Application Note DK9322-0411-0041

IP 67

Virtual Serial COM Driver | IP 67-rated solutions

This application example describes how an EP6002 EtherCAT Box can act as a serial interface in a harsh industrial environment (IP 65/67) using the TwinCAT Virtual Serial COM Driver supplement. This facilitates the positioning of a serial terminal device much further away from the controller than with a cable-based physical layer (RS232/RS422/RS485). The EP6002 EtherCAT Box from Beckhoff enables integration of external devices with a serial interface, such as barcode or RFID readers, directly in the field without a control cabinet.

The IP 67 I/O system from Beckhoff

The Beckhoff EtherCAT Box line delivers EtherCAT I/O technology without requiring a control cabinet. All modules from the IP 67 series have an integrated direct EtherCAT interface, so that the protocol's high performance is retained right down to each module. This opens up new options in the IP-67 world: fast process data communication with eXtreme Fast Control (XFC), high-precision measurement technology and drive functions integrated into I/O solutions directly in the field. With dimensions of only 126 x 30/60 x 26.5 mm (H x W x D) the modules are exceptionally small and are therefore particularly suitable for applications where available space is limited.

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Basic principles

The TwinCAT Virtual Serial COM Driver supplement, in combination with an EP6002 serial interface box module for the IP 65/67 EtherCAT Box system, enables the creation of virtual COM interfaces that can be used by Windows applications just like normal serial interfaces. The actual connection point for devices with a serial interface can be anywhere in the field (Fig. 1). In order to use such third-party devices with a serial connection in the field, in the past a PC with a suitable interface had to be installed in the field or a connection between the interface and the central controller had to be established using a suitably long cable. A PC generates additional costs for the data acquisition and system integration. The cable length is limited by the corresponding physical layer. A Windows-compliant serial interface can be set up in the PC by using the EP6002 EtherCAT Box and the TwinCAT Virtual Serial COM Driver.
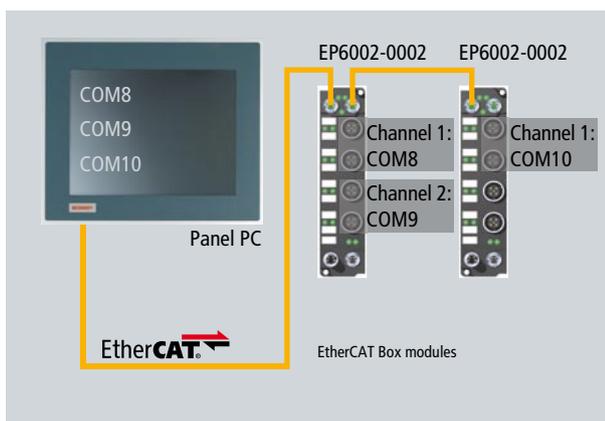

Fig. 1 Serial interfaces in the field

Advantages

The advantage of combining the TwinCAT supplement and serial terminal is that Windows applications can access one or several terminals that are linked via EtherCAT and can, therefore, be distributed at different points in the field. No separate wiring of the individual serial interfaces is required. In theory, up to 255 COM ports can be integrated, although this is rarely used in practice. Another advantage is system conformity: the integration costs are reduced since no additional computer has to be installed for operating a device in the field. The virtual interfaces can be configured conveniently (name, baud rate, handshake) via the TwinCAT in the System Manager. If several networked PCs and interface modules are distributed in the system, TwinCAT System Manager can be used to specify which interface is available on which PC.

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Configuration

TwinCAT System Manager is used to specify whether and with which number a virtual COM port should be created for both channels of the EP6002 EtherCAT Box.
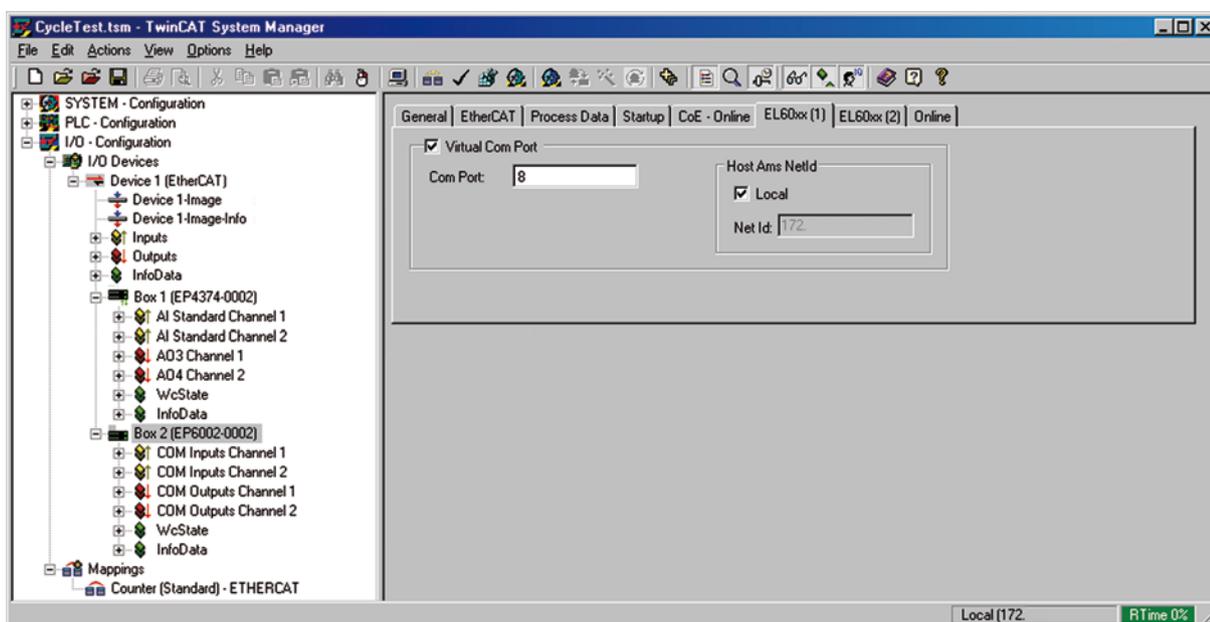

Fig. 2   Numbering of the virtual COM port in TwinCAT System Manager

After activation of the configuration in TwinCAT, the virtual COM port is available for applications that use the serial RS232/RS422/RS485 protocols for data exchange and require a COM port.

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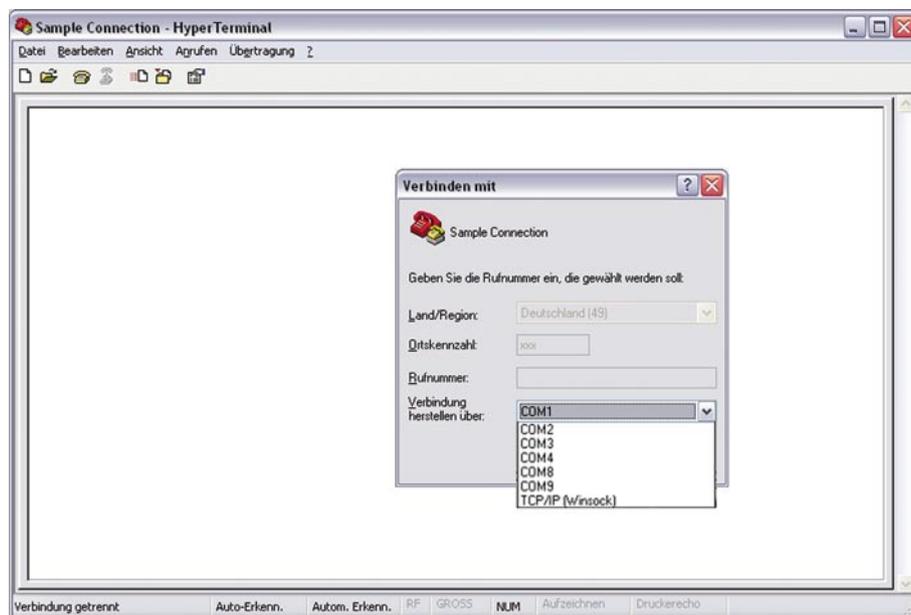
Fig. 3   Access to the virtual COM port through applications/programs (e.g. HyperTerminal)

Practical example: Virtual Serial COM Driver with EP6002 | Handheld bar code scanner integrated in the field

The software for the third-party device, for example a handheld bar code scanner, is installed on the central control system, where data are to be processed. Here the software interface is a standard Windows COM interface. However, the handheld scanner is used at a remote I/O station in the field. The software for the hand scanner cannot be implemented in TwinCAT, and the scanner data are not processed with TwinCAT. In addition, the software for the third-party device does not know about EtherCAT and need not be Ethernet- or EtherCAT-capable. The TwinCAT Virtual Serial COM Driver supplement enables the use of EtherCAT as a transmission medium for the scanner data (Fig. 4).

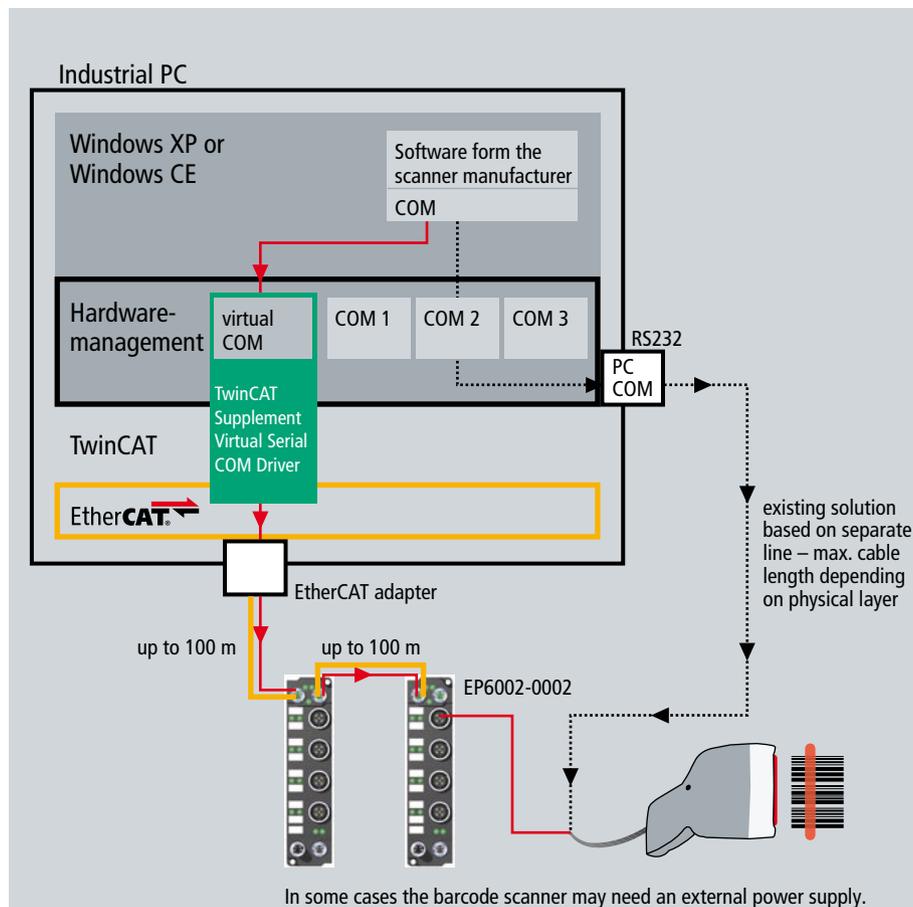## Application Note DK9322-0411-0041

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Fig. 4   Connecting a scanner

In this way the scanner data are made available at a virtual interface from the field via the EtherCAT network through TwinCAT. This virtual interface is generated through TwinCAT and displayed in the operating system of the central controller (Windows XP or CE). The software associated with the handheld scanner can access this virtual interface as standard under Windows to obtain the scanner data.

– 2-channel serial interface, RS232, RS422/RS485 **www.beckhoff.com/EP6002**
– EtherCAT Extends its Reach into the IP 67 World **www.beckhoff.com/EtherCAT-Box**
– Feldbus Box | The compact IP 67 modules **www.beckhoff.com/IP67**
– EtherCAT | Ultra high-speed communication **www.beckhoff.com/EtherCAT**
– PLC and Motion Control on the PC **www.beckhoff.com/TwinCAT**
– TwinCAT Supplements **www.beckhoff.com/supplements**

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