Product Information

EIB 3011
EIB 3091 F
EIB 3091 M
Signal Converters in Cable Design
EIB 3001
• Signal converters in a D-sub connector housing
• Integrated 16 384-fold subdivision
• Input: Incremental encoders from HEIDENHAIN
• Output: EnDat 2.2, Fanuc Serial Interface or Mitsubishi high speed interface

Specifications

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Input

- For HEIDENHAIN encoders
- Incremental signals: ~ 1 Vpp (input frequency: ≤ 400 kHz)
- Reference mark: One or distance-coded
- Electrical connection*: 16-pin, 2-row D-sub connector (female), with locking nuts
  12-pin M23 connector (female)
- Supply voltage of encoder: DC 5.2 V ±0.25 V
- Cable length: ≤ 6 m

Output

- Interface: EnDat 2.2, Fanuc Serial Interface, Mitsubishi high speed interface
- Ordering designation: EnDat22, Fanuc02, Mit03-4
- Calculation time $t_{cal}$: ≤ 5 µs
- Clock frequency: ≤ 16 MHz
- Electrical connection: 15-pin, 2-row D-sub connector (male) with locking screws and integrated electronics
- Cable length (with HEIDENHAIN cable): ≤ 100 m
- Subdivision: ≤ 16 384-fold (depending on encoder)
- Supply voltage: 3.6 V to 14 V
- Power consumption (maximum): 3.6 V: 1700 mW (including $I_{\text{max}} = 150$ mA)
  14 V: 1700 mW (including $I_{\text{max}} = 150$ mA)
- Current consumption (typical, without load): At 5 V: 75 mA + 1.3 $\cdot I_{\text{max}}$
- Operating temperature: 0 °C to +70 °C
- Storage temperature: -30 °C to +70 °C
- Vibration: 55 Hz to 2000 Hz
- Shock: 11 ms
- Protection: EN 60529: IP40
- Mass: ≤ 0.075 kg (without cable, with electronics)

Electrical connection

Pin layout: EIB

Input

<table>
<thead>
<tr>
<th>15-pin D-sub connector</th>
<th>12-pin M23 connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>Incremental signals</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>$U_p$</td>
<td>Sensor</td>
</tr>
</tbody>
</table>

Shield on housing: $U_p$ = Power supply voltage
Sensor: The sense line is connected internally to the respective power line.

Output

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</table>

* Please indicate when ordering

\(^1\) Comply with the supply voltage at the EIB; $I_{\text{encoder}} \leq 150$ mA

\(^2\) Greater cable lengths upon request

* Shield on housing: $U_p$ = Power supply voltage
Sensor: The sense line is connected internally to the respective power line.
Vacant pins or wires must not be used!
Configuration of the EIB 3001

In order for the EIB 3001 to operate correctly with the encoder, certain encoder parameters must be stored in the EIB 3001 (e.g., the number of signal periods, nominal increment of the reference marks, encoder ID). This programming can be done only by HEIDENHAIN. This information is also printed on the ID label and can be read via the EnDat interface.

Information on the ID label
The data interface designates the type of interface for transmission of the position values at the output of the EIB.

Line count or signal period
For rotatory encoders, the signal period is expressed in the number of signal periods per revolution. For linear encoders, the signal period is shown in µm.

The Encoder ID states the type of connectable encoder. For example, in the case of EnDat:
00 Incremental linear encoder without distance-coded reference marks
10 Incremental linear encoder with distance-coded reference marks
80 Incremental rotary or angle encoder without distance-coded reference marks
90 Incremental rotary or angle encoder with distance-coded reference marks
For the EnDat interface, this value is stored in word 14 of the EnDat 2.1 parameters.

The nominal increment N of the reference marks is indicated in signal periods if the connected encoder has distance-coded reference marks (EnDat 2.2 encoder ID = 10 or 90).

Example:
Information on the ID label for the connection of an ERM 280 (line count: 1024) to the EnDat 2.2 interface via an EIB 3001:
Data interface: EnDat22
Encoder ID: 80
Line count or signal period: 1024
Nominal increment of the ref. marks: N/A
Subdivision: 16384

Connection information

Finding the absolute reference
Because incremental encoders are connected to the EIB 3001, the device provides relative position values immediately upon switch-on, starting with the switch-on position. The absolute reference is not established until the reference marks are traversed.

For encoders with distance-coded reference marks, two successive reference marks must be traversed without a change in direction.

EIB 3001: requirements for the control
EnDat 2.2 permanently provides the relative position as Position 1. When the absolute reference is found, the RM bit is set in the EnDat additional data, and the absolute position value is transmitted as Position 2. Before using the EIB 3001, please check whether the subsequent electronics support this EnDat 2.2 device profile for incremental encoders.

Please note:
It is not possible to combine the EIB 3001 and interface electronics with the DRIVE-CLiQ interface (e.g., EIB 2391 S or EIB 3392 S), because these interface electronics accept only absolute encoders.

EIB 3001: encoder mounting and online diagnostics
The encoder is mounted with the help of the testing and inspection devices from HEIDENHAIN, but not with the EIB 3001. After the encoder has been mounted, it can be connected to the EIB 3001 and the downstream electronics.

For checking encoder functionality, the EIB 3001 supports online diagnostics by outputting valuation numbers for the incremental track and a valuation number for the sum evaluation of the reference pulse. This allows the function reserve of the connected encoder to be evaluated.

This Product Information document supersedes all previous editions, which thereby become invalid. The basis for ordering from HEIDENHAIN is always the Product Information document valid when the contract is made.

Further information:
Comply with the requirements described in the following documents to ensure correct operation of the encoder:
- Brochure: Interfaces of HEIDENHAIN Encoders 1078628-xx
- Brochure: Cables and Connectors 1206103-xx