

SPECIFICATION
FOR
MAGNETIC CARD READER
(Manual Slide type)

Z U - M 1 2 4 2 S 1

JUL. 2004

Date :

Signature for approval

Read and agreed by

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In case there is any contradiction appeared based on technical standard change/update etc., our specifications shall take precedence over such change/update.

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1. INTRODUCTION

This specification describes about manual slide type magnetic card reader, featuring small size, light weight and high performance which enable to read card data encoded by following ISO 1,2 standards.

2. PRODUCT NAME

2.1 Product Name : Manual slide type magnetic card reader
2.2 Model No. : ZU-M1242S1

3. FUNCTION

3.1 Card operation : One way (Refer to appearance)
3.2 Read/Write : Read only

4. EQUIPMENT SPECIFICATION

4.1 Card operating speed : 10 cm/s ~ 150 cm/s
4.2 Outer dimension : (W) 25 mm × (L) 90 mm × (H) 24 mm
4.3 Weight : Approximately 28 g
4.4 Supplied voltage
(1) Supplied voltage : DC 5V ± 0.5 V , Ripple (Less than 50 mVp-p)
(2) Current consumption : TYP. 6 mA, MAX.9 mA (at DC 5 V)
(3) Maximum applied voltage : DC 7 V
4.5 Connector : Molex Japan : 53261-0990 (Refer to 6.5)
4.6 Environment requirements : Indoors

5. CARD STANDARD

5.1 Card standard

Materials and dimensions of the card should be submitted to ISO standards. But defined items in this specification are prior to these standards.

Card Standard	ISO 7810, ISO 7811	
	Track 1 st	Track 2 nd
Recording density	210 BPI	75 BPI
Recording capacity	79 Characters (7 bit code)	40 Characters (5 bit code)
Recording method	F2F	F2F

5.2 Location of tracks

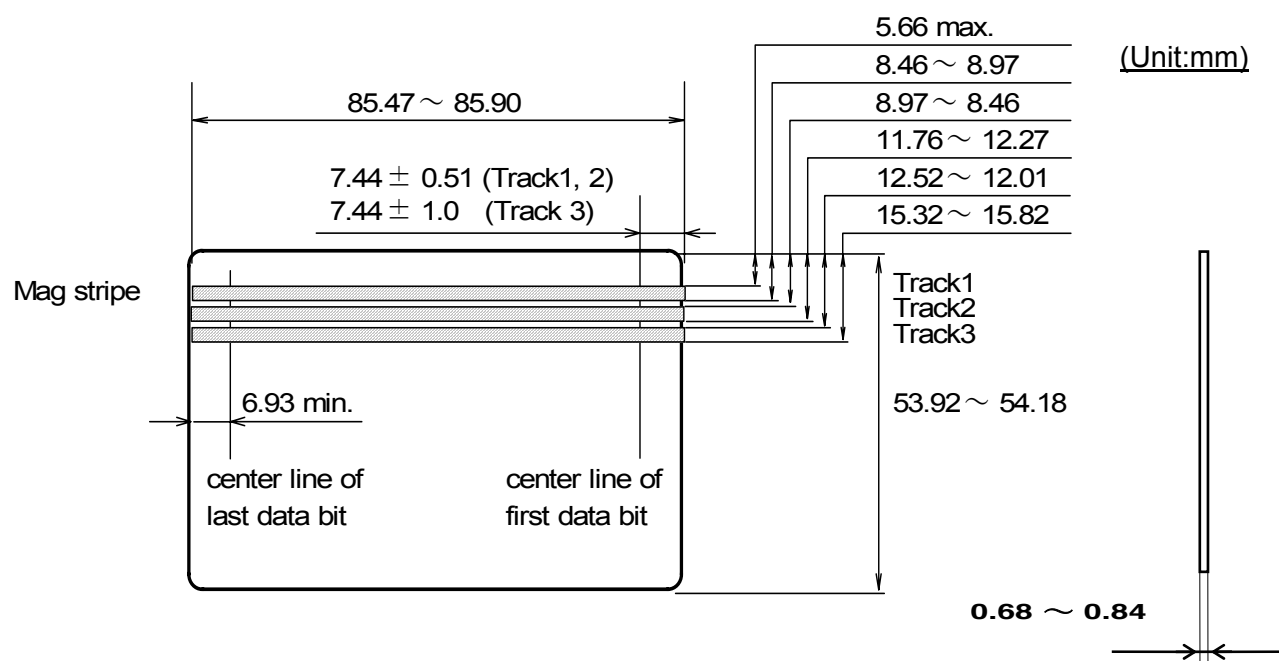


Figure 5.2 Location of Tracks

5.3 Physical characteristics

- (1) Thickness : 0.76 mm (tolerance \pm 0.08 mm)
- (2) Card Warpage : 2.5 mm max.
(include relief height of embossed characters)

5.4 Magnetic characteristics

- (1) Coercive force (Hc) : 2.4×10^4 A/m ~ 2.4×10^5 A/m
- (2) Residual flux ($e r$) : 1.25×10^{-8} Weber/cm (tolerance \pm 0.15×10^{-8} Weber/cm)
- (3) Square ratio ($e r / e m$) : More than 0.70

6. CIRCUIT CONSTRUCTION

6.1 Block diagram

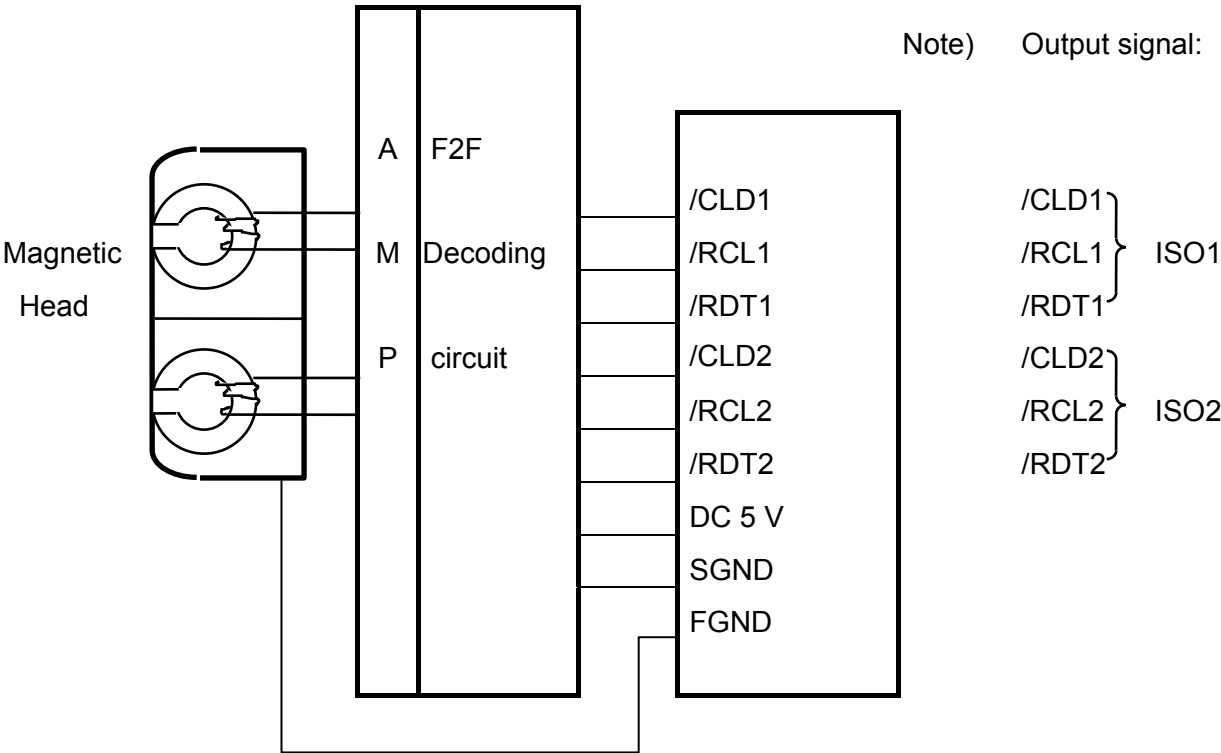


Fig 6.1 Block diagram

6.2 Interface requirement

- (1) Signal Level : CMOS level
- (2) Signal Logic : Low active
- (3) Connection condition

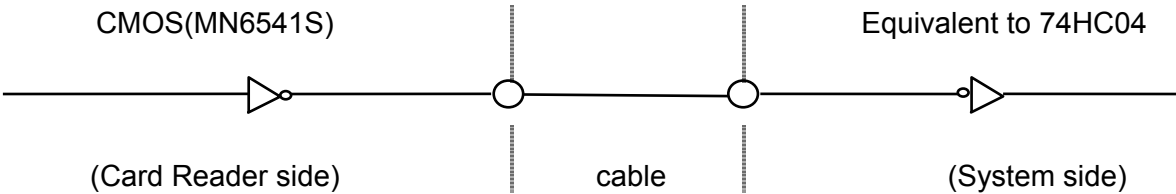


Fig 6.2 Connection of output circuit

(4) Output voltage

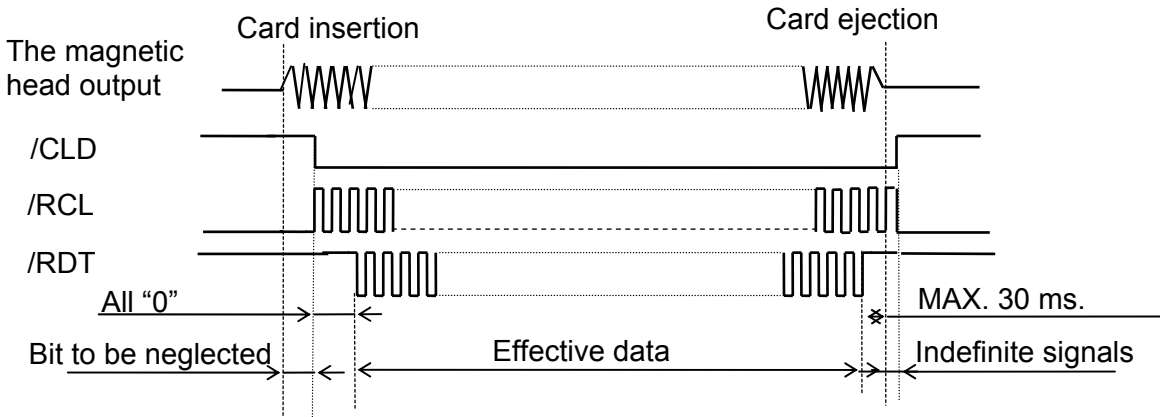
Table 6.2 Output voltage

	Min(V)	Max(V)	Conditions
H level "0"	4.0	Vcc	I _{OH} = -1.0 mA
L level "1"	---	0.4	I _{OL} = 4.0 mA

6.3 Explanation of input/output signal

- (1) /CLD(CARD LOAD) : The /CLD line will be Low when a Magnetic Card is running in the Magnetic Card Reader. The /CLD line will be High when the Card is stopped or not present in the Card reader.
- (2) /RCL(READ CLOCK) : This is used to sample the data line by it's falling edges. The time relationship of the clock with respect to the order signals is shown in Figure 6.4.
- (3) /RDT(READ DATA) : The moment /RCL change from High to Low ; /RDT is "1" when the /RDT line is Low , and /RDT is "0" when the /RDT line is High.
- (4) SGND : Signal ground
- (5) FGND : Frame ground

6.4 Output signal timing chart



/RCL & /RDT Detail timing chart

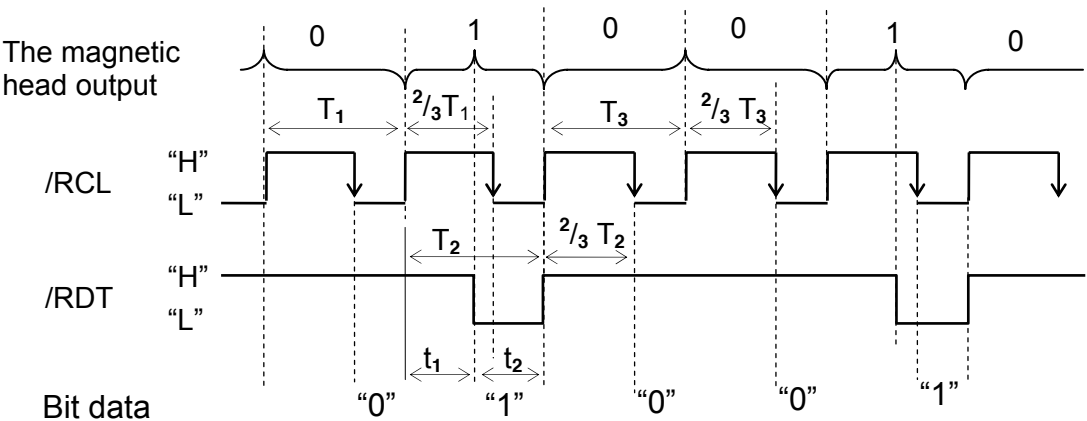


Fig 6.4 Timing sequence

When the jitter of the magnetic head output is 0 % , the following equation is satisfied.
 $T=T_1=T_2=T_3 , t_1=t_2$

$$T(s) = \frac{2.54 \text{ cm/inch}}{\text{Recording density (BPI)}} \times \frac{1}{\text{Card speed(cm/s)}}$$

6.5 Terminal No. of connector

- (1) Maker : Molex-Japan Co.,Ltd.
 (2) Model No : Connector 53261-0990 (Connect for PC. Board)
 Housing 51021-0990
 Terminal 50079-8000

(3) Pin No. & Signal Name

ZU-M1242S1 (Card reader side)

Connector Pin No.	Signal Name
1	FGND
2	SGND
3	DC 5V
4	/RDT2
5	/RCL2
6	/CLD2
7	/RDT1
8	/RCL1
9	/CLD1

Note: Cable length shall be less than 300 mm.

7. ENVIRONMENTAL CHARACTERISTICS

7.1 Operating temperature Range : -20°C ~ 60 °C

7.2 Operating humidity Range : 10 % ~ 90 % RH (No condensation allowed)

7.3 Storage temperature Range : -30 °C ~ 70 °C

7.4 Storage humidity Range : 10 % ~ 95 % RH (No condensation allowed)

* Place the card reader in the standard environment (temperature: 20 °C ± 5 °C, humidity: 35 % ~ 60 % RH).

Leave it for 12 hours, and measure the functions. Make sure no abnormality is found.

7.5 Vibration : Vibration sweep 5 Hz ~ 50 Hz, sweep 0.5 oct/min.
 X,Y,Z directions : 10 m/s²,

7.6 Shock durability : 294 m/s² (30 G)

7.7 Others : Make sure any source of noise that may deteriorate the characteristics of the card reader is not present around the card reader.

8. UNIT LIFE

Life Magnetic head : 300,000 times pass

(conditions): In a clean office room.

In damp or dirty atmosphere, the life may be 1/3 to 1/5 of the above figure.

9. GUARANTEE

If defects should occur within one year after the delivery of the card reader due to improper material or bad workmanship, the defective parts shall be replaced or repaired, free of charge.

10. MAINTENANCE

Because of difficulty in changing components on the P.C Board, replacement of whole unit is recommended for service and maintenance.

11. CAUTIONS ON THE USE

Please be noted that we do not guarantee proper performance of the card reader if it is used other than the indicated specification range.

11.1 At the installation

- (1) Be sure to install on a flat surface so as to prevent any force being applied to the card reader at the installation.
- (2) In the case that it is to incorporate into a machine, be sure that it does not touch any part of machine structures to the flexible P.C.B. other than the mounting surface. Especially, electric noise on this area should be avoided not cause reading error.
- (3) Install it so that the card is vertical when swiping to achieve most stable operation.
- (4) Installation of a card guide plate at the both (front and back) sides of the card running part may reinforce stability.
- (5) Do not touch the P.C.B. with bare hands.
- (6) Do not drop or bump anything against a card reader. Otherwise, failure may be the result.
- (7) The card reader should avoid installation of the following environment.
 - Watery, humid or dusty place.
 - Near machines which generate magnetic field or inducted noise. (Printer, LED display, CRT etc.)
 - Place which gets direct sunlight.

11.2 At the use

- (1) Be sure to use a card which conforms ISO standard.
- (2) Be sure to perform sampling of /RDT (read data) at the falling edge of /RCL (read clock).
- (3) Card operation speed should be within the specification range.
Forced stop or change of speed during the card operation may cause a read error.
Appropriate speed to maintain stable operation is 30 cm/s ~ 60 cm/s
- (4) A slant swipe of a card causes poor contact of the card to the magnetic head, and which may result in a read error.
- (5) Store the card with caution to prevent dirt, scratch and distortion.
Especially, no foreign matter shall be stuck on the magnetic stripe surface.
Use of such card may result in a read error.
- (6) Swipe a cleaning card and clean the head periodically to prevent wearing of the magnetic head.
Head cleaning using the cleaning card should be performed about once a week if the room is not dusty.
- (7) Depends on installation environment (incorporation condition) or operation condition, external noise or electrostatics and so on may affect the machine, and which may cause an error or a wrong operation.
Check the level of noise resistance and electrostatic resistance of your factory before using the card reader.

12. APPEARANCE

ZU-M1242S1

