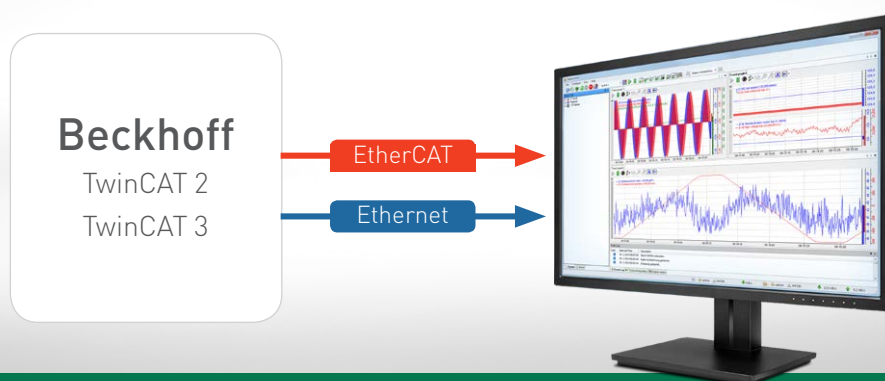


# Customized Monitoring - TwinCAT Controller Interfaces

ibaPDA Connectivity



## **ibaBM-eCAT**

Acquire data via EtherCAT  
EtherCAT diagnostics



## **ibaPDA-Interface-Generic-TCP**

## **ibaPDA-Interface-Generic-UDP**

Acquire data via Ethernet



## **ibaPDA-Request-TwinCAT**

Acquire data using the Request method



## **ibaPDA-Interface-TwinCAT-Xplorer**

Connection via Xplorer interface

### **ibaPDA Connectivity**

Acquire data from TwinCAT controllers	3
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### **Acquire data via EtherCAT**

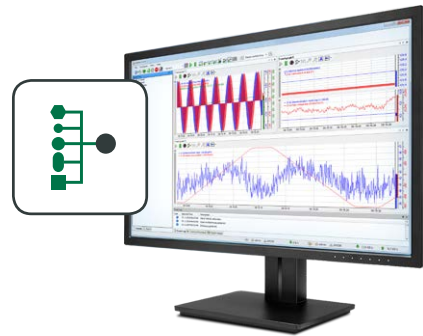
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# TwinCAT Connectivity\*

The iba system offers several ways to acquire data from the TwinCAT or other EtherCAT-based controllers - the right solution for different requirements in each case. The iba solutions support TwinCAT 2 and TwinCAT 3 in particular.



An ibaPDA system can be connected to TwinCAT controllers via EtherCAT or Ethernet communication. Which method is best depends on, amongst other things, how quickly the data needs to be acquired, whether scan-cycle-synchronous data transmission is required and which hardware is available. In addition, the Request method and the Xplorer interface offer the option of selecting signals using the symbolic identifiers via a symbol browser without any programming effort.

## Direct interface via EtherCAT

If data needs to be acquired quickly and precisely with each scan cycle, the TwinCAT system should be connected via EtherCAT with the ibaBM-eCAT bus monitor. The bus monitor can also be configured as EtherCAT slave; the programming of the output takes place directly in the program.

The setup of the signals can be retrieved from the EtherCAT project file from the automation system, provided that the ENI export file of the EtherCAT configuration has been imported in ibaPDA. Hence, the signals of all configured terminals are available in ibaPDA. The signals can be comfortably selected just by a mouse-click using the symbol browser.

## EtherCAT browser and diagnostics

If no ENI export file of the EtherCAT configuration is available, the symbol browser cannot be used for signal selection. Using the EtherCAT browser, it is optionally possible to select the values for acquisition directly from the EtherCAT bus.

The EtherCAT browser also contains diagnostic functions of the bus. For example, the individual telegrams can be analyzed and cycle and turnaround times can be displayed. A large number of diagnostic signals describing the EtherCAT bus are available for acquisition in ibaPDA.

## Connection via Ethernet

When connected via Ethernet, the communication depends on the communication performance of the controller and the network load. Therefore, the acquisition via Ethernet cannot be scan-cycle-precise. The advantage, however, is that the standard network connection of the controller can be used; in ibaPDA, only a software interface is required.

Regardless of whether the connection is via EtherCAT or Ethernet, the values to be recorded must be programmed in the controller and be

### At a glance

- › Connection to TwinCAT controllers via various interfaces: ibaBM-eCAT, Generic-TCP, Generic-UDP, TwinCAT-Xplorer
- › Free selection of symbols with Request method or Xplorer interface
- › Scan-cycle-precise acquisition via EtherCAT with ibaBM-eCAT bus monitor
- › Connection without additional hardware with software interfaces Generic-TCP, Generic-UDP and TwinCAT-Xplorer
- › Simple, cost-effective connection via Xplorer interface

sent by the controller program. Each change of values requires a program change.

## Signal selection without programming

Using special iba solutions, programming effort can be avoided: With the Xplorer interface or Request method, measured values can be changed without intervention in the programming while the controller is running. In addition, the measured values

can be flexibly selected by importing the address book.

### Request method

The Request method allows users to record signals from the controller by free signal selection. The measured values can be selected from the address book of the project and simply accessed via their symbolic names. A PLC-code block („Request block“) must be integrated into the TwinCAT system program once. After the request, the TwinCAT system sends the measured values cyclically to the ibaPDA system. The Request method is available for connections via EtherCAT and Ethernet UDP.

### How does the Xplorer interface work?

With the TwinCAT-Xplorer interface, it is possible to easily and cost-effectively connect to TwinCAT systems. Like the Request method, the Xplorer interface allows free access to

the internal data of a controller. The standard procedures of the respective controller are used; additional hardware is not required when connecting via Ethernet. However, the measured values are cyclically requested and sent by the controller in a „polling“ procedure. Data acquisition is not scan-cycle-precise since the data is only sent by the controller when the request can be processed.

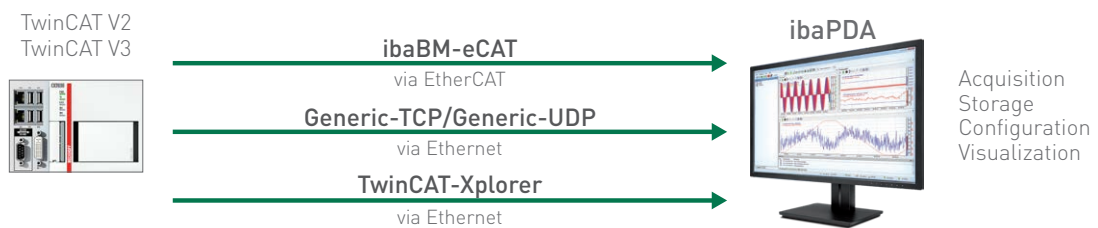
The signals can be easily selected in ibaPDA with a mouse click using the symbol browser. The selection of signals can be changed at any time without interruption to the controller running operation.

### Different Xplorer interfaces

An Xplorer interface is available not only for TwinCAT controllers but also for SIMATIC S7 systems, Allen-Bradley controllers (PLC5, SLC500, ControlLogix), B&R systems, CODESYS V2 and V3 based systems, Mitsubishi MELSEC controllers, as well

as SIGMATEK controllers. All available Xplorer interfaces are provided as a bundle for ibaPDA. A cost-effective entry-level solution is also available: ibaPDA-PLC-Xplorer offers the full ibaPDA functionality with all available Xplorer interfaces for up to 64 signals. This is ideal for applications, such as troubleshooting or commissioning.

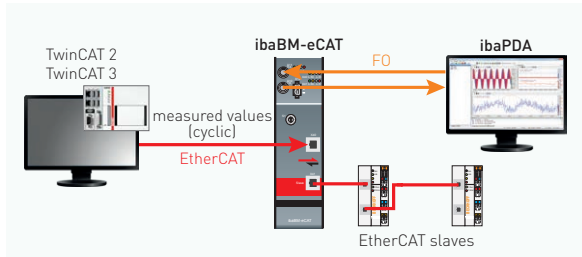
- Detailed information on the Xplorer licenses can be found under order information on page 7.



# Acquire data via EtherCAT

The connection via EtherCAT is established with the bus monitor ibaBM-eCAT. A fast and (bus) scan-cycle-precise acquisition of measured values is possible via EtherCAT.

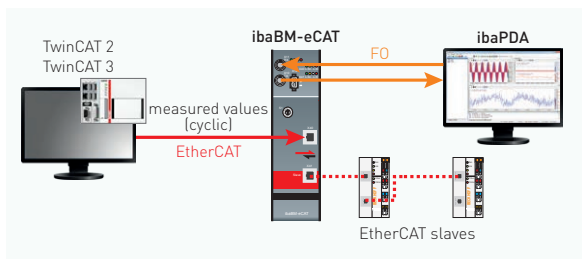
## ibaBM-eCAT as sniffer\*



- › (Bus) scan-cycle-precise transmission of measured values
- › No programming and therefore no additional load of the CPU
- › Only existing data exchange between master/ slave can be detected
- › Change of signal selection possible during operation
- › Simple signal selection via symbol browser using ENI file
- › Optional signal selection via EtherCAT browser

iba software	iba hardware
ibaPDA	ibaBM-eCAT ibaFOB-D card (in the PC)

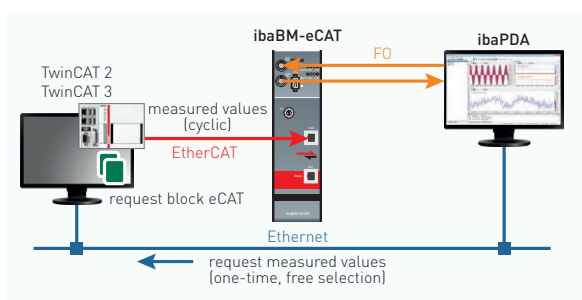
## ibaBM-eCAT as slave\*



- › In addition to sniffer functions:
- › (Bus) scan-cycle-precise transmission of measured values
- › Low additional load of the CPU
- › Direct addressing in the PLC
- › PLC program must be changed for selecting the variables to be measured
- › Signal selection like „as sniffer“

iba software	iba hardware
ibaPDA	ibaBM-eCAT ibaFOB-D card (in the PC)

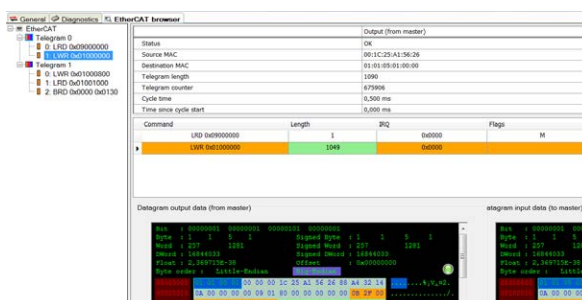
## ibaPDA-Request-TwinCAT



- › (Bus) scan-cycle-precise transmission of measured values
- › Low additional load of the CPU
- › A PLC code block needs to be integrated once
- › No PLC program changes needed for signal selection
- › Change of signal selection possible during operation
- › Simple signal selection via symbol browser

iba software	iba hardware
ibaPDA ibaPDA-Request-TwinCAT	ibaBM-eCAT ibaFOB-D card (in the PC)

## EtherCAT diagnostics\*

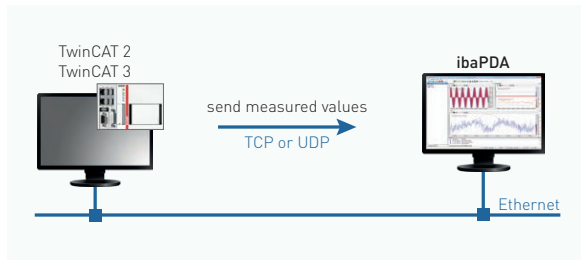


- › Detailed display of an EtherCAT telegram down to structure or byte level
- › Display of status information of the EtherCAT bus
- › No additional soft- or hardware

# Acquire data via Ethernet

A software interface in ibaPDA is required for collecting data via Ethernet (TCP or UDP), additional hardware is not necessary. The transmission performance depends on the network.

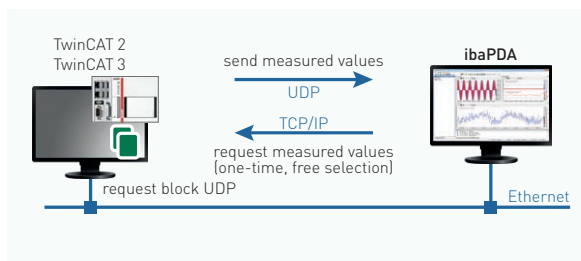
## ibaPDA-Interface-Generic-TCP / ibaPDA-Interface-Generic-UDP\*



- › Low additional load of the CPU
- › TCP and UDP supported
- › PLC program must be changed for selecting the values to be measured
- › Transmission performance and quality depend on the network

iba software	iba hardware
ibaPDA + ibaPDA-Interface-Generic-TCP or ibaPDA-Interface-Generic-UDP	-

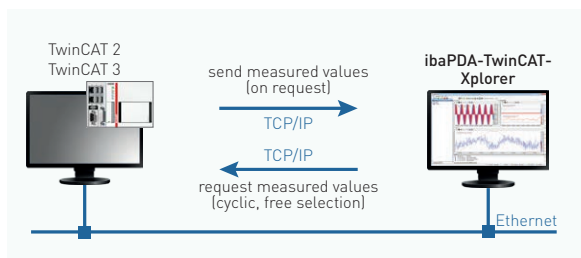
## ibaPDA-Request-TwinCAT



- › PLC code blocks need to be integrated once
- › No PLC program changes needed for selecting the measured values (free selection)
- › Change of signal selection possible during operation
- › UDP supported (not TCP)
- › Transmission performance and quality depend on the network

iba software	iba hardware
ibaPDA + ibaPDA-Request-TwinCAT	-

## ibaPDA-Interface-TwinCAT-Xplorer



- › Simple configuration
- › No PLC program changes needed for selecting the measured values (free selection)
- › Possible to change the measured value selection during operation
- › Access possible via TCP/IP

iba software	iba hardware
ibaPDA + ibaPDA-Interface-TwinCAT-Xplorer or ibaPDA-PLC-Xplorer (max. 64 signals)	-

# Order information

## Software

Order no.	Name	Description
30.770256	ibaPDA-V7-256 <sup>1</sup>	Basic package for 256 signals, 2 clients, 2 data storages
30.681502	ibaPDA-V7-PLC-Xplorer	ibaPDA system for 64 signals, 2 clients, 2 data storages + S7-Xplorer (interface for SIMATIC S7) + AB-Xplorer (interface for Allen-Bradley) + B&R-Xplorer (interface for B&R systems) + Codesys-Xplorer (interface for CODESYS-based systems) + Logix-Xplorer (interface for ControlLogix systems) + MELSEC-Xplorer (interface for Mitsubishi MELSEC systems) + Sigmatek-Xplorer (interface to SIGMATEK systems) + TwinCAT-Xplorer (interface to Beckhoff systems)
30.770009	Upgrade-PLC-Xplorer to PDA-V7-64	Upgrade to ibaPDA-V7 with 64 signals and PLC-Xplorer interfaces
31.001042	ibaPDA-Interface-PLC-Xplorer	License bundle of all current PLC-Xplorer interfaces (S7, AB, B&R, Codesys, Logix, MELSEC, Sigmatek, TwinCAT-Xplorer) for an ibaPDA system
31.000005	ibaPDA-Interface-TwinCAT-Xplorer	License extension for ibaPDA system for TwinCAT-Xplorer interface
31.100005	one-step-up-Interface-TwinCAT-Xplorer	License extension for 16 more TwinCAT-Xplorer connections
31.001075	ibaPDA-Interface-Generic-UDP	License extension for ibaPDA system for a UDP interface (64 connections)
31.101075	one-step-up-Interface-Generic-UDP	License extension for existing ibaPDA-Interface-Generic-UDP interface for 64 more UDP connections (maximum 3)
31.001076	ibaPDA-Interface-Generic-TCP	License extension for ibaPDA system for a TCP interface (64 connections)
31.101076	one-step-up-Interface-Generic-TCP	License extension for existing ibaPDA-Interface-Generic-TCP interface for 64 more TCP connections (maximum 3)
31.001303	ibaPDA-Request-TwinCAT	License extension for ibaPDA system for the use of Request-TwinCAT with ibaBM-eCAT or UDP

<sup>1</sup> Other licenses are available for ibaPDA for a larger number of signals, clients and data storages.

## Hardware

13.127000	ibaBM-eCAT	Bus monitor for EtherCAT
11.118030	ibaF0B-2i-Dexp	F0 card, PCI Express, 2 inputs
11.118020	ibaF0B-io-Dexp	F0 card, PCI Express, 1 input, 1 output
11.118010	ibaF0B-2io-Dexp	F0 card, PCI Express, 2 inputs, 2 outputs
11.118000	ibaF0B-4i-Dexp	F0 card, PCI Express, 4 inputs
11.116200	ibaF0B-4o-D rackline-slot	F0 card, 4 outputs, short design for ibaRackline
11.117010	ibaF0B-io-USB	F0 adapter with USB interface, 1 input, 1 output



## Headquarters Germany

### iba AG

#### Office address

Koenigswarterstr. 44  
D-90762 Fuerth

#### Mailing address

P.O. box 1828  
D-90708 Fuerth

Tel.: +49 (911) 97282-0  
Fax: +49 (911) 97282-33

www.iba-ag.com  
iba@iba-ag.com

## Europe

### iba Benelux BVBA

Benelux, France, Spain, Portugal, Ireland,  
Great Britain, French-speaking Switzerland  
sales@iba-benelux.com

### iba Italia S.R.L.

Italy, Slovenia, Croatia, Italian-  
speaking Switzerland  
sales@iba-italia.com

### iba Scandinavia

Denmark, Finland, Norway, Sweden  
c/o Begner Agenturer AB  
info@iba-scandinavia.com

### iba Polska

c/o ADEGIS Sp. z o.o. Sp.k.  
support@iba-polska.com

### 000 iba Russia

dmitry.rubanov@iba-russia.com

## Asia

### iba Asia GmbH & Co. KG

Western and Central Asia, Philippines,  
Cambodia, Laos, Myanmar, Bangladesh,  
Bhutan, Nepal, Sri Lanka  
henry.regn@iba-asia.com

### iba China Ltd.

julia.wang@iba-china.com

### iba Gulf

Saudi Arabia, UAE, Qatar,  
Kuwait, Bahrain and Oman  
c/o ASM  
a.magboul@iba-gulf.com

### iba Indonesia

c/o PT. Indahjaya Ekaperkasa  
sandhi.sugiarto@iba-indonesia.com

### iba Korea System Co. Ltd.

Korea and Japan  
sh.lee@iba-korea.com

### iba Malaysia

c/o iba Engineering & Consulting  
(Malaysia) SDN. BHD  
bruno.marot@iba-malaysia.com

### iba Singapore

c/o iba (S.E.A.) Engineering &  
Consulting Pte. Ltd.  
bruno.marot@iba-sea.com

### iba Systems India Pvt. Ltd.

shraddhap@iba-india.com

### iba Thailand

c/o SOLCO Siam Co. Ltd.  
pairote@iba-thai.com

### iba Turkey Ltd.

ahmet@iba-turkey.com

### iba Vietnam

c/o Tang Minh Phat Co., Ltd  
sales@iba-vietnam.com

## Australia and Oceania

### iba Oceania Systems Pty Ltd.

Australia, New Zealand, PNG, Micronesia and  
South Pacific Islands (except US territories)  
fritz.woller@iba-oceania.com

## Central and South America

### iba LAT, S.A.

eric.di.luzio@iba-lat.com

### iba LAT Argentina

alejandro.gonzalez@iba-lat.com

### iba LAT Bolivia

mario.mendizabal@iba-lat.com

### iba LAT Brazil

iba@iba-brasil.com

## North America (NAFTA)

### iba America, LLC

USA  
esnyder@iba-america.com

### iba America, LLC

Canada  
dkober@iba-america.com

### iba America, LLC

Mexico  
jgiraldo@iba-america.com

## Africa

### iba Africa

c/o Variable Speed Systems cc  
danie@iba-africa.com

iba AG is represented worldwide by  
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