

SPECIFICATIONS

MTM-7x0S-xR-0101

MTM-7x0S-xR-0102

MOTOR DRIVEN MAGNETIC CARD READER

NEURON CORPORATION

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Upgrading of specifications or equipment may be conducted without notice.

1 GENERAL

This specification describes the technical characteristics of Neuron motorized magnetic card reader MTM-7xxS series.

- (1) RS-232 interface
- (2) Magnetic card reader for ISO model
- (3) Strong conveyance force (twice as much as MTM-5xx series)
- (4) Allowable card thickness: 0.20 ~ 0.84 mm
- (5) Optional shutter available (Model No.: MTM-7x0S-xR-0102)
- (6) Low profile
- (7) IC card module: Can be retrofitted later

2 Version List

Table 1 Version List

Model Number	ISO (Magnetic)			Normal	With Shutter
	Track 1	Track 2	Track 3		
MTM-760S-1R	R			-0101	-0102
MTM-770S-1R		R			
MTM-780S-1R			R		
MTM-730S-2R	R	R			
MTM-710S-2R		R	R		
MTM-790S-3R	R	R	R		

3 Related Document

Refer to the following document for operation.

- (1) "Software Communication Protocol" MTM-6xx / 7xx

Document number: R-0001

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 (STX, ETX, LRC included)	Track 1: 79 characters (6 bits + 1 parity) 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.1: Depending on card materials, conditions of card surfaces, etc, there is a possibility that cards with thickness 0.20 ~ 0.25mm can not be carried normally.	
(9) Card warpage	Max. 2 mm (Including the card thickness)
(10) Coercive force	24 kA/m ~ 320 kA/m (300 Oe ~ 4000 Oe)
(11) Optical transmission density	1.5 or more

5 SPECIFICATIONS (Magnetic Card Reader)

(1) Card conveyance method	DC motor and Rubber roller
(2) Card speed	300 mm/s ± 20 mm/s
(3) Reading movement	Forward only
Note.2: Forward / From Bezel side, Reverse / To Bezel side.	
(4) Insert direction	Front and Rear
(5) Detection of card position	Optical detection by Photo interrupter (5 positions)
(6) Magnetic head	1 track read head (for MTM-760S, 770S, 780S) 2 tracks read head (for MTM-730S, 710S) 3 tracks read head (for MTM-790S)
(7) Reading width of head	1.4 mm

6 SHUTTER SPECIFICATIONS (MTM-7x0S-xR-0102)

- (1) Detecting method (Magnetic data + Card width)
or (Card width only)
- Note.3:** Magnetic data detection system can't detect unrecorded card
- (2) Magnetic data detecting method
- | | |
|------------------|--|
| Track position | ISO/IEC 7811 Track 1 (for MTM-760S) |
| | ISO/IEC 7811 Track 2
(for MTM-770S, 730S, 710S, 790S) |
| | ISO/IEC 7811 Track 3 (for MTM-780S) |
| Detectable speed | 100 mm/s ~ 400 mm/s |
- (3) Card width detecting method
- | | |
|-------------------|---|
| Optical detection | (By two mechanical levers that detect card width) |
|-------------------|---|

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

- (1) Temperature and Humidity Durability
40 ± 3 degC, 90 ~ 95 % RH, 96 h
- (2) Vibration Durability
Acceleration 4.9 m/s², 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.4:** Standard condition: 20 ± 5 degC, 35 ~ 60 % RH. Indoor use.
(will be shorter at dusty condition)

9 PHYSICAL SPECIFICATIONS

- (1) Mounting position Horizontal mounting in principle
- (2) Appearance, form Refer to [17 APPEARANCE] (page 8)
- (3) Mass
MTM-7x0S-xR-0101 : Approx. 340g
MTM-7x0S-xR-0102 : Approx. 470g

10 CONNECTOR

10.1 Power Connector

- (1) Connector J1 FI-W7P-HF (JAE)
 (2) Pin Assignment

Table 2 Pin Assignment table (Power Connector)

Pin No.	Signal	I/O	Contents
1 ~ 3	Vcc	I	Voltage (+12Vdc)
4	FG	-	FG
5 ~ 7	GND	-	Ground

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

10.2 Communication Connector

- (1) Connector J11 FI-W11P-HF (JAE)
 (2) Pin Assignment

Table 3 Pin Assignment table (Communication Connector)

Pin No.	Signal	I/O	Contents
1	TxD	O	Transmitted Data
2	RxD	I	Received Data
3	RTS	O	Request to Send
4	DTR	O	DTE Ready (Always "High")
5	CTS	I	Clear to Send
6	DSR	I	DCE Ready (Not observed)
7 , 8	SG	-	Ground
9	N.C.	-	Not Connected
10 , 11	FG	-	FG

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

10.3 External Capacitor Connector

- (1) Connector J17 FI-W7P-HF (JAE)
 (2) Pin Assignment

Table 4 Pin Assignment table (External Capacitor Connector)

Pin No.	Signal	I/O	Contents
1 , 2	C+	-	Terminal +
3 , 4 , 5	N.C.	-	Not Connected
6 , 7	C-	-	Terminal -

10.4 Connector Position

Refer to [17 APPEARANCE] (page 8)

11 ELECTRICAL CHARACTERISTICS

11.1 Absolute Maximum Rating

Table 5 Absolute Maximum Rating table

Parameter	Symbol	Standrad Value	Units
Power Voltage	V_{CC}	-0.5 ~ +13.2	V
RxD , CTS , DSR Input Voltage	V_{RSin}	-25.0 ~ +25.0	V
TxD , RTS , DTR Output Voltage	V_{RSout}	-13.2 ~ +13.2	V

Note.5: Exceeding the maximum rating will cause unit to fail permanently.

11.2 DC characteristic

Operational conditions

Power Voltage (Vcc) : 12V ± 5%

Ripple Voltage : 100 mVp-p or less

Table 6 DC characteristic table

Parameter		Symbol	min.	typ.	max.	Units	Conditions
Output "High" Level	TxD, RTS, DTR	V_{OH}	5.0	5.4	-	V	
Output "Low" Level	TxD, RTS, DTR	V_{OL}	-	-5.4	-5.0	V	
Input "High" Level	RxD, CTS, DSR	V_{IH}	-	1.8	2.4	V	
Input "Low" Level	RxD, CTS, DSR	V_{IL}	0.8	1.5	-	V	
Power consumption	Waiting Mode	I_{CC}	-	250	-	mA	
	Card Operation		-	800	950		
	Motor Starting up, Stopping, Reversing		-	1200 (25ms)	1500 (30ms)		
	Shutter Operation		-	700	850		

12 TRANSMISSION

(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
(5)	Frame Configuration	8 bit + 1 parity (even)
(6)	Stop bit number	1 bit
(7)	Transmission code	ASCII
(8)	Transmission data structure	

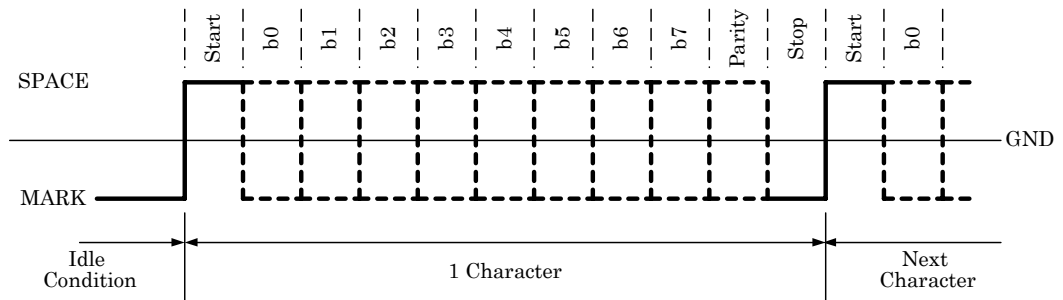


Fig. 1 Transmission data structure

13 POWER FAILURE

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

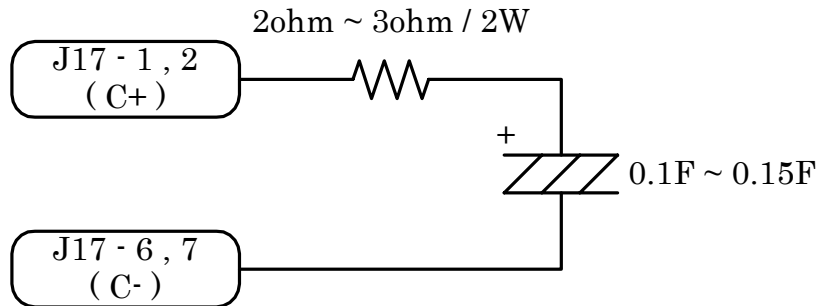


Fig. 2 Connecting Capacitor

Note.6: Full power voltage is present between C+ and C-. Please exercise care when working around circuit.

Note.7: This unit is not designed to install battery between C+ and C-. Please not install battery.

14 CLEANING

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.8: The above cards are wet-type cleaning cards (Ethyl Alcohol: 70 % , Water: 30 %).

Note.9: 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.10: Do not use a dried cleaning card. Dip it in the cleaning liquid before using.

15 EMC TESTING

EMC approval is obtained as the final system. EMC approval may not be obtained even using all EMC approved components for the system. This product is tested by the following system configuration.

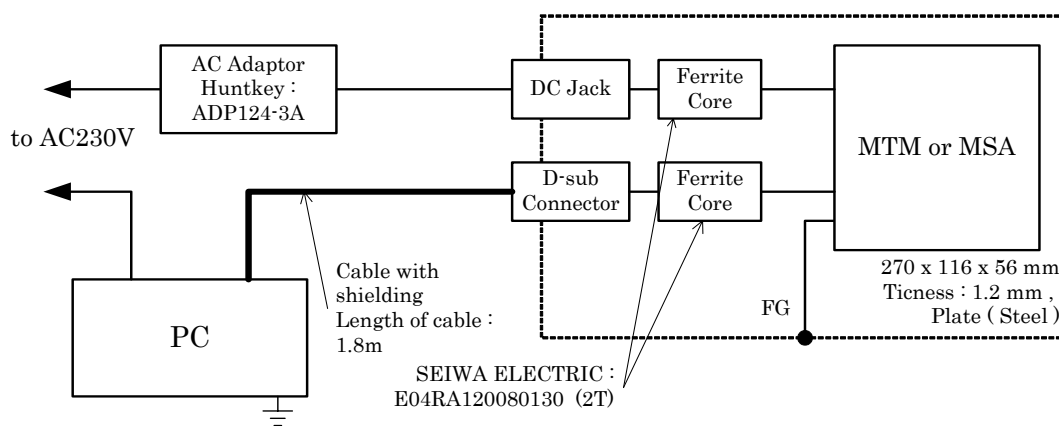


Fig. 3 Example (System)

16 INSTALLATION

Flatness of base plate must be 0.5 mm or less.

17 APPEARANCE

17.1 MTM-7x0S-xR-0101

Unit: mm

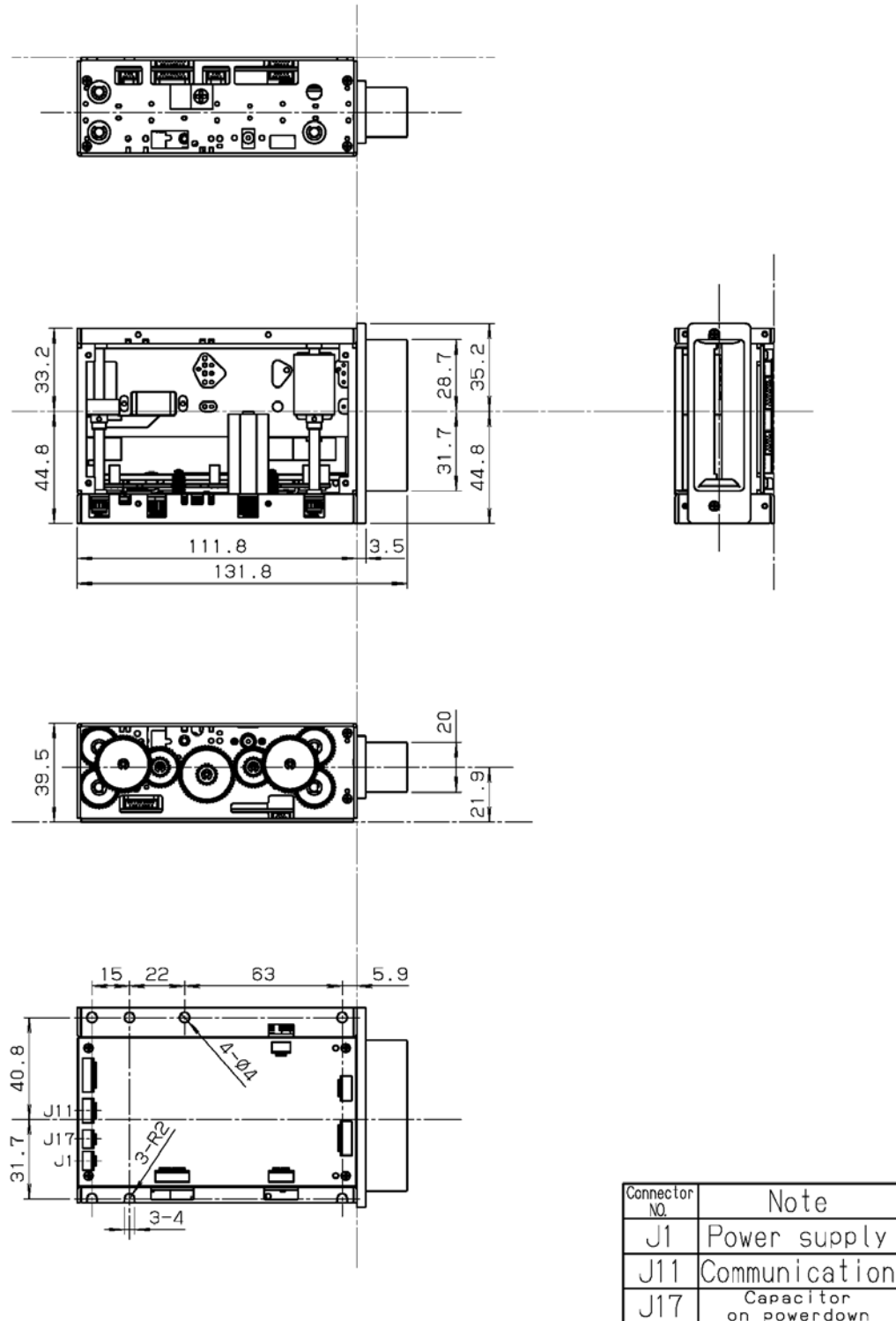


Fig. 4 Appearance

17.2 MTM-7x0S-xR-0102

Unit: mm

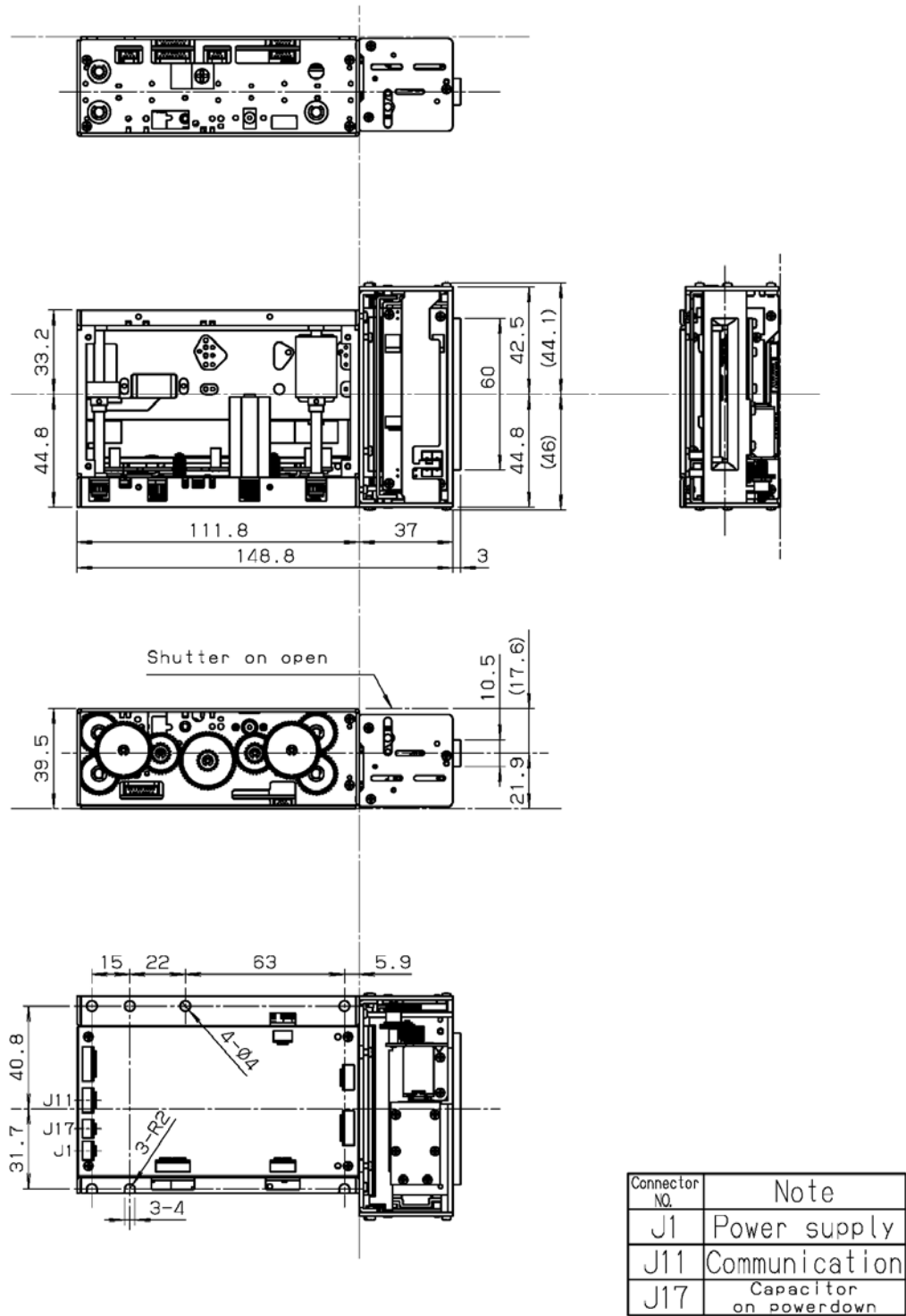


Fig. 5 Appearance

History of Revision

Model:				
	MTM-7x0S-xR-0101	Remarks:		
	MTM-7x0S-xR-0102			
Rev.	Contents of Revision	Approved	Checked	Prepared
00	Tentative			2003-10-28 A.Utsui
01	1 st . Release			2004-03-23 A.Utsui
02	12 TRANSMISSION (5) 7 bit + 1 parity (even) --> 8 bit + 1 parity (even)			2004-04-21 A.Utsui
03	8 ENDURANCE (2) Width 2mm --> Acceleration 4.9 m/s ²			2004-05-20 A.Utsui
04	Deleted 4 (5) Electronic signals and transmission protocols]			2004-06-08 A.Utsui
05	Updated Fig.2 and Fig.3			2004-07-28 A.Utsui
06				
07				
08				
09				