Product Information

EIB 3392 S
Signal Converter in Cable Design
Encoder requirements
The EIB 3392 S makes it possible to connect encoders with the ordering designation EnDat22 to the DRIVE-CLiQ interface.

Depending on the firmware version of the EIB and the subsequent electronics, it might be possible to also attach other encoder with an EnDat22 interface. Please contact HEIDENHAIN or the manufacturer of the subsequent electronics for further information.

After switch-on, the EIB tests various characteristics of the connected encoder and automatically adapts itself to it. If the encoder does not meet the necessary requirements, an error message is issued via the DRIVE-CLiQ interface.

**TIME_MAX_ACTVAL**
The calculation time **TIME_MAX_ACTVAL** specifies the earliest time (relative to the request time) after which the transfer of data from the encoder to the control can begin. The value depends on the parameters of the connected encoder (calculation time and resolution) and the cable length. Furthermore, there can be restrictions when setting the cycle times. For more information, please refer to the documentation for the DRIVE-CLiQ subsequent electronics.

Online diagnostics
With EnDat 2.2 encoders, valuation values can be read cyclically from the encoder to evaluate its functioning. The valuation numbers provide the current state of the encoder and ascertain the encoder’s “function reserves.” These function reserves are also transferred over the DRIVE-CLiQ interface and can be displayed in the high-level control. Further information is available from HEIDENHAIN upon request.

Fastening
The EIB 3392 S must be fastened. This is possible, for example, with a 20 mm cable clamp (see also “Dimension drawing”).

Power supply of encoder
The EIB 3392 S provides voltage of **U_P = 8.0 V** to the encoder. Please comply with the supply voltage range of the connected encoder. Due to their voltage range, certain encoders with the ordering designation EnDat22 cannot be connected, e.g. LC 1x3, LC 4x3, and EN 225.

**Specifications EIB 3392 S**

### Functional safety
Depending on the connected encoder and subsequent electronics, suited for applications with up to:
- **SIL 2** as per EN 61508 (further basis for testing: EN 61800-5-2)
- **Category 3 PL d** as per EN ISO 13849-1:2016-06

**PFH**
26 · 10⁻⁹ (with respect to an operating elevation of ≤ 1000 m above sea level)

### Safe position
Determined by the connected encoder and the subsequent electronics (i.e. through the configuration), the EIB has no influence on the safe position.

### Input
#### Interface
EnDat 2.2

#### Ordering designation
EnDat22 (note the Encoder requirements)

#### Electrical connection
Various connectors (see Versions of the EIB 3392 S)

#### Encoder supply voltage (**U_P**)
DC 8.0 V ±0.4 V, max. 1800 mW

#### Cable length
≤ 30 m¹²

### Output
#### Interface
DRIVE-CLiQ

#### Firmware
01.32.27.15

#### SINAMICS SIMOTION®
≥ V4.8 HF3

#### SINUMERIK with safety
≥ V4.7 SP1 HF1

#### SINUMERIK without safety
≥ V4.5 SP2 HF4

#### Calculation time **TIME_MAX_ACTVAL**
Refer to **TIME_MAX_ACTVAL** on page 2

#### Ordering designation
DQ01

#### Electrical connection
Various connectors (see Versions of the EIB 3392 S)

#### Cable length
≤ 30 m¹²

#### Supply voltage (**U_P**) (up to DC 36.0 V possible without impairing functional safety)

#### Power consumption
**Maximum**
- At 16.0 V: ≤ 3200 mW
- At 28.8 V: ≤ 3300 mW

**Typical**
- At 24 V: 1000 mW + 0.96 x PMtyp (with PMtyp = typical power consumption of the encoder)

### Elevation
≤ 1000 m

### Operating temperature
0 °C to 60 °C

### Storage temperature
-30 °C to 70 °C

### Vibration
55 Hz to 2000 Hz
- Shock 11 ms
100 m/s² (IEC 60068-2-27)
200 m/s² (IEC 60068-2-27)

### Protection rating
EN 60529
IP65

### Mass
= 0.2 kg (with 1 m cable length on both sides)

---

¹ With HEIDENHAIN cable. Comply with the supply voltage at the encoder
² Information from Siemens as per the document “Certified encoders with DRIVE-CLiQ Dependencies on SIMOTION / SINUMERIK and SINAMICS Hardware and Software versions” version: 04/2019
³ Depending on the output cable; the plug connection to the EIB is to be considered a DRIVE-CLiQ coupling.
⁴ Use the correct connector version

**DRIVE-CLiQ** is a registered trademark of Siemens AG.
**Messgeräte**

z.B. Encoders, for example ECA 4xxx

---

### Versions of the EIB 3392S

**Overview of connection options (the encoders are examples)**

<table>
<thead>
<tr>
<th>ID</th>
<th>Input Connecting elements</th>
<th>Cable Ø/²</th>
<th>Cable length</th>
<th>Output Connecting elements</th>
<th>Cable Ø/A²</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1159077-11</td>
<td>12-pin ultra-lock connector (female)</td>
<td>4.5 mm²/² 0.16 mm²</td>
<td>2.5 m</td>
<td>8-pin M12 connector (male)</td>
<td>6.8 mm²/¹ 0.24 mm²</td>
<td>0.5 m</td>
</tr>
<tr>
<td>1164824-11</td>
<td>14-pin M12 connector (female)</td>
<td>4.5 mm²/² 0.16 mm²</td>
<td>2.5 m</td>
<td>8-pin M12 connector (male)</td>
<td>6.8 mm²/¹ 0.24 mm²</td>
<td>0.5 m</td>
</tr>
<tr>
<td>1159070-11</td>
<td>9-pin M12 connector (female)</td>
<td>6 mm²/² 0.16 mm²</td>
<td>1 m</td>
<td>8-pin M12 connector (male)</td>
<td>6.8 mm²/¹ 0.24 mm²</td>
<td>1 m</td>
</tr>
<tr>
<td>1164806-11</td>
<td>9-pin M12 connector (female)</td>
<td>6 mm²/² 0.16 mm²</td>
<td>0.5 m</td>
<td>6-pin RJ45 connector (male)</td>
<td>6.8 mm²/¹ 0.24 mm²</td>
<td>2.5 m</td>
</tr>
</tbody>
</table>

---

**Temperature sensor information**

The EIB 3392S does not have a temperature sensor input, but it can evaluate the temperature sensor information from connected EnDat encoders and pass it through the DRIVE-CLiQ interface. Up to four types of temperature information can be transmitted. The EIB 3392S supports transmission from:

- one internal temperature sensor (value is provided in the DRIVE-CLiQ parameter "Encoder Temperature")
- up to three external temperature sensors (values are provided in the DRIVE-CLiQ parameter "Motor temperature 2-4"; the calculated highest value of the three sensors is output in the parameter "Motor temperature 1")

The EIB 3392S can simultaneously process the information of one external and one internal temperature sensor. If more than one external temperature sensor is used, the value of the internal temperature sensor can no longer be provided.

The evaluation of the connected sensors can be set via the DRIVE-CLiQ interface, depending on the settings of the EnDat encoder. This allows temperature sensors of types KTY 94-130, PT 1000, and PTC to be evaluated. For more information, please contact HEIDENHAIN.

---

**Designation of the connecting cables**

The connection cables for input and output have differing colors.

- **ID Input**
  - Connecting elements
  - Cable Ø/²
  - Cable length
  - Connecting elements
  - Cable Ø/A²
  - Cable length

- **Output**
  - Connecting elements
  - Cable Ø/A²
  - Cable length

- **Connection elements**
  - 12-pin ultra-lock connector (female)
  - 14-pin M12 connector (female)
  - 9-pin M12 connector (female)
  - 9-pin M12 connector (female)

- **Cable Ø/²**
  - 4.5 mm²/² 0.16 mm²
  - 4.5 mm²/² 0.16 mm²
  - 6 mm²/² 0.16 mm²
  - 6 mm²/² 0.16 mm²

- **Cable length**
  - 2.5 m
  - 2.5 m
  - 1 m
  - 0.5 m

- **Cable Ø/A²**
  - 6.8 mm²/¹ 0.24 mm²
  - 6.8 mm²/¹ 0.24 mm²
  - 6.8 mm²/¹ 0.24 mm²
  - 6.8 mm²/¹ 0.24 mm²

- **Cable length**
  - 0.5 m
  - 0.5 m
  - 1 m
  - 2.5 m

---

**Functional safety**

In principle, the EIB can be used in safety-related applications only if functional safety is supported by the connected encoder. The characteristics with regard to functional safety are substantially determined by the connected encoder and the subsequent electronics (if required, contact the manufacturer; the EIB basically conveys the characteristics of the encoder).

The safe position is also substantially determined by the connected encoder and the subsequent electronics. The EIB itself does not influence the safe position. The “safe position” and “safety-related measuring step (SM)” of the connected EnDat encoder are required to calculate the safe position. Please contact the manufacturer of the subsequent electronics for further information.

The PFH value of the total system (EIB 3392S + encoder) is the sum of the PFH values of the EIB 3392S and the connected encoder. For information on the encoder, please refer to its documentation (Product Information document, brochure, and mounting instructions).

---

**Restrictions**

With linear encoders featuring measuring lengths greater than 50 m, there may under certain circumstances be limitations in the output of the commutation angle via the DRIVE-CLiQ interface. Please contact HEIDENHAIN in such cases. HEIDENHAIN recommends setting the datum shift in the subsequent electronics. If the datum shift is used in the EnDat area, it must be less than 3 m, and no position values less than zero may result.

---

**Overview of ID numbers for the EIB 3392S**

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Connector, female</th>
<th>Coupling, male</th>
<th>Cable PUR/²</th>
<th>PUR cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1164912-11</td>
<td>EnDat22</td>
<td>Black cable color</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1166913-11</td>
<td>DG01</td>
<td>Green cable color</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**NOTE:**

The software of the DRIVE-CLiQ subsequent electronics must be designed for operation of the EIB 3392S in safety-related applications. For more information on availability, please refer to the manufacturer.
## Interfaces

### Pin layout of the EIB input

**Mating connector**

8-pin M12 coupling

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Serial data transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>EnDat</td>
<td>UP₂</td>
</tr>
<tr>
<td>Sensor</td>
<td>UP₂</td>
</tr>
<tr>
<td>0 V</td>
<td>Sensor 0 V</td>
</tr>
<tr>
<td>DATA</td>
<td>DATA</td>
</tr>
<tr>
<td>CLOCK</td>
<td>CLOCK</td>
</tr>
</tbody>
</table>

**Siemens pin layout**

**RJ45 connector**

8-pin M12 coupling

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Serial data transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UP</td>
<td>0 V</td>
</tr>
<tr>
<td>TXP</td>
<td>TXN</td>
</tr>
<tr>
<td>RXP</td>
<td>RXN</td>
</tr>
</tbody>
</table>

*Cable shield* connected to housing; **UP** = Power supply voltage

---

### Further information:

To ensure proper and intended use, comply with the specifications in the following documents:

- Brochure: *Interfaces of HEIDENHAIN Encoders* 1078628-xx
- Brochure: *Cables and Connectors* 1206103-xx
- Brochure, Product Information, and Mounting Instructions of the connected encoder
- Mounting Instructions: EIB 3392S 1177939-xx