 39 39 BLK BLK R 65 6C 2E
Reply Code:	0	
<u>E</u> xecute	<u>C</u> lose	

DISABLE RETRY:

• (PM) =30H disable Retry in Read/Write mode (only for test)

Disable Retrieve	
TX:	
RX:	
Reply Code:	
	lose

DOWN LOAD:

-		
Down Load (L	Update Firm w are)	
Port: Source File:	COM2 A:CPS50.hex	Browse
Execute		0

enabled to update the Firmware on MCR33xx

NOTE:

During this operation the serial rate with HOST is automatically configured to 9600 baud.

Set the MCR33xx in download mode and check the correct file to download (*.hex). Verify the correct COM port.

WARNING:

If the download procedure fails (corrupted file, black out ...), theMCR33xx could hangs. Only in this case is mandatory to run the procedure CLEAR FLASH

MULTI TESTS READ/WRITE:

This is a multi read and write test, and it can be considered a "stress" test for the MCR33xx.

Write & Read (plus)	
Loops: 0	Ready
Write Track 1 Track 2 T	Prack 3 ■ Track 1 ■ Track 2 ■ Track 3 ■ All Track
Options ? Clear Buffer Card Move	Retrieve Card Eject to Gate Eject to Read Pos.
Automatic Write Track1: CTS 7 Track2: 2222 7 Track3: 3333	ELECTRONICS &d LOOP(S) 200000&d 300000&d
? TX: RX:	
? Track1: Track2: Track3:	
Execute Stop Confront	Set Track Close Total Loops: 0

MULTI TESTS EJECT:

This command loop the card insertion and ejection to discover if any mechanical problems occour in the card transportation.

Eject & R	etrieve			
71	Loop: 0	·	Ready	
		Eject Eject to Gate	Eject to Read Pos.	?
TX: RX:				
<u>E</u> xec	ute <u>S</u> top	<u>C</u> lose		

CONTROL ELECTRONICS

Control electronics are mounted on the CPSRWboard, fastened on the right side of the MCR33xx peripheral.



CPSRW Board

- J1 Card inlet photo (one) FOING
- J2 Reserved
- J3 Head photo
- J4 Card outlet photo
- J5 Reserved
- J6 Auxiliary chip card connection
- J7 Chip card photo
- J8 Card presence microswitch
- J9 Card inlet photo (two) FOPIN
- J10 Shutter position microswitch
- J11 RS 232 serial line
- J12 Shutter opening electromagnet
- J13 Stepped motor
- J14 Chip card contact board electromagnet
- J15 Power supply
- J16 Track 1 read/write head
- J17 Track 2 read/write head
- J18 Track 3 read/write head
- J19 Magnetic track card presence reading head
- J20 Automatic card feeder motor(optional)
- J21 Sensors Test Point
- J22 Automatic card feeder sensor (optional)

J2	J21 Test Point - Sensors			
1	FOING	Card inlet		
2	FOTRW	reader/writer		
3	FOUSC	Card outlet		
4	FOT00	Reset chip card		
5	MIPRE	Microsw, card presence		
6	MISHU	Microsw, shutter		
7	FOPIn	Pre input		



Test point

TP1 - logic reset TP2 - power failure TP3 - V. Power supply (24 Vdc) TP4 - V. Write circuit (15 Vdc) TP5 - track 1 reading circuit - squaring TP6 - track 1 reading circuit - first amplifier TP7 - track 1 reading circuit - output TTL TP8 - track 1 reading circuit - second amplifier TP9 - track 2 reading circuit - squaring TP10 - track 2 reading circuit - first amplifier TP11 - track 2 reading circuit - output TTL TP12 - track 2 reading circuit - second amplifier TP13 - track 3 reading circuit - squaring TP14 - track 3 reading circuit - first amplifier TP15 - track 3 reading circuit - output TTL TP16 - track 3 reading circuit - second amplifier TP17 - magnetic badge presence sensor - squaring TP18 - magnetic badge presence sensor - first amplifier TP19 - magnetic badge presence sensor - output TTL TP20 - magnetic badge presence sensor - second amplifier TP21 - tension for the squaring circuit Vr= 7.5V TP22 - V. Logic = 5V TP23 - GND

- P1 open (standard) when close at the power on it means clear flash command
- P2 closed CPU run mode
- P3 closed GND closing/GND analogic



MECHANICAL ADJUSTMENTS

Mechanical or electrical adjustments are described with a series of instructions complete with one or more figures.

If necessary, operating procedures are provided, to be used as guides and to verify whether the purpose of the adjustment operation has been reached.

NOTE:

In the figure, a star indicates where you need to operate with a suitable tool (screwdriver, wrenches, etc.)

SHUTTER ADJUSTMENT

Checking the shutter opening mechanism

In the resting position, plate 4 should have about 0.1 mm of play. To adjust, slightly bend flap 5 of plate 4.

Shutter opening electromagnet adjustment

Electromagnet 1 controls the inlet opening; its adjustment must assure that the shutter opens completely when the electromagnet is energized. To adjust:

- Manually activate electromagnet 1 by pressing the armature in the direction indicated by the large black arrow.
- Loosen the two screws highlighted by the star.
- Move the electromagnet until inlet 2 is fully open.
- Tighten the two screws.



Shutter position microswitch adjustment

Microswitch 3 controls shutter position; to adjust, proceed as follows.

- Loosen the two screws that fasten the microswitch to the side of the shutter (indicated with a star in the figure).
- Manually activate electromagnet 1 controlling shutter opening.
- Check that the micro switches when the shutter is still closed (see figure on previous page).
- Tighten the microswitch fastening screws (don't overtighten!).

Checking the shutter opening mechanism

Verify that on the left side of the shutter (in the rest position) the distance between the spring device and the shutter opening plate is 0.2 mm.

If you need to make an adjustment, slightly bend the lever highlighted with the star.



Card presence microswitch adjustment

When card 1 is inserted in the inlet, it displaces roller 2 which, thrust outward by the card, activates microswitch 3.

To adjust:

- Loosen the two screws fastening microswitch 3 (highlighted with the star)
- Insert at card into the inlet
- When the card is inserted the microswitch switches
- Verify that, when the card is completely inserted, the microswitch blade continues about 0.5 mm after switching.
- Tighten the two microswitch fastening screws (don't overtighten!).





ADJUSTING THE POSITIVE DRIVE BELT

NOTE:

If a belt is over tightened, its wear will be excessive and the motor may seize, whereas if it is under tightened it may flit. Both conditions would cause problems to the motion of the mechanisms driven by the belt.

In the absence of specific indications, proper tension is checked by pushing the belt on the median point between two pulleys; the value of the arrow is proportional to the distance between the two pulley centers.

Adjusting the belt

Loosen the two screws that fasten the stepped motor to the side of the MCR33xx.

Belt tension is correct whenever a force a 100 gram force applied to point 1 causes the belt to flex by 1 mm.



ADJUSTING THE CONTRAST ROLLERS

The three rubber rollers 1, 2, 3 for transporting the card have fixed positions whereas the three bearings A, B, C, have a variable position. The purpose of the adjustment is to obtain the distances specified below between the three pairs of rollers/bearings.

- Before proceeding with the adjustment, you need to disassemble the inlet.
- Use a probe to verify that the distance between roller 2 and bearing B is 0.3 0.4 mm.
- If not, act on screw 5
- Use a probe to verify that the distance between roller 1 and bearing A is 0.4 0.6 mm
- If not, act on screw 4
- Use a probe to verify that the distance between roller 3 and bearing C is 0.4 0.6 mm
- If not, act on screw 6





Checking Contrast Roller Adjustment

- Insert a card between roller 1 and bearing A; verify that there is friction on the card upon its passage (Figure 1).
- Repeat the operation for roller 3 and bearing C.
- Insert the card between roller 2 and bearing B; in this case friction should be greater than in the previous cases (Figure 2).
- Position the card to be gripped between roller 2 and the related bearing B; insert an additional card between roller 1 and bearing A: you should feel a slight friction (Figure 3)
- Repeat the operation for roller 3 and bearing C.



Figure 1



Figure 2

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READ/WRITE HEAD ADJUSTMENT

To adjust:

- Attach a dynamometer to read/write head 1
- pull in the direction indicated by the arrow
- the load on the leaf spring should be about 390 grams (typical range 380÷400)
- if not, act on screw 2



NOTE:

An excessive pression on the card may cause a jam along the card path, while a tension too loose cannot guarantee the best contact between the read/write head and the card.

CHIP CARD ELECTROMAGNET ADJUSTMENT

Electromagnet 1 moves the levers on which the contact board for reading the chip card is fastened. The purpose of the adjustment is to have proper coupling between the contact board and the chip card.

- Insert a card under the contact board
- Manually activate the electromagnet
- Check that the contact board exerts a slight pressure on the card, making the elastic contacts 1 to trip
- If you need to make an adjustment, move the electromagnet by loosening the two screws indicated by the star.





GENERAL FEATURES

Applications

- ID Checking
- Debit card payment systems
- Self service applications
- Access control

Features

- Reads three tracks simultaneously
- Software-driven selection of the writing level (high/low coercivity)
- Compatible with market standards for hardware and software

Options

- Shutter
- IC Contacts (8-16 pin)

Specifications

- Card standards
- ISO 7810-7811/1, 2, 3, 4, 5, 6(TK 1, 2, 3)
- Card speed: 190 mm/sec
- Head working life: ~1.000.000 passes
- Coercivity:
- 2500÷4000 OE HI-CO
- 300 OE LO-CO

Connection with Host

• RS232-C (RS485)

Dimensions and weight

- Dimensions: 103x221.5x75.5
- Weight: 1.15 Kg