# SPECIFICATIONS

Manual Slide Type Magnetic Card Reader

## ZU−M1121S16

NOTE:

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| REF No. | MIS-DG60A138 | REV |
|---------|--------------|-----|
|         |              | A   |

| DATE |  |
|------|--|
| PREPARED |  |
| LAWS |  |
| APPROVED |  |
| Q A |  |
| SALES |  |

# Revision History

| Revision No. | Date | Description | Page |
|---|---|---|---|
| MIS-DG60A138 | FEB.2001 | Initial Release | |
| MIS-DG60A138A | DEC.2006 | Altered our corporate name to Panasonic Communications Co.,Ltd. Devices and Components Company Information Equipment Category | Cover page |
| | | This Card reader is RoHS compliant version.<br>・The connector terminals for I/O connector have been changed from the solder plating to the tin one<br>　　Molex　53261-0690→53261-0671 | 1,5,8 |
| | | | |

# C O N T E N T S

# 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 2 standard.

# 2. PRODUCT NAME

2.1   Product Name      :   Manual slide type magnetic card reader
2.2   Model No.         :   ZU-M1121S16

# 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               : 8 cm/s ~ 150 cm/s
4.2   Out dimension                      : (W) 25 mm x (L) 90 mm x (H) 24 mm
4.3   Weight                             : Approximately 25 g
4.4   Supplied voltage
      (1)Supplied voltage                : DC 2.7 V ~ DC 5.5 V / Ripple (Less than 50 mVp-p)
      (2)Current consumption             : TYP. 3 mA, MAX.6 mA (at DC 5.0 V)
      (3)Maximum applied voltage         : DC 7 V
4.5   Connector                          : Molex-Japan Co., Ltd.   53261-0671 (Refer to 6.5)
4.6   Environment requirement            : Indoor

## 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 2nd |
| Recording density<br>Recording capacity | 75 BPI<br>40 Characters<br>(5 bit code) |
| Recording method | F2F |

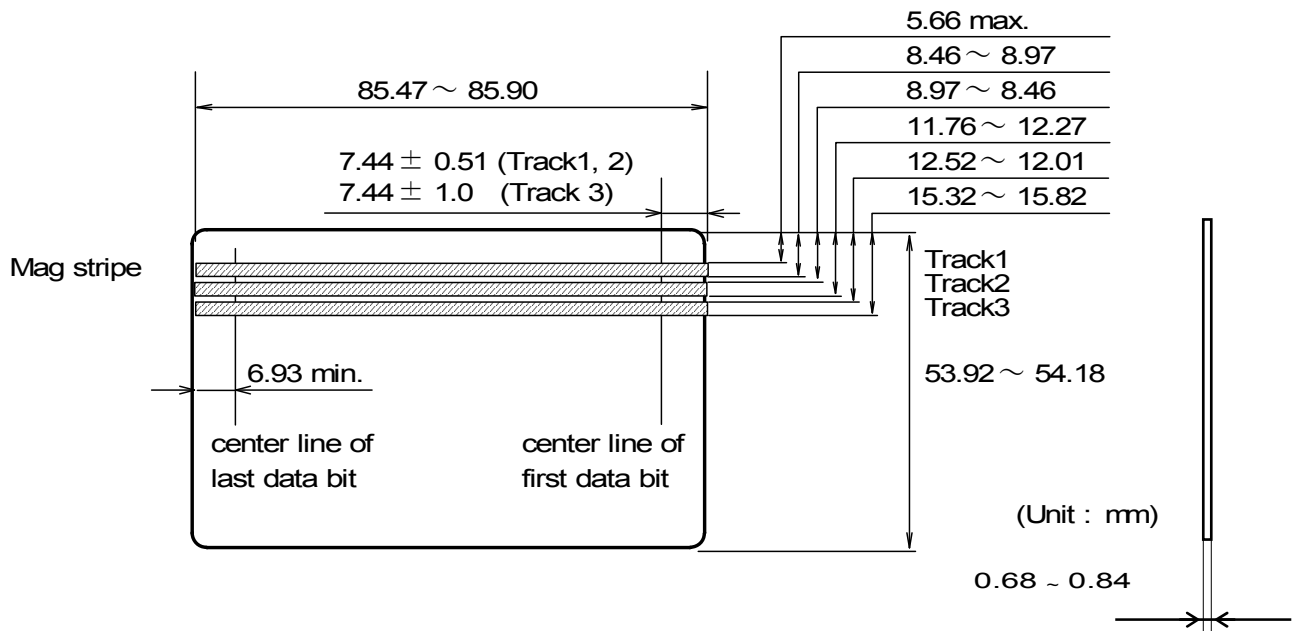### 5.2 Location of tracks



Figure 5.2 Location of Tracks

### 5.3 Physical characteristics

(1) Thickness          : 0.76 mm (tolerance ± 0.08 mm)

(2) Card Warpage    : 2.5 mm max.

(include relief height of embossed characters)

### 5.4 Magnetic characteristics

(1) Coercive force (Hc)    : $2.4 \times 10^4$ A/m ~ $2.4 \times 10^5$ A/m

(2) Residual flux (¢r)      : $1.25 \times 10^{-8}$ Weber/cm (tolerance ± $0.15 \times 10^{-8}$ Weber/cm)

(3) Square ratio             : More than 0.70

(¢r/¢m)

## 6. CIRCUIT CONSTRUCTION

### 6.1 Block diagram



Note) Output signal:

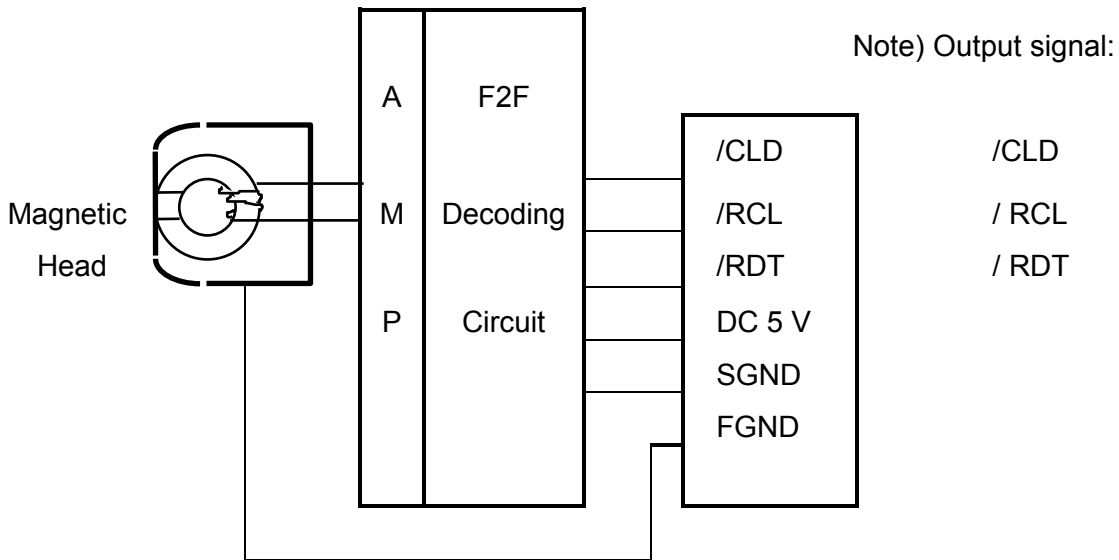| | | | | |
|---|---|---|---|---|
| | A | F2F | /CLD | /CLD |
| Magnetic | M | Decoding | /RCL | / RCL |
| Head | | | /RDT | / RDT |
| | P | Circuit | DC 5 V | |
| | | | SGND | |
| | | | FGND | |

Fig 6.1   Block diagram

### 6.2 Interface requirement

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



CMOS(MN6543S)                                    Equivalent to 74HC04

(Card Reader side)              Cable              (System side)
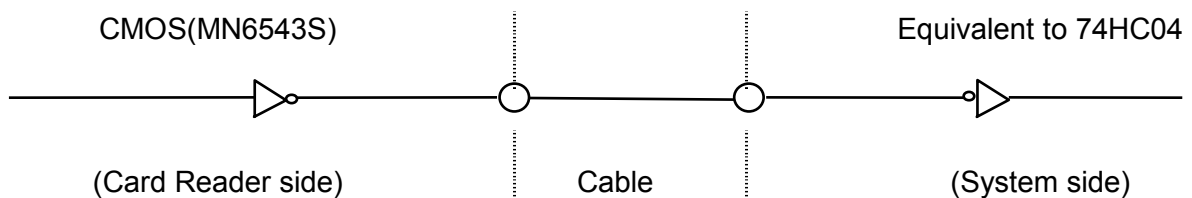
Fig 6.2   Connection of output circuit

(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 | $I_{OL}$ =    5.0 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
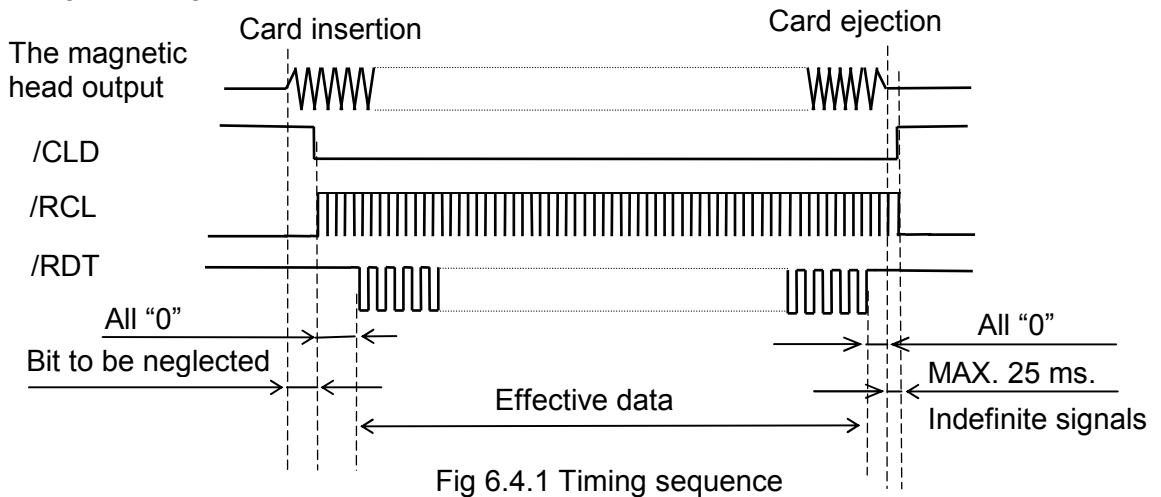(5)  FGND                : Frame ground

## 6.4  Output signal timing chart



Fig 6.4.1 Timing sequence

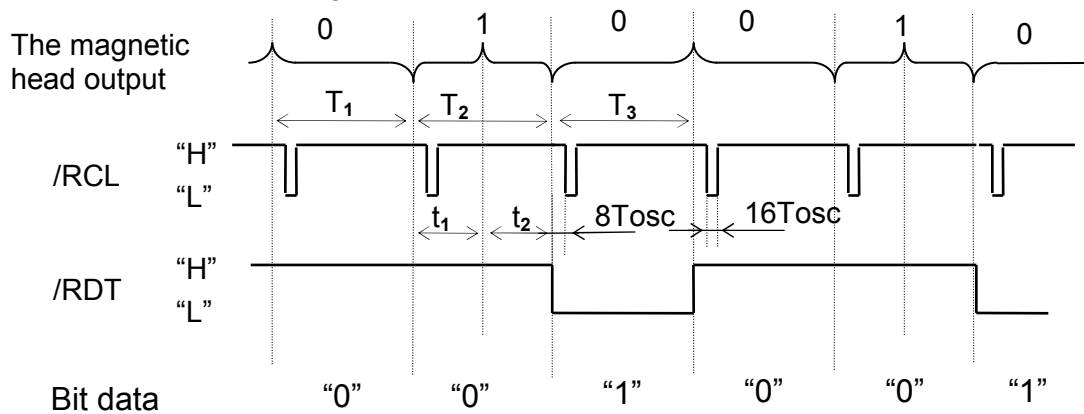/RCL & /RDT Detail timing chart



Fig 6.4.2 Timing sequence (Detail)

Tosc:210BPI → 0.48$\mu$S
75BPI → 1.2$\mu$S

Bit data of magnetic head output appear as one bit delayed.
When the jitter of the magnetic head output is 0 % , the following equation is satisfied.

$$T=T_1=T_2=T_3 , \quad t_1=t_2$$

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

6.5　Terminal No. of connector

   (1)　Maker　　**:**　Molex-Japan Co.,Ltd.

   (2)　Model No　**:**　Connector　53261-0671（Connect for PC. Board）

                      Housing　　51021-0690

                      Terminal　　50079-8000

   (3) Pin No. & Signal Name

(Card reader side)

| Connector Pin No. | Signal Name |
|:---:|:---:|
| 1 | FGND |
| 2 | SGND |
| 3 | DC 5V |
| 4 | /RDT |
| 5 | /RCL |
| 6 | /CLD |

     (Note) : Make sure to use the connection cable of less
                than 300 mm length for the card reader.

## 7.　ENVIRONMENTAL CHARACTERISTICS

7.1　Operating temperature Range　: -20 ℃ ~ 60 ℃

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

7.3　Storage temperature Range　　: -30 ºC ~ 70 ºC

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

 * Place the card reader in the standard environment (temperature: 20 ºC ± 5 ºC, humidity:
  35 % ~ 60 % RH).
  Leave it for 12 hours, and measure the functions. Make sure no abnormality is found.

7.5　Vibration　　　　　　　　:　Vibration sweep 10 Hz ~ 50 Hz, sweep 0.5 oct/min
                                X,Y,Z directions :10 m/s$^2$

7.6　Shock durability　　　　　　: 294 m/s$^2$(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) Install it so that flexible cable does not touch the mount surface. Noise possible to
   　　　　break into the circuit , or magnetic head will not move correctly when flexible cable
   　　　　touch the mount surface.
   　　　　　(ie)・Make a hole to mount surface around the flexible cable.
   　　　　　　　・Make a space around the flexible cable by spacer.

   　　(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 bear 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 trailing edge of /RCL (read clock).
Pulse width of the period "L" of /RCL is about $19\mu s$ in case of ISO 2 (75 BPI specification).
If sampling method is other than edge sampling (such as a method detecting "L" of /RCL by means of polling) is used, please check with us since data may not be read depending on polling frequency at the host side.

(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 insertion 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) Insert 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-M1121S16

Card Sliding Direction

11.7
13.3
21

Connector
53261-0671(Molex)

1.4 ±0.2

24

3

90 ±0.5

6
78 ±0.2
12
66 ±0.2

12 ±0.2
7.5 ±0.2

2-Ø3.2

2-Ø2.2
Tapping Screw Spec.
(Nominal Diameter2.6)

General Tolerance:±0.3
unit : mm

CARD READER
Panasonic
Made in Japan