SPECIFICATIONS

OPTICAL DATA TRANSMISSION DEVICE WITH LOGGING FUNCTION
CORRESPONDING TO SEMI E84-1000
DMG-HB1-Z09

Approved by
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Title
Optical Data Transmission Device With Logging function DMG-HB1-Z09 Specifications

Drawing No.
C-42-3206

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1. General
This is an optical data transmission device with 8 bits parallel I/O. This device provides with I/O data memorized function (Logging function) and so this function is very helpful to analyze when troubles such as interlocking etc. happened. Also, this device is compatible with standard models, DMS-HB1/GB1 series under the circumstances such as optical communication, input/output and installation and so it is easy to replace them at the current facilities.

![Diagram of Optical Data Transmission Device]

* Refer to page 5 or later about specifications of logging functions etc.

2. Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>DMG-HB1-Z09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission distance</td>
<td>0 to 1m (With projection amount adjuster)</td>
</tr>
<tr>
<td>Directive angle</td>
<td>30° (Full angle)</td>
</tr>
<tr>
<td>Transmission directions</td>
<td>SIDE-ON</td>
</tr>
<tr>
<td>Transmission capacity (Input/Output)</td>
<td>8 bit/8 bit</td>
</tr>
<tr>
<td>Transmission method</td>
<td>Half-duplex two-way transmission</td>
</tr>
<tr>
<td>Transmission time</td>
<td>40msec</td>
</tr>
<tr>
<td>Modulation method</td>
<td>Pulse modulation</td>
</tr>
<tr>
<td>Verification method</td>
<td>Parity check</td>
</tr>
<tr>
<td>Power source</td>
<td>10 to 30VDC (24VDC is recommended)</td>
</tr>
<tr>
<td>Current consumption</td>
<td>100mA Max.</td>
</tr>
<tr>
<td>Ambient illuminance</td>
<td>4,000lux or less</td>
</tr>
<tr>
<td>Ambient temperature/ humidity</td>
<td>-10 to 50 degrees C / 85%RH or less (Not dew-drops)</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>Double amplitude 1.5mm, 10 to 55Hz. Each 2 hour in X, Y and Z directions</td>
</tr>
<tr>
<td>Impact resistance</td>
<td>490 m/s² Each 10 time in X, Y and Z directions</td>
</tr>
<tr>
<td>Connection</td>
<td>D-sub 25 pins connector</td>
</tr>
<tr>
<td>Protective structure</td>
<td>IP64 (Except for connector part)</td>
</tr>
</tbody>
</table>
3. 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

<table>
<thead>
<tr>
<th>Data variable</th>
<th>Max. 100 times  Note 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memorizing data</td>
<td>Transmission/reception data : Each 8 bits, GO output, SELECT input</td>
</tr>
<tr>
<td>Measuring unit of invariable time</td>
<td>0.05sec</td>
</tr>
<tr>
<td>Measuring error of invariable time</td>
<td>+/- 0.05sec</td>
</tr>
<tr>
<td>Measuring range of invariable time</td>
<td>Max. 1638.35sec(Approx. 27min.)  Note 3)</td>
</tr>
<tr>
<td>Memorizing media</td>
<td>Ferroelectric memory(512 byte)</td>
</tr>
<tr>
<td>Memorizing cycle</td>
<td>Min. 20msec</td>
</tr>
</tbody>
</table>
| Memorizing life | Nos. 10⁴ times  
|                | Years 10 years |

Note 1) Transmission/reception data is monitored and memorized.  It may be different with input/output data.
Note 2) In case that data variable Nos. exceed max. value, it is overwritten from older data.
Note 3) In case that measuring of invariable data for transmission/reception data exceeds max. value, it is Memorized as max. value.
4. Transmission characteristics

(1) Characteristics data

<table>
<thead>
<tr>
<th>Items</th>
<th>Symbols</th>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input data holding time</td>
<td>tIH</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>Transmission time</td>
<td>tON, tOFF</td>
<td>13</td>
<td>40</td>
</tr>
<tr>
<td>Transmission starting delay time</td>
<td>tSD</td>
<td>30</td>
<td>110</td>
</tr>
<tr>
<td>Output holding time(Against SELECT A)</td>
<td>tOH1</td>
<td>50</td>
<td>90</td>
</tr>
<tr>
<td>Output holding time(Against SELECT B)</td>
<td>tOH2</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Output holding time(Against light-interruption)</td>
<td>tOH3</td>
<td>50</td>
<td>90</td>
</tr>
</tbody>
</table>

Unit (msec)

(2) Characteristics measuring condition
*Mode : Side A – Reception stand-by mode, Side B – Transmission stand-by mode
*It was measured under input(side A) and output(side B).

(3) Measuring block diagram

(4) Transmission timing

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5. External wiring

Cable 5m
D-sub 25 pins connector(Male)
Plugs JBC-25P(JST)
Hood XM2S-2511(Omron)
Contact J-SP2140(JST)
Locking screw XM2Z-0073
(Onmon)
#4-40UNC Inch screw

Colors | Pin No. | Functions
--- | --- | ---
Brown | 1 | IN1
Red | 2 | IN2
Orange | 3 | IN3
Yellow | 4 | IN4
Green | 5 | IN5
Blue | 6 | IN6
Purple | 7 | IN7
Gray | 8 | IN8
White | 10 | SELECT
Pink | 11 | MODE
White/Black | 12 | GO

Colors | Pin No. | Functions
--- | --- | ---
Brown/Black | 14 | OUT1
Red/Black | 15 | OUT2
Orange/Black | 16 | OUT3
Yellow/Black | 17 | OUT4
Green/Black | 18 | OUT5
Blue/Black | 19 | OUT6
Purple/Black | 20 | OUT7
Gray/Black | 21 | OUT8
Pink/Black | 23 | +VIN
--- | 22 | +VIN
Pale blue/Black | 24 | -VIN
Pale blue | 25 | COM

* It is shorted between COM and –VIN, and 22 and 23 inside.

6. Function for each terminal

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN1 to IN 8</td>
<td>Input data</td>
</tr>
<tr>
<td>OUT1 to OUT8</td>
<td>Output data</td>
</tr>
</tbody>
</table>
| SELECT input | It is shorted to COM : Transmission/reception is stopped and logging data can’t be read out.  
It is opened : Transmission/reception is operated and logging data can be read out. |
| MODE input(Note) | It is opened : Transmission standby mode  
It is shorted to COM : Reception standby mode |
| GO output | It is ON when normal data was received and OFF when light was interrupted or reception error. |
| COM | Common for input/output |
| +VIN | +24VDC(10 to 30V) |
| -VIN | 0V |

Note) Make sure to set other one to reception standby mode.

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7. Logging function of communication data

Logging function means to memorize both transmission/reception and variable time between Active equipment (A) and Passive Equipment (P) in a lump at all time when ordinary sequence will be made. Accordingly, the following sequence data (Time chart) can be memorized:

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**Single Time Diagram for Single Handoff (LOAD)**

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8. How to read out logging data
When some troubles such as interlocking etc. happened, you can read out memorized data with data transfer checker (Optical remote controller, option) and show them on PC with exclusive application software. It is easy to read out without removing cover because of reading out by optical communication. It is made by facing the head of data transfer checker (Optical remote controller) to transmission/reception part of DMG. However, when read out, make sure to be active status by releasing SELECT input (Opened or +VIN). (Refer to the specifications sheet of data transfer checker in details.)

Structure

- DMG
- Data transfer checker
- Head
- Power box
- Switch for read-in of logging data
- AC adaptor
- PC

Read-in of logging data can be made by switch
For read-in even if it is not connected to PC.