Expanding the iba system with I/O modules of the 750 series from WAGO/Beckhoff

ibaW-750
Central unit for WAGO I/O system 750
with Ethernet connection

ibaNet750-BM-D
Central unit for WAGO I/O system 750
with fiber optic connection

Measurement Systems for Industry and Energy
www.iba-ag.com

Decentralized I/O system for various applications

The iba system can be expanded easily and cost-effectively with 750 series I/O modules from WAGO and K-bus modules from Beckhoff. The two central units ibaW-750 and ibaNet750-BM-D offer different possibilities of connection to the iba system: via Ethernet or fiber optics.

Ideal supplement

The flexible, decentralized WAGO I/O system is an ideal supplement to the iba system. All common I/O module types are supported.

Connection via fiber optics or Ethernet

There are two ways of simply integrating the I/O modules into the iba system with automatic detection (plug & play): on the one hand via a standard Ethernet connection with the central unit ibaW-750, on the other hand via fiber optics (FO) with ibaNet750-BM-D.

The two variants differ mainly with regard to the possible sampling rates, the necessary cabling and the operating distance.

Easy configuration, automatic detection

Both central units can be easily configured in ibaPDA as usual. The devices including the connected I/O modules are automatically detected in ibaPDA. When using ibaW-750, the device and the ibaPDA computer must be in the same LAN.

Coupling to K-bus

A maximum data volume of 2048 bytes can be transferred via the K-bus. The sampling rate depends on the cycle time on the K-bus.

Module types

The following I/O module types are supported:

- analog and digital I/O modules
- incremental encoders
- SSI inputs
- RTDs
- thermocouples
- measuring bridges
- modules for power measurement.

Various WAGO I/O modules are available at iba, please see www.iba-ag.com.

Measure power, calculate characteristics

ibaW-750 also supports various modules for power measurement of the 750-494 and 750-495 series. The modules measure current and associated voltages in the three-phase supply network and calculate characteristic values, e.g.

- effective/reactive/apparent power
- effective/reactive/apparent energy
- power factor
- phase angle
- frequency

The power measurement modules are particularly suitable for acquiring power characteristics in the low-voltage range directly at consumers. In addition, simple, but not standard-compliant grid analyses can be carried out on consumers.

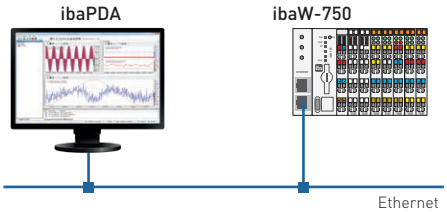
The Power Quality Unit ibaPQU-S is available for a standard-compliant measurement of the power quality.

Comfortable configuration in ibaPDA

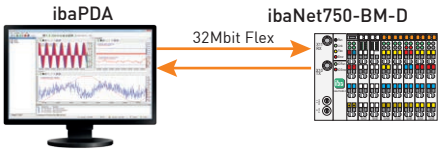
The power measurement modules are comfortably configured in ibaPDA. In addition, a large number of diagnostic signals are available, which can trigger an alarm in ibaPDA if, for example, a preset limit value is exceeded or not reached.

The devices at a glance:

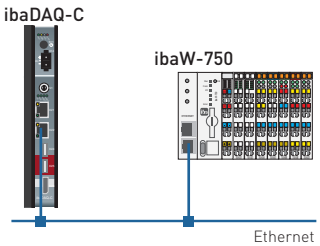
	ibaW-750 	ibaNet750-BM-D 
PC/hardware	› Standard Ethernet connection › Any PC, even as a virtual machine › Standard Ethernet cable › Operating distance plant-wide, worldwide (VPN tunnel)	› PC with PCIe slot and iba-FO input/output card required or › ibaDAQ* › FO cable › up to 2000 m distance
Transmission	› Ethernet › Packet-oriented › Error correction with packet repetition	› Fiber optic cable (FO) › Synchronous to the acquisition › No error correction necessary, due to dedicated FO cable
Acquisition	› Deterministic › Synchronized with ibaPDA › up to 250 I/O modules	› Deterministic › Synchronous via FO › up to 255 I/O modules
Configuration	› I/O modules are detected automatically (plug & play)	› I/O modules are detected automatically (plug & play)



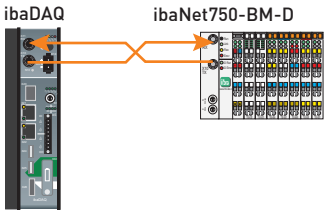
Measured data acquisition with ibaPDA via Ethernet



Measured data acquisition with ibaPDA via FO



Measured data acquisition with ibaDAQ-C* via Ethernet



Measured data acquisition with ibaDAQ via FO

*Detailed information on local data acquisition with ibaDAQ and ibaDAQ-C can be found in a separate brochure about the ibaDAQ family

Acquisition via Ethernet with ibaW-750

At a glance

- ibaNet-E protocol: Deterministic signal transmission via Ethernet
- Automatic module detection
- Flexible setting of the sampling rate (1 Hz ... 1 kHz)
- Supports up to 250 analog and digital input and output modules, complex modules and modules for power measurement

Acquisition of measured values via Ethernet

ibaW-750 connects the K-bus I/O system to the ibaPDA data acquisition system via Ethernet. The signals are converted in the device and are available via the Ethernet interface. The ibaPDA system can be connected via a standard Ethernet card. ibaW-750 works with the new ibaNet-E protocol.

The two 10/100 Mbit Ethernet interfaces offer a switch function. So the network can be expanded easily via the ibaW-750 device.

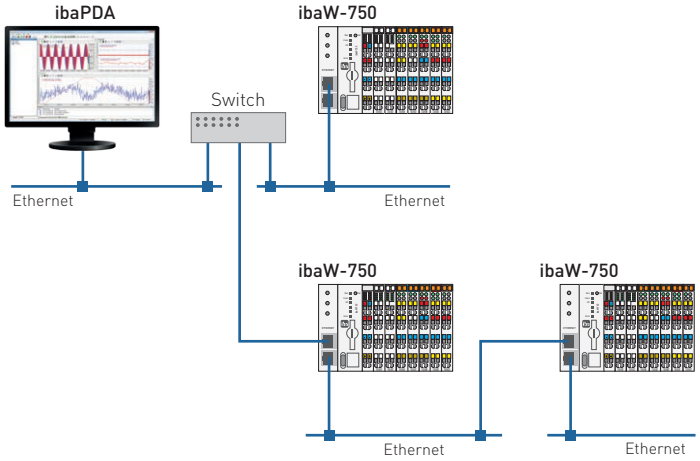
By using the Ethernet transmission protocol ibaNet-E and a standard Ethernet connection, both the integration into the ibaPDA system and the device configuration for network/IT integration of ibaW-750 are extremely convenient.

A new function for device search ensures automatic detection if ibaW-750 is in the same LAN as the ibaPDA computer.

Isochronous measurement

ibaPDA synchronizes all ibaW-750 systems connected to it, enabling isochronous measurement of several distributed I/O systems via Ethernet. The time stamping is done in the central unit.

One ibaW-750 device supports up to 250 I/O modules.



Connection via external or integrated switch possible

Advantages of ibaNet-E

- Use of (existing) Ethernet cables and infrastructure
- Plant-wide connection
- Higher bandwidth than with fiber optics (ibaNet 32Mbit / 3 Mbit)
- Cycle times can be up to 1 second (e.g. for measured temperature values), up to now max. 1.4 ms possible with the FO connection

Acquisition via FO with ibaNet750-BM-D

At a glance

- ibaNet protocols: 32Mbit Flex, 32Mbit, 3Mbit
- With ibaNet 32Mbit Flex:
  - Automatic module detection
  - Flexible setting of the sampling rate
  - Ring topology with up to 15 devices
- Supports up to 255 analog and digital input and output modules, complex modules and modules for power measurement

Acquisition of measured values via FO

The connection of ibaNet750-BM-D to ibaPDA is realized via optical fiber with a fiber optic card of type ibaFOB-D. The signals are converted internally and are available via the FO interface. ibaNet750-BM-D supports up to 255 I/O modules.

ibaNet interface

The device supports different ibaNet protocols at the fiber optic side:

Flexible settings with 32Mbit Flex

Using 32Mbit Flex configuration as well as process data is transmitted via a bidirectional fiber optic cable connection. What is particularly comfortable for the user: ibaPDA automatically detects the modules used and the signals can be easily selected and configured by mouse click.

With the ibaNet protocol 32Mbit Flex, the sampling rate can be flexibly set up to 40 kHz. The maximum data volume to be transmitted depends on the adjusted sampling rate: The higher the sampling rate, the lower the data volume. The ibaPDA application automatically determines the maximum sampling rate, which depends on the type and number of the I/O modules.

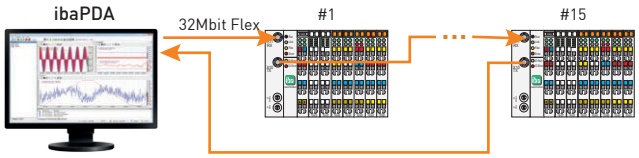
With 32Mbit Flex, it is possible to connect up to 15 devices to a ring topology. The signal limitation applies to the entire ring. Thereby, the distance between the devices can be up to 2 km. Other 32Mbit Flex-enabled iba devices can be integrated into the ring as well.

32Mbit for ibaLogic

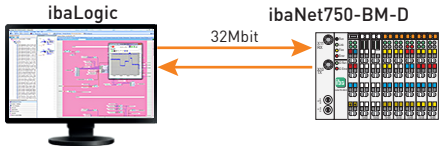
The 32Mbit protocol is especially used in ibaLogic applications. The device is connected to an ibaLogic system via a bidirectional fiber optic connection. Using a cycle time of 500 µs data is transmitted with a minimum delay to ibaLogic, which samples with 1 ms. Up to 256 (REAL)/ 512 (INT) analog and digital signals can be transmitted per cycle.

Compatibility mode 3Mbit

Using the 3Mbit protocol, the device is compatible to the previous ibaNet750-BM version. Up to 8 devices may be connected in a line topology and used as pure input or output devices. If input and output signals should be processed at the same time, it is recommended to use a ring topology. Moreover, the devices may operate peer-to-peer without a PC involved. The cycle time is 1 ms in all applications.



Connection of up to 15 devices to a ring topology with 32Mbit Flex



Peer-to-Peer communication with ibaLogic

Technical data ibaW-750

Name	ibaW-750
Description	Central unit for WAGO I/O system 750
Order no.	15.140020
Bus interface (K-bus)	
Number	1
Design	Local bus
Data volume	Up to 2048 Bytes
Number of I/O modules	Up to 64, 250 with bus extension
Sampling rate	According to the bus cycle time, system-dependent minimum 1 ms The update time of the signals may differ from the bus cycle due to specific properties of the I/O modules
Connector type	6 sliding contacts, according to WAGO I/O system 750, incl. power supply
ibaNet interface	
Number	2
Design	Standard Ethernet
ibaNet protocol	ibaNet-E
Number of ibaPDA connections	1
Data volume	min. 320 Bytes at max. ibaNet-E sampling rate (1 kHz), depending on ibaNet-E sampling rate
Sampling rate	1 Hz - 1 kHz, freely adjustable
Connector type	2 x RJ45 socket (10/100 Mbit/s), switched
System supply	
Voltage supply	24 V DC (±10%)
Max. power consumption	550 mA
Connector type	2 CAGE CLAMP® contacts, 0.08 mm² ... 2.5 mm², AWG 28-14
Total current for I/O modules max.	1700 mA (5 V DC)
Field supply	
Voltage supply	24 V DC (±10%), without protection
Max. power consumption	10 A
Connector type	2 x 2 CAGE CLAMP® contacts, 0.08 mm² ... 2.5 mm², AWG 28-14
Further interfaces, operating and indicating elements	
Indicators (LEDs)	Status indicators for operation, ibaPDA connection, K bus and error
SD card	For service purposes only
Switch	1, Reset and IP configuration
Protective earth connection	2 CAGE CLAMP® contacts, 0.08 mm² ... 2.5 mm², AWG 28-14
Operating and environmental conditions	
Operating temperature	0 °C ... +55 °C (32 °F ... 131 °F)
Storage/transport temperature	-25 °C ... +85 °C (-13 °F ... 185 °F)
Mounting	DIN rail according to EN 50022 (TS 35, DIN Rail 35)
Cooling	passive
Relative humidity	Up to 95 %, no condensation
Protection class	IP20
Standards	CE, EMV (EN 61000-6-2 / EN 61000-6-3), UL508
Dimensions (w x h x d / from upper edge of rail)	62 mm x 100 mm x 72 / 65 mm
Weight / incl. box and documentation	0.16 kg / approx. 0.3 kg

Technical data ibaNet750-BM-D

Name	ibaNet750-BM-D		
Description	Bus module for WAGO I/O System 750		
Order no.	15.140010		
Bus interface (K-bus)			
Number	1		
Design	Local bus		
Data volume	Up to 2048 Bytes		
Number of I/O modules	Up to 64, 255 with bus extension		
Sampling rate	According to the bus cycle time The update time of the signals may differ from the bus cycle due to specific properties of the I/O modules		
Connector type	6 sliding contacts, according to WAGO I/O system 750, incl. power supply		
ibaNet interface			
Number	1		
Design	Fiber optic cable		
ibaNet protocol	**32Mbit Flex** (bidirectional) Allows connecting up to 15 devices at a time in ring topology. Can be used for measured data, setup data and service (e. g. updates).	**32Mbit**	**3Mbit**
Data transmission rate	32 Mbit/s	32 Mbit/s	3 Mbit/s
Sampling rate	up to 40 kHz, freely adjustable	2 kHz	1 kHz
Connector type	2 ST connectors (62.5 µm/125 µm) for RX and TX, cable length up to 2000 m without repeater		
System supply			
Voltage supply	24 V DC (±10%), protected against reverse polarity		
Max. power consumption	500 mA		
Connector type	2 CAGE CLAMP® contacts, 0.08 mm² ... 2.5 mm², AWG 28-14		
Total current for I/O modules max.	2000 mA (5 V DC)		
Field supply			
Voltage supply	DC 24 V (±10%), without protection		
Max. power consumption	10 A		
Connector type	2 x 2 CAGE CLAMP® contacts, 0.08 mm² ... 2.5 mm², AWG 28-14		
Further interfaces, operating and indicating elements			
Indicators (LEDs)	Status indicators for operation, configuration, K-bus and error		
USB	1, socket, Mini B		
Switch	2, device mode and address setting		
Protective earth connection	2 CAGE CLAMP® contacts, 0.08 mm² ... 2.5 mm², AWG 28-14		
Operating and environmental conditions			
Operating temperature	0 °C ... +50 °C (32 °F ... 122 °F)		
Storage/transport temperature	-25 °C ... +70 °C (-13 °F ... 158 °F)		
Mounting	DIN rail according to EN 50022 (TS 35, DIN Rail 35)		
Cooling	passive		
Humidity class (DIN 40040)	F, no condensation		
Protection class	IP20		
Standards	CE, EMV (EN 61326-1:2006, class A)		
Mechanical stability	DIN IEC 68-2-6 (when mounted correctly)		
MTBF[1]	5,366,925 hours / 612 years		
Dimensions (w x h x d / from upper edge of rail)	51 mm x 100 mm x 71/65 mm		
Weight / incl. box and documentation	0.18 kg / approx. 0.3 kg		

[1] MTBF (mean time between failure) according to Telcordia 3 SR232 (Reliability Prediction Procedure of Electronic Equipment; Issue 3 Jan. 2011)

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
info@iba-ag.com

Europe

iba Benelux BV
Belgium, the Netherlands, Luxembourg, France, Ireland, Great Britain, French-speaking Switzerland, Maghreb, Senegal
sales@iba-benelux.com

iba Ibérica
Spain, Portugal
christian.giusti@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

OOO 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.
Japan
hj.park@ibakorea.co.kr

iba Korea System Co. Ltd.
Korea
sh.lee@ibakorea.co.kr

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 Brasil
iba@iba-brasil.com

iba Chile
iba@iba-chile.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 Benelux BV
Maghreb (Morocco, Algeria, Tunisia), Senegal
sales@iba-benelux.com

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

iba AG is represented worldwide by subsidiaries and sales partners.
Technical changes and errors excepted.

Brochure_iba-WAGO-IO-Integration_v1.1_en 08/2020