Powerful industrial PCs
PC connections
FO infrastructure

PCs & FO Infrastructure

ibaRackline, ibaDeskline
Industrial computers with state-of-the-art PC technology

ibaFOB-D
Interface cards for fiber optics connections

ibaFOB-TDC/SD/PlusControl
FO connection to Siemens systems

ibaBM-COL-8i-o/DIS-i-8o/FOX-i-3o-D
Concentrating and distributing FO connections

ibaClock
Time synchronization

USB-Dongle-/Deviceserver
Using USB dongles/ devices via network

With the comprehensive range of the iba infrastructure products, we offer you reliable hightech hardware. With this hardware, you can transmit signals and other measured values without any changes from the control system to the data acquisition system. There you can record the data.

The product range comprises the following products:

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State-of-the-art technology, reliable and with a long service life

Powerful industrial PCs

For the demanding tasks in the fields of data acquisition and analysis, iba offers powerful industrial computers which meet the highest standards. The computers stand out by the high product quality coupled with state-of-the-art technology. They are designed for a long service life in a rough industrial environment.

At a glance

- Standard system with a hard disk; can be upgraded with up to 7 hard disks
- Operating system Microsoft Windows 10 IoT Enterprise
- Suited for process data acquisition and analysis
- System test and commissioning of industrial plants

Enhancement options

- RAID 1 system with 2 hard disks and redundant power supply unit
- RAID 6 system with 8 hard disks and redundant power supply unit

ibaRackline

ibaDeskline

Customized equipment

We offer the PCs in different versions:

- ibaRackline for mounting on 19" rack
- ibaDeskline as Tower PC

Both computer types have powerful processors and motherboards and run on the Microsoft Windows 10 IoT Enterprise Long-Term Servicing operating system.

Moreover, we have equipped the computers with high-performance hard disks in SAS technology. Hence they are extremely robust, highly available and suited reliably for the use on a 24/7 basis.

The computers offer 5 PCIe slots for iba cards and another 6 slots for iba extension modules in compact design. All connections, like USB interfaces or connections for external devices, can be reached easily. Cooling is provided by a highly efficient cooling system.

The PCs are configured according to your individual needs. The iba software will be installed according to your order. The computers only leave the production after having been carefully tested.

Technical highlights ibaRackline & ibaDeskline

- Processor Xeon E and industrial mainboard with LGA1151 socket and C246 chipset as well as 32 GB DDR4-RAM
- High performance hard disk in SAS technology
- Slots for up to 8 hard disks
- Power supply unit (single/redundant)
- On board graphics board
- 5 PCIe slots for measuring boards,
  1 PCIe x16 slot for SAS controller
  1 PCI slot
- 6 special slots for iba extension modules in compact design
- Intergrated optical DVD writer
- Ports for external devices (keyboard, mouse, network and others)
- USB interface for the dongle on the frontside (concealed installation)
- High efficiency cooling system
- Monitoring of temperature and voltage supply (optional) with LED status display and alarm outputs

Compact and mobile

Moreover, we offer the following solutions for mobile use or the use in confined space conditions:

- ibaNotebook
  Workstation power for mobile use
  Currently available notebooks are available on request.
- ibaIPC-Fanless
  Compact, fanless, maintenance free

For a description of the technical data, see page 7.

Accessories

We offer optional extension components for applications with increased demands in terms of system availability and storage capacity:

- Hard disk upgrade (SAS)
- SSD hard disk
- ibaOut-Temp/ibaOut-State:
  PC cards for monitoring temperature and voltage supply with LED status display and alarm outputs
- Additional fans
- Redundant power supply units
- GigE network card for connecting GigE cameras

ibaRackline and ibaDeskline are also available with SSD hard disk on request.

For ordering information, see page 12

Back view ibaRackline (standard system)

Front view ibaRackline without cover panels

Back view ibaDeskline

Interfaces on the housing top of ibaDeskline

Technical data ibaRackline

ibaRackline	Standard system	RAID 1 system	RAID 6 system
Power supply unit	400 W AC 90 V to 264 V DC 110 V to 374 V	1x redundant 500 W draw-out unit AC 100 V to 240 V DC 90-120 V / 198-242 V	
Assembly	19'' cabinet/19'' rack		
Installation height	180 mm (4 units of height)		
Current consumption	up to 8 A		
Power output	up to 400 W		
Dimensions (width x height x depth)	19.02 in x 7.01 in x 21.42 in (483 mm x 178 mm x 544 mm), installation depth 19.69 in (500 mm)		
Weight (incl. packaging and documentation)	approx. 16 kg	approx. 18 kg	approx. 20 kg
MTBF* (determined for ibaRackline 40.004308)	17500 h / 2 years		
Electronic components and connections			
Processor	Intel® Xeon E 2146G, 3.5 GHz		
Motherboard	Industrial mainboard with C246 chipset and LGA1151 socket		
Graphics on board	Integrated Intel UHD graphic		
Ethernet on board	2x 10 Mbps/100 Mbps/1000 Mbps		
HD audio on board	Realtek ALC892		
Main memory	32 GB DDR4		
PCI Express x16: SAS controller	Microsemi Adaptec SmartRAID 3102-8i		
PCI Express, free	5x for measuring boards		
PCI, free	1x		
M.2	1x M-Key (2242/2260/2280), PCI-ex4 1x A-Key (2230), supports WiFi module		
USB 2.0 USB 3.0 LAN Graphic	2x frontside (1x dongle, 1x frontside) 8x backside 2x backside 1x VGA, 1x HDMI, 1x DP		
Drive frame	2x 4x 2.5" SAS HDD		
Hard disk	1x 600 GB SAS HDD 7x optionally expandable	2x 600 GB SAS HDD 6x optionally expandable	8x 600 GB SAS HDD (approx. 3.6 TB net capacity)
DVD writer	internal S-ATA		

* MTBF (mean time between failure) according to Telcordia Issue 3 (SR332) Reliability Prediction Procedure of Electronic Equipment (Issue 3 Jan. 2011).

Technical data ibaDeskline

ibaDeskline	Standard system	RAID 1 system	RAID 6 system
Power supply unit	400 W AC 90 V to 264 V DC 110 V to 374 V	1 x redundant 500 W draw-out unit AC 100 V to 240 V DC 90-120 V / 198-242 V	
Assembly	Tower-PC		
Current consumption	up to 8 A		
Power output	up to 400 W		
Dimensions (width x height x depth)	8.07 in x 18.11 in x 19.29 in (205 mm x 460 mm x 490 mm)		
Weight (incl. packaging & documentation)	approx. 16 kg	approx. 19 kg	approx. 20 kg
Electronic components and connections			
Processor	Intel® Xeon E 2146G, 3.5 GHz		
Motherboard	Industrial mainboard with C246 chipset and LGA1151 socket		
Graphics on board	Integrated Intel UHD graphic		
Ethernet on board	2x 10 Mbps/100 Mbps/1000 Mbps		
HD audio on board	Realtek ALC892		
Main memory	32 GB DDR4		
PCI Express x16: SAS-Controller	Microsemi Adaptec SmartRAID 3102-8i		
PCI Express, free	5x for measuring boards		
PCI, free	1x		
M.2	1x M-Key (2242/2260/2280), PCI-ex4 1x A-Key (2230), supports WiFi module		
USB 2.0 USB 3.0 LAN Graphic	2x frontside (1x dongle, 1x frontside) 8x backside 2x backside 1x VGA, 1x HDMI, 1x DP		
Drive frame	2 x 4x 2.5" SAS HDD		
Hard disk	1x 600 GB SAS HDD 7x optionally expandable	2x 600 GB SAS HDD 6x optionally expandable	8x 600 GB SAS HDD (approx. 3.6 TB net capacity)
DVD writer		internal S-ATA	

Operating and environmental conditions valid for all ibaRackline and ibaDeskline types	
Operating temperature	32 °F to 131 °F (0 °C to +55 °C)
Storage temperature	-13 °F to 158 °F (-25 °C to +70 °C)
Transport temperature	-13 °F to 158 °F (-25 °C to +70 °C)
Cooling	Fan cooling
Humidity class (Operation, storage, transport)	F (5% - 95%), no condensation
Protection class	IP20

ibaIPC-Fanless

At a glance

- Fanless embedded system with Intel® Core™ i7 processor
- Meets highest requirements for computing intensive and graphic oriented applications
- Interfaces 4x USB 3.0, 6x USB 2.0, 5x RS232, 1x RS232/422/485
- 2x RJ45 Gigabit Ethernet
- 1x VGA, 1x DVI-D and 2x Display Ports
- 2x PCIe slots

ibaIPC-Fanless	
Description	Fanless PC with PCIe slots
Order number	42.824124
Power supply and operating system	
Power supply	12 V to 24 V DC Power supply unit for 230 V included in delivery
Operating system	Microsoft Windows 10 IoT Enterprise
Electronic components and interfaces	
Processor	i7-CPU, 2.9 GHz
Ethernet on board	2x Gigabit Ethernet
Working memory	2x 4 GB DDR4-RAM
PCI Express slots	2x PCIe
Interfaces	6x USB 2.0 4x USB 3.0 2x Display Port 1x VGA 1x DVI-D 6x COM
Hard disk	256 GB SSD
Operating and environmental conditions	
Operating temperature	14 °F to 158 °F (-10 °C to +70 °C), with air flow
Storage temperature	-4 °F to 176 °F (-20 °C to +80 °C)
Relative humidity	5% to 90% at 113 °F (45 °C)
Dimensions and weight	
Dimensions (width x depth x height)	8.27 in x 10.43 in x 5.08 in (210 mm x 265 mm x 129 mm)
Weight	Approx. 6 kg

ibaRackline-PC CAM

At a glance

- Frame-accurate video information with ibaCapture
- IP and GigE Vision cameras for fast data processing
- High performance und storage capacity by RAID 5 technology and five 4 TB hard disks

Everything at a glance

ibaRackline-PC CAM has been developed for video and image recording purposes with our solution ibaCapture. The PC is ideally suited for video recordings from IP and GigE Vision cameras and meets the high demands in the field of fast data processing. RAID 5 technology and five 4 TB hard disks guarantee high performance and high memory capacity. For the use of GigE vision cameras, the PC can be specifically optimized with network and graphics cards.

The system offers a redundant power supply unit and is therefore protected against failure when operating in different circuits. Furthermore, the operating system Windows 10 IoT in the Long-Term Servicing version is used which offers a longer support period by Microsoft.

Estimate the storage capacity

The required storage capacity varies due to many factors including resolution, frame rate and how much activity is present in the image.

The figures (in GB) in the table below therefore only represent an estimate of the required storage capacity. The estimate is based on a bit rate of 2 Mbit/s for continuous recording. The actual bit rate for every camera will only be visible after recording has been started.

	1 day	7 days	31 days
1 camera	21 GB	144 GB	639 GB
4 cameras	82 GB	577 GB	2554 GB
16 cameras	330 GB	2307 GB	10217 GB

Software ibaCapture

Record live images time-synchronously

With ibaCapture live images from video cameras and HMI systems can be captured and recorded synchronously to measurement data. Unlike conventional video systems, ibaCapture not only records videos, but links recorded measurement data time-synchronously with the visual information.

A frame-accurate display

The video information can be viewed frame by frame with the exact matching to process signals. As a result, relationships which are not evident at first sight can be understood more easily. Errors can be detected more quickly and root causes can be better identified.

Technical data

Supply, dimensions and weight	
Power supply unit	1 x redundant 500 W draw-out unit; AC 100 V to 240 V
Assembly	19'' cabinet/19'' rack
Installation height	180 mm (4 units of height)
Current consumption	up to 8 A
Power output	up to 500 W
Dimensions (width x height x depth)	19.02 in x 7.01 in x 21.42 in (483 mm x 178 mm x 544 mm), installation depth 19.69 in (500 mm)
Weight (incl. packaging & documentation)	approx. 22 kg
Electronic components and connections	
Processor	Intel® Xeon E 2146G, 3.5 GHz
Motherboard	Industrial mainboard with C246 chipset and LGA1151 socket
Graphics on board	Integrated Intel UHD graphic
Ethernet on board	2x 10 Mbps/100 Mbps/1000 Mbps
HD Audio on board	Realtek ALC892
Working memory	32 GB DDR4
PCI Express x16: SAS-Controller	Microsemi Adaptec SmartRAID 3102-8i
PCI Express, free	6x for measuring boards
PCI, free	1x
M.2	1x M-Key (2242/2260/2280), PCI-ex4 1x A-Key (2230), supports WiFi module
USB 2.0 USB 3.0 LAN Graphic	2x frontside (1x dongle, 1x frontside) 8x backside 2x backside 1x VGA, 1x HDMI, 1x DP
Drive frame	5x 3,5", SAS
Hard disk	5x 4TB SAS HDD (approx. 16 TB net capacity)
DVD drive	external DVD writer (USB connection, included in delivery)

ibaRackline-PC HD

At a glance

- Efficient process analysis with ibaHD-Server V2
- RAID 5 technology and five 4 TB hard disks for long-term data acquisition of HD-data
- Additional NVMe-SSD as intermediate buffer optimizes access times

Processing large amounts of data in the shortest time possible

ibaRackline-PC HD has been specially designed for the application ibaHD-Server V2. The PC offers RAID 5 technology, five 4 TB hard disks and is therefore suitable for long-term data acquisition of measurement data. The additional NVMe-SSD is used as an intermediate buffer and optimizes the measurement data in order to guarantee short access times even for large amounts of data. The SSD technology also enables fast processing and storing for very large amounts of measurement data in a short time.

The system offers a redundant power supply unit and is therefore protected against failure when operating in different circuits. Furthermore, the operating system Windows 10 IoT in the Long-Term Servicing version is used which offers a longer support period by Microsoft.

Estimate the storage capacity

Number of signals	Resolution	Occupied storage*		
		Recording time 24 h	Recording time 7 days	Recording time 30 days
100 analog	100 ms	0.5 GB	3 GB	14 GB
100 analog	10 ms	4.5 GB	31 GB	135 GB
100 analog	1 ms	45 GB	310 GB	1350 GB
100 digital	100 ms	10 MB	50 MB	200 MB
100 digital	10 ms	30 MB	160 MB	660 MB
100 digital	1 ms	100 MB	650 MB	2650 MB
10 events	1 event per second	100 MB (864000 registered events)	780 MB	3 GB

Software HD-Server

Store historical data on a long-term base

The application ibaHD-Server (Historical Data Server) allows that measured data are recorded continuously over a long period of time and continuously displaying it afterwards.

Beside recording signals, events can be recorded and displayed in the event table. The event messages are automatically generated by a trigger signal and can be used for storing the event of product changes or events to analyze failures. These events can easily be filtered in the event table and serve as a base for an effective navigation towards the next entry.

*The values shown here for the occupied storage capacity are determined synthetically. For the estimation, test signals were used which can only be compressed insignificantly with the compression algorithms in the ibaHD-Server. In real operation, the compression algorithms are very effective and far less storage capacity is required for analog or digital signals.

Technical data

Supply, dimensions and weight	
Power supply unit	1 x redundant 500 W draw-out unit; AC 100 V to 240 V
Assembly	19'' cabinet/19'' rack
Installation height	180 mm (4 units of height)
Current consumption	up to 8 A
Power output	up to 500 W
Dimensions (width x height x depth)	19.02 in x 7.01 in x 21.42 in (483 mm x 178 mm x 544 mm), installation depth 19.69 in (500 mm)
Weight (incl. packaging & documentation)	approx. 22 kg
Electronic components and connections	
Processor	Intel® Xeon E 2146G, 3.5 GHz
Motherboard	Industrial mainboard with C246 chipset and LGA1151 socket
Graphics on board	Integrated Intel UHD graphic
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HD Audio on board	Realtek ALC892
Working memory	32 GB DDR4
PCI Express x16: SAS-Controller	Microsemi Adaptec SmartRAID 3102-8i
PCI Express, free	5x for measuring boards
PCI, free	1x
M.2	1x M-Key (2242/2260/2280), PCI-ex4 1x A-Key (2230), supports WiFi module
USB 2.0 USB 3.0 LAN Graphic	2x frontside (1x dongle, 1x frontside) 8x backside 2x backside 1x VGA, 1x HDMI, 1x DP
Drive frame	5x 3,5'', SAS
Hard disk	5x 4TB SAS HDD (approx. 16 TB net capacity), 1x 256 GB NVMe SSD (Intermediate Storage)
DVD drive	external DVD writer (USB connection, included in delivery)

Order information

PC systems	Order number
ibaRackline SAS, XEON E, Win10	40.004308
iibaRackline SAS, XEON E, Win10, SSD	40.004328
ibaDeskline SAS, XEON E, Win10	40.002006
ibaDeskline SAS, XEON E, Win10, SSD	40.002016
ibaRackline-PC CAM, XEON E, Win 10	40.005021
ibaRackline-PC HD, XEON E, Win10	40.005031
Enhancement options	
Upgrade kit to RAID 1 system (1 hard disk, 1 redundancy power supply)	43.000370
Upgrade kit to RAID 6 system (7 hard disks, 1 redundancy power supply)	43.000371
Upgrade kit to RAID 1 system, for SSD-PC	43.000374
HD 600 GB to 1200 GB Upgrade SAS	43.000420
HD 600 GB to 1800 GB Upgrade SAS	43.000421
HD 600 GB to 2400 GB Upgrade SAS	43.000422
SSD 800GB to 1600GB Upgrade SAS SSD	43.000427
Redundancy Power Supply (100 V/240 V AC, 110 VDC & 220 VDC)	43.000560
Upgrade ibaRackline-PC CAM with NVME-SSD for OS-Installation	43.001002
Upgrade HD 5X4TB to 5X8TB SAS, hard disk extension for ibaRackline-PC CAM or HD	43.001020
Upgrade HD 5X4TB to 5X12TB SAS, hard disk extension for ibaRackline-PC CAM or HD	43.001021
Upgrade ibaRackline-PC HD/CAM with graphics card (NVIDIA Quadro P2000)	43.001001
Accessories	
HD 600 GB SAS	43.000326
HD 1200 GB SAS	43.000329
HD 1800 GB SAS	43.000328
HD 2400 GB SAS	43.000330
Backup HD 2 TB SAS	43.000346
ibaOut-Temp (PC slot card, can be optionally retrofitted, for monitoring temperature and power supply with LED status indication, 2 separate alarm outputs)	11.110001
ibaOut-State (PC slot card, can be optionally retrofitted, for monitoring temperature and power supply with LED status indication, 6-pin output)	11.110002
Intel PCIe 10/100/1000 Mbit Network Card, Single-Port	43.000525
Intel GigE-Network Card PCI Express (Dual-port Gigabit Ethernet, I350 T2)	19.116012
Intel GigE-Network Card PCI Express (Quad-port Gigabit Ethernet, I350 T4 V2 SVR)	19.116011

FO connections - safe & reliable

The cards of the ibaFOB-D family are communication cards for ibaNet fiber optical links. The ibaFOB-D cards can be used for connecting a computer like e.g. iba industrial computers with iba peripherals like e.g. ibaPADU compact measurement modules, ibaLink system couplings and iba bus modules.

At a glance

- PCI express cards for connecting iba field devices and system couplings
- Fast data transfer between card and computer's memory by DMA technology (CPU load relieving)
- Support for all ibaNet communication protocols (2Mbit, 3Mbit, 5Mbit, 32Mbit and 32Mbit Flex)
- Up to 4060 Byte user data per FO link
- ibaFOB-io-USB for connection to USB ports
- "Plug and Play" installation

The ibaFOB-D family

ibaFOB-D cards and ibaFOB-io-USB adapters are available in different versions:

- ibaFOB-D cards: PCI express cards with different numbers of FO connections
- ibaFOB-io-USB adapter for connecting to USB ports

Communication protocols

All current and former ibaNet communication protocols are supported by ibaFOB-D cards. The fiber optical input/output channels of one card can detect and process all valid ibaNet protocols independently from each other: 3Mbit, 5Mbit, 32Mbit and 32Mbit Flex.

Using the ibaNet protocol 32Mbit Flex, it is possible to transmit measurement and configuration data bidirectionally via FO connections with 32 Mbit/s. In contrast to other protocols, a LAN connection for transmitting configuration data is no longer required. The size of the data telegrams is flexible and can be up to 4060 Byte per FO connection.

Ring topology with 32Mbit Flex

32Mbit Flex supports up to 15 "flex capable" devices connected in a ring topology. The size of the data telegrams is flexible, as long as the total data amount of 4060 Byte will not be exceeded.

The maximum sampling rate depends on the acquisition devices and can be selected flexibly from 1 kHz to 100 kHz. The following basically applies: The less data are transferred, the higher is the possible sampling rate.

ibaPDA offers a useful function when setting sampling rate and data amount. For a device connected to the fiber optics, you can determine in the I/O manager, the maximum data amount that can be transferred depending on the configured sampling rate. Thus, you can e.g. estimate the maximum possible number of participants in a ring topology or the amount of data needed for the I/O modules, that are to be used.

Fast data processing with reduced CPU load

Due to the DMA technology (DMA = Direct Memory Access) measured data are written directly into the computer's memory which is used by the software application for reading the data. This is a significant relief for the CPU load while data traffic is boosted.

Extension modules for output signals

With the extension module ibaFOB-4o-D, 4 outputs are available that can be used for 2 different functions:

- Mirroring the inputs: The optical signals of the input channels are mirrored to the output channels without delay.
- Application outputs in duplex operation: Thus, with ibaPDA the alarm outputs can be used. Hence, in ibaLogic, output resources are available.

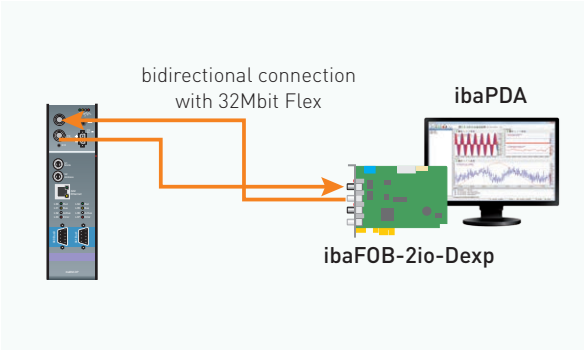
For output signals, the ibaFOB-4i-Dexp and ibaFOB-2i-Dexp cards can be extended with up to 2 additional ibaFOB-4o-D modules. You can only connect one additional module for mirroring the inputs and outputs to the ibaFOB-io-Dexp and ibaFOB-2io-Dexp cards.

FO connection to notebooks

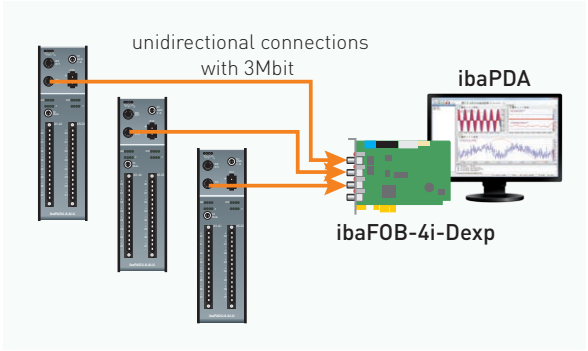
The ibaFOB-io-USB adapter converts the iba fiber optic connection to a USB 2.0 or USB 3.x interface for connecting notebooks to ibaNet fiber optics. The USB adapter offers an FO input and an FO output. Performance and function are the same as for an ibaFOB-io-D card. Only one ibaFOB-io-USB adapter can be used per notebook or PC.

ibaFOB-io-USB-Adapter

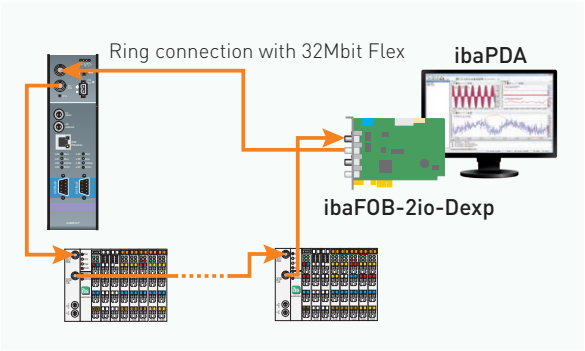
Configuration examples



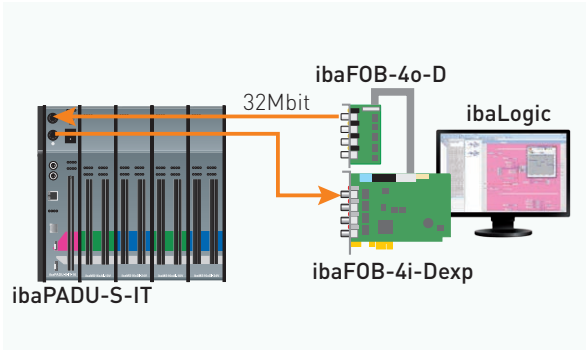
Connecting a bus monitor via a bidirectional FO connection with 32Mbit Flex protocol



Connecting several ibaPADU devices via unidirectional FO connections with 3Mbit protocol



Ring topology of multiple "Flex devices" with 32Mbit Flex protocol



Process control with ibaLogic and ibaPADU-S-IT (32 Mbit)

Technical data

	Order number	FO connectors
ibaFOB-2i-Dexp	11.118030	2 x input
ibaFOB-io-Dexp	11.118020	1 x input, 1 x output
ibaFOB-2io-Dexp	11.118010	2 x input, 2 x output
ibaFOB-4i-Dexp	11.118000	4 x input
Mounting, supply, indicators		
Mounting	PCIe slot (x1, x4, x8, x16)	
Power supply	12 V over PCIe 1.0-x1 compatible slot	
Bus clock	2.5 Gbit/s (PCIe 1.0)	
Power consumption	Typ. 4.2 W	
Indicators	4 LEDs per FO connector (state of communication) 7-segment display	
Assembly dimension (depth x height)	5.2 in x 3.98 in (132 mm x 101 mm)	
Weight (incl. packaging and documentation)	Approx. 200 g	
Extension modules		
ibaFOB-4o-D	Extension module for ibaFOB-D for mirroring of FO inputs or for active FO outputs	
	Order number	**FO connectors**
ibaFOB-4o-D rackline-slot (short design for ibaRackline)	11.116200	4 x output
ibaFOB-4o-D-PCI (long design for PCI slot)	11.116201	4 x output
Dimensions and weight		
Assembly dimension (depth x height)	1.46 in x 2.95 in (37 mm x 75 mm)	
Weight (incl. packaging and documentation)	Approx. 150 g	

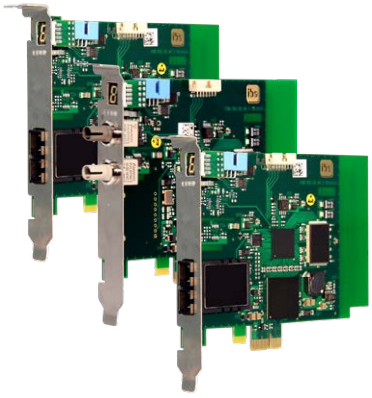
Short description	
Name	**ibaFOB-io-USB**
Order number	11.117010
Description	USB adapter with 1 FO input and 1 FO output
Interface, power supply and indicators	
USB	1x USB 2.0 socket type B
Power supply	Over USB port
Power consumption	Max. 1.25 W
Indicators	4 LEDs (adapter status)
Cooling	Passive
Dimensions and weight	
Dimensions (depth x width x height)	3.9 in x 2.17 in x 0.94 in (99 mm x 55 mm x 24 mm)
Weight (incl. packaging and documentation)	Approx. 180 g

Technical data, valid for all ibaFOB-D cards and ibaFOB-io-USB adapter

FO connectors	
FO cable and connector	62,5/125 µm with ST connector
Distance between 2 devices	Up to 2000 m, without repeater
ibaNet protocols	2Mbit, 3Mbit, 5Mbit, 32Mbit, 32Mbit Flex
Operating and environmental conditions	
Cooling	Passive
Operating temperature	32 °F to 122 °F (0 °C to 50 °C)
Storage temperature	-13 °F to 158 °F (-25 °C to 70 °C)
Transport temperature	-13 °F to 158 °F (-25 °C to 70 °C)

FO connection to Siemens systems

The ibaFOB-TDCexp, ibaFOB-SDexp and ibaFOB-PlusControl cards couple the iba process data acquisition system ibaPDA with the SIEMENS control systems SIMATIC TDC or SIMADYN-D. With these cards, you can read the process variables directly from the control system.



At a glance

- PCI Express cards for the connection to Siemens control systems:
  - ibaFOB-TDCexp for SIMATIC TDC systems (GDM)
  - ibaFOB-SDexp for SIMADYN D systems (CS12/13/14) and SIMATIC TDC systems (CP53)
  - ibaFOB-PlusControl for PLUSCONTROL systems
- Fast data transmission between card and memory due to DMA technology (load reduction on CPU)
- Bidirectional fiber optic connection for fast data transmission
- Enhanced diagnostics of the connected system
- „Plug and Play" installation

Plug & Play Installation

For the coupling with the control systems, all cards provide a bidirectional FO connection. The cards can be used right after they have been mounted (plug & play), all component parameters are controlled by software. Enhanced system diagnostics for the cards and the communication with the control systems are available in ibaPDA.

The cards offer a fast PCI express interface and integrated DMA technology. Thus, the CPU of the PC is relieved significantly and the data traffic is boosted.

Connection to PLUSCONTROL systems

For coupling Siemens PLUSCONTROL systems to the ibaPDA Process Data Acquisition system, we offer the ibaFOB-PlusControl card. This card allows you to transmit up to 400 analog or digital signals. The parameters are set completely using the software. You can plug up to 4 cards in one PC.

Supported operational modes with ibaFOB-TDCexp and ibaFOB-SDexp

The cards ibaFOB-TDCexp and ibaFOB-SDexp support 2 operational modes.

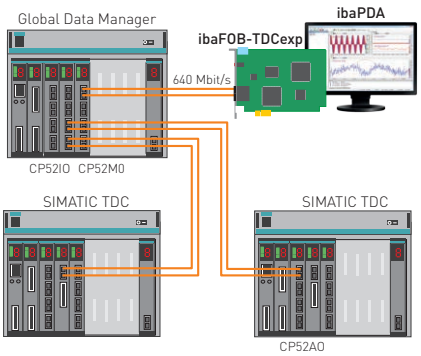
- ibaPDA Lite

The values to be measured are programmed in the control systems. For one card, a maximum of 16 telegrams is supported with 32 analog and 32 digital signals each. ibaPDA supports a maximum of 4 cards on one PC, additionally one Technostring signal.

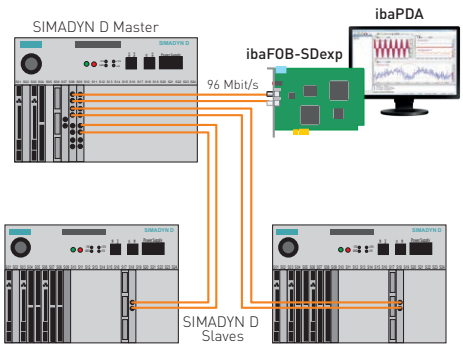
- ibaPDA Request*

The values to be measured are configured in ibaPDA by selecting the variables from the respective engineering software. The variables can be selected in an address book, without having to change the configuration. Up to 4 cards with up to 50 processor connections as well as Technostring signal are supported. The maximum number of signals depends on the ibaPDA license.

*Additional license required



Example for SIMATIC TDC connection



Example for SIMADYN D connection

Technical data

Name	ibaFOB-TDCexp	ibaFOB-SDexp	ibaFOB-PlusControl
Description	Interface card for SIMATIC TDC	Interface card for SIMADYN D	Interface card for PLUSCONTROL systems
Order number	11.112601	11.112701	11.112602
Interfaces			
TDC/SD connection	1 duplex	1 duplex	1 duplex
FO connection	SC connector	ST connector	SC connector
FO cable	62.5/125 µm (recommended)	62.5/125 µm (recommended)	62.5/125 µm (recommended)
Distance between 2 devices	Up to 400 m, without repeater	Up to 400 m, without repeater	Up to 400 m, without repeater
Data transmission rate	640 Mbit/s	96 Mbit/s	1 Gbit/s
Fastest sample time	1 ms	1 ms	10 µs
Supply and indicators			
Power supply	via PCIe 1.0-x1 compatible slot		
Current consumption	Up to 1000 mA		
Bus cycle	2.5 Gbit/s (PCIe 1.0)		
Indicators	4 LEDs for communication status 7-segment display		
Operating and environmental conditions			
Cooling	Passive		
Mounting	PCIe slot (x1, x4, x8, x16)		
Operating temperature	32 °F to 122 °F (0 °C to 50 °C)		
Storage temperature	-13 °F to 158 °F (-25 °C to 70 °C)		
Transport temperature	-13 °F to 158 °F (-25 °C to 70 °C)		
Dimensions (depth x height)	6.69 in x 3.32 in (170 mm x 97 mm)		
Weight (incl. packaging and documentation)	Approx. 200 g		

Software licenses required for using the Request function:

Order no.	Name	Description
31.001320	ibaPDA-Request-SD	ibaPDA request for data: SIMADYN D system (access to variables within a running SD application without reprogramming the PLC. ibaPDA basic license is required)
31.001330	ibaPDA-Request-TDC	ibaPDA request for data: TDC system (free request to variables of SIMATIC TDC via service function blocks. ibaPDA basic license is required)

Concentrating, distributing and multiplying optical signals

With the devices from the FO infrastructure product range, the user can concentrate and distribute FO connections with ibaNet protocols of different speed categories (3Mbit up to 32Mbit).

ibaBM-COL-8i-o
ibaBM-DIS-i-8o
ibaBM-FOX-i-3o-D

At a glance

ibaBM-COL-8i-o

- Data concentrator concentrates 8 ibaNet lines into one line
- The inputs support 2Mbit and 3Mbit (sampling time 1 ms), the output supports 32 Mbit

ibaBM-DIS-i-8o

- Distributes one ibaNet line to 8 ibaNet lines
- Mirroring mode: 1 input is mirrored to 8 + 1 outputs (2Mbit, 3Mbit, 5Mbit and 32Mbit)
- Distribution mode: Distributes 1 input with 32Mbit to 8 outputs with 3Mbit, in addition the input signal is mirrored to an output

ibaBM-FOX-i-3o-D

- Distributes one ibaNet line to 3 ibaNet lines
- Supports 2Mbit, 3Mbit, 5Mbit and 32Mbit

Optical data concentrator ibaBM-COL-8i-o

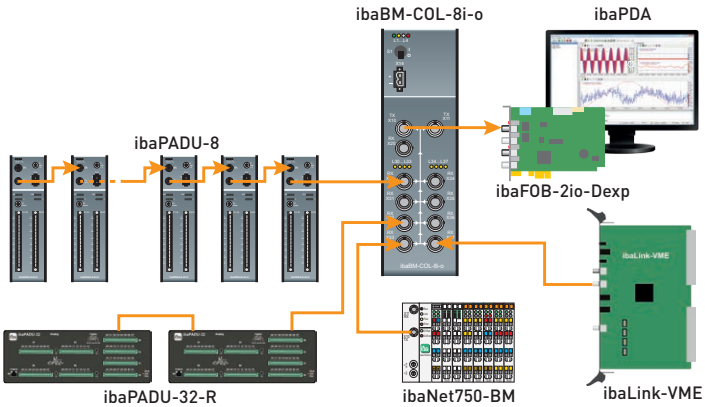
The device ibaBM-COL-8i-o concentrates the data streams of up to 8 ibaNet fiber optic inputs into one (fiber optic) output. On the input side, it is possible to connect all ibaNet devices that support the ibaNet protocol 3Mbit.

The 8 telegrams on the input side with 64 analog and 64 digital values are combined in the ibaBM-COL-8i-o device into one telegram with 512 analog and 512 digital values and transmitted with 32Mbit to the fiber optic output. Therefore, an ibaFOB-D card must be inserted in the receiving ibaPDA-PC or ibaLogic-PC.

8-fold data volume over one fiber optic cable

The use of ibaBM-COL-8i-o allows you to transmit the 8-fold data volume over a single fiber optic cable. This way, it is possible to achieve a significant reduction of the number of ibaFOB input cards in the existing systems that have a large number of ibaNet peripheral devices.

The free slots resulting from this can be used for new additional measuring cards.



Up to 8 3Mbit connections can be transmitted via one FO connection to the ibaPDA PC.

Optical data distribution system ibaBM-DIS-i-8o

ibaBM-DIS-i-8o distributes the signals of one ibaNet line to 8 ibaNet lines. The device offers 2 operating modes with different properties:

Mirroring mode

In the mirroring mode, 1 incoming fiber optic signal is mirrored to 9 outputs. The input signal is output with a minimum delay and without any change.

You can use the ibaNet protocols 2Mbit, 3Mbit, 5Mbit and 32 Mbit as input signals.

The device automatically identifies the type of the incoming input signal.

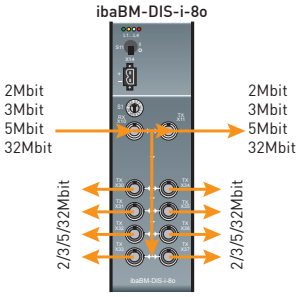
Moreover, an incoming signal can be distributed as synchronization signal. Thus several iba transducers can be sampled synchronously.

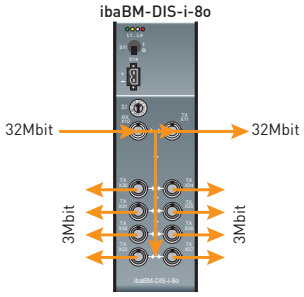
Distribution mode

In the distribution mode, one fiber optic signal with 32Mbit (respectively 512 analog and digital signals) is distributed to 8 fiber optic signals with 3Mbit (respectively 64 analog and digital signals). In addition, there is a fiber optic output available that mirrors the fiber optic input. If necessary, it can be used to connect several devices in series. This mode functions in the opposite direction compared to the ibaBM-COL-8i-o device.

When combining both devices, the ibaBM-DIS-i-8o and ibaBM-COL-8i-o, the cabling effort can be reduced significantly, especially for covering long distances.

In mirroring mode, the incoming signal is mirrored to the outputs without any changes.





In distribution mode, the incoming 32Mbit signal is distributed as 3Mbit signal to the outputs.

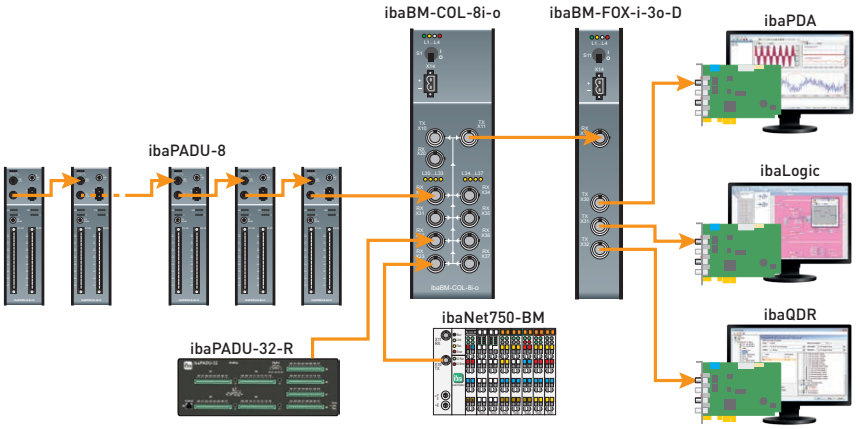
Optical signal multiplier ibaBM-FOX-i-3o-D

With the ibaBM-FOX-i-3o-D device, the user can distribute, multiply and process optical signals within the iba device family. The input signal is transferred to 3 outputs without any losses and without any delay.

The measurement devices that are connected to the input, can supply multiple systems with measurement data, e.g. when installing redundant acquisition systems in different places using the same metrological infrastructure.

The device has a repeater for signal regeneration. Distances of more than 2 km can be covered.

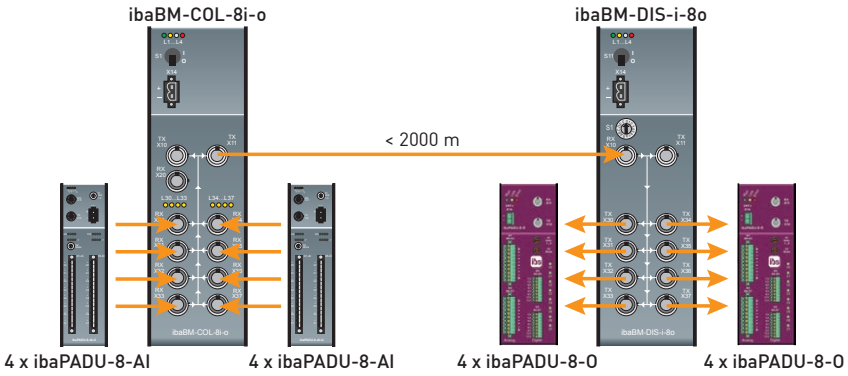
On the input side, the ibaNet protocols 2Mbit, 3Mbit, 5Mbit (only unidirectional) and 32Mbit can be used.



With ibaBM-FOX-i-3o-D, multiple data acquisition systems can use the same infrastructure in different locations.

Technical data

Name	ibaBM-COL-8i-o
Description	Optical data concentrator
Order number	13.114000
FO connections	
Number	8 FO inputs + 1 (optional for future extensions) 2 FO outputs for identical output to 2 receiving devices
ibaNet protocols	FO inputs: 2Mbit, 3Mbit FO outputs: 32Mbit
FO cable	62.5/125 µm (recommended)
FO connector	ST connector
FO cable length	Up to 2000 m, without repeater
Supply and indicators	
Power supply	24 V DC, ±10 % unstabilized
Power consumption	<3 W
Indicators	4 LEDs (operating state) 8 LEDs, 1 for the state of each input
Operating and environmental conditions	
Mounting	DIN rail mounting, vertical
Cooling	Passive
Operating temperature	32° F to 122° F (0 °C to 50 °C)
Storage temperature	-13° F to 158° F (-25 °C to 70 °C)
Transport temperature	-13° F to 158° F (-25 °C to 70 °C)
Humidity class (DIN 40040) (Operation, storage, transport)	F (5% - 95%), no condensation
Protection class	IP20
Certification	CE, EMC (EN 61326-1:2006, class A), FCC class B
Dimensions (width x height x depth)	2.28 in x 7.64 in x 6.10 in (58 mm x 194 mm x 155 mm), incl. mounting rail clip
Weight (incl. packaging and documentation)	Approx. 1.05 kg



When combining data concentrator and data distributor, the wiring effort can be reduced significantly, especially in large plants.

Technical data

Name	ibaBM-DIS-i-8o	ibaBM-FOX-i-3o-D
Description	Optical data distribution system	Optical signal multiplier
Order number	13.114100	13.113501
FO connections		
Number	1 FO input 8 +1 FO outputs	1 FO input 3 FO outputs
ibaNet protocols	Mirroring mode: 1 input with 2Mbit, 3Mbit, 5Mbit, 32Mbit input mirrored on 8 + 1 outputs Distribution mode: 1 input (32Mbit, 1 ms cycle time) with 512 digital and 512 analog signals, distributed on 8 outputs (3Mbit, 1 ms cycle time) with 64 digital and 64 analog signals each	2Mbit, 3Mbit, 5Mbit (only unidirectional), 32Mbit
FO cable	62.5/125 µm (recommended)	62.5/125 µm (recommended)
FO connector	ST connector	ST connector
FO cable length	Up to 2000 m, without repeater	Up to 2000 m, without repeater
Supply and indicators		
Power supply	24 V DC, ±10 % unstabilized	24 V DC, ±10 % unstabilized
Power consumption	< 5 W	
Current consumption		Up to 200 mA
Indicators	4 LEDs for mode of operation	4 LEDs for mode of operation
Operating elements	Rotary switch for selecting the mode of operation (Copy mode, distribution mode, distribution mode "Integer", distribution mode "Real")	-
Operating and environmental conditions		
Mounting	DIN rail mounting, vertical	DIN rail mounting, vertical
Cooling	Passive	Passive
Operating temperature	32° F to 122° F (0 °C to 50 °C)	32° F to 122° F (0 °C to 50 °C)
Storage temperature	-13° F to 158° F (-25 °C to 70 °C)	-13° F to 158° F (-25 °C to 70 °C)
Transport temperature	-13° F to 158° F (-25 °C to 70 °C)	-13° F to 158° F (-25 °C to 70 °C)
Humidity class (DIN 40040) (Operation, storage, transport)	F (5% - 95%), no condensation	F (5% - 95%), no condensation
Protection class	IP20	IP20
Certification	EMC (EN 61326-1:2006, class A)	EMC: EN 61326-1
Mechanical stability	DIN IEC 68-2-6 (with correct assembly)	
Dimensions (w x h x d)	2.28 in x 7.64 in x 6.1 in (58 mm x 194 mm x 155 mm), with DIN-rail clip	1.30 in x 7.44 in x 5.94 in (33 mm x 189 mm x 151 mm), with DIN-rail clip
Weight (incl. packaging and documentation)	1.05 kg	0.75 kg

Time synchronization for distributed systems

With the time synchronization module ibaClock, several distributed iba systems can be synchronized precisely. ibaClock provides a precise time basis for all connected systems and enables an exactly synchronized data acquisition.

ibaClock

GPS smart antenna

Highest precision

The timebase for ibaPDA systems is the clock of the respective ibaPDA computer. In case decentrally acquired data have to be correlated or a measurement has to be done in real time, it is necessary in such distributed systems to synchronize all computers or provide the exact GPS time to a computer.

ibaClock determines a uniform, exact time basis for all connected systems and enables an exact time synchronous recording of the data with a precision of better than 150 ns. The measurement systems are connected to ibaClock using fiber optic cables.

ibaClock can use different time sources:

- GPS time signal
- Timecode IRIG-B
- Ethernet-based PTP (Precision Time Protocol) according to IEEE 1588 standard

For synchronizing the time of non-iba systems, ibaClock supports several time server models:

- Fiber optics for ibaPDA systems
- IEEE 1588 (PTP)
- NTP
- DCF77*

Configuration in ibaPDA or Web Interface

ibaClock can be configured using ibaPDA or a web interface. The user can see the quality of the GPS signal and the device status on the LED display of the device or in the web interface and ibaPDA.

Antenna

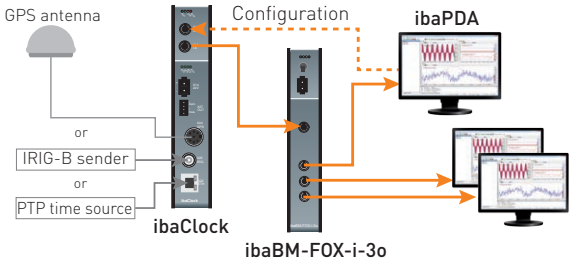
The device supports a special GPS smart antenna, that can be mounted with a cable length of up to 400 m from the device. The antenna with a suitable cable and an optional mounting bracket can be purchased from iba.

Fields of application

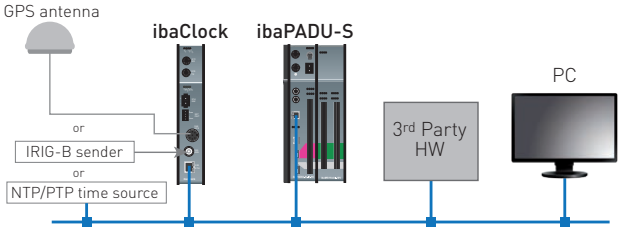
- Correlation of decentrally acquired data
- Linking processes in decentralized structures
- Energy supply (phasor measurement)

At a glance

- High precision time server
- Time sources: GPS signal, IRIG-B or IEEE 1588
- Fiber optic connection to ibaPDA systems via ibaFOB-D cards
- Synchronization of ibaPDA systems with sample accuracy
- Can be used as IEEE 1588 time server or as NTP time server in a network
- Configuration and diagnostics via ibaPDA or web interface
- Maintenance-free
- Rugged design, easy mounting



Synchronization of several ibaPDA systems via fiber optics



ibaClock as time server via network

*with future firmware versions

Technical data

Name	ibaClock
Description	Universal time server
Order number	10.160000
Time sources	
GPS	Supported GPS antenna: Smart antenna Trimble Acutime GG or Acutime 360 Power supply via ibaClock Antenna precision: 15 ns (static) Cable length: up to 400 m Control accuracy of internal PLL: (typ.) < ±150 ns of the absolute GPS-PPS signal Time stability in case of GPS signal loss: < 0.15 ppm after at least 10 minutes GPS reception
IRIG-B	Plug connector: BNC, 50 Ω Supported telegrams: B004, B124, B005, B125, B006, B126, B007, B127 IEEE1344 / IEEE C37.118 AFNOR NF S87-500
IEEE 1588	PTP (Precision Time Protocol), hardware based
Time server function	
ibaNet	Time synchronization of ibaPDA systems via fiber optics
IEEE 1588	PTP (Precision Time Protocol), hardware based
NTP Time & Daytime	Synchronization over network via NTP According to RFC 868 and RFC 867
DCF77*	Optionally: output of DCF77 time code via semiconductor relay output
Alarm	
Alarm	Semiconductor relay output , switching current up to 200 mA, open in de-energized state
Interfaces/features	
Fiber optics	Time synchronization, configuration and diagnostics
Ethernet	RJ45 socket (Ethernet 10/100 Mbit/s) for configuration and diagnostics
Simulation	Time server function without active time source (e. g. commissioning, etc.)
Freewheel accuracy	High-precision with PLL-controlled internal quartz basis
RTC	Buffered RTC (Real Time Clock) for approx. 10 days
Supply and indicators	
Power supply	24 V DC (±10 %), unstabilized
Power consumption	Up to 2 W (without antenna), approx. 2.5 W (with antenna)
Indicators	4 LEDs for operating status of the device 4 LEDs for status of the time sources
Operating and environmental conditions	
Cooling	Passive
Operating temperature	32 °F to 122 °F (0 °C to 50 °C)
Storage/transport temperature	-13 °F to 149 °F (-25 °C to 65°C)
Humidity class (DIN 40040) (Operation, storage, transport)	F (5% - 95%), no condensation
Protection class	IP20
Certification	EMC: EN 55011:2009+A1:2010, EN 61326-1:2013, FCC part 15 class A
Mounting	DIN rail, vertical
Dimensions and weight	
Dimensions (w x h x d)	1.5 in x 7.4 in x 5.7 in (37 mm x 188 mm x 145 mm), incl. DIN rail clip
Weight (incl. packaging and documentation)	Approx. 1.1 kg

*with future firmware versions

Safe and fast connections over long distances

By means of light, fiber optic cables transfer data incredibly fast and without any disturbances. Due to the low cable losses in optical cables, long distances can be covered.

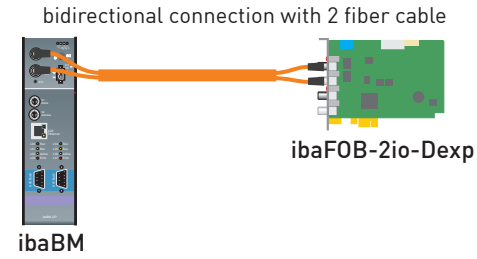
FO patch cable duplex

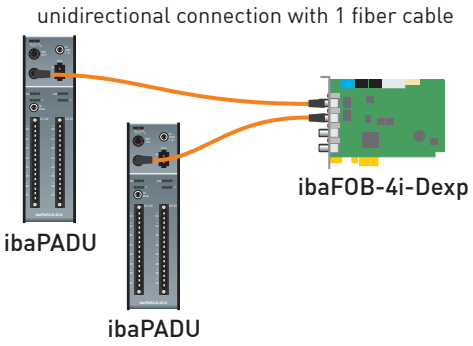
FO patch cable simplex

Multimode fibres are used in all FO patch cables. There are two versions of FO cables available:

- Simplex with one fiber for unidirectional connections
- Duplex with 2 fibers for bidirectional connections

The plugs are designed for both versions as ST plug (62.5/125 µm)





Order no.	Name	Description
50.101002	FO/p1-002 Patch Cable 0,2m	FO patch cable 0.2 m, 1 fiber (simplex), ST jack
50.101020	FO/p1-2 Patch Cable 2m	FO patch cable 2 m, 1 fiber (simplex), ST jack
50.101050	FO/p1-5 Patch Cable 5m	FO patch cable 5 m, 1 fiber (simplex), ST jack
50.101100	FO/p1-10 Patch Cable 10m	FO patch cable 10 m, 1 fiber (simplex), ST jack
50.101200	FO/p1-20 Patch Cable 20m	FO patch cable 20 m, 1 fiber (simplex), ST jack
50.101300	FO/p1-30 Patch Cable 30m	FO patch cable 30 m, 1 fiber (simplex), ST jack
50.101500	FO/p1-50 Patch Cable 50m	FO patch cable 50 m, 1 fiber (simplex), ST jack
50.102020	FO/p2-2 Patch Cable 2m	FO patch cable 2 m, 2 fibers (duplex), ST jack
50.102050	FO/p2-5 Patch Cable 5m	FO patch cable 5 m, 2 fibers (duplex), ST jack
50.102100	FO/p2-10 Patch Cable 10m	FO patch cable 10 m, 2 fibers (duplex), ST jack
50.102200	FO/p2-20 Patch Cable 20m	FO patch cable 20 m, 2 fibers (duplex), ST jack
50.102300	FO/p2-30 Patch Cable 30m	FO patch cable 30 m, 2 fibers (duplex), ST jack
50.102500	FO/p2-50 Patch Cable 50m	FO patch cable 50 m, 2 fibers (duplex), ST jack
50.102800	FO/p2-80 Patch Cable 80m	FO patch cable 80 m, 2 fibers (duplex), ST jack

USB dongles and devices available over network

The dongle server provides USB dongles via the network. Copy protection dongles do not have to be plugged directly into the client anymore. Using the device server, USB devices can be used over the network.

Dongleserver Pro

INU-100

utnserver Pro

Dongleserver Pro
The dongleserver Pro by SEH reliably and securely provides software license dongles via eight USB interfaces (4 USB 3.0 SuperSpeed and 4 USB 2.0 Hi-Speed) in the network.

The plug & play principle of the dongle server allows easy installation and commissioning. The connected USB dongles can be transparently managed by the UTN Manager software just as if they were locally connected to the PCs.

With the dongleserver Pro the connected dongles can not only be used via LAN connections, but also via VPN, VLANs and the Internet. This allows the USB dongles to be used in server-based computing environments and virtualized environments with VMware, Citrix XEN and Microsoft Hyper-V.

Device server INU-100 and utnserver Pro
With the USB device servers INU-100 and utnserver Pro it is possible to use different USB devices via network, such as external hard disks, dongles, card readers, scanners, etc.

Up to two USB devices can be connected to the device servers simultaneously and can be used by multiple users over the network.

Configuration and management can be carried out easily and conveniently in a Web Control Center.

In addition to password protection, authentication procedures according to 802.1X, IP-based access restriction and encryption of communication using SSL 3.0, TLS1.0/1.1/1.2 and HTTPS can also be used for security purposes.

At a glance

- Ideal solution for virtualized network environments
- Dongles are always ready for use virtually across the network
- Dongles are available for several users without pulling off and reinserting
- Independence from USB interfaces at PC/notebook
- Individual dongles can be assigned to specific users, departments, etc.
- Security features
- Simple, centralized management
- Plug & play

Dongle server und Device server are tested by iba AG and recommended for applications under virtual machines.
Further information and detailed technical data, e.g. complete list of operating systems, can be found at www.seh-technology.com.
Images: SEH Technology Ltd.

Technical data

Name	**Dongleserver Pro**	**SEH INU-100**	**SEH utnserver Pro**
Description	USB Dongle server	USB Device server for DIN rail	USB Device server (desktop device)
Order number	19.000012	19.000013	19.000014
Interfaces			
USB	4x USB 2.0 Hi-Speed, 4x USB 3.0 SuperSpeed	2x USB 3.0 SuperSpeed	2x USB 3.0 SuperSpeed
Network	Gigabit Ethernet (10BaseT/100BaseTX/1000BaseT)	Gigabit Ethernet (10BaseT/100BaseTX/1000BaseT)	Gigabit Ethernet (10BaseT/100BaseTX/1000BaseT)
Operating systems	Microsoft Windows (32/64-Bit; Windows 7, Windows 8, Windows 10, Server 2008 R2, Server 2011, Server 2012, Server 2016, Server 2019) OS X/macOS (10.9.x, 10.10.x, 10.11.2 or later, 10.12.x or later) Linux (64-Bit; Ubuntu 14.04, Ubuntu 16.04, Debian 8.10, Debian 9, Oracle 6.9, Oracle 7.4, CentOS 6.9, CentOS 7.4, SUSE Linux Enterprise 12.3, Red Hat Enterprise Linux 7.4, Red Hat Enterprise Linux 7.6, openSUSE Leap 42.3)	Microsoft Windows (32/64-bit: XP, Windows 7, Windows 8, Windows 10, Server 2003, Server 2011, Server 2012, Server 2016,), OS X/mac OS (32/64-Bit: OS X 10.8.x, OS X 10.9.x, OS X 10.10.x, OS X 10.11.2 or later, macOS 10.12.x or later), Linux (64-bit: Ubuntu 12.4.x LTS, Ubuntu 14.04.x LTS, Oracle Linux 6.5)	Microsoft Windows (32/64-Bit; Windows 10 or later, Server 2012 R2 or later) macOS 10.9 or later Linux (Debian 10, Ubuntu 18.04, Red Hat Enterprise Linux 8, Oracle 8, CentOS 8, SUSE Linux Enterprise 15.1, openSUSE Leap 15.1)

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