

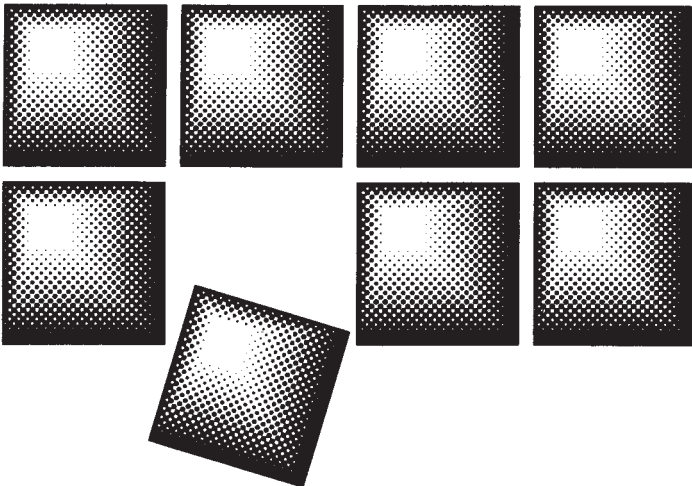
**VISUAL CARD  
READER/WRITER**

---

***MCP210ZD / MCM210S***

---

**PROGRAMMER'S MANUAL**



## Notice:

- 1)The contents of this manual are subject to change without notice.
- 2)All efforts have been made to ensure the accuracy of the contents of this manual at the time of going to press. However, should any errors be detected, STAR would greatly appreciate being informed of them.
- 3)The above notwithstanding, STAR can assume no responsibility for any errors in this manual.  
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# Precautions

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Please read this manual carefully and follow the instructions to fully understand the contents, before using this product. Misuse can cause an accident, or damage the product and/or the peripherals.

## ● Installation:

- 1) This system is a precision type. Install this system at a solid and horizontal plane. Do not apply shock or vibration to the system.
- 2) Do not install this system at a place where the system may be exposed to direct sunlight, heavy dust, heat and humidity.
- 3) Do not install this system at a place where the system inside may be exposed to water, oil and metal powder or where the system may be exposed to corrosive gas and chemical steam.
- 4) This system is a magnetic card reader/writer. Do not install this system at a place where the system is exposed to magnetic field.
- 5) Be sure to apply the specified power supply of AC120, 230, 240V, 50/60Hz.
- 6) Do not share the power outlet with a noise causing electric instrument.
- 7) Do not clog the vent port provided at the side of the system.
- 8) Prepare the earth ground at the power supply connector.
- 9) Keep an ample amount of space to operate the system and which allows for radiation.
- 10) The 8-pin modular connector at the back of MCP210ZD is reserved for possible future use. Do not connect to any cables such as telephone wire, or peripherals.

## ● Operation:

- 1) Do not use any other card than our specified card.
- 2) Do not use the card if wet, stained with oil, etc. After using the dirty/wet card accidentally, clean up both the card and the system(reader/writer).
- 3) Do not touch the card with a hand stained with oil, etc.
- 4) Keep the card away from magnetized or electric devices that cause magnetic fields, such as speakers, TV set etc.
- 5) Do not use a bent card, otherwise the card may be caught inside the system.
- 6) Insert the card in the specified direction only.
- 7) Do not insert any other material in the card slot other than the card.
- 8) Do not turn off the power switch during card processing.
- 9) When any of the anomalous (noise, off-flavor, smoke, firing, etc.) is found, turn off the power switch and disconnect the power cable immediately.
- 10) Do not start the system after changing the environmental condition(temperature, humidity etc.), even if under the specified condition. Leave the system about one hour in the new conditions before you start. Do not use the system under condensation.
- 11) It is recommended to clean the system at regular intervals, in order to keep the reliability of the system.

# Contents

1. Outline.....	2
2. Unpacking .....	3
3. Appearance and Nomenclature .....	4
4. Connection to External Units and Setting.....	6
5. Dip Switch Setting .....	11
6. Protocol .....	13
7. How to Use Cleaning Card .....	46
8. Cleaning Rollers.....	47
9. Troubleshooting .....	48
10. General Specifications .....	49

The MCP200 series has a reading/writing equipment for an ISO magnetic stripe type plastic card. It also has print/erase capability to a re-writable human readable area on the surface of the card. This series is compatible with most host computers and various POS systems.

The main features of the MCP200 series are as follows:

1. Reads data from a magnetic stripe on the card.
2. Writes data to a magnetic stripe on the card.
3. Prints characters/graphics to a human readable area and erases them.
4. Serial interface of RS-232C(MCP210ZD), or CMOS(MCM210S).
5. Back up RAM
6. The card may be re-used up to 10,000 times under the proper condition.
7. Number of printing characters:
  - 3 lines of 29 characters by 12 x12 dot font
  - 3 lines of 22 characters by 16 x 16 dot font
  - 2 lines of 14 characters by 24 x 24 dot font

#### Model Name

MCP210ZD ..... Standard type reader/writer  
(with case and power supply)

MCM210S ..... Card issuing/collecting type  
(mechanism with control board)

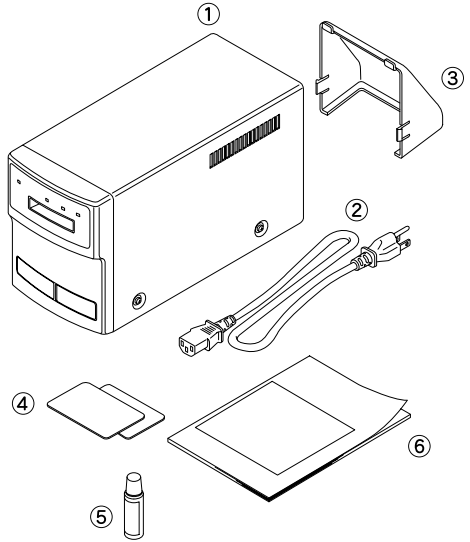
## 2

# UNPACKING

After unpacking the unit, check that all the accessories are included in the individual box.

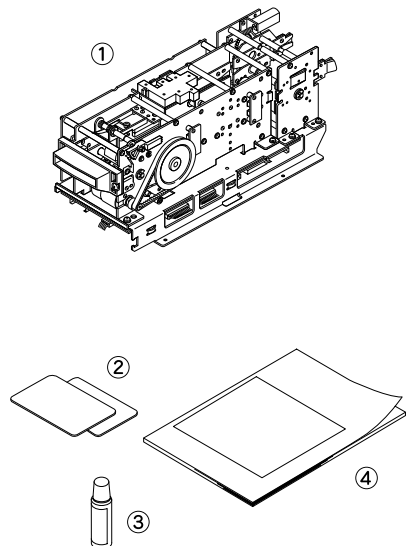
### MCP210ZD

- ① MCP210ZD
- ② Power cable
- ③ Connector cover
- ④ Cleaning card (2 pcs)
- ⑤ Cleaning liquid
- ⑥ Instruction manual



### MCM210S

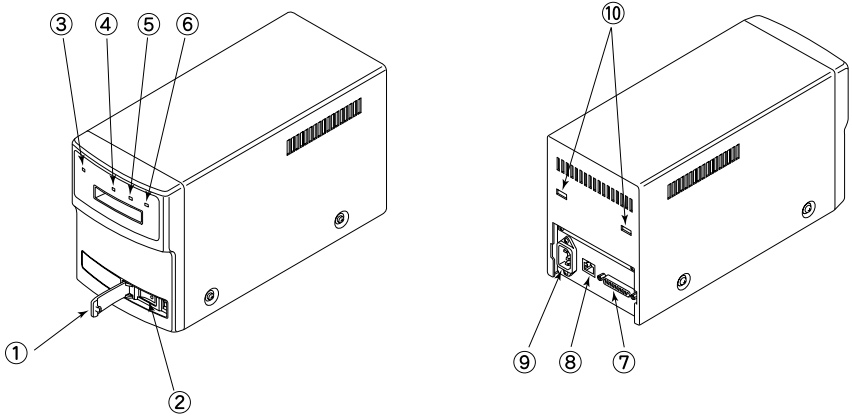
- ① MCM210S
- ② Cleaning card (2 pcs)
- ③ Cleaning liquid
- ④ Instruction manual



# 3

# APPEARANCE AND NOMENCLATURE

## 3-1. MCP210ZD Standard type (with case and power supply)



- ① Switch Cover      This cover protects the power switch of the system. Push to open and close.
- ② Power Switch      This switch turns the power of the system on/off.
- ③ POWER LED      This LED indicates that the power of the system is on.
- ④ READY LED      This LED indicates that the card processing is ready.
- ⑤ OK LED      This LED indicates that the card has been processed without error.
- ⑥ ERROR LED      This LED indicates that the card has not been read due to an error e.g. jamming of the card in the Reader/Writer.
- ⑦ RS232C serial connector      This connector interfaces the connection between host computers and the Reader/Writer.
- ⑧ 8 pins modular connector      This connector is reserved for possible future use. Do not use.

**IMPORTANT :**

Do not connect to any cables such as telephone wire, or peripherals. It may cause a serious damage for MCP210ZD or the peripherals.

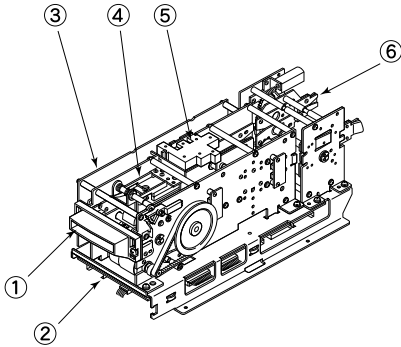
- ⑨ AC Power Inlet      Connect this inlet to the power source with the attached AC power cable.

**IMPORTANT :**

A three terminal earth grounded power supply cable is attached with MCP210ZD. For safety, do not remove the ground pin.

- ⑩ Connector cover install slot      These slots are for installing the connector cover.

### 3-2. MCM210S Card issuing/collecting type (mechanism with control board)

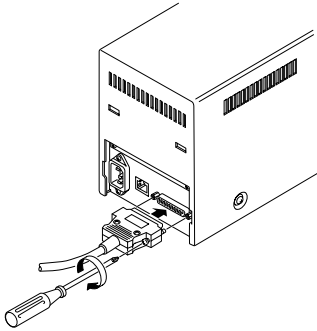


- ① Card Slot
- ② Control Board
- ③ Driver Board
- ④ Print Head
- ⑤ Erase Head
- ⑥ Card Rejection Unit



### 4-1. MCP210ZD, Standard type (with case and power supply)

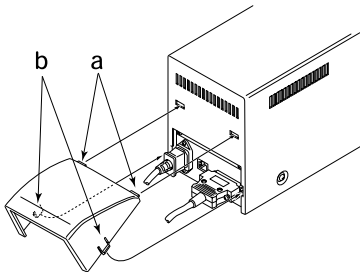
<Connecting the interface cable>



- ① Turn off power of the host computer and the Reader/Writer.
- ② Plug in an end of the interface cable to the Reader/Writer connector and the other end to the serial port of the host computer.
- ③ Fasten two screws located at both the shoulders of the interface cable connectors.

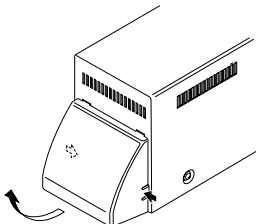
<Installation of the connector cover>

The connector cover should be installed after attachment of the power supply and interface cable.



- ① Insert two upper tabs(a) into the slots.
- ② Insert the locking tabs (b) into the lower slots, keeping the upper tabs in place. When you hear a click-in sound, the cover is locked.

<Removal of the connector cover>



- ① Apply force to the cover to release both locking tabs.
- ② Lift up the connector cover, and remove upper tabs.

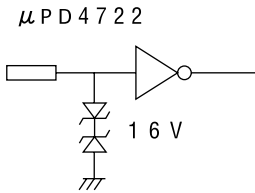
<Serial Interface (RS-232C)>

- ① Installed connector: DSB-25S(female)
- ② Mating connector: D-sub 25 pin(male)
- ③ Connector terminals: See the table below
- ④ I/O circuit: See the figure below

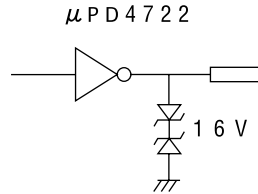
DSB-25S

Pin No.	Signal name	Direction	Function
1	F-GND	-	Frame ground
2	TXD	OUT	Transmitted data
3	RXD	IN	Received data
4	RTS	OUT	Request-to send (always ON after reset)
5	CTS	IN	Clear-to-send (no detection)
6	DSR	IN	Data-set-ready (no detection)
7	S-GND	-	Signal ground
20	DTR	OUT	Data-terminal-ready (always ON after reset)

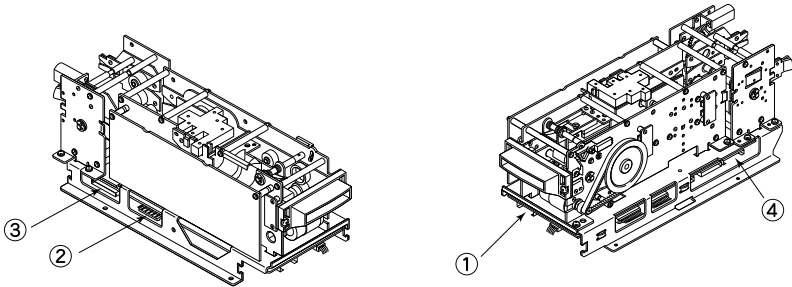
Input circuit



Output circuit



## 4-2. MCM210S, Card issuing/collecting type (mechanism with control board)



① CN1 (LED, audible indication)

③ CN9 (Serial Interface)

② CN6 (Power Supply)

④ CN8 (Card hopper interface)

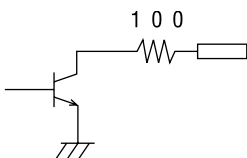
① CN1 (LED, audible indication)

Applicable Connector: JST S10B-PH

Pin No.	Signal name	Direction	Function
1	N/C	–	Not used
2	N/C	–	Not used
3	N/C	–	Not used
4	BZ	OUT	Beep Buzzer (2.4kHz)
5	ERROR	OUT	ERROR LED (“L”: ON)
6	OK	OUT	OK LED (“L”: ON)
7	READY	OUT	READY LED (“L”, ON)
8	STATUS	–	STATUS LED (* )
9	GND	–	Signal Ground
10	VCC	–	Power supply +5V

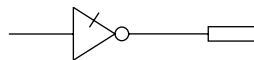
\* This signal can be used when the status indication of card hopper is necessary, such as “card near empty”, “card empty”.

BZ output circuit



LED output circuit

Open corrector



② CN6 (Power Supply)

Applicable Connector: JST B6PS-VH

Pin No.	Signal name	Function
1	+24V	Power supply for mechanism
2	M-GND	Ground for mechanism
3	VCC (+5V)	Control Power Supply
4	VCC (+5V)	Control Power Supply
5	GND	Signal Ground
6	GND	Signal Ground

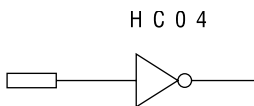
M-GND and GND is connected internally.

③ CN9 (Serial Interface)

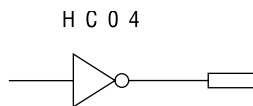
Applicable Connector: Molex 53015-1310

Pin No.	Signal name	Direction	Function
1	TXD	OUT	Transmit data
2	RXD	IN	Receive data
3	RTS	OUT	Request to send (ON locked after reset)
4	CTS	IN	Clear to send (not detected)
5	DSR	IN	Data set ready (not detected)
6	DTR	OUT	Data terminal ready(ON locked after reset)
7	ERES	IN	External reset input
8	VCC	-	Control power supply
9	GND	-	Signal ground
10	IA0	IN	Interface address (not used)
11	IA1	IN	Interface address (not used)
12	IA2	IN	Interface address (not used)
13	IA3	IN	Interface address (not used)

Input circuit



Output circuit

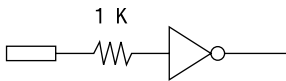


④ CN8 (Card hopper interface)

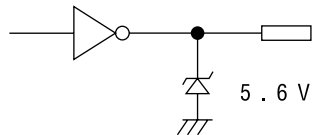
Applicable Connector: JST S12B-PH

Pin No.	Signal name	Direction	Function
1	RESET	OUT	Reset signal (L)
2	EJC	IN	Card in passing (H)
3	EMP	IN	Card empty (H)
4	REM	IN	Card near empty (L)
5	STB	IN	Stand by for card dispensing (H)
6	DRES	OUT	Card dispensing error reset (L)
7	FOR	OUT	Motor drive, forward (H)
8	CON	OUT	Motor On (H)
9	REV	OUT	Motor drive, reverse (H)
10	CDJAM	IN	Card jamming (H)
11	GND	-	Signal ground
12	24V	-	Power supply for card hopper

Input circuit



Output circuit

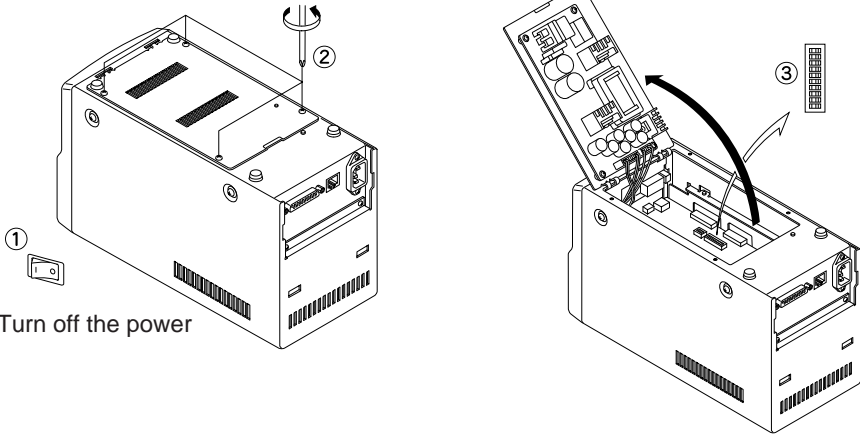


	J.S.T. CN1: S10B-PH CN6: B6PS-VH CN8: S12B-PH	Molex CN9: 53015-1310
Available at (USA)	J.S.T. CORPORATION 1957 South Lakeside Drive Waukegan IL 60056 Tel: 708-473-1957 Fax: 708-473-7373	Molex USA 2222 Wellington Court Lisle IL 60532 Tel: 708-969-4550 Fax: 708-969-1352
(EC)	J.S.T. DEUTSCHLAND GMBH Kuferstr 15 P.O.Box 1210, D-7065 Winterbach, F.R. of Germany Tel: 07181-4007-0 Fax: 7243-31420	MOLEX ELEKTRONIK GMBH Einstein Strasse 18A 7505 Ettlingen, F.R. of Germany Tel: 7243-3350 Fax: 07181-4007-21

# 5

# DIP SWITCH SETTING

The factory setting are all ON. Follow these instructions to change the setting.



<MCP210ZD>

- ① Turn off the power of host computer and the Reader/writer.

**IMPORTANT :**

Before starting, disconnect the power cable from the Reader/Writer to avoid accidents such as electric shock.

- ② Turn over the Reader/Writer. Remove four screws from the bottom plate and open the cover.
- ③ Set the DIP switches.  
Do not change the setting on the four terminals DIP switch (always ON).

**IMPORTANT :**

Pay attention not to drop anything into the machine, when the cover is open.

- ④ After setting the switches, carefully replace the cover.  
Replace four screws into the cover.

<MCM210S>

- ① Turn off the power of host computer and the Reader/writer.
- ② Turn over the Reader/Writer and set up the DIP switches.

The function of the DIP Switches are as follows.

DIP Switch 1 (10 terminals)

No.	Function	OFF	ON	Default
1	Always set to ON State			ON
2	Always set to ON State			ON
3	Baud rate	See the table below		ON
4	Baud rate	See the table below		ON
5	Stop bits	2 bits	1 bit	ON
6	Parity	Odd	Even	ON
7	Parity	Valid	Invalid	ON
8	Character length	7 bits	8 bits	ON
9	Card Gate	no use	use	ON
10	Always set to ON State			ON

3	4	Baud rate
OFF	ON	2400
ON	OFF	4800
ON	ON	9600
OFF	OFF	19200

DIP Switch 2 (4 terminals)

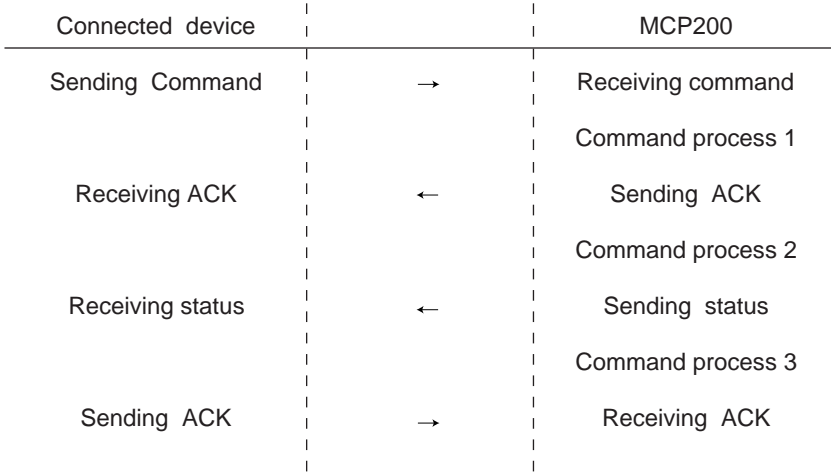
No.	Function	OFF	ON	Default
1	Always set to ON State			ON
2	Always set to ON State			ON
3	Always set to ON State			ON
4	Always set to ON State			ON

# 6

# PROTOCOL

## 6-1 Communication Procedure

Basic procedure of communication is as follows.



## 6-2 Command transfer formats and response transfer formats

Command transfer format

STX	Command	Data	ETX	BCC
-----	---------	------	-----	-----

Response transfer format

STX	Command	Status	Data	ETX	BCC
-----	---------	--------	------	-----	-----

BCC is exclusive OR between command and ETX.



## \*) Command Structure and Error Checking Protocol

Status : Status consists of 1 byte of information returned by MCP210.

For detailed information, see Page “Command and status list”.

BCC : Block Check Character.

MCP210 compares the result of the calculation at the transmission side with the calculation result at the receiving side. When the results are the same, MCP210 judges the data transmission as being completed without any trouble.

Example:

- 1.) The host sends the command “STX-30H-ETX-BCC” to MCP210
- 2.) After receiving the command, MCP210 starts calculating in order to check for no communication error.
- 3.) MCP210 compares the result of calculation to see if it matches the BCC on the command format.
- 4.) If no error, MCP210 sends ACK to the host.
- 5.) If there is any communication error, MCP210 send NAK to the host. After receiving NAK, the host judges that the communication was not successful and sends the command again.
- 6.) When MCP210 receives 30H(Read magnetic stripe → eject card) with no error, it reads the data on the magnetic stripe and send back the (STX-30H -Status-Data-ETX-BCC) to the host.
- 7.) After receiving the response, the host starts calculating in order to check for no communication error.
- 8.) The host compares the result of calculation to see if it matches the BCC on the response format.
- 9.) If no error, the host sends ACK to MCP210.
- 10.) If there is any communication error, the host send NAK to MCP210. After receiving NAK, MCP210 judges that the communication was not successful and sends the response again.

### 6-3 Transmission Control Characters and Print Characters

#### Transmission control characters

Character	Code	Function
STX	02h	Start of Text
ETX	03h	End of Text
ACK	06h	Acknowledge
SO	0Eh	End of using Chinese character code
SI	0Fh	Start of using Chinese character code
NAK	15h	Negative Acknowledge
DLE	10h	Data Link Escape
ESC	1Bh	Start of Escape Sequence
US	1Fh	Line Feed ( for card printing)
BCC	-	Block Check Character

- ACK occurs when the MCP200 receives a valid command and a valid BCC.
- NAK occurs when the MCP200 receives an invalid BCC.
- DLE occurs when the MCP200 receives an invalid or unrecognized command.

#### Print characters

	20	30	40	50	60	70	80	90
00	sp	0	@	P	'	p		
01	!	1	A	Q	a	q		
02	"	2	B	R	b	r		
03	#	3	C	S	c	s		
04	\$	4	D	T	d	t		
05	%	5	E	U	e	u		
06	&	6	F	V	f	v		
07	'	7	G	W	g	w		
08	(	8	H	X	h	x		
09	)	9	I	Y	i	y		
0A	*	:	J	Z	j	z		
0B	+	;	K	[	k	{		
0C	,	<	L	\	l			
0D	-	=	M	]	m	}		
0E	.	>	N	^	n	~		
0F	/	?	O	_	o			

The codes 90h to 9Fh are the user defined graphic/character and are freely designed by "set 16x16/24x24 user defined graphic/character " command.

User defined graphics/character are developed in RAM and backed up by a capacitor.

## 6-4 Command and Status Lists

Contents of the commands and executable commands are as follows.

Code		Contents	Z	S
ASCII	HEX			
0	30h	Read magnetic stripe → eject card	*	*
1	31h	Read magnetic stripe → hold card	*	*
2	32h	Write magnetic stripe → eject card	*	*
3	33h	Write magnetic stripe → hold card	*	*
4	34h	Issue card → write magnetic stripe → eject card		*
5	35h	Issue card → write magnetic stripe → hold card		*
6	36h	Print to human readable area → eject card	*	*
8	38h	Clean magnetic head	*	*
<	3Ch	Eject card	*	*
=	3Dh	Collect card		*
@	40h	Control LED / buzzer	*	*
B	42h	Request status byte	*	*
C	43h	Select number of print lines	*	*
D	44h	Set 16 x 16 user defined graphics / character	*	*
E	45h	Set 24 x 24 user defined graphics / character	*	*
F	46h	Set character font	*	*
G	47h	Dot graphic command	*	*
H	48h	Check communication	*	*
J	4Ah	Select reading track	*	*
K	4Bh	Set left margin of human readable area printing	*	*
L	4Ch	Initialize MCP200	*	*
M	4Dh	Set 12 x 12 user defined graphics / character	*	*
'	60h	Read magnetic stripe → eject card (28h status available)	*	*
a	61h	Read magnetic stripe → hold card (28h status available)	*	*
b	62h	Write magnetic stripe → eject card (28h status available)	*	*
c	63h	Write magnetic stripe → hold card (28h status available)	*	*
d	64h	Issue card → eject card		*
e	65h	Issue card → hold card		*
g	67h	Initialize card → hold card	*	*

Z : MCP210ZD

S : MCM210S

Contents of the statuses are as follows.

Code		Contents
ASCII	HEX	
SP	20h	Normal
!	21h	Read/Write magnetic stripe error
"	22h	Card feed error
#	23h	No card in a dispensing unit
(	28h	No card inserted (for commands 60h-63h)

- \* When commands 30h to 33h are sent to the MCP200, the MCP200 will not return status until a card is inserted. The host must wait for the card to be inserted before other tasks can be performed. If the user does not insert a card for a period of time, the host can issue the initialize command (4Ch) to break the wait mode of the MCP200.

When commands 60h to 63h are sent to the MCP200, the MCP200 will immediately return status of 28h if a card is not present. If a card is present the requested function will be performed and status will be returned after execution of the command. This allows the host to perform other tasks while the MCP200 is executing the requested commands.

## 6-5 Escape Sequence

MCP200 is added the special functions as below by the following Escape Sequences.

<ESC>0 (1Bh, 30h)	Select 16 x 16 dot font characters
<ESC>1 (1Bh, 31h)	Select 24 x 24 dot font characters (option)
<ESC>2 (1Bh, 32h)	Select 12 x 12 dot font characters
<ESC>W1(1Bh, 57h, 31h)	Select double width expanded characters
<ESC>W0(1Bh, 57h, 30h)	Cancel double width expanded characters

## 6-6. Details of command

### (1) Read magnetic stripe → eject card

This command reads the magnetic stripe and ejects the card.

Command format

To MCP210	STX	30h	ETX	BCC
-----------	-----	-----	-----	-----

Response format

MCP210 response	STX	30h	Status	Data	ETX	BCC
--------------------	-----	-----	--------	------	-----	-----

### (2) Read magnetic stripe → hold card

This command reads the magnetic stripe and holds the card.

Command format

To MCP210	STX	31h	ETX	BCC
-----------	-----	-----	-----	-----

Response format

MCP210 response	STX	31h	Status	Data	ETX	BCC
--------------------	-----	-----	--------	------	-----	-----

### (3) Write magnetic stripe → eject card

This command writes to the magnetic stripe and ejects the card.

Command format

To MCP210	STX	32h	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

Response format

MCP210 response	STX	32h	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

Data consists of 0 to 104 bytes. Data bytes must be between 30h to 3Ah, and 3Ch to 3Eh. After writing MCP210 will read the track that has been written, and if successful it will return 20h as status.

#### (4) Write magnetic stripe → hold card

This command writes to the magnetic stripe and holds the card.

Command format

To MCP210	STX	33h	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

Response format

MCP210 response	STX	33h	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

#### (5) Issue card → write magnetic strip → eject card

This command issues the card, writes to the magnetic stripe, and eject the card.

Command format

To MCP210	STX	34h	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

Response format

MCP210 response	STX	34h	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

#### (6) Issue card → write magnetic strip → hold card

This command issues the card, writes to the magnetic stripe, and holds the card.

Command format

To MCP210	STX	35h	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

Response format

MCP210 response	STX	35h	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

**(7) print to human readable area → eject card**

This command prints to the human readable area and ejects the card.

Command format

To MCP210

STX	36h	Data	ETX	BCC
-----	-----	------	-----	-----

Response format

MCP210  
response

STX	36h	Status	ETX	BCC
-----	-----	--------	-----	-----

Line feed from the 1st line to the 2nd line on the Human Readable Area is executed by US(1Fh). The printing data range is from 20h to 7Eh, and from 90h to 9Fh.

The amount of data on one line must be less than the maximum printing columns per line.

The maximum number of printing character can be calculated by the following formula:

$$352 \geq (\text{the number of } 16 \times 16 \text{ dot font characters}) \times 16 \\ + (\text{the number of } 12 \times 12 \text{ dot font characters}) \times 12 \\ + (\text{the number of } 24 \times 24 \text{ dot font characters}) \times 25$$

(Double width expanded characters are calculated as two normal size characters.)

### (8) Clean magnetic head

This command cleans the magnetic head using the cleaning card.

Command format

To MCP210	STX	38h	ETX	BCC
-----------	-----	-----	-----	-----

Response format

MCP210 response	STX	38h	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

### (9) Eject card

This command ejects the card.

Command format

To MCP210	STX	3Ch	ETX	BCC
-----------	-----	-----	-----	-----

Response format

MCP210 response	STX	3Ch	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

### (10) Collect card

This command collects the card.

Command format

To MCP210	STX	3Dh	ETX	BCC
-----------	-----	-----	-----	-----

Response format

MCP210 response	STX	3Dh	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----



## (11) Control LED / Audible indicator

This command controls LED and Audible indicator

### Command format

To MCP210

STX	40h	Data	ETX	BCC
-----	-----	------	-----	-----

### Response format

MCP210  
response

STX	40h	Status	ETX	BCC
-----	-----	--------	-----	-----

The data is composed of the following five bytes.

Data train	Contents
1st byte	Ready-LED setting data
2nd byte	OK-LED setting data
3rd byte	Error-LED setting data
4th byte	Always 20h
5th byte	Audio transducer setting data

Code	Function
20h	No function change
30h	OFF ("H")
31h	ON("L")
32h	Blink
33h	Blink once
34h	Blink 3 times

## (12) MCP210 status inquiry

This command checks MCP210 state.

### Command format

To MCP210

STX	42h	ETX	BCC
-----	-----	-----	-----

### Response format

MCP210  
response

STX	42h	Status	Data	ETX	BCC
-----	-----	--------	------	-----	-----

The data is composed of the following three bytes.

Data train	Contents
1st byte	State of card entry / exit slot
2nd byte	State of card waiting
3rd byte	State of card feeder

1st byte (State of card entry / exit slot)

Code	Function
30h	No card at the card entry / exit slot
31h	Card exists at the card entry / exit slot
32h	Either invalid card or card waiting to be pulled out exists

2nd byte (State of card waiting)

Code	Function
30h	No card waiting to be issued
31h	Card waiting to be issued exists

3rd byte (State of card feeder)

Code	Function
30h	No card remains
31h	Cards are loaded into the card feeder
32h	Card feeder error

As for MCP210ZD, the 3rd byte is meaningless data because card feeder is not attached on this device.

### (13) Select number of print lines

This command selects number of print lines.

#### Command format

To MCP210

STX	43h	Data	ETX	BCC
-----	-----	------	-----	-----

#### Response format

MCP210  
response

STX	43h	Status	ETX	BCC
-----	-----	--------	-----	-----

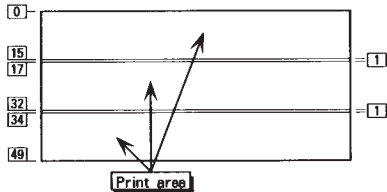
Code	Function
30h	3 line print
31h	2 line print
32h	1 line print

The setting by this command is effective until the next setting or reset.

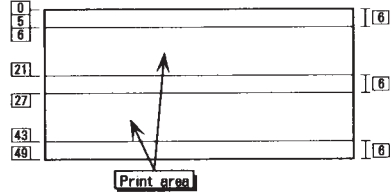
When the power is turned on, MCP210 is set to print 3 lines.

After selecting the number of print lines, the print starting position is automatically changes per figures below.

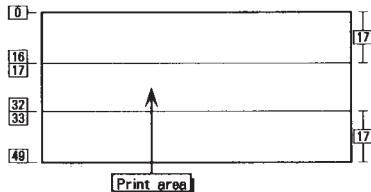
16 × 16 dot print, 3 lines



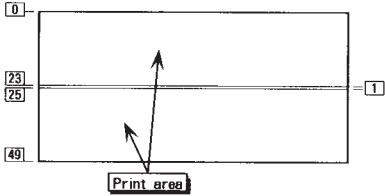
16 × 16 dot print, 2 lines



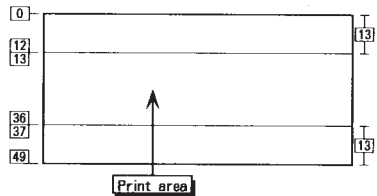
16 × 16 dot print, 1 line



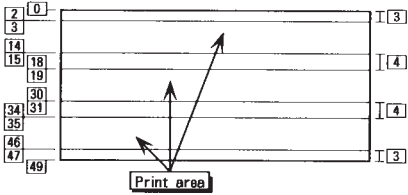
24 × 24 dots, 2 lines



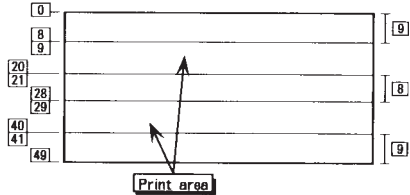
24 × 24 dots, 1 line



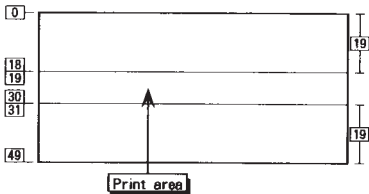
12 × 12 dot print, 3 lines



12 × 12 dot print, 2 lines



12 × 12 dot print, 1 line



With 24 x 24 dots font characters, 3 lines of printing is not possible.

## GRAPHIC DATA CONVERSION CHART

	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●
	○	○	●	●	○	○	●	●	○	○	●	●	○	○	●	●
	○	○	○	○	●	●	●	●	○	○	○	○	●	●	●	●
	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●
ASCII	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
HEX	30h	31h	32h	33h	34h	35h	36h	37h	38h	39h	41h	42h	43h	44h	45h	46h

This chart shows you how to convert the graphic data to Hexadecimal command structure used by the MCP200. By using this chart, the following explanation of the user defined graphic/character and dot graphics will be easier.

### (14) Set 16 x 16 dot user defined graphic/character

This command sets 16 x 16 user defined graphic/character.

The user defined characters are stored in a back up RAM.

#### Command format

To MCP210	STX	44h	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

#### Response format

MCP210 response	STX	44h	Status	ETX	BCC
-----------------	-----	-----	--------	-----	-----

The data consists of the following 65 bytes.

Data	Function
1st byte	Set address (90h to 9Fh)
2nd byte to 65th byte	Font data

The relationship between the user defined graphic/character and the font data is as follows.

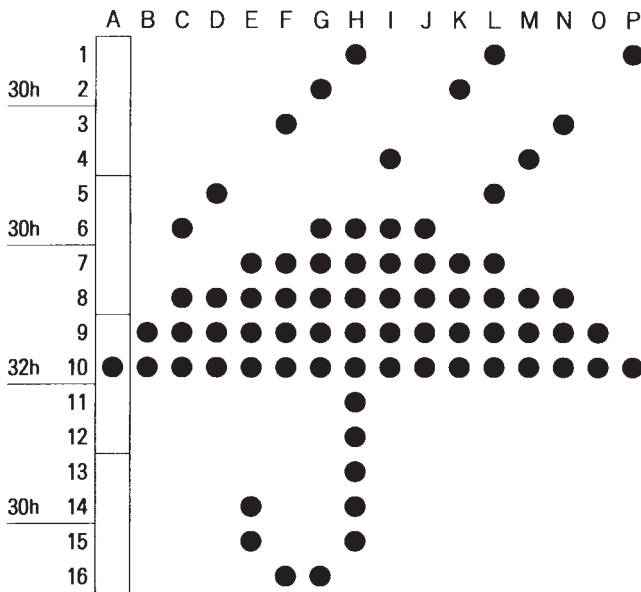
[ User defined graphic/character ]																[ Font data ]		
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P		
1																	2nd byte	line A, 1 - 4
2																	3rd byte	line A, 5 - 8
3																	4th byte	line A, 9 - 12
4																	5th byte	line A, 13 - 16
5																	6th byte	line B, 1 - 4
6																	.	.
7																	.	.
8																	.	.
9																	.	.
10																	.	.
11																	.	.
12																	.	.
13																	.	.
14																	.	.
15																	64th byte	line P, 9 - 12
16																	65th byte	line P, 13 - 16

The user defined graphic/character is created by sending the hexadecimal characterized data within four bits, and it is sent from the top-left corner of the matrix down four bits respectively within a column (please review diagram). For example, the four initial bits are sent from A1 to A4 respectively, continuing in spurts of four bits, eventually reaching A16.

The following graphic is shown as 0000(binary system), because the dots from A1 through A4 are all blank. The data 0000 is 0 in hexadecimal number system, and shown as 0 (30h in character code) in number after hexadecimal characterized.

The following example is used to set the user defined graphic/character and font data.

[ User defined graphic/character ]



[ Font data ]

A - B	30h, 30h, 32h, 30h, 30h, 30h, 33h, 30h
C - D	30h, 41h, 33h, 30h, 30h, 39h, 33h, 30h
E - F	30h, 43h, 33h, 30h, 34h, 43h, 33h, 33h
G - H	32h, 45h, 33h, 34h, 31h, 45h, 33h, 34h
I - J	38h, 45h, 46h, 33h, 30h, 45h, 33h, 30h
K - L	32h, 45h, 33h, 30h, 31h, 44h, 33h, 30h
M - N	38h, 38h, 33h, 30h, 34h, 38h, 33h, 30h
O - P	30h, 30h, 33h, 30h, 31h, 30h, 32h, 30h

[ Example Program ]

Below is how to set the user defined graphic/character into character code 90h:

```
1000 PRINT #1, CHR$(2);CHR$(&H44);
1010 BCC = &H44;
1020 FOR I = 1 TO 65
1030 READ DT
1040 PRINT #1, CHR$(DT);
1050 BCC = BCC XOR DT
1060 NEXT I
1070 PRINT #1, CHR$(3); CHR$(BCC)
1080 DATA &H90
1090 DATA &H30, &H30, &H32, &H30, &H30, &H30, &H33, &H30
1100 DATA &H30, &H41, &H33, &H30, &H30, &H39, &H33, &H30
1110 DATA &H30, &H43, &H33, &H30, &H34, &H43, &H33, &H33
1120 DATA &H32, &H45, &H33, &H34, &H31, &H45, &H33, &H34
1130 DATA &H38, &H45, &H46, &H33, &H30, &H45, &H33, &H30
1140 DATA &H32, &H43, &H33, &H30, &H31, &H44, &H33, &H30
1150 DATA &H38, &H38, &H33, &H30, &H34, &H38, &H33, &H30
1160 DATA &H30, &H30, &H33, &H30, &H31, &H30, &H32, &H30
```

**(15) Set 24 x 24 dots user defined graphic/character**

This command sets 24 x 24 user defined graphic/character.

The user defined characters are stored in a backed up RAM.

Command format

To MCP210	STX	45h	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

Response format

MCP210 response	STX	45h	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

The data consists of the following 145 bytes.

Data	Function
1st byte	Set address (90h to 9Fh)
2nd byte to 145th byte	Font data



The relationship between the user defined graphic/character and the font data is as follows :

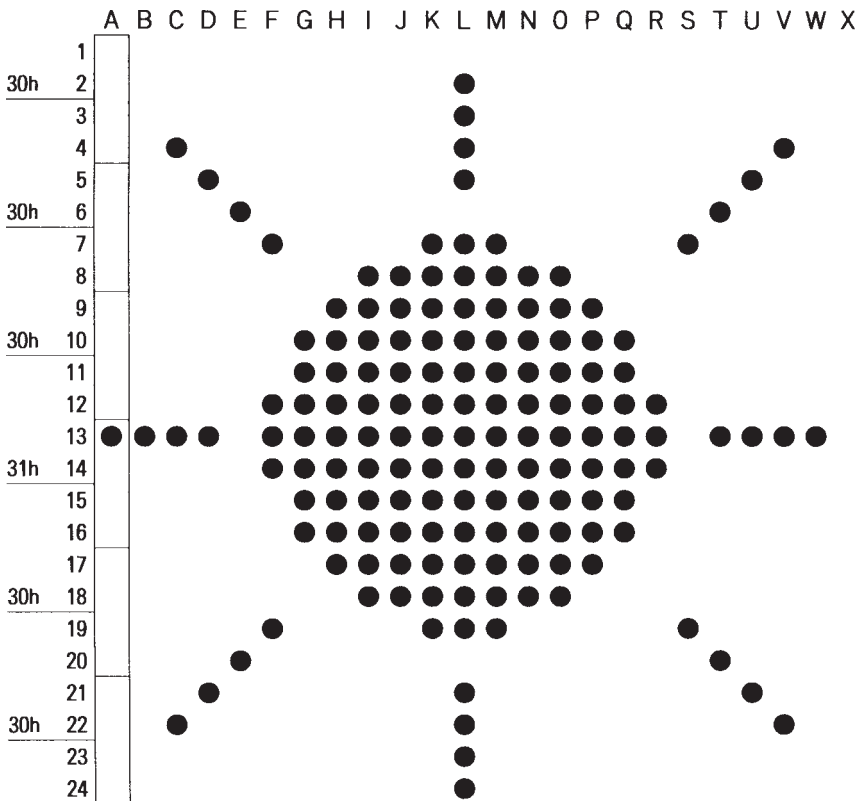
[ User defined graphic/character ]																[ Font data ]		
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P		
1																	2nd byte	line A, 1 - 4
2																	3rd byte	line A, 5 - 8
3																	4th byte	line A, 9 - 12
4																	5th byte	line A, 13 - 16
5																	6th byte	line B, 1 - 4
6																	.	
7																	.	
8																	.	
9																	.	
10																	.	
11																	.	
12																	.	
13																	.	
14																	.	
15																	64th byte	line P, 9 - 12
16																	65th byte	line P, 13 - 16

The user defined graphic/character is created by sending the hexadecimal characterized data within four bits, and it is sent from the top-left corner of the matrix down four bits respectively within a column (please review diagram). For example, the four initial bits are sent from A1 to A4 respectively, continuing in spurts of four bits, eventually reaching A16.

The following graphic is shown as 0000(binary system) because the dots from A1 through A4 are all blank. The data 0000 is 0 in hexadecimal number system, and shown as 0 (30h in character code) in number after hexadecimal characterized.

The following example is used to set the user defined graphic/character and the font data.

[ User defined graphic/character ]



[ Font data ]

A	30h, 30h, 30h, 31h, 30h, 30h,
B	30h, 30h, 30h, 31h, 30h, 30h,
C	38h, 30h, 30h, 31h, 30h, 32h,
D	30h, 31h, 30h, 31h, 30h, 31h,
E	30h, 32h, 30h, 30h, 38h, 30h,
F	30h, 34h, 38h, 33h, 34h, 30h,
G	30h, 30h, 45h, 46h, 30h, 30h,
H	30h, 30h, 46h, 46h, 31h, 30h,
I	30h, 38h, 46h, 46h, 33h, 30h,
J	30h, 38h, 46h, 46h, 33h, 30h,
K	30h, 43h, 46h, 46h, 37h, 30h,
L	45h, 44h, 46h, 46h, 37h, 46h,
M	30h, 43h, 46h, 46h, 37h, 30h,
N	30h, 38h, 46h, 46h, 33h, 30h,
O	30h, 38h, 46h, 46h, 33h, 30h,
P	30h, 30h, 46h, 46h, 31h, 30h,
Q	30h, 30h, 45h, 46h, 30h, 30h,
R	30h, 34h, 38h, 33h, 34h, 30h,
S	30h, 32h, 30h, 30h, 38h, 30h,
T	30h, 31h, 30h, 31h, 30h, 31h,
U	38h, 30h, 30h, 31h, 30h, 32h,
V	30h, 30h, 30h, 31h, 30h, 30h,
W	30h, 30h, 30h, 31h, 30h, 30h,
X	30h, 30h, 30h, 30h, 30h, 30h,

[ Example Program ]

Below is how to set the user defined graphic/character (shown above) into character code 90h:

```
1000 PRINT #1, CHR$(2);CHR$(&H45)
1010 BCC =&H45;
1020 FOR I = 1 TO 145
1030 READ DT
1040 PRINT #1, CHR$(DT);
1050 BCC =BCC XOR DT
1060 NEXT I
1070 PRINT #1, CHR$(3); CHR$(BCC)
1080 DATA &H90
1090 DATA &H30, &H30, &H30, &H31, &H30, &H30,
1100 DATA &H30, &H30, &H30, &H31, &H30, &H30,
1110 DATA &H38, &H30, &H30, &H31, &H30, &H32,
```

1120 DATA &H30, &H31, &H30, &H31, &H30, &H31,  
 1130 DATA &H30, &H32, &H30, &H30, &H38, &H30,  
 1140 DATA &H30, &H34, &H38, &H33, &H34, &H30,  
 1150 DATA &H30, &H30, &H45, &H46, &H30, &H30,  
 1160 DATA &H30, &H30, &H46, &H46, &H31, &H30,  
 1170 DATA &H30, &H33, &H46, &H46, &H33, &H30,  
 1180 DATA &H30, &H38, &H46, &H46, &H33, &H30,  
 1190 DATA &H30, &H43, &H46, &H46, &H37, &H30,  
 1200 DATA &H45, &H46, &H44, &H46, &H37, &H46,  
 1210 DATA &H30, &H43, &H46, &H46, &H37, &H30,  
 1220 DATA &H30, &H38, &H46, &H46, &H33, &H30,  
 1230 DATA &H30, &H38, &H46, &H46, &H33, &H30,  
 1240 DATA &H30, &H30, &H46, &H46, &H31, &H30,  
 1250 DATA &H30, &H30, &H45, &H46, &H30, &H30,  
 1260 DATA &H30, &H34, &H38, &H33, &H34, &H30,  
 1270 DATA &H30, &H32, &H30, &H30, &H38, &H30,  
 1280 DATA &H30, &H31, &H30, &H31, &H30, &H31,  
 1290 DATA &H38, &H30, &H30, &H31, &H30, &H32,  
 1300 DATA &H30, &H30, &H30, &H31, &H30, &H30,  
 1310 DATA &H30, &H30, &H30, &H31, &H30, &H30,  
 1320 DATA &H30, &H30, &H30, &H30, &H30, &H30,

## (16) Select character font

This command selects the character font.

### Command format

To MCP210	STX	46h	Data (character font code)	ETX	BCC
-----------	-----	-----	----------------------------	-----	-----

### Response format

MCP210 response	STX	46h	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

The data (character font code) must be selected from the following.

Character font code	Function
30h	Select 16 x 16 dot font
31h	Select 24 x 24 dot font
32h	Select 12 x 12 dot font

This command set is effective until the next set or reset.

When the power is turned on, MCP210 is set to select 12 x 12 dot font.

### (17) Dot graphic command

This command sets the dot graphics.

#### Command format

To MCP210	STX	47h	Data (graphic data)	ETX	BCC
-----------	-----	-----	---------------------	-----	-----

#### Response format

MCP210 response	STX	47h	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

The control codes must be selected from the following.

Character font code	Function
1Fh	Line feed
20h	Column feed (space)

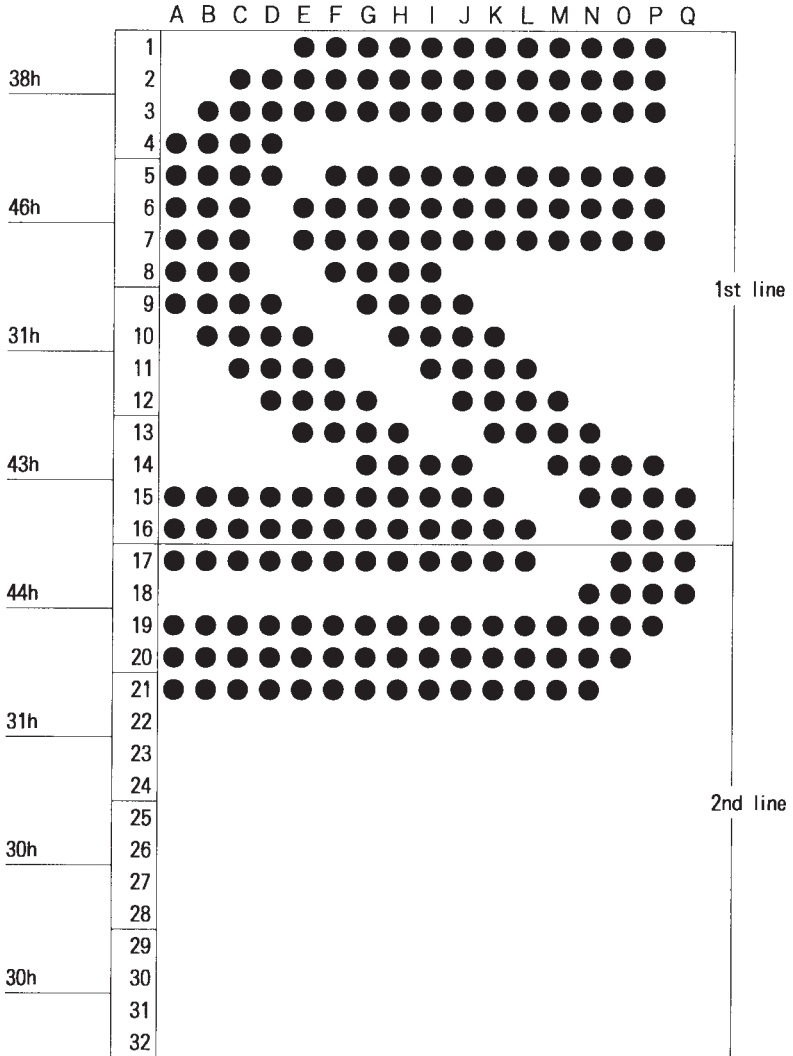
The dot graphics data is created by sending the hexadecimal characterized data within four bits, and it is sent from the top-left corner of the matrix down four bits respectively within a column.

For example, in the following graphic, the first four bits are black-white-white-white from the bottom to the top. If we make the black dot as “1” and the white dot as “0”, this data is shown as 1000 in binary system. It is 8 in hexadecimal number system. After characterized, this 8 is shown as 8 (38h in character code). This is the first data on the following graphic.

The vertical length of dot graphics is 16 dots. The first column is filled by the first 4 data (the first 4 bytes), the 5th data (the 5th byte) will be the first data in the 2nd column. In the example on the next page, the data from A17 to A20 is not set after the data from A13 to A16. It is set after the data from Q13 to Q16 and 1Fh.

There are two control codes for the dot graphics. One is <US>(1FH in character code) for the line feed. The other one is “space (20h)” for the column feed. When MCP210 finds the line feed code, it feeds the line and the printing position will move to the first column in next line. When the “space” is found, the setting position of the graphic data will move one column (16 dots) to the right. The dot command can not execute printing to Human Readable Area by itself. In order to print the dot graphics, it is necessary to use “Print to Human Readable Area Eject card” command. To print the dot graphics only, the print data should be blank (no data).

Following is the example of the dot graphics setting:



[ Font data ]

Following is an example of the font data which starts drawing the previous graphic from 2nd column (17th dot).

20h,  
38h, 46h, 31h, 43h, 43h, 46h, 33h, 43h,  
45h, 46h, 37h, 43h, 45h, 31h, 46h, 43h,  
37h, 36h, 45h, 44h, 37h, 46h, 43h, 44h,  
37h, 46h, 39h, 46h, 37h, 46h, 33h, 46h,  
37h, 46h, 37h, 45h, 37h, 37h, 46h, 45h,  
37h, 37h, 45h, 44h, 37h, 37h, 43h, 39h,  
37h, 37h, 38h, 33h, 37h, 37h, 30h, 37h,  
37h, 37h, 30h, 45h, 37h, 37h, 30h, 45h,  
30h, 30h, 30h, 43h,  
1Fh  
20h  
44h, 31h, 30h, 30h, 44h, 31h, 30h, 30h,  
44h, 31h, 30h, 30h, 44h, 31h, 30h, 30h,  
44h, 31h, 30h, 30h, 44h, 31h, 30h, 30h,  
44h, 31h, 30h, 30h, 44h, 31h, 30h, 30h,  
44h, 31h, 30h, 30h, 44h, 31h, 30h, 30h,  
44h, 31h, 30h, 30h, 44h, 31h, 30h, 30h,  
43h, 30h, 30h, 30h, 45h, 31h, 30h, 30h,  
46h, 30h, 30h, 30h, 37h, 30h, 30h, 30h,  
33h, 30h, 30h, 30h,



### (18) Check communication

This command checks the communication between the host and MCP210.

#### Command format

To MCP210	STX	48h	Data (check data)	ETX	BCC
-----------	-----	-----	-------------------	-----	-----

#### Response format

MCP210 response	STX	48h	status	Data (check data)	ETX	BCC
-----------------	-----	-----	--------	-------------------	-----	-----

The check data consists of 0 byte to 68 bytes. For successful communication, the data must be from 20h to 7Eh , 80h to 8Ah, and 90h to FEh,

### (19) Select reading track

This command selects reading track.

#### Command format

To MCP210	STX	4Ah	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

#### Response format

MCP210 response	STX	4Ah	Status	ETX	BCC
-----------------	-----	-----	--------	-----	-----

Data	Function
31h	Read track 1
32h	Read track 2
33h	Read track 3

This command set will be effective until the next set or reset. After set, the used code for each track is automatically changed. When the power is turned on, MCP210 is set to read track 3.

## (20) Set left margin of human readable print area

This command sets the print start position to the right (set the left margin) by a dot.

### Command format

To MCP210	STX	4Bh	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

### Response format

MCP210 response	STX	4Bh	Status	ETX	BCC
-----------------	-----	-----	--------	-----	-----

The data that sets the position where the printing starts must be 3 characters or less. For example, if the printing starts from the 10th bit, the data should be one of 10, 010 or 10(space10).

## (21) Initialize MCP210

This command initializes MCP210.

### Command format

To MCP210	STX	4Ch	ETX	BCC
-----------	-----	-----	-----	-----

### Response format

MCP210 response	STX	4Ch	Status	Data	ETX	BCC
-----------------	-----	-----	--------	------	-----	-----

## (2) Set 12 x 12 dot user defined graphic/character

This command sets 12 x 12 user defined graphic/character.  
The user defined characters are stored in a back up RAM.

### Command format

To MCP210	STX	4Dh	ETX	BCC
-----------	-----	-----	-----	-----

### Response format

MCP210 response	STX	4Dh	Status	Data	ETX	BCC
-----------------	-----	-----	--------	------	-----	-----

The data consists of the following 37 bytes.

Data	Function
1st byte	Set address (90h to 9Fh)
2nd byte to 37th byte	Font data

The relationship between the user defined graphic/character and the font data is as follows.

[ User defined graphic/character ]

[ Font data ]

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

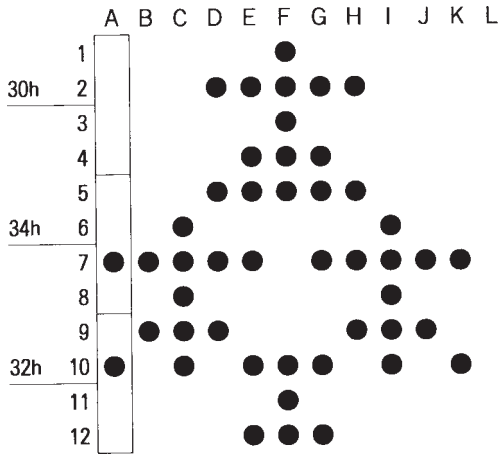
2nd byte	line A, 1 - 4
3rd byte	line A, 5 - 8
4th byte	line A, 9 - 12
5th byte	line A, 13 - 16
6th byte	line B, 1 - 4
	.
	.
	.
	.
	.
36th byte	line L, 5 - 8
37th byte	line L, 9 - 12

The user defined graphic/character is created by sending the hexadecimal characterized data within four bits, and it is sent from the top-left corner of the matrix down four bits respectively within a column (please review diagram). For example, the four initial bits are sent from A1 to A4 respectively, continuing in spurts of four bits, eventually reaching A16.

The following graphic is shown as 0000(binary system) because the dots from A1 through A4 are all blank. The data 0000 is 0 in hexadecimal number system, and shown as 0 (30h in character code) in number after hexadecimal characterized.

The following example is used to set the user defined graphic/character and the font data.

[ User defined graphic/character ]



[ Font data ]

A 30h, 30h, 30h, 31h, 30h, 30h,  
 B 30h, 30h, 30h, 31h, 30h, 30h,  
 C 38h, 30h, 30h, 31h, 30h, 32h,  
 D 30h, 31h, 30h, 31h, 30h, 31h,  
 E 30h, 32h, 30h, 30h, 38h, 30h,  
 F 30h, 34h, 38h, 33h, 34h, 30h,

[ Example Program ]

Below is how to set the user defined graphic/character (shown above) into character code 90h;

```

1000 PRINT #1, CHR$(2);CHR$(&H4A)
1010 BCC =&H4A;
1020 FOR I = 1 TO 41
1030 READ DT
1040 PRINT #1, CHR$(DT);
1050 BCC =BCC XOR DT
1060 NEXT I
    
```

1070 DATA &H90  
 1080 DATA &H30, &H30, &H32, &H30, &H34, &H31,  
 1090 DATA &H30, &H45, &H33, &H32, &H35, &H31,  
 1100 DATA &H41, &H35, &H41, &H46, &H31, &H45,  
 1110 DATA &H41, &H35, &H41, &H32, &H35, &H31,  
 1120 DATA &H30, &H45, &H33, &H30, &H34, &H31,  
 1130 DATA &H30, &H30, &H32, &H30, &H30, &H30,

**(23) Read magnetic stripe → eject card (28h status available)**

This command reads to the magnetic stripe and ejects the card.

Command format

To MCP210	STX	60h	ETX	BCC
-----------	-----	-----	-----	-----

Response format

MCP210 response	STX	60h	Status	Data	ETX	BCC
-----------------	-----	-----	--------	------	-----	-----

If there is no card at the card entry/exit slot, MCP210 sends 28h to the host as the status data. In this case, no magnetic stripe data is sent to the host.

**(24) Read magnetic stripe → hold card (28h status available)**

This command reads to magnetic stripe and holds the card.

Command format

To MCP210	STX	61h	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

Response format

MCP210 response	STX	61h	Status	Data	ETX	BCC
-----------------	-----	-----	--------	------	-----	-----

If there is no card at the card entry/exit slot, MCP210 sends 28h to the host as the status data. In this case, no magnetic stripe data is sent to the host.

## (25) Write magnetic stripe → eject card (28h status available)

This command writes to the magnetic stripe and ejects the card.

### Command format

To MCP210	STX	62h	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

### Response format

MCP210 response	STX	62h	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

Data consists of 0 to 104 bytes. Data bytes must be between 30h to 3Ah , and 3Ch to 3Eh. After writing, MCP210 will read the track that has been written, and if successful it will return 20h as status.

If there is no card at the card entry/exit slot, MCP210 sends 28h to the host as the status data.

## (26) Write magnetic stripe → hold card (28h status available)

This command writes to the magnetic stripe and eject the card.

### Command format

To MCP210	STX	63h	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

### Response format

MCP210 response	STX	63h	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

Data consists of 0 to 104 bytes. Data bytes must be between 30h to 3Ah , and 3Ch to 3Eh. After writing, MCP210 will read the track that has been written, and if successful, it will return 20h as status.

If there is no card in a dispensing unit , MCP210 sends 28h to the host as the status data.

### (27) Issue card → eject card

This command issues the card and ejects the card.

#### Command format

To MCP210	STX	64h	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

#### Response format

MCP210 response	STX	64h	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

Data consists of 0 to 104 bytes. Data bytes must be between 30h to 3Ah , and 3Ch to 3Eh. After writing, MCP210 will read the track that has been written, and if successful, it will return 20h as status.

If there is no card at the card entry/exit slot, MCP210 sends 28H to the host as the status data.

### (28) Issue card → eject card

This command issues the card and ejects the card.

#### Command format

To MCP210	STX	65h	Data	ETX	BCC
-----------	-----	-----	------	-----	-----

#### Response format

MCP210 response	STX	65h	Status	ETX	BCC
--------------------	-----	-----	--------	-----	-----

Data consists of 0 to 104 bytes. Data bytes must be between 30h to 3Ah , and 3Ch to 3Eh. After writing, MCP210 will read the track that has been written, and if successful, it will return 20h as status.

If there is no card at the card entry/exit slot, MCP210 sends 28h to the host as the status data.

**(29) Initialize card (erase magnetic stripe and Human Readable Area) → hold card**

This command initializes the card (erase both of the magnetic stripe and Human Readable Area) and holds the card.

Command format

To MCP210

STX	67h	ETX	BCC
-----	-----	-----	-----

Response format

MCP210  
response

STX	67h	Status	ETX	BCC
-----	-----	--------	-----	-----

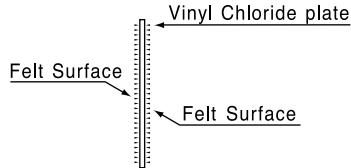
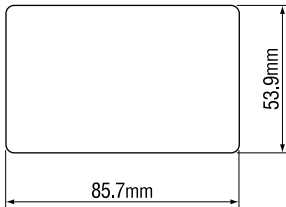


# 7

## How to Use Cleaning Card

Periodical cleaning is essential for maintaining the MCP200 series' performance level. Two cleaning cards and one bottle of cleaning liquid are supplied in the enclosed plastic bag for cleaning of the magnetic head.

### (1) Dimensions of cleaning card



### (2) Frequency of cleaning

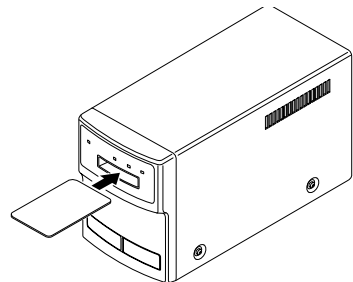
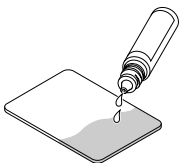
1. Under normal conditions, clean magnetic head once a week or once 500 times reading/writing.
2. Clean the magnetic head in the event of an error.

### (3) How to use

1. Issue the cleaning command to place the reader/writer in the waiting card state.
2. Apply a penetration of the cleaning liquid to the felt surface of the cleaning card.  
\* For units with one-sided magnetic stripe cards, apply the cleaning liquid on only the magnetic stripe side. For units with double-sided magnetic stripe cards, apply both side.
3. Insert the cleaning card into the card slot. Make sure that the penetrated side of the cleaning card goes onto the magnetic stripe head.
4. Allow the system approximately 1 minute for drying.
5. Ethel alcohol solvent may also be applied for cleaning.

#### Important:

Do not use a bent cleaning card.  
Bent cards will cause a card jam.



# 8

## Cleaning Pinch Rollers, etc.

If the print head, rollers, etc. are heavily stained, use the following steps for cleaning with a cotton swab:

### (1) Frequency of cleaning

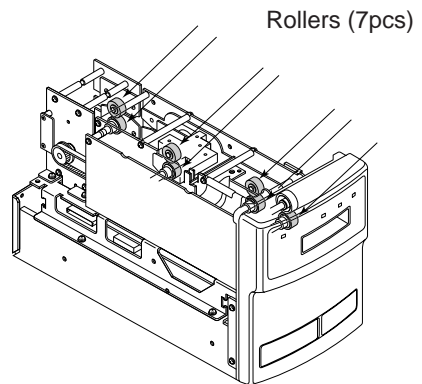
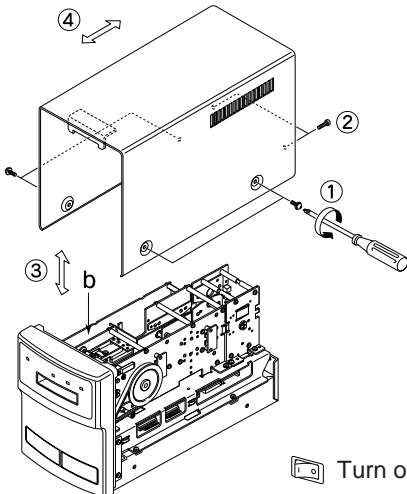
1. Each time after a continuous read/write error to the magnetic stripe occurs.
2. Each time after a continuous human readable area printing error occurs.

### (2) How to clean

1. Turn off both host computer and reader/writer.
2. Remove the screws ① and ② (six screws total).
3. Lift up case from the chassis in the direction ③, and slide it to direction ④.
4. Apply cleaning liquid to a cotton swab, and carefully wipe the foreign deposits from the pinch rollers. (as shown with the arrows)
5. After cleaning, assemble the case to the chassis in the opposite order.

#### CAUTION!

When assembling/disassembling the unit, avoid hooking cable b with metal part a. To prevent damage to cable b, carefully move the case to ③'s direction.



# 9

# Troubleshooting

Difficulties when the power is turned on.

Symptom		Possible cause	Remedy
Power LED lamp does not light up.	Card is not accepted	Power cable is not properly plugged in.	Properly plug power cable
		Power cable is broken.	Consult technical support
	Power fuse is blown		
Card is accepted	LED lamp is broken.		
Power LED lamp light up.	Card is not accepted	Trouble with the main unit	Use applicable card
		Card failure Flaw or bent card, loss of card data, or using card other than Visual card.	
	Card is accepted, but main unit does not properly run.	Stain on heed	Clean the head with cleaning card
		System does not properly run.	Consult technical support
		Trouble with main unit.	

Difficulties during the operation

Symptom	Possible cause	Remedy
Card is not ejected.	Card jamming	Reset the power
Read/write error	Card is not applicable	Use applicable card
	Using card other than Visual card	
	Card data is erased by a magnetized source	Issue new card
	Card is bent	
	Card has flaws	
	Head is stained	Clean the head with cleaning card
Card is not inserted	Thouble with card gate sensor	Consult technical suport

# 10

# GENERAL SPECIFICATIONS

Common specifications		MCP210ZD	MCM210S
Card feeding part	Driving method	Feed roller	
	Card inserting direction	Face up in one direction	
	Card feed speed	450mm/s (high speed) 140mm/s (low speed)	
Magnetic recording part	Number of Tracks	3 tracks Track1, Track2: Read only Track3: Read&Write	
	Width of Tracks	Write:3mm+0.05 or -0.1 Read:1.0mm ± 0.075	
	Recording method	Frequency modulation (F2F)	
	Recording density	Track 1 and 3 : 8.3 bit/mm ± 2% (210BPI) Track 2 : 3.0 bit/mm ± 2% (75BPI)	
	Recording capacity	Max. 104 characters	
Printing part	Printed characters	29 characters x 3 lines (12 x 12 dot font) 22 characters x 3 lines (16 x 16 dot font) 14 characters x 2 lines (24 x 24 dot font)	
	Charcter font	Alpha-numeric (standard) Chinese characters , Korean characters (option)	
	Font configuration	12 x 12 dot font 16 x 16 dot font 24 x 24 dot font	
	Dot pitch	0.29mm ± 0.05mm Horizontally 0.181mm ± 0.05mm Vertically	
Environment condition	Installation place	Indoor	
	Operating temperature and humidity	0 to 40°C , 20 to 80%RH (no condensation)	
	Storage temperature and humidity	-30to65°C , 20 to 90%RH (no condensation)	
	Vibration resistance	1.5G 7 to 100Hz XYZ direction each 1hr	
Reliability	Unit service life	300,000 times	
	Error rate	1/500(Head cleaning is required according to the operating circumstance)	
Applicable card		Visual card	
Outer case		Provided	Not provided
Power supply		AC 100/120, 230/240V *10% 20W	DC 5V ±5%, 3A MAX. DC 24V ±10% 1.5A MAX.
Interface		RS232C	CMOS level serial
Installation of card dispenser		Not available	Enabled Card Dispenser optional
Weight		4.1Kg	2.2Kg
Dimension		130(w) x 174(H) x 302(D)mm	123(W) x 115.3(H) x 312.4(d)mm



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