# MODULAR TYPE OPTICAL DATA TRANSMISSION DEVICE
## SPECIFICATIONS
## (SEMI STANDARD TYPE)
## (CE MARKING)

## HEAD
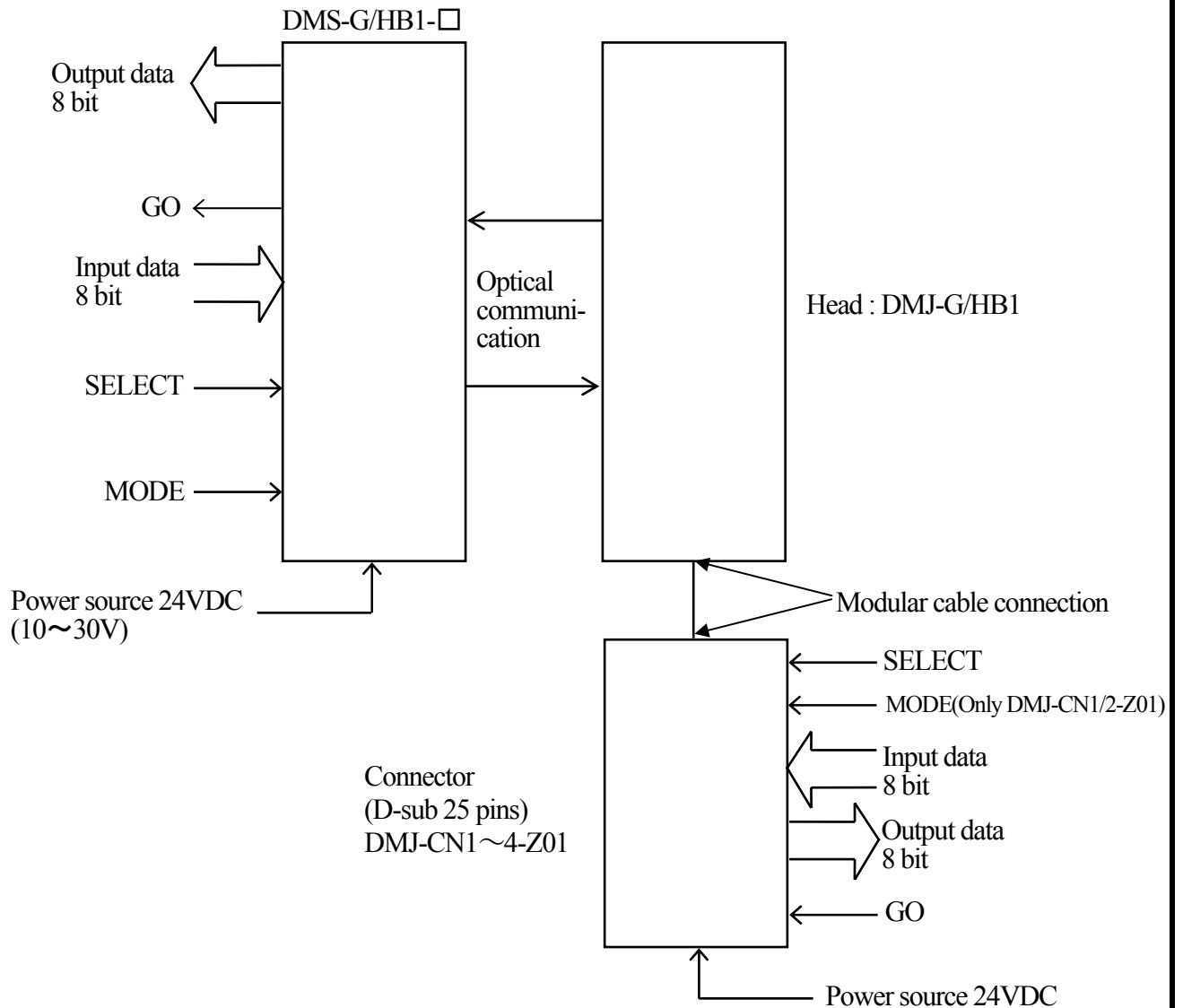DMJ-GB1-Z01(HEAD-ON)
DMJ-HB1-Z01(SIDE-ON)

## CONNECTOR
DMJ-CN1-Z01(METRIC SCREW)
DMJ-CN2-Z02(INCH SCREW)
DMJ-CN3-Z01(RECEPTION STANDBY/METRIC SCREW)
DMJ-CN4-Z01(RECEPTION STANDBY/INCH SCREW)

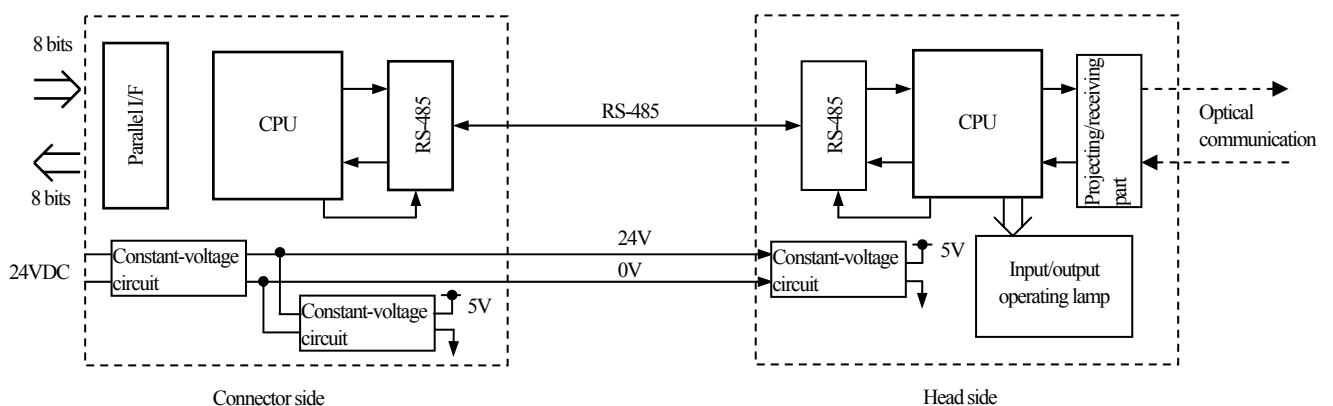| Symbol | Amended reason | | | | Pages | Date | Corrector | Amended No. |
|--------|------|------|------|------|-------|------|-----------|-------------|
| Approved by | Checked by | Drawn by | Designed by | Title | Modular Type Optical Data Transmission Device Specifications | | | |
| MAEJIMA | HINO | HAYASHIYA | HAYASHIYA | Drawing No. | C-42-3694 | | | 1/6 |

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## 1. General

This device is a DMJ head and a connector[note1] for high-frequency noise resistance. Modular cable is applied between a head and a connector of E84 parallel I/O and it is very easy to make a wiring at user side. Communicating configuration is as follows:-



DMS-G/HB1-□

Output data 8 bit

GO

Input data 8 bit

SELECT

MODE

Optical communication

Power source 24VDC (10～30V)

Head : DMJ-G/HB1

Modular cable connection

Connector (D-sub 25 pins) DMJ-CN1～4-Z01

SELECT

MODE(Only DMJ-CN1/2-Z01)

Input data 8 bit

Output data 8 bit

GO

Power source 24VDC

Note 1) Make sure to use the combination with DMJ-G/HB1-Z01 and DMJ-CN1～4-Z01.

## 2. Hardware configuration



8 bits

Parallel I/F

CPU

RS-485

RS-485

24VDC

Constant-voltage circuit

Constant-voltage circuit

5V

Connector side

RS-485

CPU

Projecting/receiving part

Optical communication

24V

0V

Constant-voltage circuit

5V

Input/output operating lamp

Head side

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|-------|---------------------------------------------------------------|-------------|-----------|-----|

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## 3. Specifications

| Model No.(Head) | DMJ-GB1-Z01 | DMJ-HB1-Z01 |
|---|---|---|
| Direction | Head-ON | Side-ON |

| Model No. (Connector) | DMJ-CN1-Z01 | DMJ-CN2-Z01 | DMJ-CN3-Z01 | DMJ-CN4-Z01 |
|---|---|---|---|---|
| Mode | Changeover of transmission/reception standby mode by outer input | Changeover of transmission/reception standby mode by outer input | Reception standby mode(Fixed) | Reception standby mode(Fixed) |
| Fixed screw | Metric screw | Inch screw | Metric screw | Inch screw |

| Model No. | DMJ-G/HB1-Z01 |
|---|---|
| Transmitting distance | 0.6m(It can be changed by adjuster) |
| Directional angle | 30 degrees(Full angle) |
| Transmitting capacity(I/O) | 8 bits/8 bits |
| Transmitting system | Half-duplex two-way transmission system |
| Transmitting time | 40msec |
| Power source | 24VDC |
| Current consumption | 100mA max. |
| Ambient illuminance | 4,000lx or less |
| Ambient temperature/ humidity | -10 to 50℃/85%RH |
| Vibration resistance | Double amplitude 1.5mm, 10 to 55Hz, Each 2 hour in X, Y and Z directions |
| Impact resistance | 500m/s$^2$   Each 10 time in X, Y and Z directions |
| Connection | D-sub 25 pins connector |
| Protective structure | IP40 |
| Input IN1 to IN8, SELECT, MODE |  IN1 to IN8 SELECT, MODE  ON current 2.5mA or more  OFF current 1mA or less (Operating threshold current 1.5 to 2mA) |
| Output, OUT1 to OUT8, GO |  OUT1 to OUT8 GO  NPN open-collector output  VCE30V or less  IC50mA or less  Residual voltage 1.8V or less |

| Optical communication part | Modulating system | Pulse modulation |
|---|---|---|
| | Detecting system | Parity check, All output is getting OFF when twice continuous error |

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| Specifications between a head and a connector | Communicating standard | RS-485 |
|---|---|---|
| | Communicating speed | 38.4kbps |
| | Detecting system | Parity check/SUM check |
| | Connection | RJ-11(Modular jack) |
| Max. extending length | 200m* | |

\* Cable should be AWG26.

## 4. Logging data processing

(1) This device memorizes transmission/reception data, GO, SELECT and invariable time of reception data in non-volatile storage in all time by using changes of transmission/reception data, SELECT input and GO output as trigger. [Note 1)]

(2) Communication logging specifications

| Data variable time | Max. 100 times [Note 3)] |
|---|---|
| Memorizing data | Transmitting/receiving data : Each 8 bits, GO output, SELECT input |
| Measuring unit of invariable time | 0.05sec |
| Measuring error of invariable time | ±0.05sec |
| Measuring range of invariable time | Max. 1638.35sec(Approx. 27min.) [Note 4)] |
| Memorizing media | Ferroelectric memory(512 byte) |
| Memorizing cycle | Min. 20msec |
| Memorizing life | Nos. | $10^{10}$ times |
| | Years | 10 years |

Note 2) Transmitting/receiving data is monitored and memorized.   It may be different with input/output data.

Note 3) In case that data variable Nos. exceed max. value, it is overwritten from older data.

Note 4) In case that measuring of invariable data for transmitting/receiving data exceeds max. value, it is memorized as max. value.

## 5. Transmission characteristics

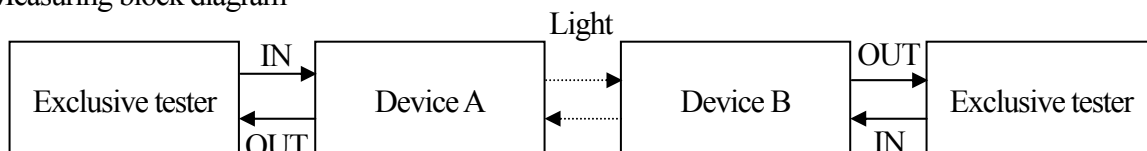(1)  Characteristics data                                                                             Unit(msec)

| Items | Symbols | MIN | MAX |
|---|---|---|---|
| Input data holding time | tIH | 30 | - |
| Transmission time | tON, tOFF | 13 | 40 |
| Transmission starting delay time (Against optical axis coincidence) | tSD | 30 | 110 |
| Output holding time(Against SELECT A) | tOH1 | 50 | 90 |
| Output holding time(Against SELECT B) | tOH2 | - | 5 |
| Output holding time(Against light-interruption) | tOH3 | 50 | 90 |

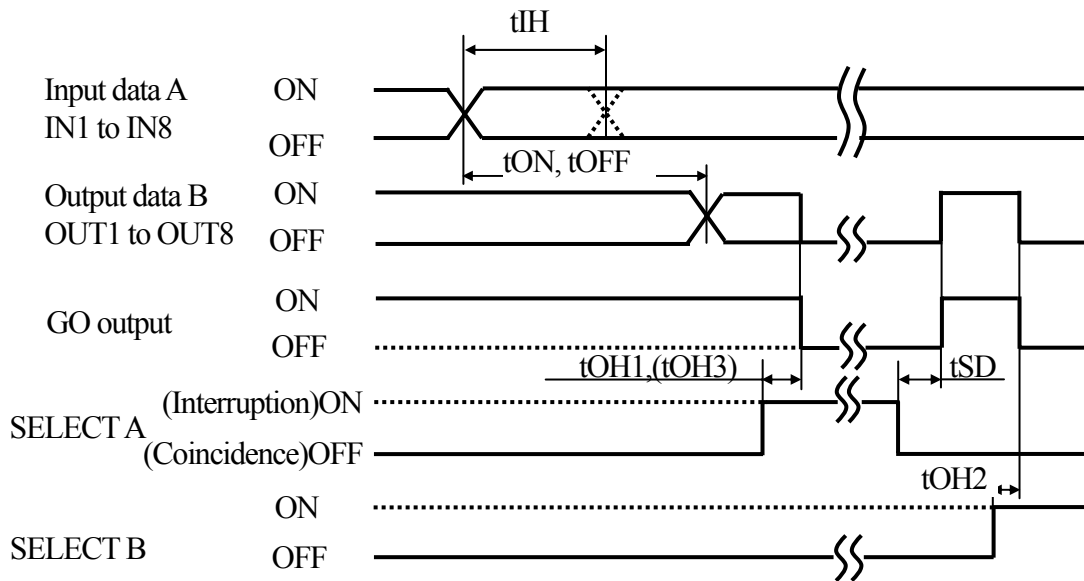(2) Characteristics measuring condition

   \*Mode : Side A – Reception standby mode, Side B – Transmission standby mode

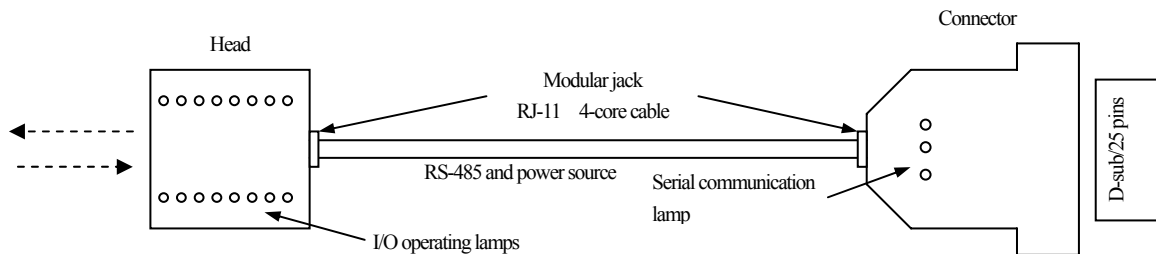   \*It was measured under input(side A) and output(side B).

(3) Measuring block diagram



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|---|---|---|---|---|

(4) Transmission timing



## 6. Appearance and connection



| Pin No. | Functions | Pin No. | Functions |
|---------|-----------|---------|-----------|
| 1 | IN1 | 14 | OUT1 |
| 2 | IN2 | 15 | OUT2 |
| 3 | IN3 | 16 | OUT3 |
| 4 | IN4 | 17 | OUT4 |
| 5 | IN5 | 18 | OUT5 |
| 6 | IN6 | 19 | OUT6 |
| 7 | IN7 | 20 | OUT7 |
| 8 | IN8 | 21 | OUT8 |
| 9 | NC | 22 | +VIN |
| 10 | SELECT | 23 | +VIN |
| 11 | MODE | 24 | -VIN |
| 12 | GO | 25 | COM |
| 13 | NC | | |

\* It is short-circuited between pin No.22 and No.23.

\* It is short-circuited between –VIN(Pin No.24) and COM(Pin No.25) inside.

\* Mode is available only for DMJ-CN1/2-Z01.

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## 7. Function for each terminal

| Terminals | Functions | |
|---|---|---|
| IN1 to IN 8 | Input data | |
| OUT1 to OUT8 | Output data | |
| SELECT | It is shorted to COM : Stop to communicate<br>It is opened : Possible to communicate | |
| MODE<br>(Only for DMJ-CN1/2) | It is opened : Transmission standby mode<br>It is shorted to COM : Reception standby mode | |
| GO | ON when receiving normal data<br>OFF when interrupting the beam | |
| COM | Common for input/output | |
| +VIN | +24V($\pm$10%) | Power source input |
| -VIN | 0V | |

Note) Make sure to set one side to reception stand-by mode.

## 8. Operating lamps

| | |
|---|---|
| Head | Each parallel I/O is shown.　I/O is the same indication as standard device(8-bit type)<br>　　IN : 8 points, OUT : 8 points, GO, POW, NS<br>NS : Lights up when serial communication with connector is normal. |
| Connector | NS : Lights up when serial communication with head is normal.<br>MODE : Lights up when reception-standby mode<br>POW : Lights up when putting power source in |

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