HEIDENHAIN

Product Information

EIB 700 Series
External Interface Box

EIB 700 Series

The EIB 700 units are external interface boxes for precise position measurement. They are ideal for inspection stations and multipoint inspection apparatuses as well as for mobile data acquisition, such as in machine inspection and calibration.

The EIB 700 series is ideal for applications requiring high-resolution encoder signals and fast measured-value acquisition. Ethernet transmission also enables you to use switches or hubs for connecting more than one EIB. It is also possible to use WLAN transmission, for example.

The EIBs are suited for the following voltage supplies:
EIB 741: 100 V AC to 240 V
EIB 742: 24 V DC

A maximum of **four HEIDENHAIN encoders,** either with sinusoidal incremental signals ($\sim$ 1 V$_{PP}$; $\sim$ 11 µA$_{PP}$ on request) or with EnDat interfaces (EnDat 2.1 and EnDat 2.2) can be connected to the EIB 700 series.

The EIB 700 series subdivides the periods of the incremental signals up to 4 096-fold for **measured-value generation.** The deviations within one signal period are automatically reduced by adjustment of the sinusoidal incremental signals.

The integrated **measured-value memory** enables the EIB 700 series to save typically 250 000 measured values per axis. Internal or external triggers can be used for axis-specific storage of the measured values.

A standard Ethernet interface using TCP/IP or UDP communication is available for **data output.** This permits direct connection to a PC, laptop or industrial PC. The type of measured-value transfer can be selected through the operating mode (transfer of individual values, block transfer, or transfer upon software request).
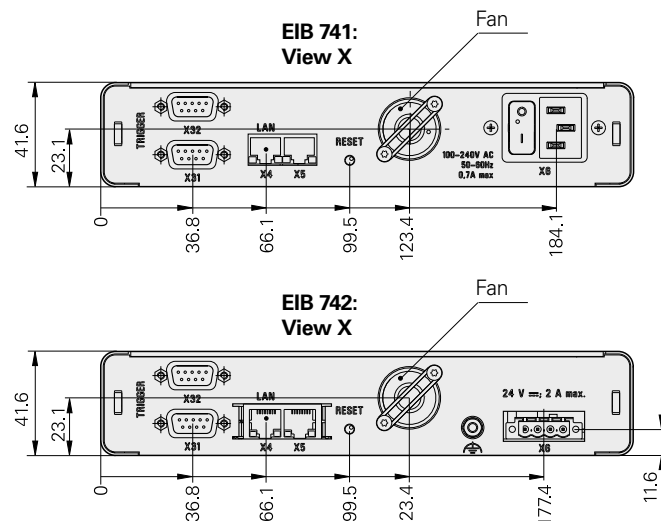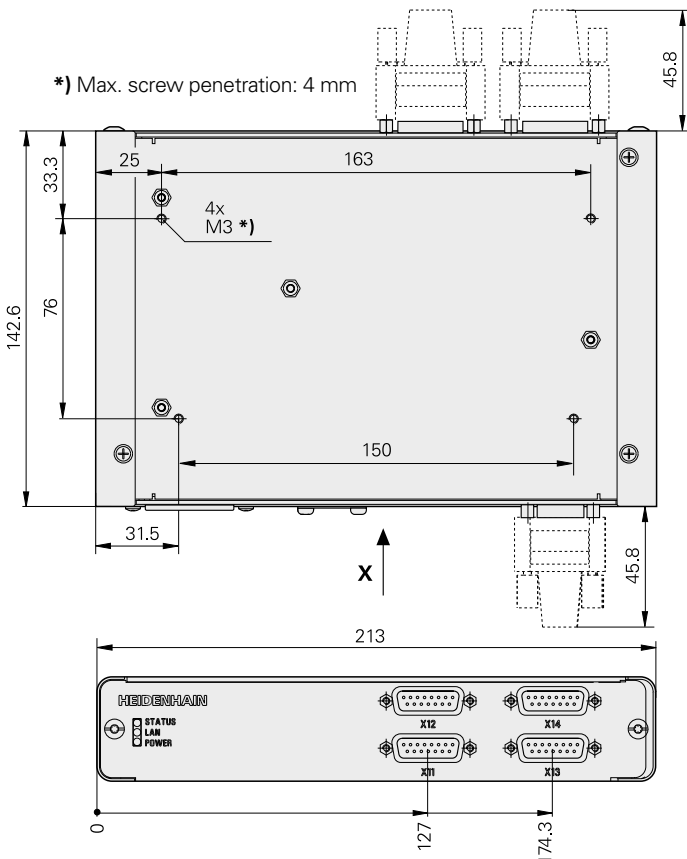
Driver software for Windows, Linux and LabVIEW as well as example programs and the EIB application software are included in the items supplied, in order to **process the measured values** on the PC. The driver software enables customers to easily programming their own applications. It also contains program examples demonstrating the capabilities of the EIB 700 series. The EIB application software serves for commissioning and demonstrating the capabilities of the EIB 700 series. This software is made available in the source code and can serve as a platform for the development of one's own applications.

Thanks to the compact **dimensions**, two EIB 700 series interface boxes fit next to each other in a 19-inch housing. They occupy one height unit.

Accessories
Mounting bracket
For installation of two EIB 74x in a 19-inch housing
ID   671144-01

Specifications	EIB 741 EIB 742		
Encoder inputs	D-sub connections, 15-pin, female (X11 to X14), for four encoders		
Input signals (switchable)	$\sim$ 1 V$_{PP}$ ($\sim$ 11 µA$_{PP}$ upon request)	EnDat 2.1	EnDat 2.2
Voltage supply for encoders	5.12 V DC ± 0.15 V; max. 450 mA per channel Overcurrent protection (automatic switch-off, resettable) at 550 mA		
Input frequency	≤ 500 kHz	–	–
Subdivision factor	4 096-fold	–	–
Signal adjustment	Automatic adjustment of offset, phase and amplitude	–	–
Cable length[1]	≤ 150 m	≤ 150 m	≤ 100 m
Data register for measured values	48 bits (only 44 bits are used)		
Interval counter	Derived from axis 1 (only 1 V$_{PP}$), Interpolation factor can be set from 1-fold to 100-fold Can be used as trigger source or additional counting axis		
Measured-value memory	Typically 250,000 position values per channel		
Measured-value trigger[2]	Storage of the measured values of the four axes alternatively through external or internal trigger. ***External:*** • Signal via trigger input • Software command (via Ethernet) ***Internal:*** • Timer • Interval counter • Reference pulse of the respective axis (from axis 1 also possible for other axes)		
Trigger input[3]	D-sub connection, 9-pin, male Differential inputs as per RS-485 (terminating resistors can be activated)		
Trigger output[3]	D-sub connection, 9-pin, female 4 differential outputs as per RS-485		
Access to measured values	Depends on the selected operating mode (see separate table)		
Software	• Driver software for Windows, Linux and LabVIEW • Program examples • EIB application software		
Data interface[4]	Ethernet as per IEEE 802.3 (max. 1 gigabit)		
Network address	Automatic assignment through Dynamic Host Configuration Protocol (DHCP) or manual assignment		
Dimensions	Approx. 213 mm x 152 mm x 42 mm		
Operating temperature Storage temperature	0 °C to 45 °C 0 °C to 70 °C		
Voltage supply	**EIB 741:** 100 V AC to 240 V (± 10 %), 50 Hz to 60 Hz (± 2 Hz), power consumption approx. 30 W **EIB 742:** 24 V DC (- 15 %/+ 20 %), max. 2 A		

[1] The supply voltage range of the encoder must be maintained; specified cable length applies when HEIDENHAIN cables are used.
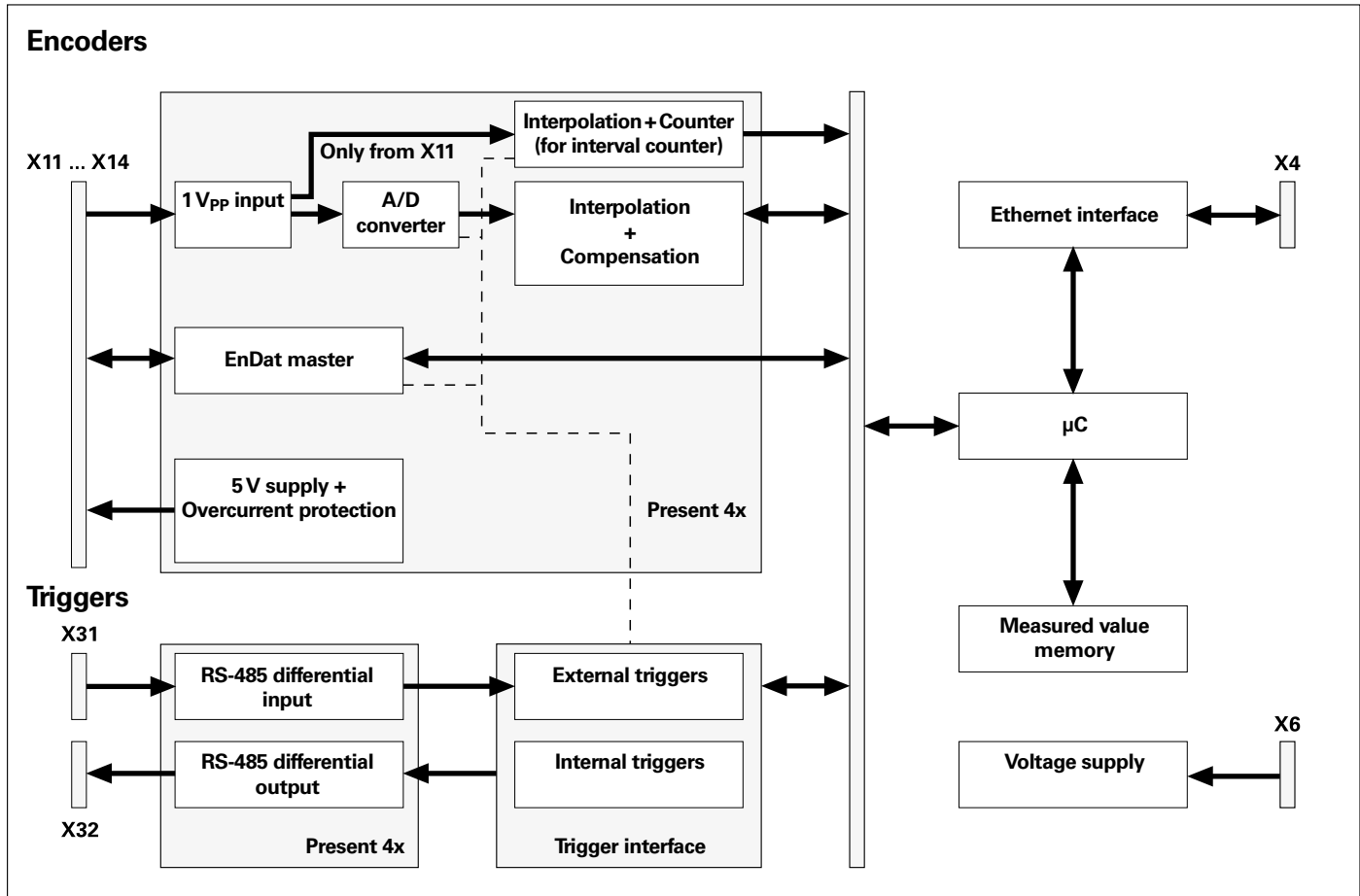[2] Different trigger sources can be assigned to the individual axes
[3] Can also be used as logical input or output
[4] The quality of the data cable between the EIB and the PC must be suitable for the requested transfer rate and the cable length.

Note: The features can be extended by updating the firmware.

Basic circuit diagram

Encoders

X11 ... X14

- **1 V_PP input** → **A/D converter** → **Interpolation + Compensation**
- **Only from X11** → **Interpolation + Counter (for interval counter)**
- **EnDat master**
- **5 V supply + Overcurrent protection**

Present 4x

Triggers

X31

- **RS-485 differential input** → **External triggers**
- **RS-485 differential output** ← **Internal triggers**

X32

Present 4x   **Trigger interface**

- **Ethernet interface** — **X4**
- **µC**
- **Measured value memory**
- **Voltage supply** — **X6**

Operating modes

	Soft Realtime Mode	Recording	Streaming	Polling
Properties	Immediate transmission of measured values when the trigger event occurs	Storage of measured values in the EIB's internal measured-value memory	Buffering and block transfer of measured values	Software request from customer application
Selectable trigger sources	All internal and external sources			By software command
Trigger rate	≤ 10 kHz (access time to position values < 100 µs)	≤ 50 kHz	≤ 50 kHz Max. 1 200 000 bytes/s	Depends on the application
Typical applications	Control operation: Closed Loop	Very high recording rate Offline analysis of data	High recording rate in combination with high recording depth	Quasi-static measured value recording

Software
EIB application software

The EIB application software covers two applications:

Commissioning and demonstration of the EIB 74x
- The settings required for easy configuration of the EIB 74x (e.g. input interface, data packets, operating mode, trigger settings).
- Management of one or more EIB 74x units.
- Simple representation of the positions transmitted by the EIB 74x.
- Settings can be saved so that different application projects can be managed.

The User's Guide provides more information.

Platform for customer applications
The EIB application software is made available in the source code. Based on this application, customers can quickly realize their own applications. The application software was programmed with C++/CLI and Windows Forms in Visual Studio 2008. This programming environment is widely used in technical application programming, but does not necessarily provide state-of-the-art operating systems like Windows 7, for example. However, the customer can adapt the program to other graphic user interfaces.
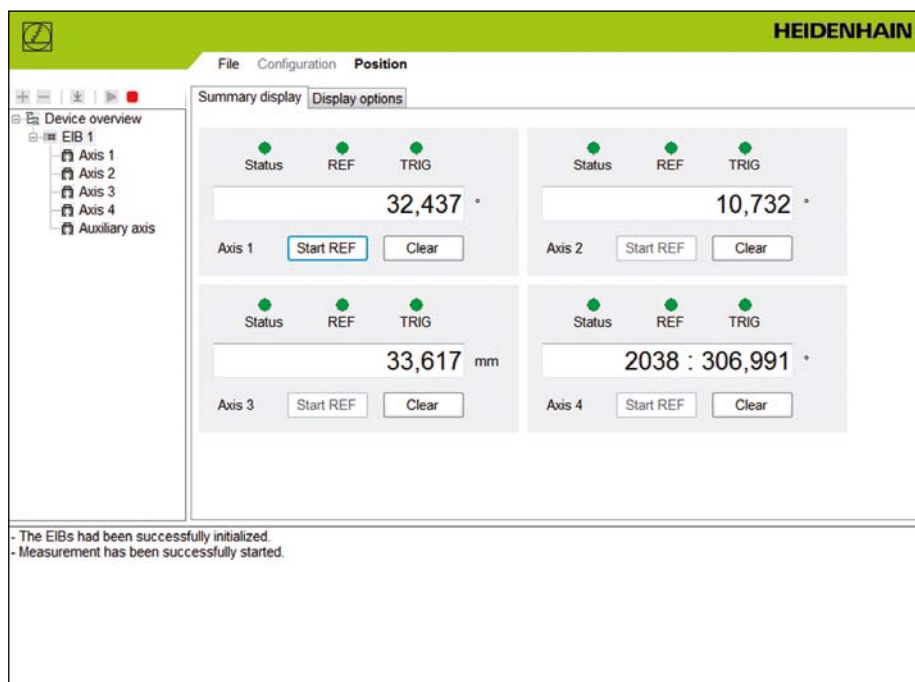
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For more information
- Product overview: *Interface Electronics*