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RCR-2110

HALF-INSERTION MAGNETIC CARD READER



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1. OVERVIEW

RCR-2110 series (Former asWBM-1370 series)is the manual half-insertion magnetic card reader , port powered, can read track 1, 2 and 3 (accordance with ISO7811Standard).

It can read approximately 60% of the magnetic stripe. (Approximately 52 characters on track 1; 25 characters on track 2; and 73 characters on track 3)

Model list as following

code	card type	bezel	Interface
RCR-2	1:magnetic	0:without bezel	0:RS232
		1:black plastic bezel	1:TTL

2. TECHNICAL PARAMETERS

Standard	ISO 7811/2		
Track	SO1 (IATA), ISO 2 (ABA), ISO 3 (MINTS)		
Recording density	210 BPI	75 BPI	210 BPI
Record characters (half-insertion)	52 Characters	25 Characters	73 Characters
Power	+5V DC $\pm 5\%$		
Current	65mA(max.)		
Head function	Read track width: 1.5mm		
Thickness	PVC $0.76 \pm 0.08\text{mm}$		
Operating speed	10--150cm/sec		
Error rate	Under 0.5%(JSE test card)		
Operating position	Indoor		
Head life	500,000 times (1 time: slot card at a time)		
Operation temperature and humidity	-20°C ~ 70°C, 20 ~ 90% RH		
Storage temperature and humidity	-30°C ~ 70°C, Less than 95% RH		
Dimension(mm)	101.5(w) x 93.0(L) x 25.5(H)		

3. INTERFACE

3.1 Physical connection

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3.1.1 RS232 connection

RS-232C Signal	Host machine (9 pin)	Card machine (6 pin)	Functions
TXD	2	4	Transmitting Data
RXD	3	5	Receiving Data
GROUND	5	6	Signal Ground

3.1.2. Card machine interface pin description

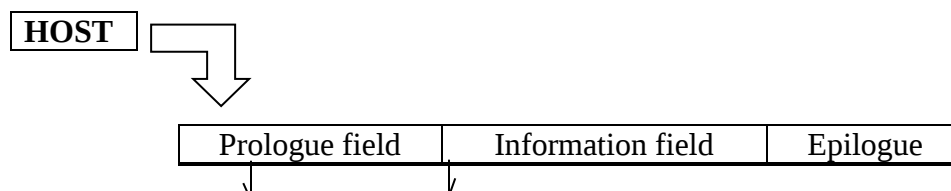
Pin No.	Signal Name	Functions
2	VCC	Power +5VDC
3	GND	Ground
4	TXD	Transmitting Data
5	RXD	Receiving Data

3.2 Software connection

3.2.1 Factory default

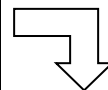
- (1) Communication type : Asynchronous half-duplex
- (2) Baud rate : 9600 bps (can be set)
- (3) Data length : 8 bit no parity
- (4) Startup bit : 1 bit
- (5) Stop bit : 1 bit

4. COMMUNICATION PROTOCOL



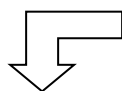
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					field
HEAD ER	LEN	CLA	INS	DATA	LRC
60h	2 byte	1 byte	1 byte	variabl e	1 byte



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Prologue field		Information field		Epilogue field
HEAD ER	LEN	EC	DATA	LRC
60h	2 byte	1 byte	variable	1 byte

HOST

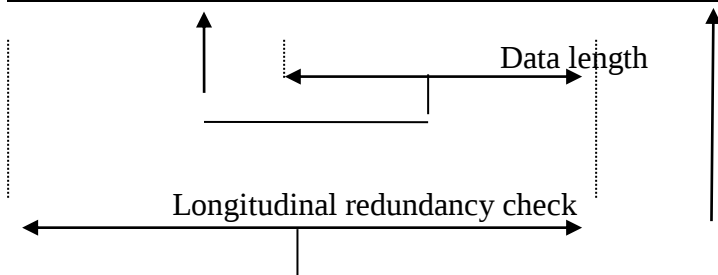
4.1. Communication Frame Description

Boot Sector (mandatory) -- Frame initiation region, contains the length of information area.

Information Zone (optional) -- Contains the application data.

Check Area (mandatory) -- LRC checksum.

Prologue field		Information field	Epilogue field
HEADE R	LEN	INF	LRC
60h	2 byte	1 to 255bytes	1 byte



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Chart 1 - Block structure

4.2 Frame Elements

4.2.1. Boot Sector (mandatory)

)

This area is necessary, which consists of two parts: header and length.

(1) Header

Header composed by one byte, used to indicate the start of the frame.

Default header is 0x60h.

(2) Length

Length used to indicate the bytes need to send in the message area.

As chart 1

'00' to 'FF'	Indicate the data length of information area is 0 ~ 255
'100' ~ 'FFFF'	Reserved for future use.

4.2.2. Information Area

Information Area is optional, when exist it contains the application date and non-application of control and status.

The transmitted bytes in the header were indicated by length.

(1) Composition of Information Area

Information Area must consists of a command area of two-byte length and an optional variable-length data zone.

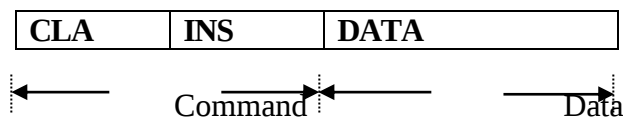


Chart 2 Composition of Information Area

Code	Description	Length
CLA	Command Type	1 bit
INS	Instruction Code	1bit
DAT A	Transmitted parameters	Multi bits

Chart 1 - - Composition of Information Area

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(2) Response of Information Area

The Response of Information Area consists of one-bit header and variable-length subject.

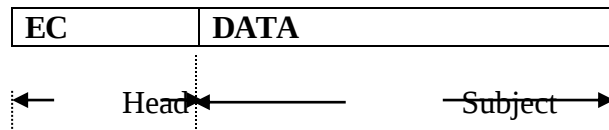


Chart 3-Response of Information Area

Code	Description	Length
EC	Error Code	1bit
DAT A	Receiving Data	Multi bits

Chart 2 Response of Information Area

4.2.3. Check Area (mandatory)

The length of LRC Check is one-bit, the LRC Checksum contain the XOR from the head to all bytes of information zone.

5. COMMAND FORMAT

5.1.Communication code list

Command	CLA	INS	Descriptions
Settings	'C' (43h)	'0' (30h)	Restore Factory Settings
		'1' (31h)	The first track switch
		'2' (32h)	The second track switch
		'3'(33h)	The third track switch
		'4'(34h)	Set the baud rate
		'5'(35h)	The prefix characters of the third track“; ”、“+”selector switch
		'6' (36h)	Whether to allow framework characters
		'7' (37h)	Whether to plus the Enter
		'8' (38h)	Read device configuration
		'9' (39h)	Version NO. of read device
		‘.’ (3Ah)	Read device status

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5.2. Error Code List

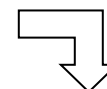
Error Code	Descriptions
'0' (30h)	Normal execution
'1' (31h)	LRC error in communication
'2' (32h)	Command Error
'3' (33h)	Data error

5.3. Control Commands

6.3.1. Restore factory settings



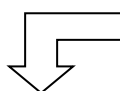
Prologue field		Information field		Epilogue field
HEAD ER	LEN	CLA	INS	LRC
60h	0002h	'C'(43h)	'0'(30h)	11h
1 byte	2 byte	1 byte	1 byte	1 byte



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- Information field (CLA,INS): See section 6.1. for the Command code list .

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Prologue field		Information field	Epilogue field
HEAD ER	LEN	EC	LRC
60h	0001h	??	??
1 byte	2 byte	1 byte	1 byte

HOST

- Error code byte (EC): See section 6.2. for the Error code list .
- Factory default settings:

Baud Rate:	9600 bps
Data length:	8-bit no parity
Startup bit:	1 bit
Stop bit:	1 bit

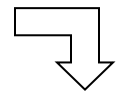
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The first track switch: ON (1)
 The second track switch: ON (1)
 The third track switch: ON (1)
 The prefix characters of the third track selector switch: “+” (1)
 Whether to allow framework characters: Allow (1)
 Whether allow to plus the carriage returns: Allow (1)

5.3.2. The first track switch

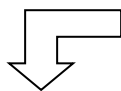
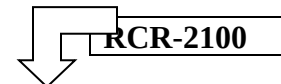


Prologue field		Information field			Epilogue field
HEAD ER	LEN	CLA	INS	DATA	LRC
60h	0003h	‘C’(43h)	‘1’(31h)	01/00	10h/11 h
1 byte	2 byte	1 byte	1 byte	1 byte	1 byte



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- Information field (CLA, INS): See section 6.1. for the Command code list .



Prologue field		Information field	Epilogue field
HEAD ER	LEN	EC	LRC
60h	0001h	??	??
1 byte	2 byte	1 byte	1 byte

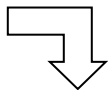
HOST

- * Error code byte (EC): See section 6.2. for the Error code list .

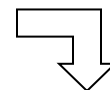
5.3.3. The second track switch

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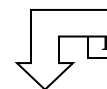
Prologue field		Information field			Epilogue field
HEAD ER	LEN	CLA	INS	DATA	LRC
60h	0003h	'C'(43h)	'2'(32h)	01/00	13h/12 h
1 byte	2 byte	1 byte	1 byte	1 byte	1 byte



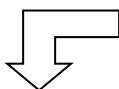
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- Information field (CLA, INS): See section 6.1. for the Command code list .

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Prologue field		Information field	Epilogue field
HEAD ER	LEN	EC	LRC
60h	0001h	??	??
1 byte	2 byte	1 byte	1 byte

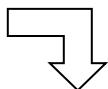


HOST

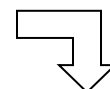
- * Error code byte (EC): See section 6.2. for the Error code list .

5.3.4. The third track switch

HOST



Prologue field		Information field			Epilogue field
HEAD ER	LEN	CLA	INS	DATA	LRC
60h	0003h	'C'(43h)	'3'(33h)	01/00	12h/13 h
1 byte	2 byte	1 byte	1 byte	1 byte	1 byte



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- Information field (CLA, INS): See section 6.1. for the Command code list .



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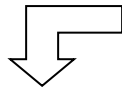
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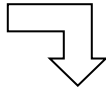
HOST

Prologue field		Information field	Epilogue field
HEAD ER	LEN	EC	LRC
60h	0001h	??	??
1 byte	2 byte	1 byte	1 byte

* Error code byte (EC): See section 6.2. for the Error code list .

5.3.5. Set the baud rate

HOST

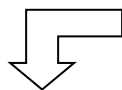


Prologue field		Information field			Epilogue field
HEAD ER	LEN	CLA	INS	DATA	LRC
60h	0003h	'C'(43h)	'4'(34h)	? ?	? ?
1 byte	2 byte	1 byte	1 byte	1 byte	1 byte

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- Information field (CLA, INS): See section 6.1. for the Command code list .

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Prologue field		Information field	Epilogue field
HEAD ER	LEN	EC	LRC
60h	0001h	??	??
1 byte	2 byte	1 byte	1 byte

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HOST

* Error code byte (EC): See section 6.2. for the Error code list .

*Data : setting baud rate

Data	Baud rate
31	4800
32	9600
33	19200
34	38400
35	57600
36	115200

5.3.6. The prefix characters of the third track“; ”、“+”selector switch

HOST

Prologue field		Information field			Epilogue field
HEAD ER	LEN	CLA	INS	DATA	LRC
60h	0003h	‘C’(43h)	‘5’(35h)	01/00	14h/15 h
1 byte	2 byte	1 byte	1 byte	1 byte	1 byte

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- Information field (CLA, INS): See section 6.1. for the Command code list .

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Prologue field		Information field	Epilogue field
HEAD ER	LEN	EC	LRC
60h	0001h	??	??
1 byte	2 byte	1 byte	1 byte

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HOST

* Error code byte (EC): See section 6.2. for the Error code list .

5.3.7. Whether to allow framework characters

HOST

Prologue field		Information field			Epilogue field
HEAD ER	LEN	CLA	INS	DATA	LRC
60h	0003h	'C'(43h)	'6'(36h)	01/00	17h/16 h
1 byte	2 byte	1 byte	1 byte	1 byte	1 byte

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- Information field (CLA, INS): See section 6.1. for the Command code list .

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Prologue field		Information field	Epilogue field
HEAD ER	LEN	EC	LRC
60h	0001h	??	??
1 byte	2 byte	1 byte	1 byte

HOST

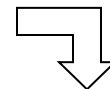
* Error code byte (EC): See section 6.2. for the Error code list .

5.3.8. Whether to add the Enter

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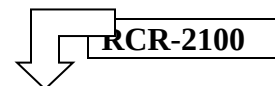
HOST

Prologue field		Information field			Epilogue field
HEAD ER	LEN	CLA	INS	DATA	LRC
60h	0003h	'C'(43h)	'7'(37h)	01/00	16h/17 h
1 byte	2 byte	1 byte	1 byte	1 byte	1 byte

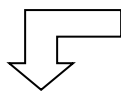


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- Information field (CLA, INS): See section 6.1. for the Command code list .



Prologue field		Information field	Epilogue field
HEAD ER	LEN	EC	LRC
60h	0001h	??	??
1 byte	2 byte	1 byte	1 byte

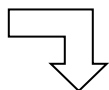


HOST

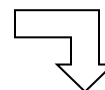
- * Error code byte (EC): See section 6.2. for the Error code list .

5.3.9. Read device configuration

HOST



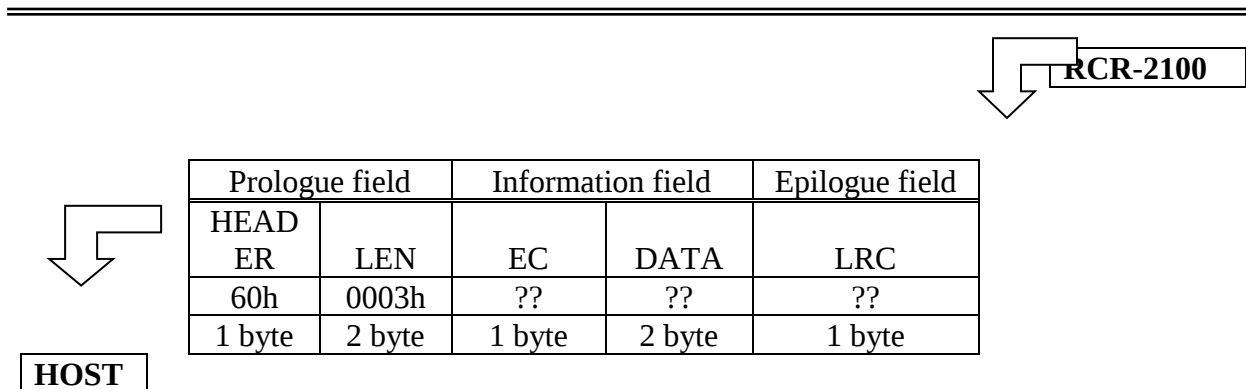
Prologue field		Information field		Epilogue field
HEAD ER	LEN	CLA	INS	LRC
60h	0002h	'C'(43h)	'8'(38h)	19 h
1 byte	2 byte	1 byte	1 byte	1 byte



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- Information field (CLA, INS): See section 6.1. for the Command code list .



- Error code byte (EC): See section 6.2. for the Error code list .
- DATA1 (bit7 ~ bit0) expression

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
The first track switch status	The second track switch status	The third track switch status			The prefix character s of the third track“; ” 、 “+”select or switch	Whether to allow framewor k character s	Whether to add the Enter

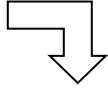
- DATA2 expression

Data2	Baud rate
31	4800
32	9600
33	19200
34	38400
35	57600
36	115200

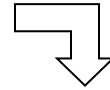
5.3.10. Read the device version No.

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Prologue field		Information field		Epilogue field
HEAD ER	LEN	CLA	INS	LRC
60h	0002h	'C'(43h)	'9'(39h)	18 h
1 byte	2 byte	1 byte	1 byte	1 byte

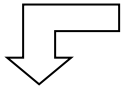


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- Information field (CLA, INS): See section 6.1. for the Command code list .

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Prologue field		Information field		Epilogue field
HEAD ER	LEN	EC	DATA	LRC
60h	??	??	??	??
1 byte	2 byte	1 byte	?? byte	1 byte

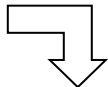


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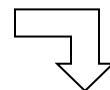
- Error code byte (EC): See section 6.2. for the Error code list .
- DATA device version

5.3.11. Read device status

HOST



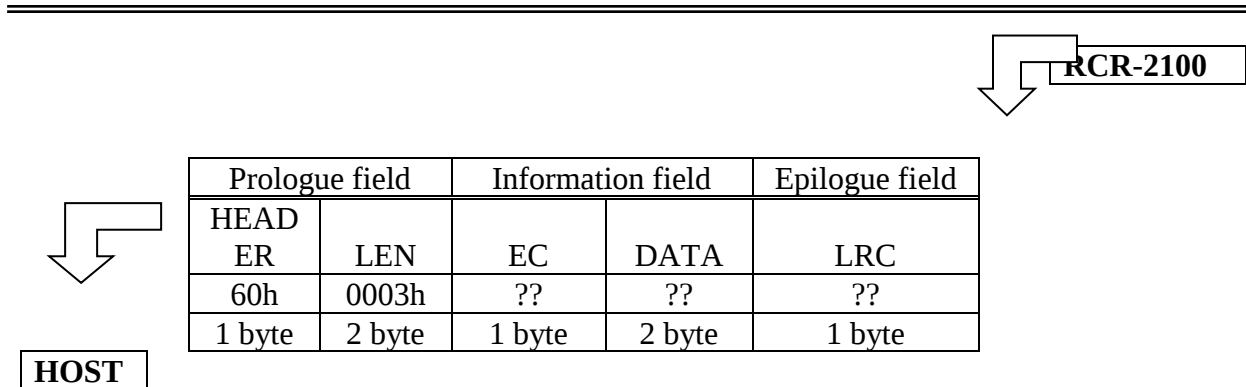
Prologue field		Information field		Epilogue field
HEAD ER	LEN	CLA	INS	LRC
60h	0002h	'C'(43h)	':'(3Ah)	1B h
1 byte	2 byte	1 byte	1 byte	1 byte



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- Information field (CLA, INS): See section 6.1. for the Command code list .



- Error code byte (EC): See section 6.2. for the Error code list .
- DATA1 0X30: Micro switch of slots in card machine – ON
0X31: Micro switch of slots in card machine – OFF
- DATA2 0X30: Micro switch of bottom card machine – ON
0X31: Micro switch of bottom card machine –OFF

6. DATE FORMAT

Upload data format of swiping card are (exist and permit in all three tracks):

Data of the first track (% DATA ?)
Data of the second track (; DATA ?)
Data of the third track (+ DATA ?)
Card status (0X31H: card in the machine, 0X30H: card out of the machine.)
CR

Framework characters、carriage returns are sent by the setting of the command.

7. CONSTRUCTION DESCRIPTION

Main Body



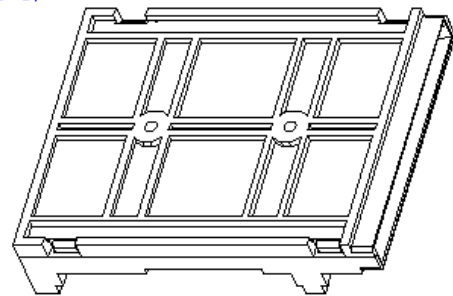
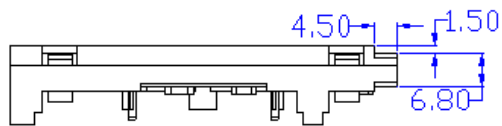
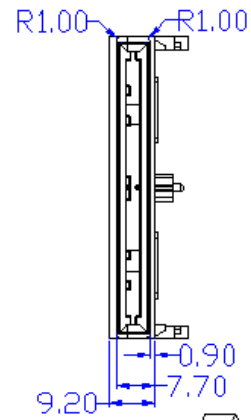
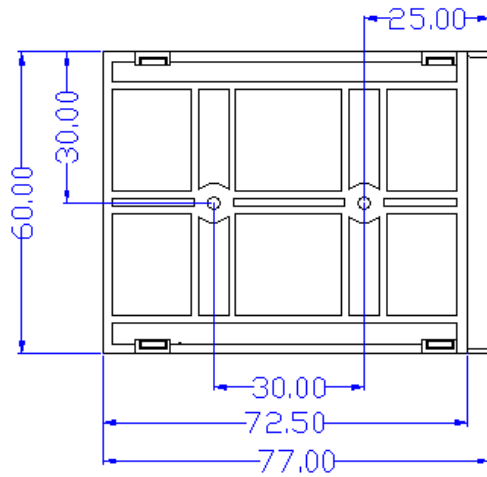
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Front Bezel



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