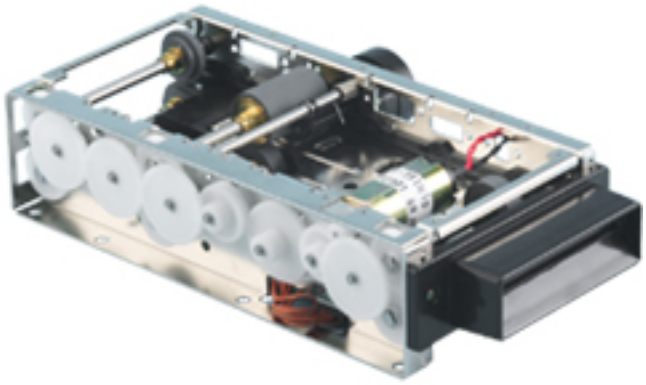
ZBA Motorized Magnetic Stripe Encoder
Assembly No. ZBMM-0312-N/S



Specification for:
MOTOR DRIVE MAGNETIC CARD READER / ENCODER
Low Coercivity / High Coercivity Switchable
(300 / 650 / 2,500 to 4,000 Oe)

ZBA, Inc
94 Old Camplain Road,
Hillsborough, NJ 08844
www.zbausa.com

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1 Document Status

Date	Comments
June 6, 2006	First draft
April 2007	Correct typos

To make a request for change, correction, additions or information on references, please contact:

ZBA, Inc.
94 Old Camplain Road
Hillsborough, NJ 08844
Phone: 908-359-2070
Fax 908-595-0909
E-mail: techsupport@zbausa.com
Website : http://www.bluetoothmodules.net

2 Features

(1) RS-232 interface
(2) Magnetic card reader / encoder for ISO model
(3) Strong conveyance force
(4) Allowable card thickness: 0.20 ~ 0.84 mm
(5) Optional shutter available
(6) Low profile
(7) IC card module: Can be retrofitted later

3 Encoding Coercivity

This device has a function of switchable coercivity and it enables to write data on three different coercivity cards. Refer to the following table for selecting correct coercivity for writing data.

Table 1: Write Current Mode

Write Current Mode	Applicable Card Coercivity
Mode 0 (Lo-Co 1)	24kA/m (300Oe +/-10%)
Mode 1 (Lo-Co 2)	52kA/m (650Oe +/-10%)
Mode 2 (Hi-Co)	200k - 320kA/m (2500 - 4000Oe)

Note.1: Be sure to select appropriate mode for cards to be written. Any data cannot be guaranteed if written with wrong coercivity.
Note.2: This setting does not affect reading operation at all.

4 SPECIFICATIONS (Card)

1	Physical characteristics	ISO/IEC 7810 ID-1 ISO/IEC 7811-2 (Magnetic Stripe)
2	Embossing	ISO/IEC 7811-1
3	Location of embossed characters	ISO/IEC 7811-1
4	Magnetic stripe / tracks	ISO/IEC 7811-2, -6
5	Maximum number of characters	Track 1: 79 characters (6 bits + 1 parity) (STX, ETX, LRC included) Track 2: 40 characters (4 bits + 1 parity) Track 3: 107 characters (4 bits + 1 parity)
6	Recording bit density	Track 1: 8.27 bits/mm (210 bpi) Track 2: 2.95 bits/mm (75 bpi)

		Track 3: 8.27 bits/mm (210 bpi)
7	Encoding technique	F2F recording
8	Allowable card thickness	0.20 ~ 0.84 mm Note 3
9	Card warpage	Max. 2 mm (Including the card thickness
10	Coercive force	Mode0 (Lo-Co1) 24 kA/m (300 Oe) ± 10% Mode1 (Lo-Co2) 52 kA/m (650 Oe) ± 10% Mode2 (Hi-Co) 200k - 320kA/m (2500 - 4000Oe)
11	Optical transmission density	1.5 or more

Note.3: Depending on card materials, conditions of card surfaces, etc, there is a possibility that cards with thickness 0.20 ~ 0.25mm cannot be carried normally.

5 SPECIFICATIONS (Magnetic Reader/ Encoder)

1	Card conveyance method	DC motor and Rubber roller
2	Card speed	300 mm/s ± 20 mm/s
3	Reading movement	Forward only Note 4 and note 5
4	Encoding movement	Forward only note 6
5	Insert direction	Front and Rear
6	Detection of card position Optical detection by Photo interrupter	(6 positions)
7	Magnetic head	3 tracks read / write head
8	Reading width of head	1.5 mm
9	Writing width of head	3.0 mm

Note.4: Forward / From Bezel side, Reverse / To Bezel side.
Note.5: Reverse reading cannot be warranted due to the instability comes from such as the condition of the encoded data.
Note.6:Reverse writing cannot be warranted because encoded data could be out of ISO specifications.

6 Shutter specification

1	Detecting method	(Magnetic data + Card width) or (Card width only) Note.7
2	Magnetic data detecting method	Track position ISO/IEC 7811
3	Card width detecting method	Optical detection (By two mechanical levers that detect card width)
4	Detectable speed	100 mm/s ~ 400 mm/s

Note.7: Magnetic data detection system can't detect unrecorded card

7 ENVIRONMENTAL CHARACTERISTICS

1	Temperature and Humidity	0 ~ 50 degC, 20 ~ 80 % RH (without condensation
2	Storage Temperature and Humidity	- 20 ~ 70 degC, 20 ~ 80 % RH (without condensation
3	Location for use	Indoor with 1,000 Lx or less

8 ENDURANCE CHARACTERISTICS

1	Temperature and Humidity Durability	40 ± 3 degC, 90 ~ 95 % RH, 96 h
2	Vibration Durability	Width 2 mm, 10 ~ 50 Hz/min, 15 min, X, Y, Z directions
3	Shock Durability	294 m/s2, 11 ms, one time only, X, Y, Z directions
4	Life	500,000 pass or more Note 8

Note.8: Standard condition: 20 ± 5 degC, 35 ~ 60 % RH. Indoor use.
(will be shorter at dusty condition)

9 Physical specification

1	Mounting position	Horizontal mounting in principle
2	Appearance	Refer to section 16
3	Mass	Approx. 600g
4		

Note.9: Card protrudes from the rear side of the unit in reading operation. The length of protrusion is about 35mm.

10 Connector

10.1 Power Connector

Connector J1 FI-W7P-HP (JAE)
Pin Assignment

Pin 1-3	Vcc I Voltage (+12Vdc)
Pin 4	FG Frame ground
Pin 5-7	GND -Ground

It is strongly recommended to connect FG (Encoder) to FG (System) with low-impedance cable.

10.2 Communications Connector

Connector J11 FI-W11P-HP (JAE)
Pin Assignment

Pin 1	TxD O Transmitted Data
Pin 2	RxD I Received Data
Pin 3	3 RTS O Request to Send
Pin 4	DTR O DTE Ready (Always "High")
Pin 5	CTS I Clear to Send
Pin 6	DSR I DCE Ready (Not observed)
Pin 7	SG –Ground
Pin 8	SG –Ground
Pin 9	N.C. -Not Connected
Pin 10	FG –FG
Pin 11	FG –FG

It is strongly recommended to connect FG (Encoder) to FG (System) with low-impedance cable.

10.3 External Capacitor

Connector J17 FI-W7P-HP (JAE)
Pin Assignment

Pin 1-2	C+ -Terminal +
Pin 3-5	N.C. -Not Connected
Pin 6-7	C- Terminal -

10.4 Connector Locations

Connector Position
Please refer to Section 16

11 ELECTRICAL CHARACTERISTICS

11.1 Absolute Maximum Ratings

PARAMETER	SYMBOL	STANDARD Value	Units
Power Voltage	VCC	-0.5 ~ +13.2	V
RxD , CTS , DSR Input Voltage	VRSin	-25.0 ~ +25.0	V
TxD , RTS , DTR Output Voltage	VRSout	-13.2 ~ +13.2	V

Note.10: Exceeding the maximum rating will cause unit to fail permanently.

11.2 DC Characteristics

11.2.1 Operational characteristics

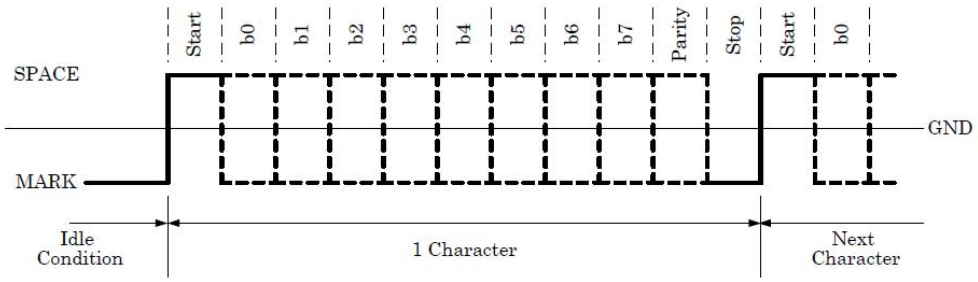
PARAMETER	SYMBOL	STANDARD Value
Power Voltage	VCC	12V ± 5%
Ripple Voltage	Vripp	: 100 mVp-p or less

Parameter		Symbol	min	. typ.	max	Units	Conditions
Output "High" Level	TxD, RTS, DTR	VOH	5.0	5.4	-	V	
Output "Low" Level	TxD, RTS, DTR	VOL	-	-5.4	-5.0	V	
Input "High" Level	RxD, CTS, DSR	VIH	-	1.8	2.4	V	
Input "Low" Level	RxD, CTS, DSR	VIL	0.8	1.5	-	V	
Power consumption Waiting Mode	ICC			320		mA	
Writing Operation	ICC		-	2400	2600	mA	Writing three tracks
				1400	- 1600	mA	Writing one track
Card Operation	ICC			1000	1200		
Motor Starting up, Stopping, Reversing	ICC			1300 (25ms)	1600 (30ms)	mA	
Shutter Operation	ICC			800	950	mA	

11.2.2 **TRANSMISSION Format**

1	Electrical Standard	RS-232 (EIA)
2	Baud rate	9600 bits/s
3	Transmission technique	Asynchronous transmission / half duplex
4	Start bit number	1 bit
	Frame Configuration	8 bit + 1 parity (even)
	Stop bit number	1 bit
	Transmission code	ASCII

(8) Transmission data structure



Start

Fig. 1 Transmission data structure

12 POWER FAILURE

As is indicated on Fig. 2, by connecting capacitor, when power voltage goes low, card is ejected from the front.

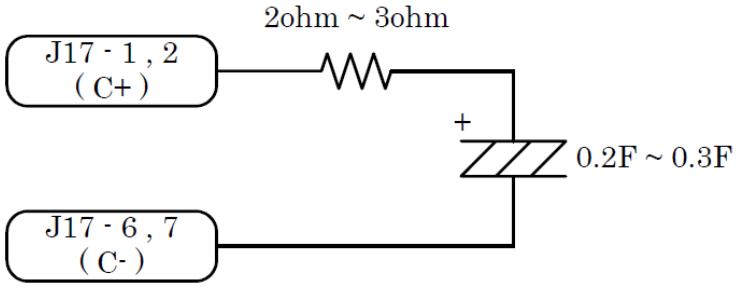


Fig. 2 Connecting Capacitor

Note.11: Full power voltage is present between C+ and C-. Please exercise care when working around circuit.

Note.12: This unit is not designed to install battery between C+ and C-.

Please not install battery.

13 CLEANING the Heads and Rollers

Clean the unit when frequent reading errors or transportation errors are observed. Using without cleaning may cause permanent deterioration of unit performance or shorten lifetime of the magnetic head or other components.

(1) Cleaning card
Head : WCS-85C90
Roller : WCS-250C25
Note.13: The above cards are wet-type cleaning cards
(Ethyl Alcohol: 70 % , Water: 30 %).
Note.14: Wait for about 5 min to dry cleaning liquid before starting operation.

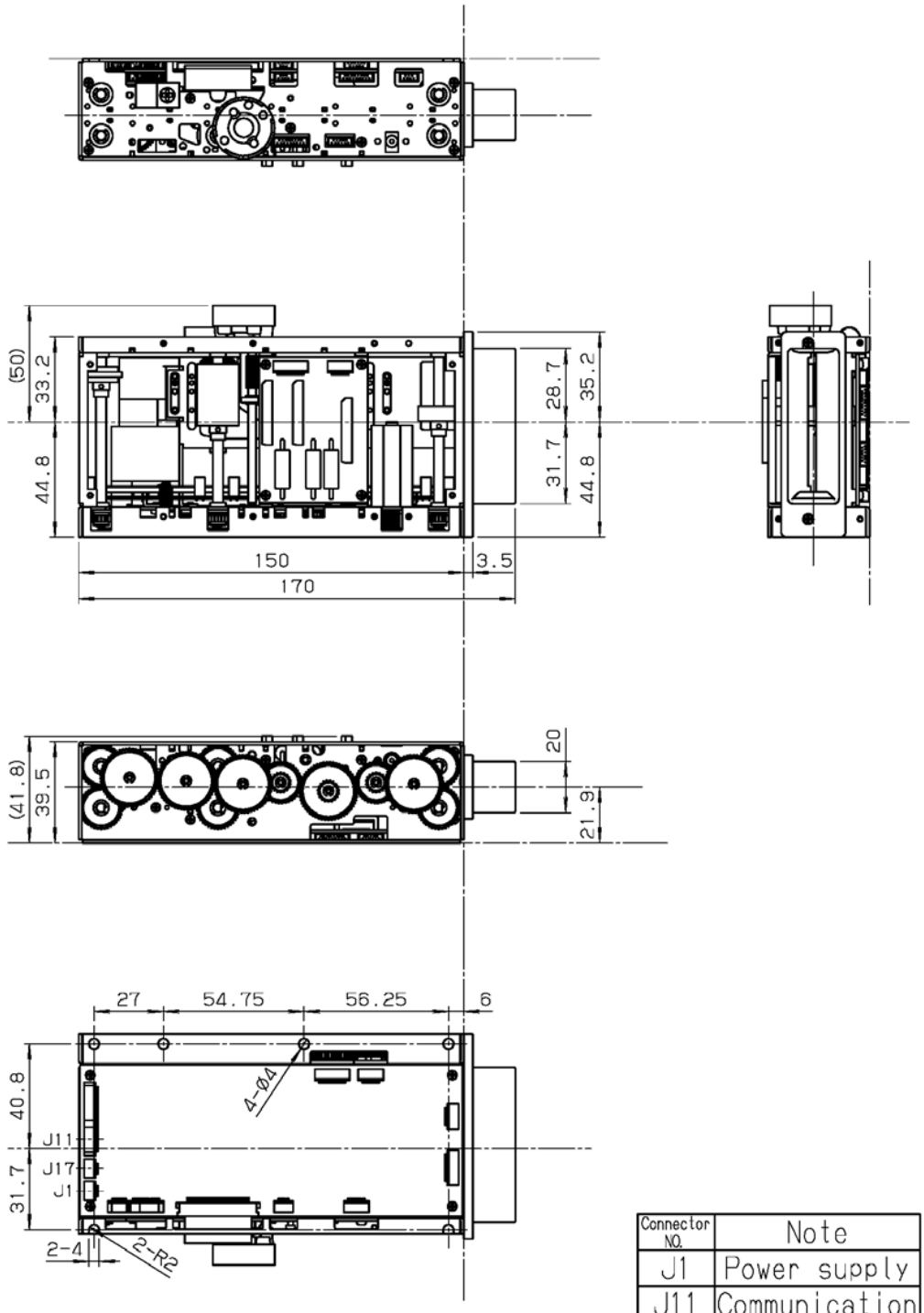
(2) Cleaning method (Head)
Perform reading operation using cleaning card (3 to 5 times)

(3) Cleaning method (Roller)
In a condition of a cleaning card to be held at each rubber roller point, rotate rubber rollers for about 5 to 10 seconds.
Note.15: Do not use a dried cleaning card. Dip it in the cleaning liquid before using.

14 INSTALLATION

Flatness of base plate must be 0.5 mm or less.

15 Dimensional Drawings



Connector NO.	Note
J1	Power supply
J11	Communication
J17	Capacitor on powerdown