



# HEIDENHAIN



Product Information


## **EIB 192**

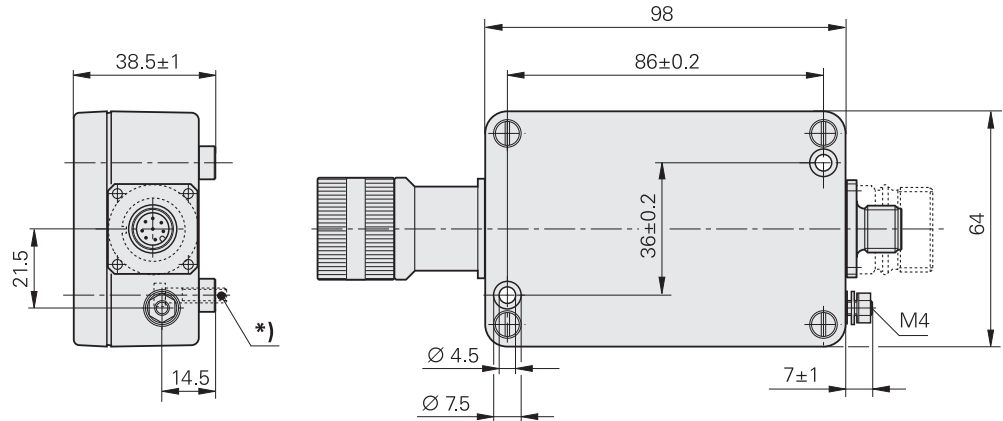
Interface Electronics

July 2014

# EIB 192

- Interpolation and digitizing electronics
- Integrated 16384-fold subdivision
- Input: Incremental encoders from HEIDENHAIN
- Output: Position values as per EnDat 2.2, Fanuc Serial Interface or Mitsubishi high speed interface

mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 < 6 mm: ±0.2 mm



\*) 2 mounting screws (M4 x 16 DIN 912/ISO 4762)


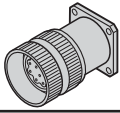



Specifications	EIB 192	EIB 192F	EIB 192M
<b>Input</b>	For HEIDENHAIN encoders		
Interface	~ 1 V <sub>PP</sub> ; input frequency ≤ 400 kHz		
Reference mark	One or distance-coded		
Electrical connection	12-pin M23 flange connector (female)		
Power supply for encoders	From EIB voltage supply		
Cable length	≤ 6 m		
<b>Output</b>			
Interface	EnDat 2.2	Fanuc Serial Interface	Mitsubishi high speed interface
Ordering designation	EnDat22	Fanuc02	Mit02-4
Calculation time $t_{cal}$ Clock frequency	≤ 5 μs ≤ 16 MHz	–	–
Electrical connection	8-pin M12 flange socket (male)	17-pin M23 flange socket (male)	
Cable length (with HEIDENHAIN cable)	≤ 100 m <sup>1)</sup>	≤ 20 m <sup>2)</sup>	≤ 20 m <sup>2)</sup>
<b>Subdivision</b>	≤ 16384-fold (depending on encoder)		
<b>Power supply</b>	5 V DC ± 0.25 V		
Power consumption (max.)	1900 mW (including I <sub>Emax</sub> = 150 mA)		
Current consumption (typical, without load)	160 mA + I <sub>Etyp</sub>		
<b>Operating temperature</b> <b>Storage temperature</b>	0 °C to 70 °C –30 °C to 70 °C		
<b>Vibration</b> 55 to 2000 Hz <b>Shock</b> 11 ms	100 m/s <sup>2</sup> (EN 60068-2-6) 300 m/s <sup>2</sup> (EN 60068-2-27)		
<b>Protection</b> EN 60529	IP 65		
<b>Weight</b>	≈ 0.3 kg		

<sup>1)</sup> 5 V ± 0.25 V supply voltage must be maintained at the EIB


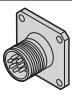



<sup>2)</sup> I<sub>Encoder</sub> ≤ 150 mA; greater cable lengths upon request


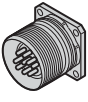


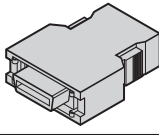
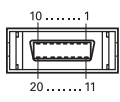



# Electrical connection


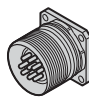


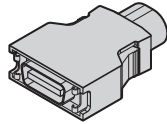
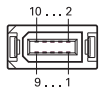

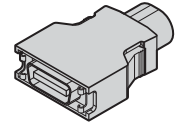
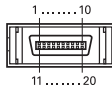




## Pin layout of EIB input

<b>12-pin flange connector, M23</b>   												
	Power supply				Incremental signals						Limit pos. sign.	
	<b>12</b>	<b>2</b>	<b>10</b>	<b>11</b>	<b>5</b>	<b>6</b>	<b>8</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>7</b>	<b>9</b>
	<b>U<sub>P</sub></b>	<b>Sensor U<sub>P</sub></b>	<b>0V</b>	<b>Sensor 0V</b>	<b>A+</b>	<b>A-</b>	<b>B+</b>	<b>B-</b>	<b>R+</b>	<b>R-</b>	<b>H/L1<sup>1)</sup></b>	<b>L/L2<sup>1)</sup></b>
	Brown/Green	Blue	White/Green	White	Brown	Green	Gray	Pink	Red	Black	Violet	Yellow

## Pin layout of EIB output

<b>EIB 192 8-pin flange socket, M12</b>   								
	Power supply				Position values			
	<b>8</b>	<b>2</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>7</b>	<b>6</b>
	<b>U<sub>P</sub></b>	<b>Sensor U<sub>P</sub></b>	<b>0V</b>	<b>Sensor 0V</b>	<b>DATA</b>	<b>DATA</b>	<b>CLOCK</b>	<b>CLOCK</b>
	Brown/Green	Blue	White/Green	White	Gray	Pink	Violet	Yellow

<b>EIB 192F 17-pin flange socket, M23</b>   					<b>20-pin Fanuc connector</b>   				
	Power supply					Position values			
	<b>7</b>	<b>1</b>	<b>10</b>	<b>4</b>	–	<b>14</b>	<b>17</b>	<b>8</b>	<b>9</b>
	<b>9</b>	<b>18/20</b>	<b>12</b>	<b>14</b>	<b>16</b>	<b>1</b>	<b>2</b>	<b>5</b>	<b>6</b>
	<b>U<sub>P</sub></b>	<b>Sensor U<sub>P</sub></b>	<b>0V</b>	<b>Sensor 0V</b>	<b>Shield</b>	<b>Serial Data</b>	<b>Serial Data</b>	<b>Request</b>	<b>Request</b>
	Brown/Green	Blue	White/Green	White	–	Gray	Pink	Violet	Yellow





<b>EIB 192M 17-pin flange socket, M23</b>   					<b>10-pin Mitsubishi connector</b>   					<b>20-pin Mitsubishi connector</b>   			
	Power supply					Position values							
	<b>7</b>	<b>1</b>	<b>10</b>	<b>4</b>	<b>14</b>	<b>17</b>	<b>8</b>	<b>9</b>					
	<b>1</b>	–	<b>2</b>	–	<b>7</b>	<b>8</b>	<b>3</b>	<b>4</b>					
	<b>20</b>	<b>19</b>	<b>1</b>	<b>11</b>	<b>6</b>	<b>16</b>	<b>7</b>	<b>17</b>					
	<b>U<sub>P</sub></b>	<b>Sensor U<sub>P</sub></b>	<b>0V</b>	<b>Sensor 0V</b>	<b>Serial Data</b>	<b>Serial Data</b>	<b>Request Frame</b>	<b>Request Frame</b>					
	Brown/Green	Blue	White/Green	White	Gray	Pink	Violet	Yellow					

**Shield** on housing; **U<sub>P</sub>** = Power supply

**Sensor:** The sensor line is connected internally with the corresponding power line  
Vacant pins or wires must not be used!





<sup>1)</sup> Only for LIF 4x1/LIDA 4xx; color assignment applies only to connecting cable

# Cables

			EIB 192
<b>PUR connecting cables</b>		[[4 × 0.14 mm <sup>2</sup> ) + (4 × 0.34 mm <sup>2</sup> )]; A <sub>P</sub> = 0.34 mm <sup>2</sup>	
<b>Complete</b> With 8-pin M12 connector (female) and 8-pin M12 coupling (male)		Ø 6 mm	368330-xx
<b>Complete</b> With 8-pin M12 connector (female) and 15-pin D-sub connector (female) for IK 220		Ø 6 mm	533627-xx
<b>Complete</b> With 8-pin M12 connector (female) and 15-pin D-sub connector (male) for PWM 20/EIB 74x		Ø 6 mm	524599-xx
<b>With one connector</b> With 8-pin M12 connector (female)		Ø 6 mm	634265-xx

A<sub>P</sub>: Cross section of power supply lines

Ø: Cable diameter

			EIB 192F	EIB 192M
<b>PUR connecting cables</b>		Ø 8 mm: [(4 × 0.14 mm <sup>2</sup> ) + (4 × 1 mm <sup>2</sup> )]; A <sub>P</sub> = 1 mm <sup>2</sup> Ø 6 mm: [(4 × 0.14 mm <sup>2</sup> ) + (4 × 0.5 mm <sup>2</sup> )]; A <sub>P</sub> = 0.5 mm <sup>2</sup>		
<b>Complete</b> With M12 connector (female, 17-pin) and M23 coupling (male, 17-pin)		Ø 8 mm	349314-xx	
<b>Complete</b> With M23 connector (female, 17-pin) and Fanuc connector (female)		Ø 8 mm	534855-xx	–
<b>Complete</b> With M23 connector (female, 17-pin) and Mitsubishi connector (female, 10-pin)		Ø 8 mm	–	573661-xx
<b>Complete</b> With M23 connector (female, 17-pin) and Mitsubishi connector (male, 20-pin)		Ø 6 mm	–	367958-xx

A<sub>P</sub>: Cross section of power supply lines

Ø: Cable diameter

# Configuration of the EIB 192

In order for the EIB 192 to function correctly together with the encoder, certain encoder parameters must be stored in the EIB 192 (such as the number of signal periods, nominal increment of the reference marks, encoder ID, etc.). Only HEIDENHAIN can program this information. This information is also printed on the ID label. It can also be read out 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 rotary encoders the number of signal periods per revolution is indicated. For linear encoders, the signal period is shown in  $\mu\text{m}$ .

The **encoder ID** indicates the type of encoder that can be connected, e.g. EnDat22:

- 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:

Connection of an ERM 280 (line count: 1024) with an EIB 192 to the EnDat 2.2 interface

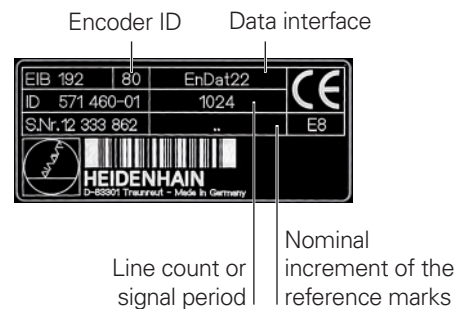
Information on the ID label:

Data interface: EnDat22

Encoder ID: 80

Line count or signal period: 1024

Nominal increment of the ref. marks: –



# Connection information

## Establishing the absolute reference

Because incremental encoders are connected to the EIB 192, immediately after switch-on it provides relative position values that begin with the position upon switch-on. 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 changing direction.

## EIB 192: Requirements for the EIB

EnDat 2.2 permanently provides the relative position as Position 1. When the absolute reference is established, the RM bit is set and the absolute position value is transmitted in the EnDat additional data as Position 2. Before you use the EIB 192, 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 192 and EIB 2391 S, because the EIB 2391 S accepts only absolute encoders.

## EIB 192: Online diagnostics

The EIB 192 supports the online diagnostics of EnDat 2.2 and provides valuation numbers for the incremental track.

# HEIDENHAIN

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

## Further Information

- Product overview: *Interface Electronics*
- Catalog: *Interfaces of HEIDENHAIN Encoders*