

# ibaW-750

Central unit for WAGO I/O system 750

Manual

Issue 1.9

Measurement Systems for Industry and Energy

[www.iba-ag.com](http://www.iba-ag.com)

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The content of this publication has been checked for compliance with the described hardware and software. Nevertheless, deviations cannot be excluded completely so that the full compliance is not guaranteed. However, the information in this publication is updated regularly. Required corrections are contained in the following regulations or can be downloaded on the Internet.

The current version is available for download on our web site <http://www.iba-ag.com>.

Issue	Date	Revision	Author	Version HW/FW
1.9	08-2025	Supported terminals	st	02.02.002

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## Certification

The product is certified according to the European standards and directives. This product meets the general safety and health requirements.

Other international and national standards were observed.

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# 1 About this documentation

This documentation describes the construction, the use and the operation of the device *ibaW-750*.

## 1.1 Target group

This documentation is aimed at qualified professionals who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded as professional if he/she is capable of assessing safety and recognizing possible consequences and risks on the basis of his/her specialist training, knowledge and experience and knowledge of the standard regulations.

## 1.2 Notations

In this manual, the following notations are used:

Action	Notation
Menu command	Menu <i>Logic diagram</i>
Calling the menu command	<i>Step 1 – Step 2 – Step 3 – Step x</i> Example: Select the menu <i>Logic diagram – Add – New function block</i> .
Keys	<Key name> Example: <Alt>; <F1>
Press the keys simultaneously	<Key name> + <Key name> Example: <Alt> + <Ctrl>
Buttons	<Key name> Example: <OK>; <Cancel>
Filenames, paths	<i>Filename, Path</i> Example: <i>Test.docx</i>

## 1.3 Used symbols

If safety instructions or other notes are used in this manual, they mean:

---

### Danger!



**The non-observance of this safety information may result in an imminent risk of death or severe injury:**

- Observe the specified measures.
- 

### Warning!



**The non-observance of this safety information may result in a potential risk of death or severe injury!**

- Observe the specified measures.
- 

### Caution!



**The non-observance of this safety information may result in a potential risk of injury or material damage!**

- Observe the specified measures
- 

### Note



A note specifies special requirements or actions to be observed.

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### Tip



Tip or example as a helpful note or insider tip to make the work a little bit easier.

---

### Other documentation



Reference to additional documentation or further reading.

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## 2 Introduction

The fieldbus coupler *ibaW-750* is designed to integrate I/O modules of the 750 series from WAGO and K-bus terminals from Beckhoff into the iba system. The remote I/O system is connected to the *ibaPDA* system via Ethernet.

The WAGO I/O system of the 750 series is an ideal supplement to the iba system. Digital and analog I/O modules can be integrated into the system as well as incremental encoders, SSI inputs, RTDs, thermocouples and measuring bridges.

Up to 255 WAGO I/O terminals can be connected to a *ibaW-750* device.

### 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 an Ethernet card. *ibaW-750* works with the new *ibaNet-E* protocol. The two 10/100 Mbit Ethernet interfaces offer a switch function.

One connection to one *ibaPDA* system is possible per *ibaW-750* device, whereby the sampling rate is freely selectable from 1 Hz to 1 kHz.

### Automatic detection

The device including the connected I/O modules are automatically detected in *ibaPDA* if *ibaW-750* and the *ibaPDA* computer are in the same LAN. *ibaPDA* synchronizes all *ibaW-750* systems connected to it, enabling isochronous measurement of multiple remote I/O systems via Ethernet.

### 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.

---

#### Note



**I/O range:** Not all of the WAGO terminal range can be used. Contact iba AG if in doubt. This also applies to the compatible, in principle, modules of Beckhoff.

A description of the supported terminals can be found in chapter [↗ Terminal types](#), page 50.

Before project engineering, check for each terminal type which transmission capacity is required.

---

#### Note



**Terminal diagnostics:** With the exception of complex terminals no diagnostic information is supported.

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**Note****Restrictions when operating with ibaPDA**

While all iba devices normally deliver exactly 1 ms synchronized simultaneous snapshots of the process, this cannot be guaranteed when using the WAGO750 I/O system. This is particularly due to the structure of the internal serial I/O bus (K-bus). Further on, the cycle time depends on the number of channels connected to a station. Especially analog channels and counters (terminals with a high number of bits) decrease the bus cycle, and cycle times may take several milliseconds. When several stations are used simultaneously, different cycle times may cause phase differences of up to 10 ms. This means the simultaneous measurement of a huge number of signals < 10 ms cannot be guaranteed. However, the RTD and thermocouple inputs are also a valuable addition to the capabilities of the *ibaPDA* recording system.

---

**Overview of the most important characteristic values**

- DC 24 V direct current supply ( $\pm 10\%$ ), to supply the device and the K-bus.
- The power supply is able to supply I/O modules with a max of 1.7 A. If more current is needed, additional power supply modules must be integrated within the K-bus.
- Rugged plastic chassis with DIN-rail mounting
- LED display for operating status, *ibaPDA* connection, K-bus and errors
- 2 10/100 Mbit-Ethernet interfaces with switch function
- Automatic detection of devices and modules in *ibaPDA* (within the same LAN)
- Flexible setting of sampling rate

### 3 Scope of delivery

After unpacking, check that the delivery is complete and undamaged.

The scope of delivery includes:

- Device *ibaW-750*

## 4 Safety instructions

Observe the following safety instructions for *ibaW-750*.

### 4.1 Intended use

The device is an electrical apparatus. It is only allowed to use the device for the following applications:

- Measurement data acquisition and measurement data analysis
- Applications of iba software products (*ibaPDA* etc.)

The device may only be used as defined in the "Technical Data", see chapter ➤ *Technical data*, page 73.

### 4.2 Special safety instructions

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#### Caution!



The length of the supply cable between the power source and the device must not be longer than 30 m.

---

#### Caution!



Before working on or dismantling the device, disconnect it from the power supply.

---

#### Note



Do not open the device! Opening the device will void the warranty!

---

#### Note



To clean the device, use a dry or slightly moistened cloth.

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**Other documentation**

This documentation describes only the properties of the WAGO devices which are relevant for iba systems integration.

For a detailed description of the single WAGO terminals with information on pin assignment, data format and A/D conversion, please refer to the original WAGO documentation.

Data sheets and documentations for WAGO components are available for download at [www.wago.com](http://www.wago.com).

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## 5 System requirements

Observe the following requirements for using the device *ibaW-750*.

### Hardware

#### For operation

24 V DC ( $\pm 10\%$ ) power supply

#### For parametrization of the device and for measuring

■ PC as recommended for use with *ibaPDA*:

- Multicore CPU 2 GHz, 2048 MB RAM, 100 GB HDD, or higher
- Standard Ethernet interface or *ibaN-2E* card
- Standard Ethernet patch cable
- Optional: At least one free PCI/PCIe slot

On the iba homepage <http://www.iba-ag.com> you find suitable computer systems with desktop and industrial housing.

### Software

- *ibaPDA* version 7.3.0 or higher for device configuration and for measuring and recording data

### Firmware

- *ibaW-750* version 02.02.002 or higher

## 6 Mounting and dismounting

In the following, you will learn how to *ibaW-750* install, connect and remove the device. Also refer to the notes in chapter ➤ *Safety instructions*, page 11.

---

### Caution!



Before working on or dismounting the device, disconnect it from the power supply.

---

### 6.1 Mounting

- ▶ Press the device slightly against the DIN-rail. When you hear the click the device is securely mounted.

### 6.2 Dismounting

1. First remove all connections from the device.
2. Pull the orange plastic leash in your direction. The module will easily snap out of the DIN-rail.

## 7 Device description

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### Note



Please note, that some I/O terminals may have no or just single power contacts (depending on the function of the terminal). Therefore the daisy chaining of power supplies from module to module may be interrupted. If it is necessary to supply subsequent terminals (more right positioned), an additional power supply terminal is necessary. With some terminals it is basically not possible to connect them together because the grooves for the blade contacts are closed at the top.

With the placement of an additional power terminal, the field supply via the power contacts is always interrupted. This means that a new power supply is provided from this point on, which can also include a potential change. This option ensures a high flexibility of the overall system.

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### Note



Please note, that some terminals additionally require an own power supply (mostly 24 V DC). These are mainly modules of the type “complex terminals”, see chapter ↗ *Terminal types*, page 50.

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### Other documentation

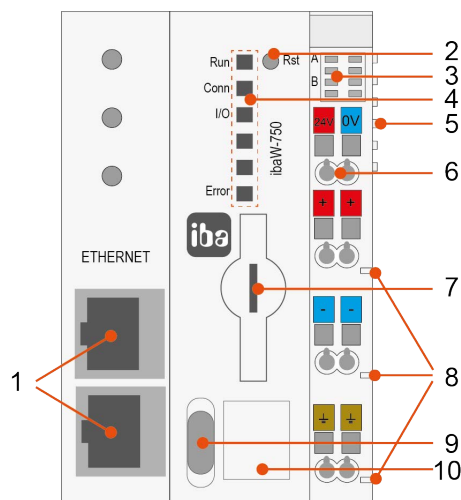


Please refer to the manufacturer’s original manual(s) for more information.

---

## 7.1 View

The following view shows the operating and indicating elements, as well as the connections of the device *ibaW-750*.



- |   |                               |    |                                  |
|---|-------------------------------|----|----------------------------------|
| 1 | Ethernet interface connection | 6  | Power supply connections         |
| 2 | Reset button                  | 7  | Memory card connection           |
| 3 | Power supply indicators       | 8  | Power jumper contacts connection |
| 4 | Operating status indicator    | 9  | Configuration switch control     |
| 5 | Terminal bus connection       | 10 | Service interface                |

## 7.2 Indicating elements

Colored LEDs on the device indicate the operating status of the device.

### 7.2.1 Operating status

The following overview shows the possible operating states of the device *ibaW-750*.

LED	Color	State	Description
Run	green	off	Out of operation, no power supply
		flashing	Ready for operation
		flashing (fast)	Firmware update active
		on	Boot sequence
Conn	green	off	No connection to the <i>ibaPDA</i> system
		on	Connection to <i>ibaPDA</i> system
I/O	green	on	K-bus active
	red	on	K-bus error
Error	red	on	System error

For further information on the K-bus error, see chapter [↗ K-bus error](#), page 49.



## 7.2.2 Power supply indicators

The following overview shows the possible states of the power supply indicators (A and B) on the device *ibaW-750*.

LED	Color	State	Description
A	green	off	No system supply present
		on	System supply present
B	green	off	No field supply present
		on	Field supply present

## 7.3 Operating elements

Below you will find further information on the operating elements of the device *ibaW-750*.

### 7.3.1 Reset button

You can reset the device to the factory settings using the reset button. For further information see chapter ➔ *Reset to factory settings*, page 22.

### 7.3.2 Configuration switch

In addition to the reset, the configuration switch is also used to define IP settings.

Position	State	Description
Cfg	Switching	User-defined IP settings are used
Static	Switching	Fixed IP setting with IP 192.168.1.1 (factory setting)
Rst	Spring-return	Reset to factory settings

Further information on resetting the device can be found in chapter ➔ *Reset to factory settings*, page 22.

## 7.4 Connections

You will find the following connections and interfaces on the device *ibaW-750*.

### 7.4.1 Ethernet interfaces

The device provides two 10/100 Mbit Ethernet interfaces with switch function.

The interfaces support:

- Auto-MDI
- Autonegotiation (10/100 Mbit and half/full duplex)

APIPA<sup>1)</sup> is not supported.

<sup>1)</sup> Automatic Private IP Addressing = automatic IP addressing without DHCP server in the IP address range 169.254.x.x

## 7.4.2 Terminal bus

Communication between the central unit and I/O modules as well as the system supply of the I/O modules takes place via the terminal bus. The terminal bus consists of 6 contacts, which are designed as self-cleaning gold spring contacts.

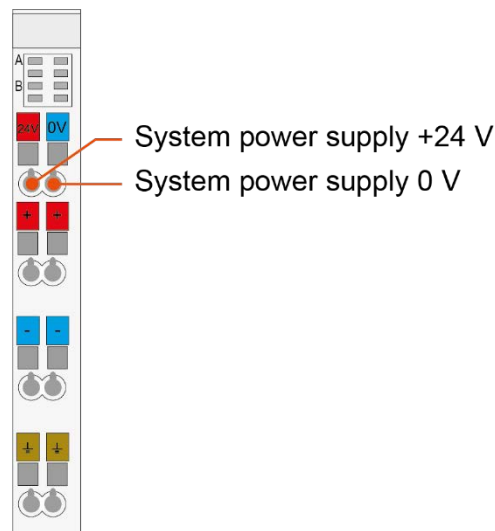
## 7.4.3 Power supply

The device requires two power supplies, one for the system supply and one for the field supply.

Information on the display elements for the power supply can be found in chapter [↗ Power supply indicators](#), page 17.

### 7.4.3.1 System supply

The device requires an external 24 V  $\pm 10\%$  DC power supply (unregulated) as system power supply. The supply voltage is to be connected via the appropriate terminals on *ibaW750* device and it is protected against reverse polarity.



#### Tip



If required, you can reorder 24V DIN rail or plug-in power supply units. Please contact the iba support.

The 24 V voltage is internally converted to a 5 V operating voltage (galvanically connected). The voltage does not only supply the device, but is also available via the terminal bus for supplying the corresponding connected terminals.

Up to 1700 mA can be used to supply the terminals. If a higher load is necessary, additional system power supply modules are required (e. g. Wago 750-613).

Some terminals do not need a supply voltage from the system supply, but use the additional field supply.

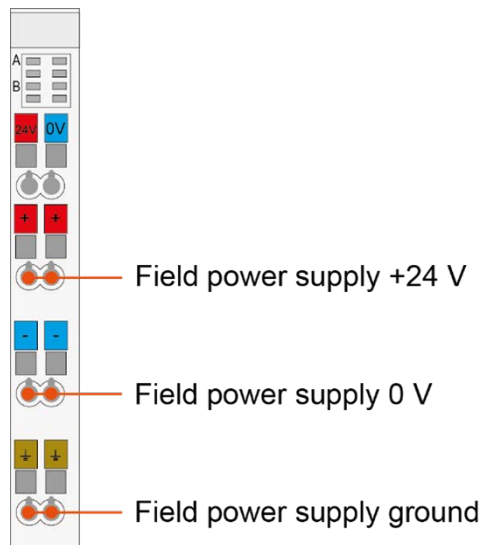
**Caution!**

The length of the supply cable between the power source and the device must not be longer than 30 m.

### 7.4.3.2 Field supply

Individual terminal types connected to the *ibaW-750* system require a 24 V voltage supply via the field supply.

This supply voltage must be applied via appropriate terminals on the device. It is a passive supply without protection.

**Tip**

If required, you can reorder 24V DIN rail or plug-in power supply units. Please contact the iba support.

For power supply at field level please refer to chapter [➤ Power jumper contacts](#), page 19.

### 7.4.4 Memory card

The slot for a microSD memory card is only intended for service purposes.

### 7.4.5 Power jumper contacts

The operating voltage is available for other terminals as voltage supply via power terminals. Power connections are made automatically from module to module via the internal power jumper contacts when snapping the terminals together.

The power load of the power contacts must not permanently exceed 10 A.

When inserting a terminal without power jumper contacts or an additional power terminal the field supply fed through the power jumper contacts is interrupted.

If necessary, a new potential can be generated on the power jumper contacts by a power terminal (e. g. WAGO750-610 for 24 V DC, WAGO750-611 for 230 V AC).

---

**Caution!**

The length of the supply cable between the power source and the device must not be longer than 30 m.

---

**Other documentation**

Regarding the power supply, please refer to the manufacturer's original manual(s) for more information.

---

### 7.4.6 Service interface

The service interface behind the flap is only intended for service purposes.

## 8 System integration

An *ibaW-750* system is always structured as follows:

- *ibaW-750* device (central unit) on the left side
- terminals of the WAGO I/O System 750 (I/O modules, power supply terminals...)
  - The device supports up to 255 terminals
- one end terminal at the right end of the station to terminate the serial K-bus

### Note

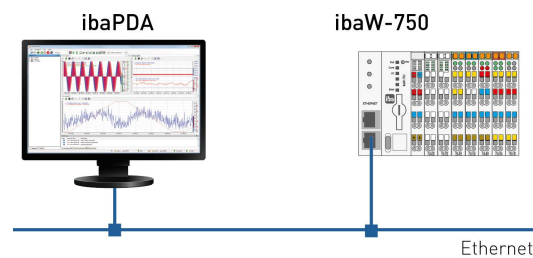


Before integrating the device into your network, inform your IT administrator and enquire about the appropriate procedure.

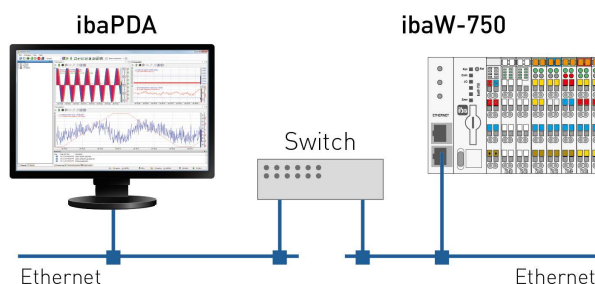
Information on device configuration in the network can be found in chapter [↗ Device configuration](#), page 26.

### 8.1 System integration with ibaNet-E via Ethernet

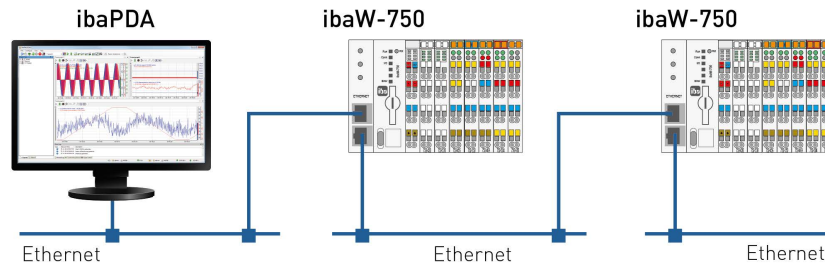
*ibaW-750* is connected to the *ibaPDA* computer via a Ethernet network. It does not matter which of the two Ethernet interfaces is used. The device works with the *ibaNet-E* protocol for the transmission of configuration and measurement data.



The network topology is not important here. The device can either be connected directly (P2P) to the *ibaPDA* computer, as shown in the following illustration, or via a switch or router.



If several *ibaW-750* devices are connected, the switch integrated in the device can also be used.



*ibaPDA* automatically recognizes the *ibaW-750* device and the connected terminals if *ibaW-750* and the *ibaPDA* computer are in the same network (LAN).

The sampling rate can be freely adjusted from 1 Hz to 1 kHz. The maximum data transfer depends on the adjusted sampling rate. The following rule applies: The higher the sampling rate, the smaller the data volume.

The update time of the signals is also limited by the update rate of the K-bus and the connected terminals with their specific properties.

## 8.2 Reset to factory settings

The device can only be reset by a hardware reset on the device itself.

### Note



If you reset the device to factory settings, the entire module configuration including the owner of this configuration will be deleted.

### Procedure

1. Move the configuration switch to the Rst position, hold it there and press the reset button at the same time.

The reset button can be pressed with a suitable object (e. g. ballpoint pen).

→ After a reset, the device restarts and the status indicators flash.

→ Device and module configuration are reset.

2. You can release both the reset button and the configuration switch again.

→ The configuration switch returns to the Static position.

3. Set the configuration switch for user-defined IP settings to the Cfg switch position.

**Device configuration after reset**

**Owner:** none

**Device name:** ibaW-xxxxxx

xxxxxx = 6-digit serial number, e. g. ibaW-000046  
The serial number can be found on the type label

**IP address:** 192.168.1.1

**Subnet mask:** 255.255.255.0

**Gateway:** 0.0.0.0

**DHCP:** no

## 9 Integration in ibaPDA

With *ibaPDA* you can search for devices in the network and configure them for operation in the network, but *ibaPDA* can also be used to configure, acquire and record the analog and digital signals of the connected terminals, and output them.

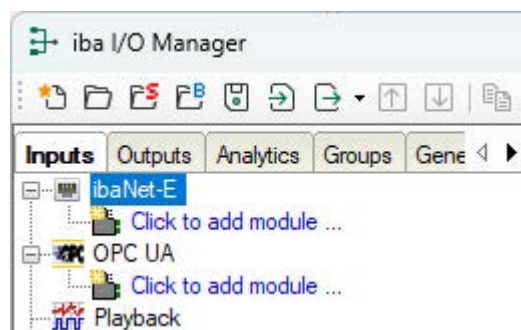
In both cases, first establish an Ethernet connection to the *ibaPDA* computer.

Start *ibaPDA*  and open the I/O Manager .

### 9.1 ibaNet-E interface

The *ibaW-750* device is connected via an Ethernet network card or Ethernet interface built into the *ibaPDA* computer and the *ibaPDA* interface *ibaNet-E*.

Standard Ethernet infrastructure components can be used in this connection.



The *ibaNet-E* interface is available from *ibaPDA* version 7.1.7. and is license-free with version 7.3.0 or higher together with the firmware v02.01.001 or higher.

#### 9.1.1 ibaNet-E – Connections tab

General configurations for the *ibaNet-E* interface can be made in this tab:

##### Stop acquisition when a broken connection is detected

If a connection to an *ibaNet-E* device is interrupted, the acquisition is stopped.

##### Set signals to zero when no data is available

If the *ibaNet-E* connection is broken, all signals in the acquisition are set to zero. Otherwise, the signal values would show the last current value before the connection was lost.

All *ibaNet-E* connections are displayed in an overview:

##### Module

The name of the connected module or device.

##### Address

Address of the target device. If the device is connected via DHCP, the host name is displayed. Otherwise, its IP address is displayed.



**Type**

Type of the ibaNet-E connection.

- ACQ: Receive connection; isochronous acquisition of all values; with telegram repetitions
- PLC: Send connection; only the most recent value is sent without any repetitions if there are transmission errors

**Direction**

Input or output direction

- Input direction: Receiving data from the ibaNet-E device
- Output direction: Sending data to the ibaNet-E device

**Frames**

Number of telegrams for this connection.

**Ping time**

Current ping time for this connection.

While a valid ibaNet-E receive connection is live, a ping is sent cyclically to the ibaNet-E device. The measured time is displayed here, and indicates the connection quality of the Ethernet network. The shorter this time is, the better the connection quality, and the more secure the data transmission. If the connection quality is poor, the connection in question is highlighted in orange.

Example:

ibaNet-E

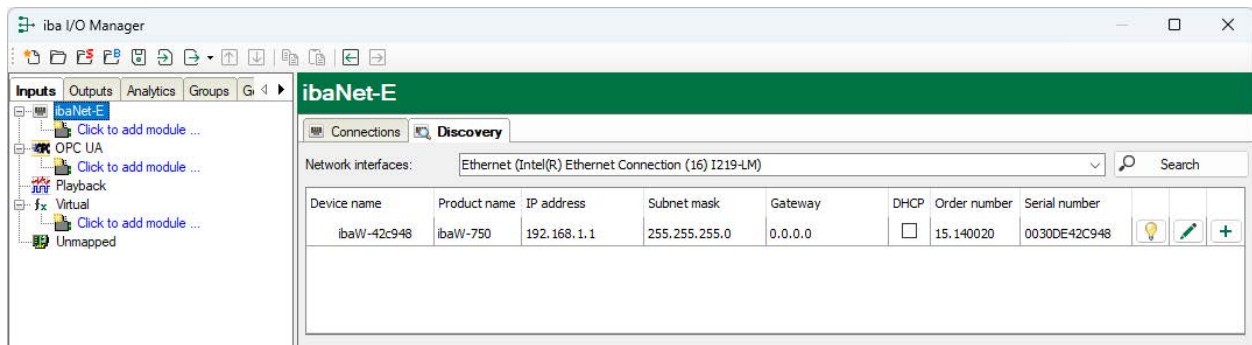
Connections

Discovery

☐ Stop acquisition when a broken connection is detected
 ☐ Set signals to zero when no data is available

	Module	Destination	Type	Direction	Messages	Ping time
0	ibaW-750-DHCP (0)	ibaW-750-DHCP	ACQ	IN	3139	3,296 ms
1	ibaW-750-DHCP (0)	ibaW-750-DHCP	PLC	OUT	233	2,044 ms
2	ibaW-750-WLAN (5)	192.168.41.201	ACQ	IN	2977	74,049 ms
3	ibaW-750-LAN (10)	192.168.1.50	ACQ	IN	3141	3,108 ms
4	ibaW-750-LAN (10)	192.168.1.50	PLC	OUT	233	1,782 ms
5	?	?	?	?	?	?
6	?	?	?	?	?	?

## 9.1.2 ibaNet-E – Discovery tab



This tab is used to set the network interfaces via which *ibaNet-E* devices are to be searched.

Please note that this search can only be successful if the device is located in the same LAN as the *ibaPDA* computer or has also been preconfigured for this LAN.



In the Network interfaces field, select the network cards via which you can reach the *ibaNet-E* devices and start the search by clicking on <Search>.

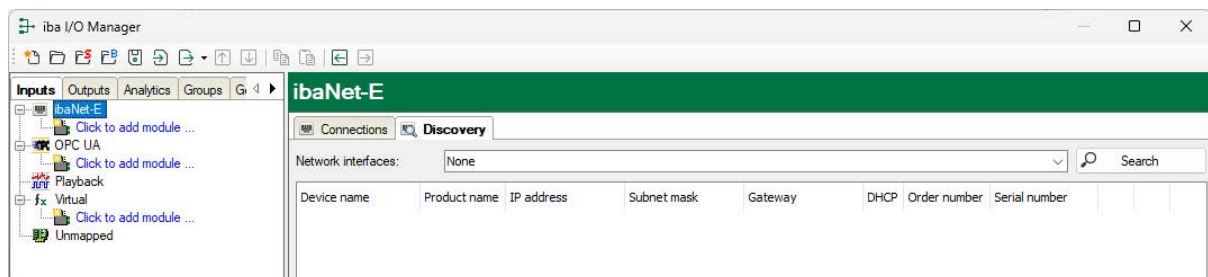
## 9.2 Device configuration

If *ibaW-750* is not yet configured for the network or this configuration is not known, a search can be started in the I/O manager of *ibaPDA*.

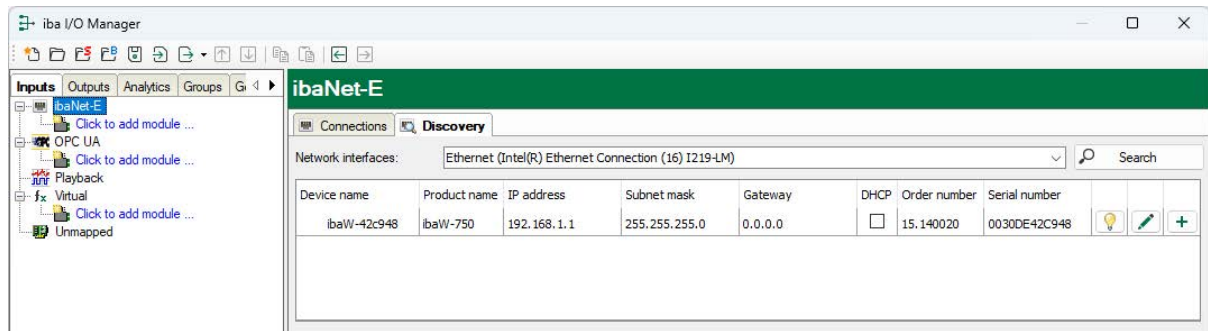
Please note that this search can only be successful if the device is located in the same LAN as the *ibaPDA* computer or has also been preconfigured for this LAN.

### 9.2.1 Searching for ibaW-750 devices

1. Start *ibaPDA*  and open the I/O Manager .
2. Select the “ibaNet-E” interface and choose the *Discovery* tab:



3. In the field *Network interfaces* select the network card(s) via which you can reach the *ibaW-750* device and start the search by clicking on <Search>:



→ Found devices are listed in the table and cannot be changed in this display.

## Information on the devices found

### Device name

Device name, or host name of the device

### Product name

*ibaW-750*

### IP address

The IP address of the device

### Subnet mask

The subnet mask of the IP settings

### Gateway

The gateway of the IP settings

### DHCP

The IP settings are obtained from a DHCP server (enabled or not).

### Order number

The iba order number of the device

### Serial number

The serial number of the device

Meaning of the buttons:



Identify device

When you click this button, the status indicators (LEDs) on the front of the device start blinking for a short time. This makes it possible to identify the device directly.



Edit device settings

Click this button to open the window for the device and IP settings.



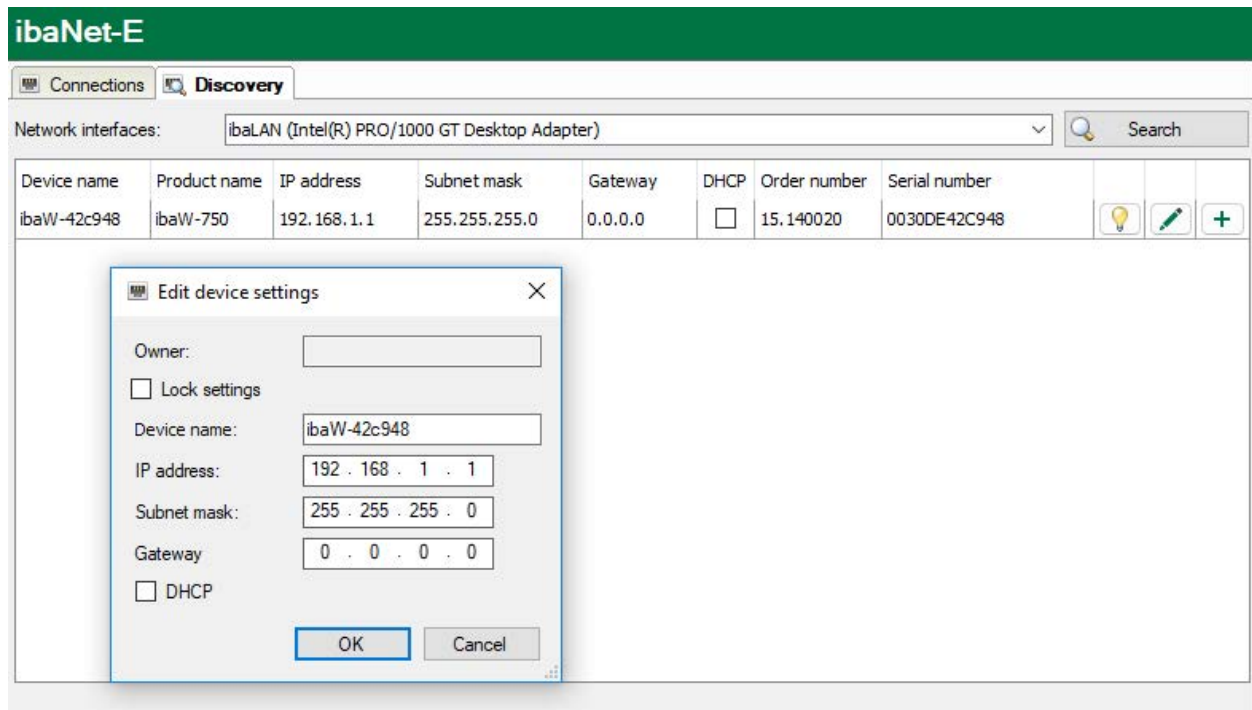
Add device to I/O configuration

Click this button to add the device to the I/O configuration of the ibaNet-E-interface in *ibaPDA*. Connected modules are identified and added automatically as far as possible.

## 9.2.2 Device settings

Open the dialog *Edit device settings* with the button .

In the device settings, device-specific values are entered, which are mainly required for the network connection to the Ethernet.



### Owner

If the device *ibaW-750* has been configured before, the last owner is shown here. Otherwise the field is empty (after delivery or resetting to factory settings).

The owner corresponds to the computer name on which *ibaPDA* is installed and by which the device was most recently configured. The entry is inserted automatically and is only readable.

### Lock settings

If this function is enabled, read and write access to the device configuration is blocked towards other *ibaPDA* systems.

### Device name

Name of the device

If DHCP is enabled and a DHCP/DNS server is in the network, this name can be used to connect the device.

### IP address

IP address of the device

This field is read-only when DHCP is enabled.

### Subnet mask

Subnet mask of the IP settings

This field is read-only when DHCP is enabled.

## Gateway

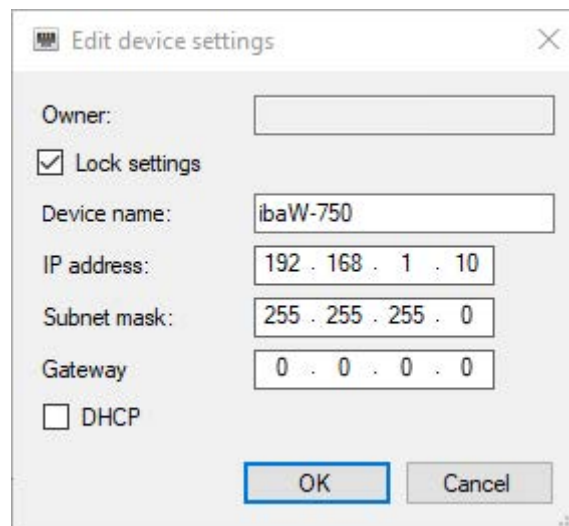
Gateway of the IP settings

This field is read-only when DHCP is enabled.

## DHCP

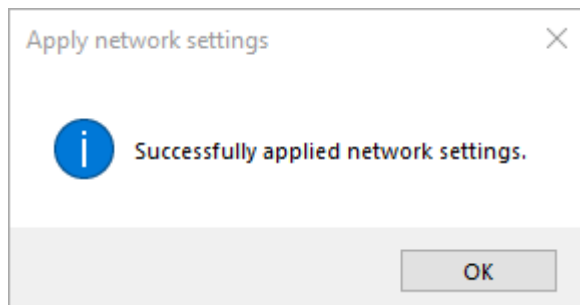
If DHCP is not enabled, a static IP address must be selected. If DHCP is enabled, the IP address of a DHCP server in the network is obtained, if possible.

Example of a device setting with fix IP address, without DHCP:



► To apply the settings, click <OK>.

→ The following message appears and the input window is closed:



→ In the *Discovery* register the configured *ibaW-750* device is displayed.

Device name	Product name	IP address	Subnet mask	Gateway	DHCP	Order number	Serial number			
ibaW-750	ibaW-750	192.168.1.10	255.255.255.0	0.0.0.0	<input type="checkbox"/>	15.140020	0030DE42C948			

### 9.2.3 Owner

If you open the device settings again after configuration, an owner is displayed. For further information on the configuration, see chapter [↗ Device configuration](#), page 26.

If the device settings are opened by the same owner, all configurations can still be changed here.

If the settings have last been **set and not locked** by another *ibaPDA* computer, the following message is displayed after confirmation:

Since the configuration is not locked, it can be changed and applied.

If the settings have been **set and locked** by another *ibaPDA* computer, the fields are write-protected and cannot be changed.

A locked device configuration can only be changed or reset by the original owner or deleted by resetting to the factory settings. For further information see chapter [↗ Reset to factory settings](#), page 22.

## 9.2.4 Adding an ibaW-750 device

You have the following options for adding an *ibaW-750* device to *ibaPDA*:

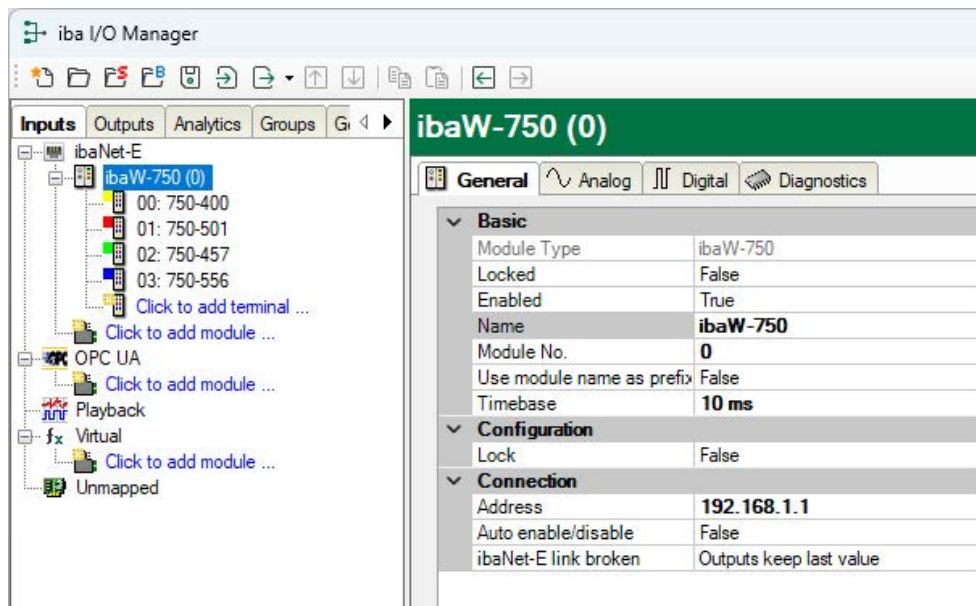
- Automatically - device is in the same LAN  
See chapter [➤ Adding device automatically](#), page 31.
- Manually - device is not in the same LAN  
See chapter [➤ Adding device manually](#), page 32.
- Offline - without connection of a device  
See chapter [➤ Adding device offline](#), page 33.

### 9.2.4.1 Adding device automatically

Proceed as follows to add the device as a module to the I/O configuration in *ibaPDA*:

#### Prerequisites:

- You have performed a search for existing devices in the same LAN, see chapter [➤ Searching for ibaW-750 devices](#), page 26.
  - The device has been configured, see chapter [➤ Device settings](#), page 28.
  - ▶ Select the *ibaW-750* device in the *Discovery* tab of the *ibaNet-E* interface and click on the button **+**.
- The device appears in the module tree of the I/O Manager.



- Connected terminals are automatically detected and added as far as possible.
- If the device has already been configured for acquisition in *ibaPDA*, this existing configuration is also read out and displayed in the I/O configuration.

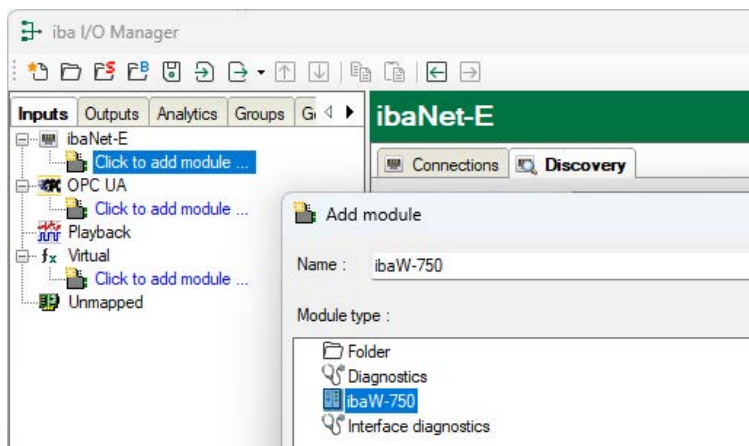


### 9.2.4.2 Adding device manually

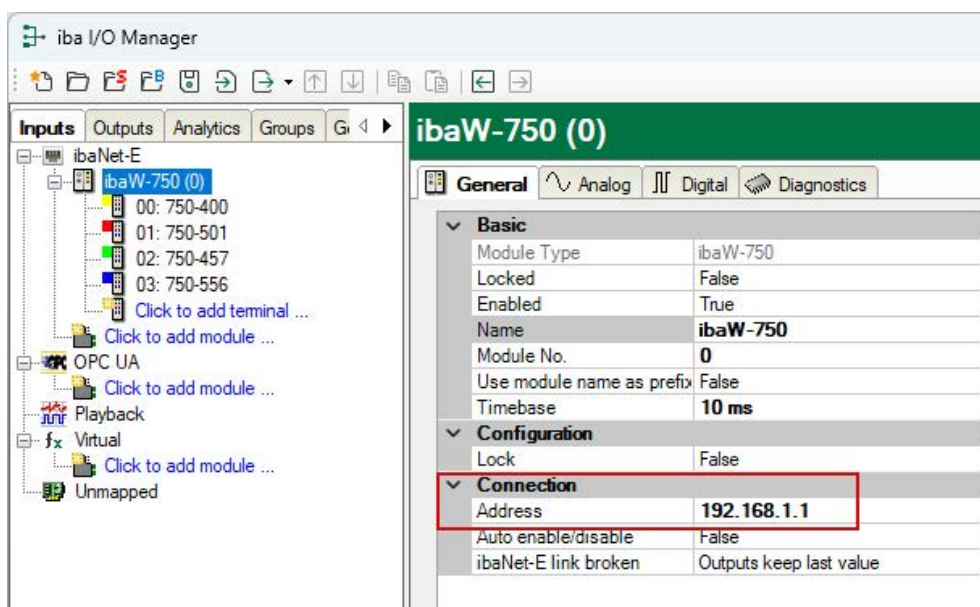
If the *ibaW-750* device is not to be operated in the same LAN as the *ibaPDA* computer, the device can also be added manually to the *ibaNet-E* interface in the I/O Manager.

**Prerequisite:** The *ibaW-750* device must have been configured separately in advance. The configuration can be carried out in the same LAN or from another *ibaPDA* system. For information on configuration, see chapter [↗ Device settings](#), page 28.

1. Click on the link *Click to add module ....*
2. Select the *ibaW-750* module type.



3. For a successful connection, first enter the (network) address via which the *ibaW-750* device can be reached.

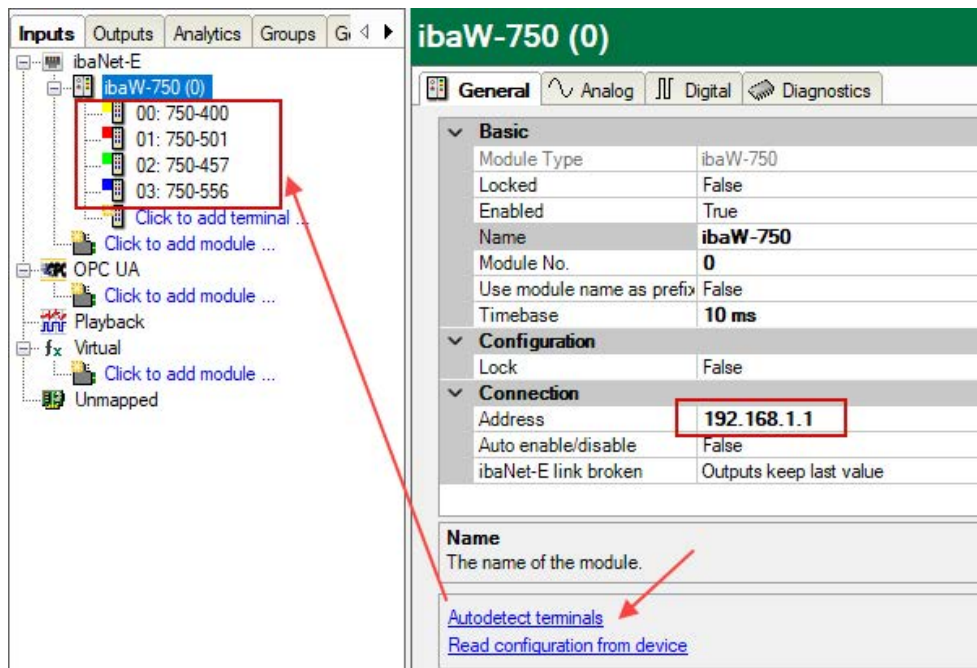


The address can either be a (fixed) IP address or the host name. The use of the host name is recommended if the device is located in a DHCP network in which the participants have not been assigned fixed IP addresses.

4. If the *ibaW-750* device can be reached via the entered address in the network via Ethernet without restrictions, you now have the following options:



- To add the connected terminals, click on the *Automatically detect terminals* link in the *General* tab.
- To also read out the module configuration (if available), click on the *Read configuration from the device* link.



### 9.2.4.3 Adding device offline

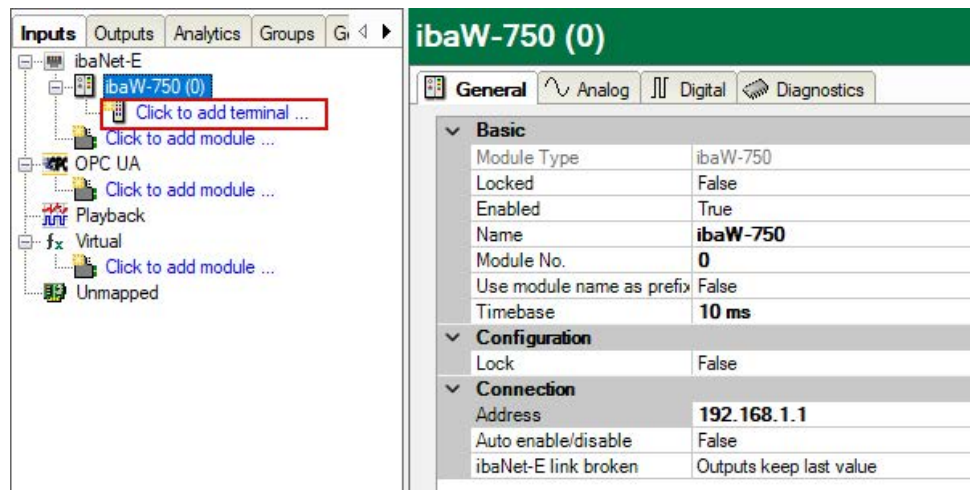
It is also possible to add and configure the *ibaW-750* device to the I/O Manager without connecting the device at the same time. With this offline option, it is possible, for example, to export a device and module configuration or to save the entire I/O configuration of the I/O Manager.

#### Note



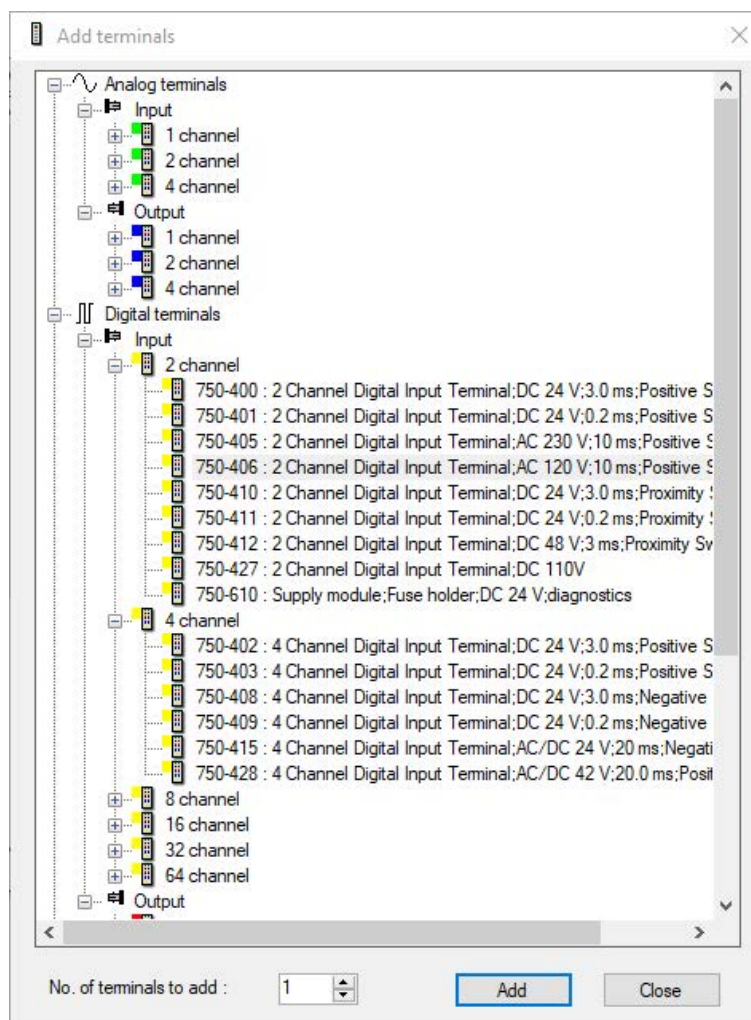
For a detailed description, please refer to the current *ibaPDA* documentation.

Proceed in the same way as when adding the device manually, with the exception that the terminals or the configuration cannot be automatically recognized and read out at the end, but must be added manually:



1. Select the "ibaW-750" module and click on the *Click to add terminals...* link.

→ The selection window for the terminals appears:



2. Select the relevant terminal and click <Add>.

Alternatively, you can double-click on the terminal.

→ The terminal is accepted without the selection window closing.

- If a terminal is to be added several times, enter the desired number in the *Number of terminals to be added* field.

#### Note



If output terminals are connected, add them also in the described way. *ibaPDA* automatically adds the output terminals to an output module under *Outputs* at the appropriate link.

## 9.3 Module configuration

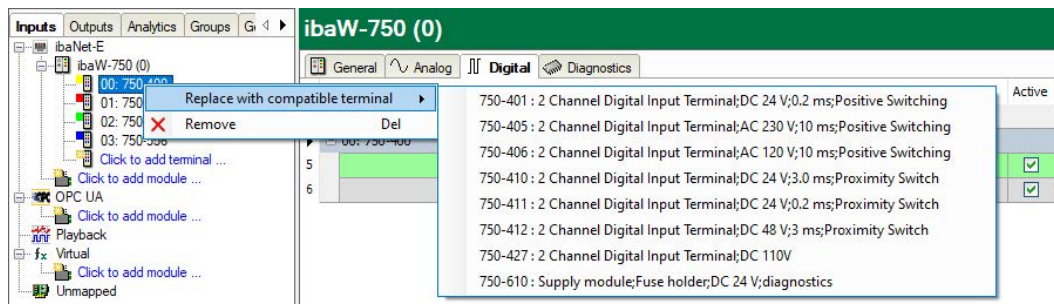
You should only carry out the module configuration in *ibaPDA* once the device with the connected terminals is correctly mapped in the I/O Manager.

#### Note



The terminal names of digital signals cannot be read out via the K-bus. However, the terminal type is correctly recognized and a terminal with the right numbers of inputs and outputs will be displayed in *ibaPDA*.

This terminal can be replaced with another compatible terminal. Right-click on the terminal and select the desired terminal.

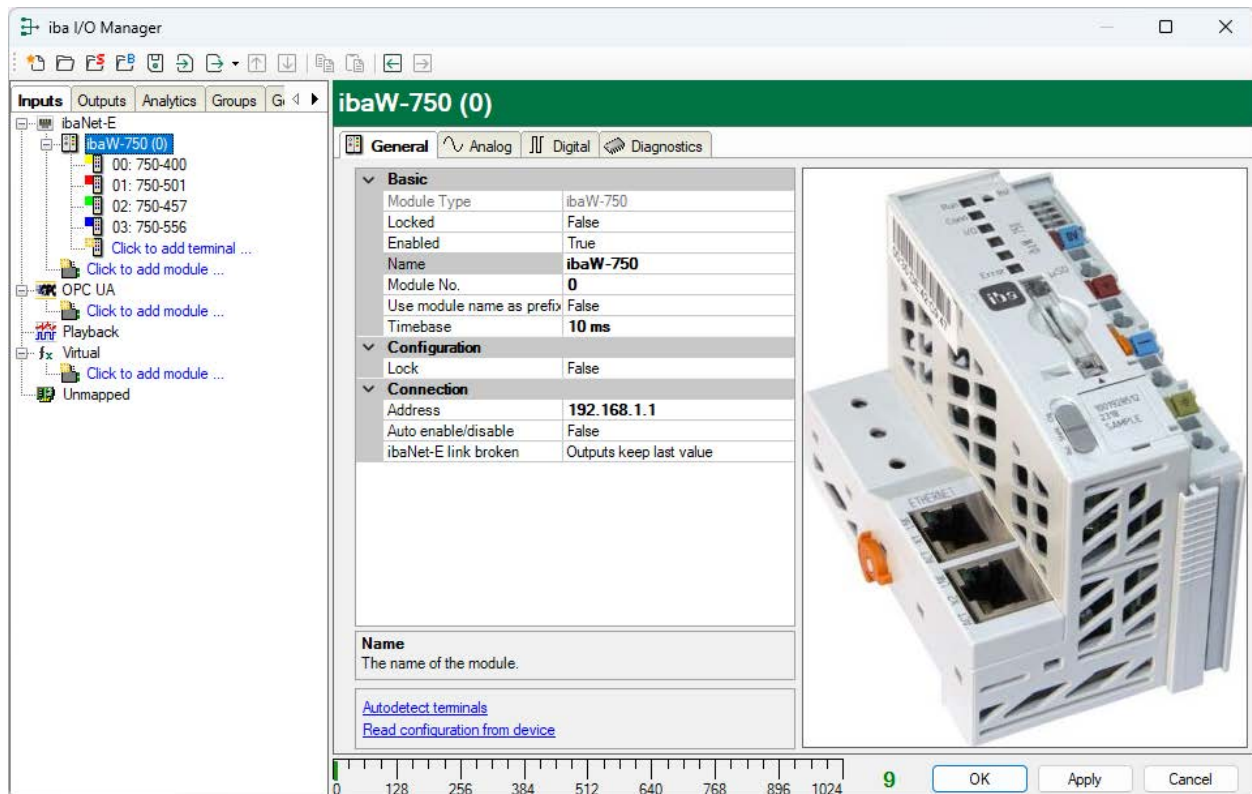


### 9.3.1 ibaW-750 – Hardware

The device module and the signal tables are described below.

#### 9.3.1.1 ibaW-750 – General tab

In the *General* tab, make the basic settings, configuration and connection settings for the "ibaW-750" device module.



#### Basic settings

##### Module Type (information only)

Indicates the type of the current module.

##### Locked

You can lock a module to avoid unintentional or unauthorized changing of the module settings.

##### Enabled

Enable the module to record signals.

##### Name

You can enter a name for the module here.

##### Comment

You can enter a comment or description of the module here. This will be displayed as a tooltip in the signal tree.

**Module No.**

This internal reference number of the module determines the order of the modules in the signal tree of *ibaPDA* client and *ibaAnalyzer*.

**Timebase**

All signals of the module are sampled on this timebase.

**Use module name as prefix**

This option puts the module name in front of the signal names.

---

**Note**

The timebase given here is independent from the K-bus cycle time. The K-bus cycle time depends on the number and the type of the connected terminals and may vary. The maximum cycle time on the K-bus is specified in the *Diagnostics* tab in the *Maximum cycle time* field.

If each cycle is to be recorded, iba recommends that the time base for *ibaPDA* should not be more than half the maximum cycle time. It is always the current data telegram that is captured.

---

**Configuration****Lock**

Blocks read and write access to the module configuration from other *ibaPDA* systems.

**Connection****Address**

Address or host name of the *ibaNet-E* device

**Auto enable/disable**

When this option is enabled and *ibaPDA* cannot connect to this device during the start of the acquisition then it will disable this module and start the acquisition without it. During the acquisition it will try to reconnect to the device. When it succeeds it will automatically restart the acquisition with this module enabled.

If this option is not enabled then *ibaPDA* won't start the acquisition when it cannot connect to the device.

**ibaNet-E link broken**

This property determines what happens with the outputs on the device when the *ibaNet-E* link to *ibaPDA* is broken.

Possible options:

- Outputs keep last value
- Outputs are reset to zero

**More functions****Autodetect terminals**

The connected terminals will be detected automatically



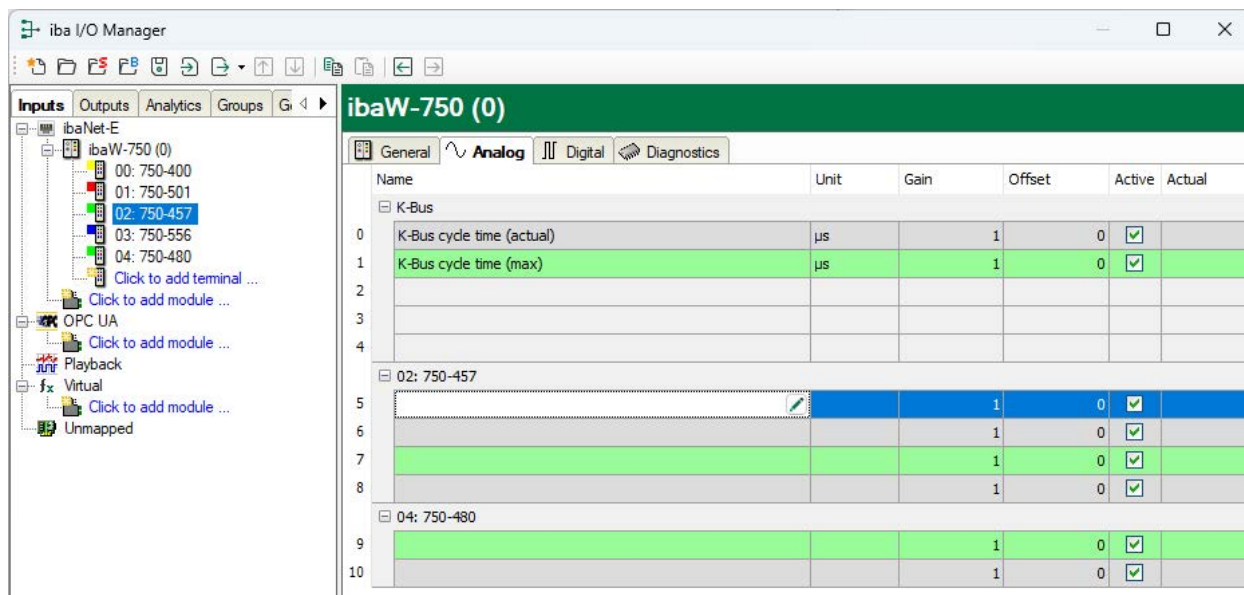
## Read configuration from device

Reads the configuration stored most recently from the device.

Modified settings are applied by clicking on <OK> or <Apply>.


### 9.3.1.2 ibaW-750 – Analog tab

The analog signal table is automatically adjusted for each terminal type. The terminals are displayed in the order in which they are added.



The signals "K-bus cycle time (actual)" and "K-bus cycle time (max.)" are available as standard and can be enabled/disabled.

#### Name

The WAGO terminal number is automatically applied. One row per channel is displayed. You can enter a signal name and additionally two comments when clicking on the  symbol in the *Name* field.

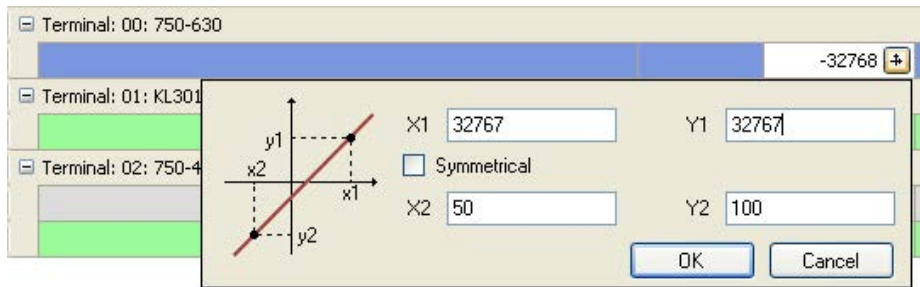
#### Unit

Here you can enter the physical unit of the analog value.

#### Gain/offset

Gradient (gain) and y-intercept (offset) of a linear equation. This allows you to convert a standardized, unit-free transmitted value into a physical value.

For making the calculation of Gain/Offset easier, an auxiliary dialog appears when clicking on the co-ordinate cross icon in the *Gain* or *Offset* field. In this dialog, you only enter two points in the line equation. *Gain* and *Offset* are then calculated automatically.



### Active

Enabling/disabling the signal

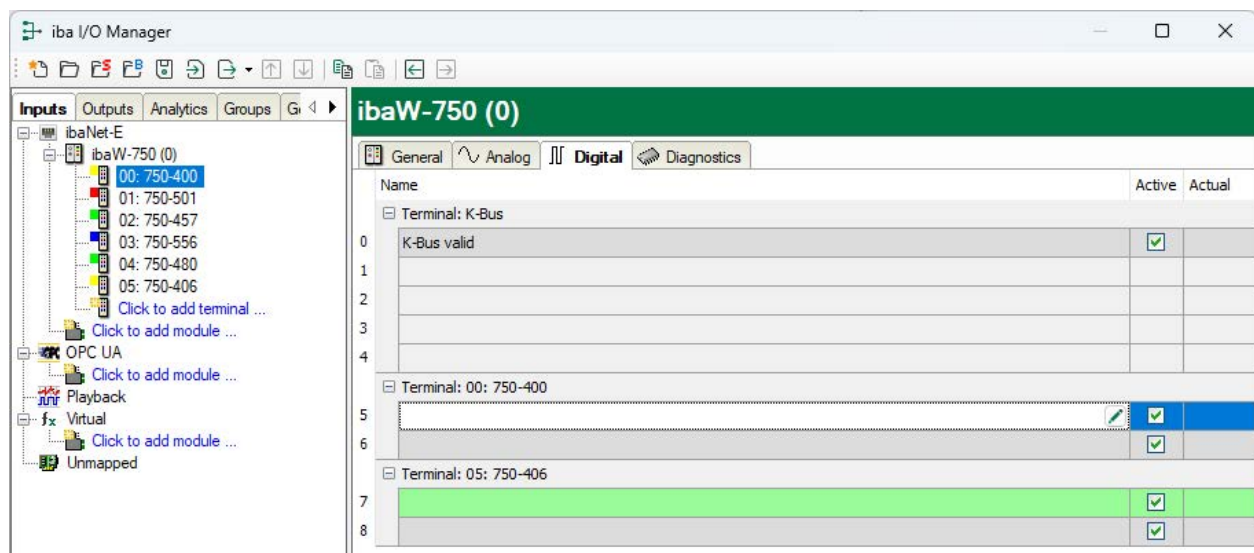
### Actual

The actual measured value is displayed here.

You can display or hide further columns using the context menu (right-click in the header line).

### 9.3.1.3 ibaW-750 – Digital tab

The digital signal table is automatically adjusted for each terminal type. The terminals are displayed in the order in which they are added.



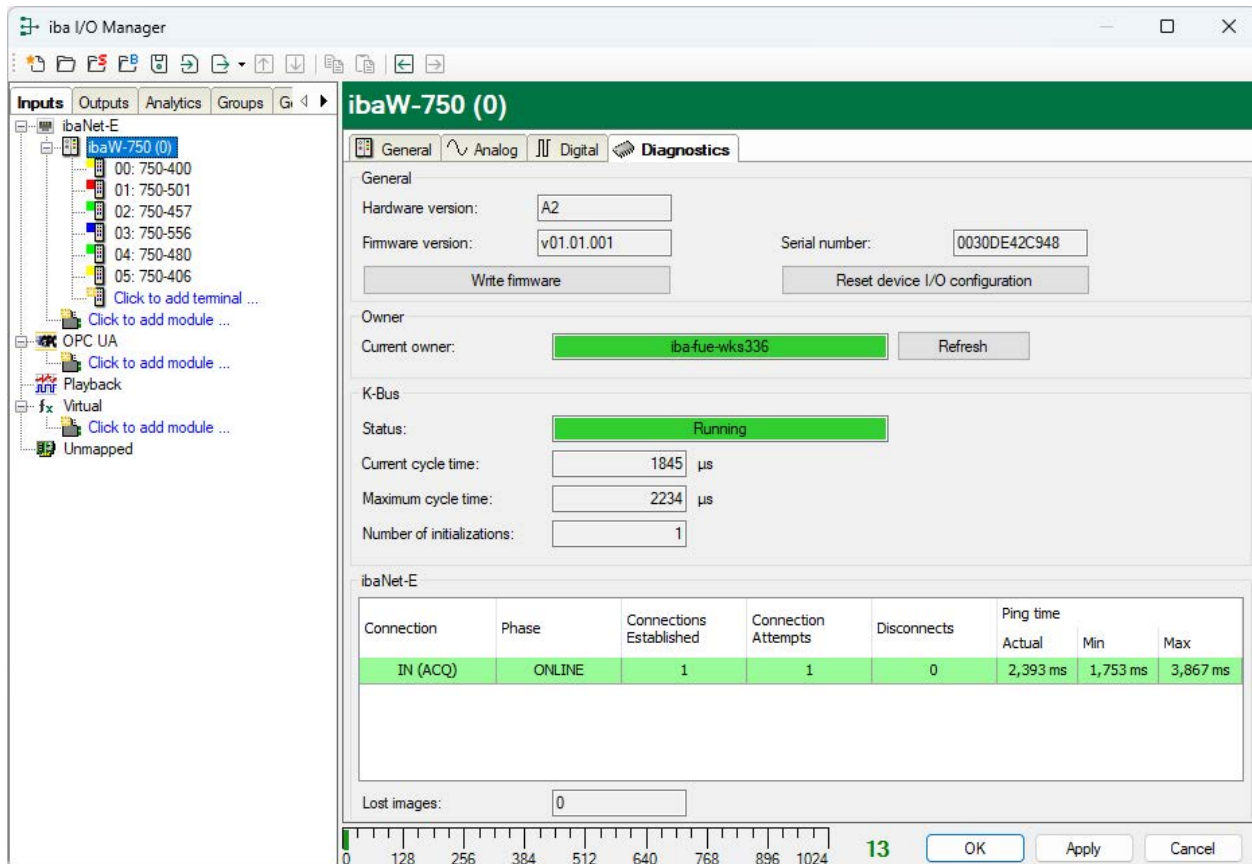
The "K bus valid" signal is available by default and can be enabled/disabled.

As long as the K-bus has been properly established and is running, this signal is "True". If a K-bus error occurs, the "K-bus valid" signal changes to "False". See also chapter [K-bus error](#), page 49.

The meaning of the columns is as in the *Analog* tab, see chapter [ibaW-750 – Analog tab](#), page 38. Here, however, the columns *Unit*, *Gain* and *Offset* are not available.

### 9.3.1.4 ibaW-750 – Diagnostics tab

The following information is displayed on the *Diagnostics* tab.



#### General

The *General* section displays the version of hardware and firmware and the serial number of the device.

#### <Write firmware>

Using the button <Write firmware>, it is possible to install firmware updates. Select the update file `w750_v[xx.yy.zzz].iba` in the browser and start the update with <OK>.

#### Note

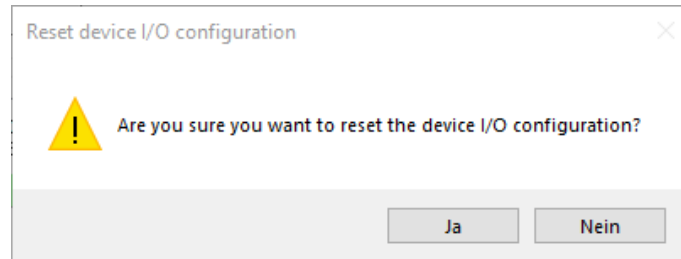


This process may take several minutes and must not be interrupted. After an update the device will be automatically rebooted.

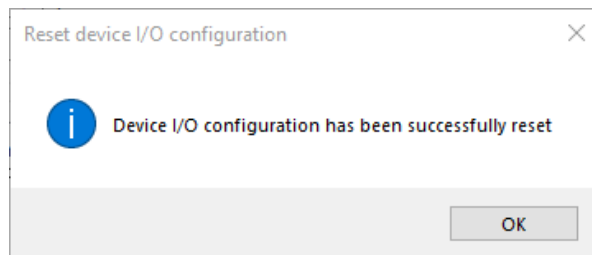
#### <Reset device I/O configuration>

The entire module configuration is reset with the <Reset device I/O configuration> button after you have confirmed the following query with <Yes>.





The following message is shown:



#### Note



The device address is not reset.

#### Owner

If a module configuration has already been carried out on the *ibaW-750* device, the last owner of this module configuration is displayed here.

After delivery or resetting to factory settings, this field is empty.

The owner corresponds to the computer name on which *ibaPDA* is installed and from which this *ibaW-750* device was last configured.

The <Refresh> button can be used to call up the current owner of the module configuration from the device at any time.

Meaning of the colors:

<b>Green</b>	The <i>ibaPDA</i> system that is currently accessing it is the owner
<b>Orange</b>	Another <i>ibaPDA</i> system is the owner, but has not locked the module configuration
<b>Red</b>	Another <i>ibaPDA</i> system is the owner and has locked the module configuration

#### K-bus

##### Status

- Running (K-bus acquisition is running)
- I/O error (K-bus interrupted)
- Configuration error (The device configuration is different from the connected terminals)

**Current cycle time**

Current sampling time

**Maximum cycle time**

Maximum sampling time

**Number of initializations**

Number of K-bus initializations

**ibaNet-E****Connection**Direction and type of the *ibaNet-E* connection**Phase:***ibaNet-E* phase of the connection**Connections established**

Number of connections established since the start of acquisition

**Connection attempts**

Number of connection attempts since the start of acquisition

**Disconnects**

Number of connection interruptions since the start of acquisition

**Ping time**

Separately measured response time for evaluating the connection quality

**Lost images**

Number of lost I/O images that were created for the sampling clock

Depending on the *ibaNet-E* phase of the connection it can be highlighted with different colors:**Orange** The connection is "online", but the Ethernet connection quality is not optimal

ibaNet-E							
Connection	Phase	Connections Established	Connection Attempts	Disconnects	Ping time		
					Actual	Min	Max
IN (ACQ)	ONLINE	1	1	0	25,108 ms	2,384 ms	88,354 ms

**Red** During the *ibaNet-E* phases "WAIT" (phase during connection establishment) and "WAIT\_SYNCRESP" (phase during connection interruption)

ibaNet-E							
Connection	Phase	Connections Established	Connection Attempts	Disconnects	Ping time		
					Actual	Min	Max
IN (ACQ)	WAIT	5	1	5	7,252 ms	2,347 ms	26,804 ms

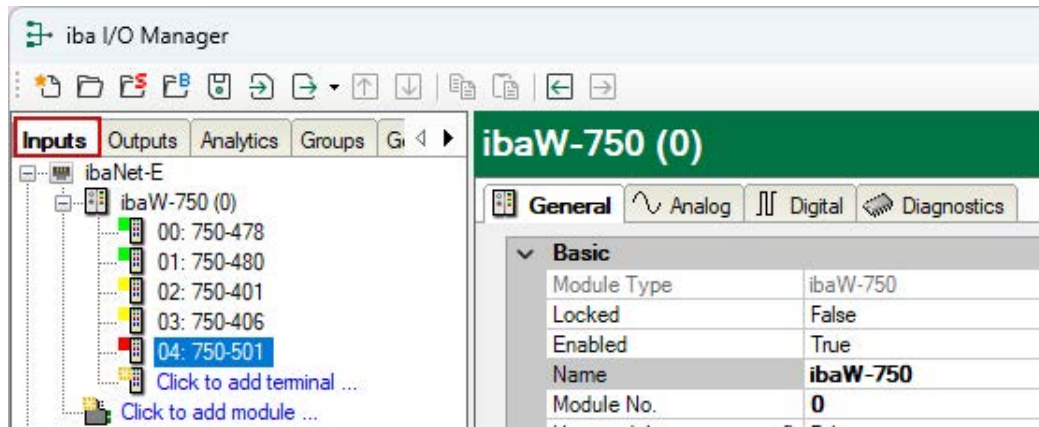
  

ibaNet-E							
Connection	Phase	Connections Established	Connection Attempts	Disconnects	Ping time		
					Actual	Min	Max
IN (ACQ)	WAIT_SYNCRESP	1	0	1	0,000 ms	0,000 ms	0,000 ms

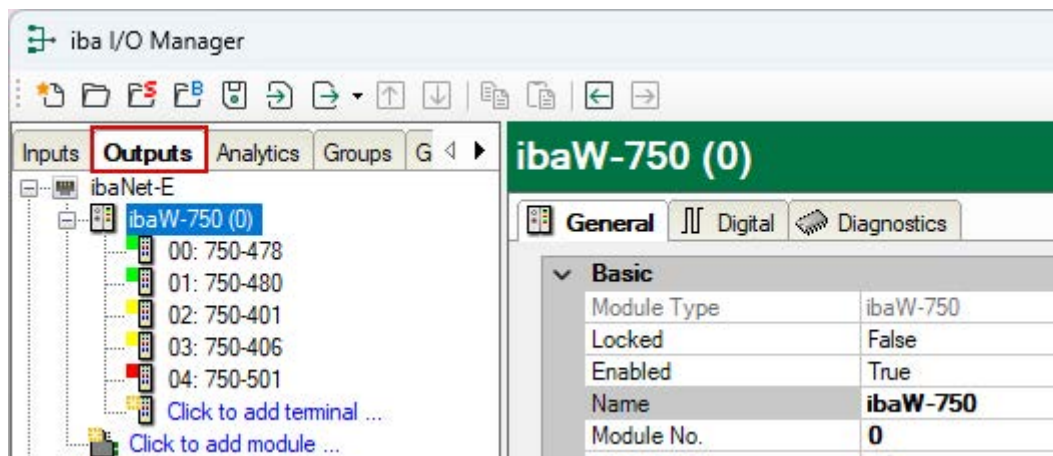
### 9.3.2 ibaW-750 - Outputs

All terminals that you have either automatically detected or manually added on the input side (*Inputs* tab) are also displayed on the output side (under *Outputs*).

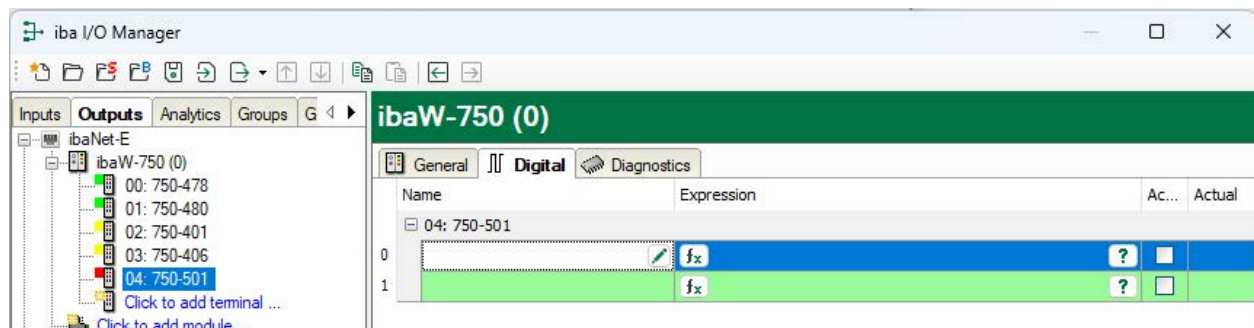
An *Analog* and a *Digital* tab are automatically adjusted for the analog and digital output terminals.



At the same time, the *ibaW-750* device module is displayed in the *Outputs* tab on the corresponding link:



The digital signals are listed in the *Digital* tab and the analog signals are listed in the *Analog* tab. For each signal you can specify an expression using the expression builder.



Note



If the *ibaNet-E* connection to the *ibaW-750* device is interrupted, the output signals behave according to the set property *ibaNet-E connection interrupted* in the *General* tab.

9.3.3 ibaNet-E Diagnostics

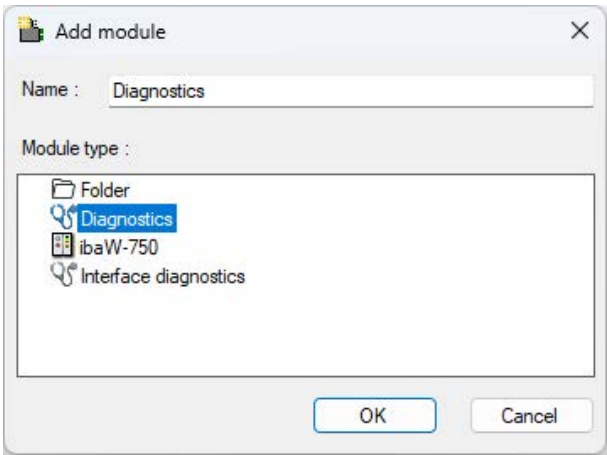
With the *Diagnostics* module at *ibaW-750* level, information about the *ibaNet-E* connection can be recorded as signals.

9.3.3.1 Add and assign diagnostic module

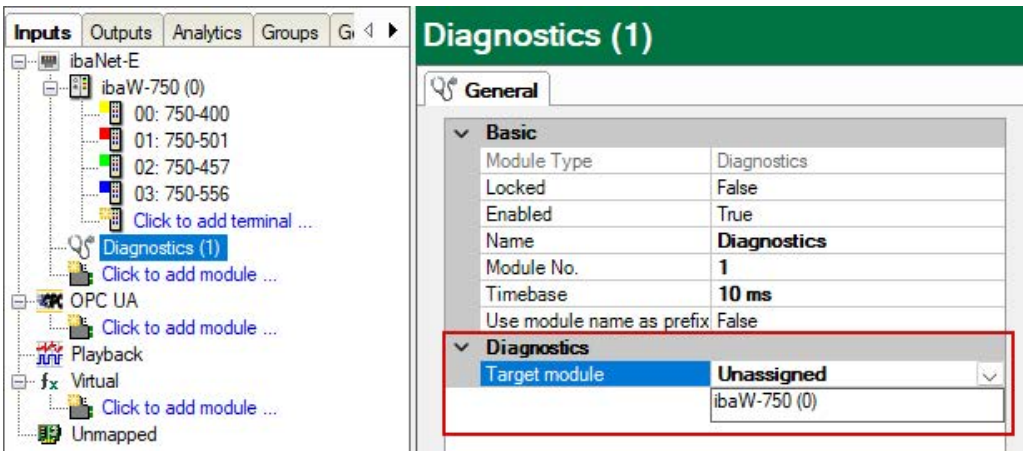
A diagnostic module becomes active only after assignment to an *ibaW-750* module and provides its connection information. By using a diagnostic module you can record and analyze the diagnostic information continuously in the *ibaPDA* system.

Diagnostic modules do not consume any license connections, since they do not establish their own connection, but refer to another module.

To add a diagnostic module, select the module type "Diagnostic" in the dialog *Add module*.

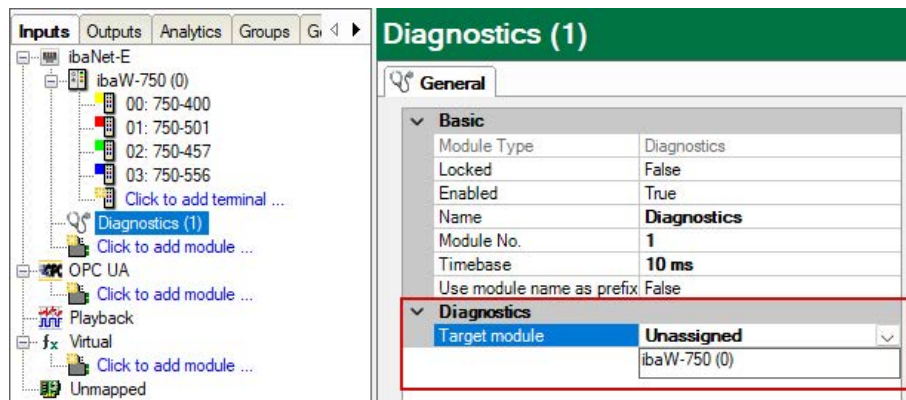


The target module is then assigned.



### 9.3.3.2 Diagnostics module – General tab

After the assignment, the following settings can be made in the *General* tab:



#### Basic settings

##### Module Type (information only)

Indicates the type of the current module.

##### Locked

You can lock a module to avoid unintentional or unauthorized changing of the module settings.

##### Enabled

Enable the module to record signals.

##### Name

You can enter a name for the module here.

##### Comment

You can enter a comment or description of the module here. This will be displayed as a tooltip in the signal tree.

##### Module No.

This internal reference number of the module determines the order of the modules in the signal tree of *ibaPDA* client and *ibaAnalyzer*.

##### Timebase

All signals of the module are sampled on this timebase.

##### Use module name as prefix

This option puts the module name in front of the signal names.


#### Diagnostics

##### Target module

By selecting the target module, you assign the diagnostic module to the module on which you want to acquire information about the connection.

### 9.3.3.3 Diagnostic signals

After assignment, the available diagnostic signals are automatically added to the *Analog* and *Digital* tabs.

ibaW-750 Diagnostics (1)						
<div>  General            Analog            Digital         </div>						
Name	Unit	Gain	Offset	Active	Actual	
0 Messages received since configuration		1	0	<input checked="" type="checkbox"/>	0	
1 Messages sent since configuration		1	0	<input checked="" type="checkbox"/>	0	
2 Messages received since connection start		1	0	<input checked="" type="checkbox"/>	0	
3 Messages sent since connection start		1	0	<input checked="" type="checkbox"/>	0	
4 Connection attempts (in)		1	0	<input checked="" type="checkbox"/>	0	
5 Connection attempts (out)		1	0	<input checked="" type="checkbox"/>	0	
6 Connections established (in)		1	0	<input checked="" type="checkbox"/>	0	
7 Connections established (out)		1	0	<input checked="" type="checkbox"/>	0	
8 Disconnects (in)		1	0	<input checked="" type="checkbox"/>	0	
9 Disconnects (out)		1	0	<input checked="" type="checkbox"/>	0	
10 Retransmission requests		1	0	<input checked="" type="checkbox"/>	0	
11 Connection phase (in)		1	0	<input checked="" type="checkbox"/>	0	
12 Connection phase (out)		1	0	<input checked="" type="checkbox"/>	0	
13 Ping time (actual)	ms	1	0	<input checked="" type="checkbox"/>	0 ms	
14 Time offset (actual)	ms	1	0	<input checked="" type="checkbox"/>	0 ms	
15 Lost images		1	0	<input checked="" type="checkbox"/>	0	
16 Duplicated images		1	0	<input checked="" type="checkbox"/>	0	
17 Discarded images		1	0	<input checked="" type="checkbox"/>	0	
18 Clock drift (PPB)		1	0	<input checked="" type="checkbox"/>	0	
19 Clock drift (deviation average)	ns	1	0	<input checked="" type="checkbox"/>	0 ns	
20 Clock drift (PI output)		1	0	<input checked="" type="checkbox"/>	0	
21 Clock drift (PI limit counter)		1	0	<input checked="" type="checkbox"/>	0	
22 Sender time difference	s	1	0	<input checked="" type="checkbox"/>	0 s	
23 Calculated time difference	s	1	0	<input checked="" type="checkbox"/>	0 s	
24 Image counter		1	0	<input checked="" type="checkbox"/>	0	

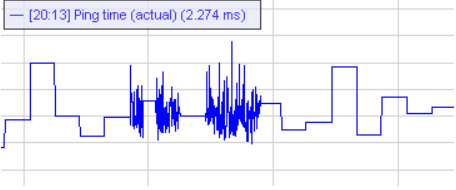
ibaW-750 Diagnostics (1)			
<div>  General            Analog            Digital         </div>			
Name	Active	Actual	
0 Synchronization	<input checked="" type="checkbox"/>	0	
1 Connected (in)	<input checked="" type="checkbox"/>	0	
2 Connected (out)	<input checked="" type="checkbox"/>	0	

The signals are all enabled by default.



**Analog diagnostic signals**

Signal name	Description
Messages received since configuration	Number of received data telegrams (in) since start of acquisition
Messages sent since configuration	Number of sent data telegrams (out) since start of acquisition
Messages received since connection start	Number of received data telegrams (in) since the start of the last connection setup Reset with each connection loss.
Messages sent since connection start	Number of sent data telegrams (out) since the start of the last connection setup Reset with each connection loss.
Connection attempts (in)	Number of attempts to establish the receive connection (in)
Connection attempts (out):	Number of attempts to establish the send connection (out)
Connections established (in)	Number of currently valid data connections for reception (in)
Connections established (out)	Number of currently valid data connections for sending (out)
Disconnects (in)	Number of currently interrupted data connections for reception (in)
Disconnects (out)	Number of currently interrupted data connections for sending (out)
Retransmission requests	Number of data telegrams requested again (in) in case of loss or delay
Connection phase (in)	Status of the ibaNet-E data connection for reception (in)
Connection phase (out)	Status of the ibaNet-E data connection for sending (out)

Signal name	Description
Ping time (actual)	<p>A feature of the connection quality for the Ethernet:</p> <p>In regular operation, a ping to the ibaNet-E device is performed every one second and the measured time is displayed here.</p> <p>The shorter this time is, the better the connection quality and the more reliable the data transmission.</p> <p>For the synchronization at the start of the acquisition and sporadically during the acquisition, this ping is performed at a much higher frequency.</p> 
Time offset (actual)	Measured time difference of synchronicity between <i>ibaPDA</i> and the ibaNet-E device
Lost images	Number of lost images (in) that were not received even after a retransmission

### Digital diagnostic signals

Signal name	Description
Synchronization	<p>The device is synchronized for isochronous acquisition.</p> <p>This is always mandatory at the start of data acquisition, but can also be performed sporadically during data acquisition.</p>
Connected (in)	A valid data connection for the reception (in) is available.
Connected (out)	A valid data connection for sending (out) is available.



## 9.4 Troubleshooting

In the following you will find help on possible errors when using *ibaW-750*. If you have any further questions, please contact the iba support.

### 9.4.1 K-bus error

A K-bus error usually occurs in the following cases:

- The bus is not terminated via the end terminal.
- A terminal within the system has a damage and the K-bus cannot be operated properly.

---

#### Note



Please note that you should always restart the system once or again after each K-bus troubleshooting operation.

---

If a K-bus error occurs during the configuration, *ibaPDA* issues an error:

"K-Bus error: No modules found"

### 9.4.2 Configuration error

During the configuration phase, various errors or messages can be displayed in *ibaPDA*, such as "Configured module not found: Module No <X> (Slot <X-1>) not connected"

The *ibaPDA* configuration does not match the actual configuration of the system. A difference has been detected at position "X". The difference detected first is always displayed. If there are several differences between the *ibaPDA* configuration and the system, only the first one detected will be displayed.

---

#### Note



Please note that the *ibaW-750* device only reads out the terminal configuration once during start-up. All subsequent changes during terminal removal can only be recognized by the *ibaW-750* device when it is restarted.

However, a terminal modification at runtime also causes a K-bus error. The system should always be restarted after such an error. See the note in chapter [↗ K-bus error, page 49](#).

---

## 10 Terminal types

There are 5 different terminal types:

- Digital I/O terminals
- Analog I/O terminals
- Complex terminals that generate multiple I/O and calculated signals for data and status
- Configurable terminals which have to be configured before use
- Miscellaneous terminals such as end terminals and terminals that do not provide I/O or status signals and are therefore usually not displayed in *ibaPDA*.

### Other documentation



This documentation describes only the properties of the WAGO devices which are relevant for iba systems integration.

For a detailed description of the single WAGO terminals with information on pin assignment, data format and A/D conversion, please refer to the original WAGO documentation.

Data sheets and documentations for WAGO components are available for download at [www.wago.com](http://www.wago.com).

### 10.1 Supported terminals

*ibaPDA* currently supports the following terminals from WAGO and Beckhoff. Further terminals may have been added in later firmware versions. Terminals available from iba AG are listed with the iba order number.

Manufacturer	Original order no.	iba order no.	Description
<b>Digital inputs</b>			
WAGO	750-1400		16 Channel Digital Input Terminal; 24 V DC; 3 ms; Positive Switching
WAGO	750-1405		16 Channel Digital Input Terminal; 24 V DC; 3 ms; Positive Switching
WAGO	750-1406		16 Channel Digital Input Terminal; 24 V DC; 0.2 ms; Positive Switching
WAGO	750-400	15.144000	2 Channel Digital Input Terminal; 24 V DC; 3 ms; Positive Switching
WAGO	750-401	15.144010	2 Channel Digital Input Terminal; 24 V DC; 0.2 ms; Positive Switching
WAGO	750-402	15.144020	4 Channel Digital Input Terminal; 24 V DC; 3 ms; Positive Switching

Manufacturer	Original order no.	iba order no.	Description
WAGO	750-402/ 025-000	15.144021	4 Channel Digital Input Terminal; 24 V DC; 3 ms; Positive Switching, extended temperature range
WAGO	750-403	15.144030	4 Channel Digital Input Terminal; 24 V DC; 0.2 ms; Positive Switching
WAGO	750-405	15.144050	2 Channel Digital Input Terminal; 230 V AC; 10 ms; Positive Switching
WAGO	750-406	15.144060	2 Channel Digital Input Terminal; 120 V AC; 10 ms; Positive Switching
WAGO	750-408	15.144080	4 Channel Digital Input Terminal; 24 V DC; 3 ms; Negative Switching
WAGO	750-409		4 Channel Digital Input Terminal; 24 V DC; 0.2 ms; Negative Switching
WAGO	750-410	15.144100	2 Channel Digital Input Terminal; 24 V DC; 3 ms; Positive Switching; 2-wire Proximity Sensor
WAGO	750-411		2 Channel Digital Input Terminal; 24 V DC; 0.2 ms; Positive Switching; 2-wire Proximity Sensor
WAGO	750-412	15.144120	2 Channel Digital Input Terminal; 48 V DC; 3 ms; Positive Switching
WAGO	750-414		4 Channel Digital Input Terminal; 5 V DC; 0.2 ms; Positive Switching
WAGO	750-415	15.144150	4 Channel Digital Input Terminal; 24 V (AC/DC); 20 ms; Negative Switching
WAGO	750-427		2 Channel Digital Input Terminal; 110 V DC; 3 ms; Positive/Negative Switching
WAGO	750-428		4 Channel Digital Input Terminal; 42 V (AC/DC); 20 ms; Positive Switching
WAGO	750-430	15.144300	8 Channel Digital Input Terminal; 24 V DC; 3 ms; Positive Switching
WAGO	750-431	15.144310	8 Channel Digital Input Terminal; 24 V DC; 0.2 ms; Positive Switching
WAGO	753-434		8 Channel Digital Input Terminal; 5/12 V DC; 0.2 ms; Positive Switching
Beckhoff	KL1408		8 Channel Digital Input Terminal; 24 V DC; 3 ms; Positive Switching
Beckhoff	KM1002		16 Channel Digital Input Terminal; 24 V DC; 3 ms; Positive Switching
Beckhoff	KM1004		32 Channel Digital Input Terminal; 24 V DC; 3 ms; Positive Switching
Beckhoff	KM1008		64 Channel Digital Input Terminal; 24 V DC; 3 ms; Positive Switching

Manufacturer	Original order no.	iba order no.	Description
Beckhoff	KM1012		16 Channel Digital Input Terminal; 24 V DC; 0.2 ms; Positive Switching
Beckhoff	KM1014		32 Channel Digital Input Terminal; 24 V DC; 0.2 ms; Positive Switching
Beckhoff	KM1018		64 Channel Digital Input Terminal; 24 V DC; 0.2 ms; Positive Switching
<b>Digital outputs</b>			
WAGO	750-1500		16 Channel Digital Output Terminal; 24 V DC; 0.5 A; 1 kHz; Positive Switching; Ribbon cable
WAGO	750-1504		16 Channel Digital Output Terminal; 24 V DC; 0.5 A; 1 kHz; Positive Switching
WAGO	750-501	15.145010	2 Channel Digital Output Terminal; 24 V DC; 0.5 A; 5 kHz; Positive Switching
WAGO	750-502	15.145020	2 Channel Digital Output Terminal; 24 V DC; 2 A; 2.5 kHz; Positive Switching
WAGO	750-504	15.145040	4 Channel Digital Output Terminal; 24 V DC; 0.5 A; 1 kHz; Positive Switching
WAGO	750-506		2 Channel Digital Output Terminal; 24 V DC; 0.5 A; 5 kHz; Positive Switching; Diag
WAGO	750-507	15.145070	2 Channel Digital Output Terminal; 24 V DC; 2 A; 2.5 kHz; Positive Switching; Diag
WAGO	750-508		2 Channel Digital Output Terminal; 24 V DC; 2 A; 1 kHz; Positive Switching; Diag
WAGO	750-512	15.145120	2 Channel Digital Output Terminal; Relay; make contacts; 250 V AC / 30 V DC; 2 A; non-floating
WAGO	750-513	15.145130	2 Channel Digital Output Terminal; Relay; make contacts; 250 V AC / 30 V DC; 2 A; isolated outputs
WAGO	750-514	15.145140	2 Channel Digital Output Terminal; Relay; changeover contacts; 125 V AC / 30 V DC; 0.5 A / 1 A; 0.33 Hz; isolated outputs
WAGO	750-517	15.145170	2 Channel Digital Output Terminal; Relay; changeover contacts; 250 V AC / 300 V DC; 1 A / 0.15 A; 0.1 Hz; isolated outputs
WAGO	750-530	15.145300	8 Channel Digital Output Terminal; 24 V DC; 0.5 A; 2 kHz; Positive Switching
WAGO	750-531		4 Channel Digital Output Terminal; 24 V DC; 0.5 A; 1 kHz; Positive Switching
WAGO	750-532		4 Channel Digital Output Terminal; 24 V DC; 0.5 A; 2 kHz; Positive Switching; Diag
WAGO	750-537		8 Channel Digital Output Terminal; 24 V DC; 0.5 A; 1 kHz; Positive Switching; Diag

Manufacturer	Original order no.	iba order no.	Description
Beckhoff	KL2408		8 Channel Digital Output Terminal; 24 V DC; 0.5 A; Positive Switching
Beckhoff	KM2002		16 Channel Digital Output Terminal; 24 V DC; 0.5 A; Positive Switching
Beckhoff	KM2004		32 Channel Digital Output Terminal; 24 V DC; 0.5 A; Positive Switching
Beckhoff	KM2008		64 Channel Digital Output Terminal; 24 V DC; 0.5 A; Positive Switching
<b>Digital inputs and outputs</b>			
WAGO	750-1506		8 Channel Digital Input/Output Terminal; 24 V DC; 0.5 A; 3 ms; 1 kHz; Positive Switching
<b>Analog inputs</b>			
WAGO	750-452	15.144520	2 Channel Analog Input Terminal; 0 ... 20 mA; Differential Input; 220 Ω; 12 Bit; 2 ms
WAGO	750-453	15.144530	4 Channel Analog Input Terminal; 0 ... 20 mA; Single Ended; 100 Ω; 12 Bit; 10 ms
WAGO	750-454	15.144540	2 Channel Analog Input Terminal; 4 ... 20 mA; Differential Input; 220 Ω; 12 Bit; 2 ms
WAGO	750-455	15.144550	4 Channel Analog Input Terminal; 4 ... 20 mA; Single Ended; 100 Ω; 12 Bit; 10 ms
WAGO	750-456	15.144560	2 Channel Analog Input Terminal; ±10 V; Differential Input; 570 kΩ; 12 Bit; 2 ms
WAGO	750-457	15.144570	4 Channel Analog Input Terminal; ±10 V; Single Ended; 100 kΩ; 12 Bit; 10 ms
WAGO	750-459		4 Channel Analog Input Terminal; 0 ... 10 V; Single Ended; 100 kΩ; 12 Bit; 10 ms
WAGO	750-460	15.144600	4 Channel Analog Input Terminal; RTD; PT100; 2-wire; Res. 0.1 °C; 250 ms
WAGO	750-460/ 000-003	15.144603	4 Channel Analog Input Terminal; RTD; PT1000; 2-wire; Res. 0.1 °C; 250 ms
WAGO	750-461	15.144610	2 Channel Analog Input Terminal; RTD; PT100; 3-wire; Res. 0.1 °C; 320 ms
WAGO	750-461/ 000-003	15.144613	2 Channel Analog Input Terminal; RTD; PT1000; 3-wire; Res. 0.1 °C; 320 ms
WAGO	750-465	15.144650	2 Channel Analog Input Terminal; 0 ... 20 mA; Single Ended; 220 Ω; 12 Bit; 2 ms
WAGO	750-466	15.144660	2 Channel Analog Input Terminal; 4 ... 20 mA; Single Ended; 220 Ω; 12 Bit; 2 ms
WAGO	750-467	15.144670	2 Channel Analog Input Terminal; 0 ... 10 V; Single Ended; 130 kΩ; 12 Bit; 2 ms

Manufacturer	Original order no.	iba order no.	Description
WAGO	750-468		4 Channel Analog Input Terminal; 0 ... 10 V; Single Ended; 133 k $\Omega$ ; 12 Bit; 4 ms
WAGO	750-469	15.144690	2 Channel Analog Input Terminal; Thermocouple, Type K; 2-wire; Res. 0.1 °C; 320 ms; Diag
WAGO	750-469/ 000-006	15.144696	2 Channel Analog Input Terminal; Thermocouple, Type J; 2-wire; Res. 0.1 °C; 320 ms; Diag
WAGO	750-472		2 Channel Analog Input Terminal; 0 ... 20 mA; Single Ended; 220 $\Omega$ ; 15 Bit; 80 ms
WAGO	750-473		2 Channel Analog Input Terminal; 4 ... 20 mA; Single Ended; 160 $\Omega$ ; 12 Bit; 80 ms
WAGO	750-474		2 Channel Analog Input Terminal; 4 ... 20 mA; Single Ended; 220 $\Omega$ ; 15 Bit; 80 ms
WAGO	750-475	15.144750	2 Channel Analog Input Terminal; 0 ... 1 A (AC/DC); Differential Input; 22 m $\Omega$ ; 15 Bit; 200 ms
WAGO	750-476		2 Channel Analog Input Terminal; $\pm 10$ V; Single Ended; 130 k $\Omega$ ; 16 Bit; 80 ms
WAGO	750-477		2 Channel Analog Input Terminal; 0 ... 10 V (AC/DC); Differential Input; 120 k $\Omega$ ; 15 Bit; 200 ms
WAGO	750-478		2 Channel Analog Input Terminal; 0 ... 10 V; Single Ended; 130 k $\Omega$ ; 16 Bit; 80 ms
WAGO	750-479	15.144790	2 Channel Analog Input Terminal; $\pm 10$ V; Differential Input; 1 M $\Omega$ ; 14 Bit; SAR 1 ms
WAGO	750-480		2 Channel Analog Input Terminal; 0 ... 20 mA; Differential Input; 270 $\Omega$ ; 13 Bit; SAR 1 ms
WAGO	750-483		2 Channel Analog Input Terminal; 0 ... 30 V; Differential Input; 1 M $\Omega$ ; 14 Bit; SAR 1 ms
WAGO	750-491	15.144910	1 Channel Analog Input Terminal; DMS (Resistance Jumpers); 16 Bit; 500 ms
WAGO	750-491/ 000-001	15.144911	1 Channel Analog Input Terminal; DMS (Resistance Jumpers); 16 Bit; 125 ms
WAGO	750-492		2 Channel Analog Input Terminal; 4 ... 20 mA; Differential Input; 270 $\Omega$ ; 13 Bit; SAR 1 ms
Beckhoff	KL3001		1 Channel Analog Input Terminal; $\pm 10$ V; Differential Input; >200 k $\Omega$ ; 12 Bit; 1 ms
Beckhoff	KL3002		2 Channel Analog Input Terminal; $\pm 10$ V; Differential Input; >200 k $\Omega$ ; 12 Bit; 2 ms
Beckhoff	KL3011		1 Channel Analog Input Terminal; 0 ... 20 mA; Differential Input; 80 $\Omega$ ; 12 Bit; 1 ms
Beckhoff	KL3012		2 Channel Analog Input Terminal; 0 ... 20 mA; Differential Input; 80 $\Omega$ ; 12 Bit; 2 ms

Manufacturer	Original order no.	iba order no.	Description
Beckhoff	KL3021		1 Channel Analog Input Terminal; 4 ... 20 mA; Differential Input; 80 Ω; 12 Bit; 1 ms
Beckhoff	KL3022		2 Channel Analog Input Terminal; 4 ... 20 mA; Differential Input; 80 Ω; 12 Bit; 2 ms
Beckhoff	KL3041		1 Channel Analog Input Terminal; 0 ... 20 mA; Single Ended; 80 Ω; 12 Bit; 1 ms
Beckhoff	KL3042		2 Channel Analog Input Terminal; 0 ... 20 mA; Single Ended; 80 Ω; 12 Bit; 2 ms
Beckhoff	KL3044		4 Channel Analog Input Terminal; 0 ... 20 mA; Single Ended; 80 Ω; 12 Bit; 4 ms
Beckhoff	KL3051		1 Channel Analog Input Terminal; 4 ... 20 mA; Single Ended; 80 Ω; 12 Bit; 1 ms
Beckhoff	KL3052		2 Channel Analog Input Terminal; 4 ... 20 mA; Single Ended; 80 Ω; 12 Bit; 2 ms
Beckhoff	KL3054		4 Channel Analog Input Terminal; 4 ... 20 mA; Single Ended; 80 Ω; 12 Bit; 4 ms
Beckhoff	KL3061		1 Channel Analog Input Terminal; 0 ... 10 V; Single Ended; >200 kΩ; 12 Bit; 1 ms
Beckhoff	KL3062		2 Channel Analog Input Terminal; 0 ... 10 V; Single Ended; >200 kΩ; 12 Bit; 2 ms
Beckhoff	KL3064		4 Channel Analog Input Terminal; 0 ... 10 V; Single Ended; >200 kΩ; 12 Bit; 4 ms
Beckhoff	KL3102		2 Channel Analog Input Terminal; ±10 V; Differential Input; >200 kΩ; 16 Bit; 140 ms; 50 Hz
Beckhoff	KL3112		2 Channel Analog Input Terminal; 0 ... 20 mA; Differential Input; 50/60 Ω; 15 Bit; 140 ms; 50 Hz
Beckhoff	KL3122		2 Channel Analog Input Terminal; 4 ... 20 mA; Differential Input; 50/60 Ω; 15 Bit; 140 ms; 50 Hz
Beckhoff	KL3201		1 Channel Analog Input Terminal; RTD; PT100; 3-wire; Res. 0.1 °C; 200 ms
Beckhoff	KL3202		2 Channel Analog Input Terminal; RTD; PT100; 3-wire; Res. 0.1 °C; 250 ms
Beckhoff	KL3204		4 Channel Analog Input Terminal; RTD; PT100; 2-wire; Res. 0.1 °C; 250 ms
Beckhoff	KL3311		1 Channel Analog Input Terminal; Thermocouple, Type K; 2-wire; Res. 0.1 °C; 200 ms
Beckhoff	KL3312		2 Channel Analog Input Terminal; Thermocouple, Type K; 2-wire; Res. 0.1 °C; 250 ms
Beckhoff	KL3314		4 Channel Analog Input Terminal; Thermocouple, Type K; 2-wire; Res. 0.1 °C; 250 ms



Manufacturer	Original order no.	iba order no.	Description
<b>Analog outputs</b>			
WAGO	750-550	15.145500	2 Channel Analog Output Terminal; 0 ... 10 V; Single Ended; $\geq 5 \text{ k}\Omega$ ; 12 Bit; 2 ms
WAGO	750-552	15.145520	2 Channel Analog Output Terminal; 0 ... 20 mA; Single Ended; $\leq 600 \Omega$ ; 12 Bit; 2 ms
WAGO	750-554	15.145540	2 Channel Analog Output Terminal; 4 ... 20 mA; Single Ended; $\leq 600 \Omega$ ; 12 Bit; 2 ms
WAGO	750-555	15.145550	4 Channel Analog Output Terminal; 4 ... 20 mA; Single Ended; $\leq 600 \Omega$ ; 12 Bit; 10 ms
WAGO	750-556	15.145560	2 Channel Analog Output Terminal; $\pm 10 \text{ V}$ ; Single Ended; $\geq 5 \text{ k}\Omega$ ; 12 Bit; 2 ms
WAGO	750-557	15.145570	4 Channel Analog Output Terminal; $\pm 10 \text{ V}$ ; Single Ended; $\geq 5 \text{ k}\Omega$ ; 12 Bit; 10 ms
WAGO	750-559		4 Channel Analog Output Terminal; 0 ... 10 V; Single Ended; $\geq 5 \text{ k}\Omega$ ; 12 Bit; 10 ms
WAGO	750-585		2 Channel Analog Output Terminal; 0 ... 20 mA; Single Ended; $\leq 500 \Omega$ ; 12 Bit; 2 ms; Ex i
Beckhoff	KL4001		1 Channel Analog Output Terminal; 0 ... 10 V; Single Ended; $> 5 \text{ k}\Omega$ ; 12 Bit; 1.5 ms
Beckhoff	KL4002		2 Channel Analog Output Terminal; 0 ... 10 V; Single Ended; $> 5 \text{ k}\Omega$ ; 12 Bit; 1.5 ms
Beckhoff	KL4004		4 Channel Analog Output Terminal; 0 ... 10 V; Single Ended; $> 5 \text{ k}\Omega$ ; 12 Bit; 2 ms
Beckhoff	KL4011		1 Channel Analog Output Terminal; 0 ... 20 mA; Single Ended; $< 500 \Omega$ ; 12 Bit; 1.5 ms
Beckhoff	KL4012		2 Channel Analog Output Terminal; 0 ... 20 mA; Single Ended; $< 500 \Omega$ ; 12 Bit; 1.5 ms
Beckhoff	KL4021		1 Channel Analog Output Terminal; 4 ... 20 mA; Single Ended; $< 500 \Omega$ ; 12 Bit; 1.5 ms
Beckhoff	KL4022		2 Channel Analog Output Terminal; 4 ... 20 mA; Single Ended; $< 500 \Omega$ ; 12 Bit; 1.5 ms
Beckhoff	KL4031		1 Channel Analog Output Terminal; $\pm 10 \text{ V}$ ; Single Ended; $> 5 \text{ k}\Omega$ ; 12 Bit; 1.5 ms
Beckhoff	KL4032		2 Channel Analog Output Terminal; $\pm 10 \text{ V}$ ; Single Ended; $> 5 \text{ k}\Omega$ ; 12 Bit; 1.5 ms
Beckhoff	KL4034		4 Channel Analog Output Terminal; $\pm 10 \text{ V}$ ; Single Ended; $> 5 \text{ k}\Omega$ ; 12 Bit; 2 ms
Beckhoff	KL4112		2 Channel Analog Output Terminal; 0 ... 20 mA; Single Ended; $< 500 \Omega$ ; 15 Bit; 3.5 ms
Beckhoff	KL4132		2 Channel Analog Output Terminal; $\pm 10 \text{ V}$ ; Single Ended; $> 5 \text{ k}\Omega$ ; 16 Bit; 1.5 ms
Beckhoff	KL4404		4 Channel Analog Output Terminal; 0 ... 10 V; Single Ended; $> 5 \text{ k}\Omega$ ; 12 Bit; 4 ms



Manufacturer	Original order no.	iba order no.	Description
<b>Complex terminals</b>			
WAGO	750-404		Up/Down Counter; 24 V DC
WAGO	750-404/ 000-001	15.144041	Up Counter; 24 V DC; Release Input
WAGO	750-404/ 000-003	15.144043	Frequency Counter; 24 V DC
WAGO	750-404/ 000-004		Up/Down Counter; 24 V DC; Switching Output
WAGO	750-630	15.146300	SSI-Interface
WAGO	750-631/ 000-004	15.146310	Incremental Encoder; 5 V DC; Differential Input; RS422; 16 Bit
WAGO	750-637	15.146370	Incremental Encoder; 24 V DC; Differential Input; RS422; 32 Bit
<b>Configurable terminals</b>			
WAGO	750-494	15.144940	3-Phase Power Measurement Module; 480 V AC / 1 A
WAGO	750-494/ 000-001	15.144941	3-Phase Power Measurement Module; 480 V AC / 5 A
WAGO	750-494/ 000-005		3-Phase Power Measurement Module; 480 V AC / ext. Shunts
WAGO	750-494/ 025-000		3-Phase Power Measurement Module; 480 V AC / 1 A; extended temperature range
WAGO	750-494/ 025-001		3-Phase Power Measurement Module; 480 V AC / 5 A; extended temperature range
WAGO	750-495	15.144950	3-Phase Power Measurement Module; 690 V AC / 1 A
WAGO	750-495/ 000-001	15.144951	3-Phase Power Measurement Module; 690 V AC / 5 A
WAGO	750-495/ 000-002		3-Phase Power Measurement Module; 690 V AC / Ro- gowski-Coils
WAGO	750-495/ 040-000		3-Phase Power Measurement Module; 690 V AC / 1 A; extended temperature range
WAGO	750-495/ 040-001		3-Phase Power Measurement Module; 690 V AC / 5 A; extended temperature range
WAGO	750-495/ 040-002		3-Phase Power Measurement Module; 690 V AC / Ro- gowski-Coils; extended temperature range
<b>Other terminals</b>			
WAGO	750-600	15.146000	End Module
WAGO	750-602	15.146020	Supply Module; Field; 24 V DC
WAGO	750-603		Supply Module; Field; 8x 24 V DC
WAGO	750-604		Supply Module; Field; 8x 0 V DC
WAGO	750-610	15.146100	Supply Module; Field; 24 V DC; Fuse Holder; Diag

Manufacturer	Original order no.	iba order no.	Description
WAGO	750-612	15.146120	Supply Module; Field; 230 V (AC/DC)
WAGO	750-613		Supply Module; System/Field; 24 V DC
WAGO	750-614	15.146140	Supply/Distribution Module; Field; 230 V (AC/DC)
WAGO	750-623		Supply Module; System/Field; 5 ... 15 V DC
WAGO	750-624		Supply/Filter Module; Field; 24 V DC
WAGO	750-627	15.146270	End Module; Bus Extension; Outgoing
WAGO	750-628	15.146280	Coupler Module; Bus Extension; Incoming/Outgoing
Beckhoff	KL9010		End Module

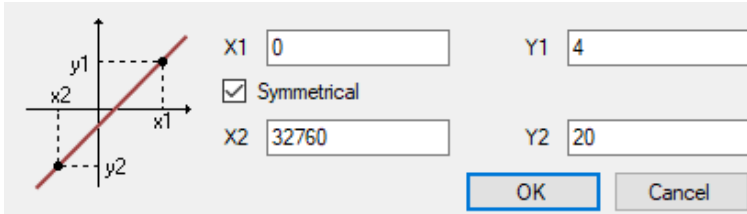
### 10.1.1 Special notes on terminals

In the following you will find specific information on special terminals.

#### 10.1.1.1 WAGO750-455

##### Scaling

The terminal 750-455 must be scaled in *ibaPDA* as follows:



The scaling dialog for WAGO750-455 shows a coordinate system with a red line passing through points (x1, y1) and (x2, y2). The input fields are as follows:

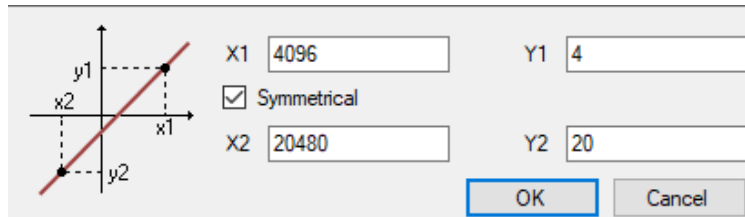
Field	Value
X1	0
Y1	4
<input checked="" type="checkbox"/> Symmetrical	
X2	32760
Y2	20

Buttons: OK, Cancel

#### 10.1.1.2 WAGO750-473

##### Scaling

The terminal 750-473 must be scaled in *ibaPDA* as follows:



The scaling dialog for WAGO750-473 shows a coordinate system with a red line passing through points (x1, y1) and (x2, y2). The input fields are as follows:

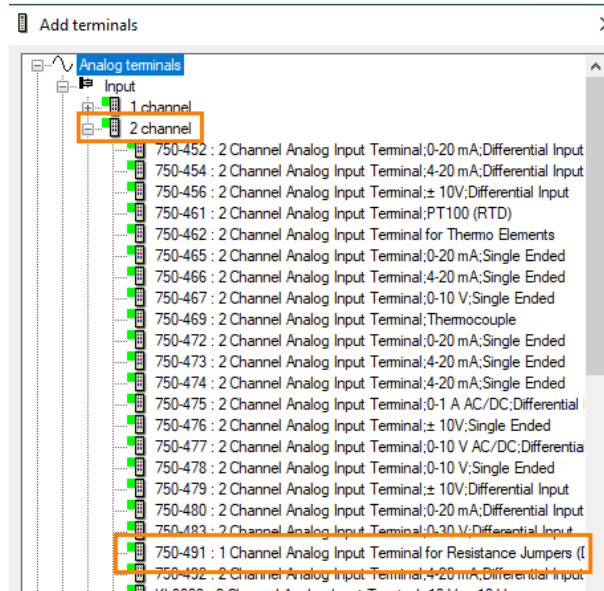
Field	Value
X1	4096
Y1	4
<input checked="" type="checkbox"/> Symmetrical	
X2	20480
Y2	20

Buttons: OK, Cancel

### 10.1.1.3 WAGO750-491

#### General

According to the manufacturer, the 750-491 terminal block is a 1-channel terminal block. However, if the terminal is added offline, it is listed in the selection dialog under the 2-channel terminals:



This is because this terminal returns two signals:

- Bridge voltage (U-D)
- Supply voltage (U-Ref)

If the terminal is detected via the Autodetect function, both signals are inserted automatically. The first signal is always U-D, the second signal is U-Ref.

Terminal: 01: 750-491

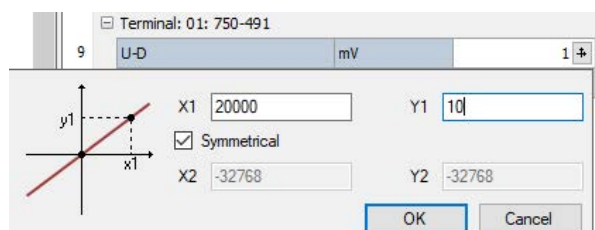
U-D		1	0	<input checked="" type="checkbox"/>
U-Ref		1	0	<input checked="" type="checkbox"/>

The actual measured value must be calculated with both signals in *ibaPDA* using a virtual signal with the following formula:

$$\frac{\text{bridge voltage}}{\text{supply voltage}}$$

#### Scaling

Both signals are assigned a measured variable of 10 when the input value is 20,000:



The bridge voltage U-D is measured in the unit "mV" and the supply voltage in the unit "V":

Name	Unit	Gain
Terminal: K-Bus		
Terminal: 00: 750-491		
U-D	mV	0,0005
U-Ref	V	0,0005

#### 10.1.1.4 WAGO750-555

##### Scaling

The outputs of terminal 750-555 can be set with the following function:

Name	Expression
00: 750-555	
Y (dec)	$f_x (X - 4) / (16 / 32767)$
	$f_x$

Y (dec) is the decimal numerical/output value that must be transferred to the terminal so that the required value in mA is output at the output. This is calculated by specifying the variable X.

X is the required value at the output in mA (4...20 mA DC). This variable must be specified.

## 10.2 Configurable terminals

### 10.2.1 3-phase power measurement terminals (WAGO-module -494/495)

3-phase power measurement terminals are used to record and measure electrical data and characteristic values of a three-phase supply network.

Before use, these terminals must be parameterized in order to adapt them to the supply network and to determine which data and characteristics are to be recorded in *ibaPDA*.

Parameterization is carried out conveniently in *ibaPDA*.

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**Note****Maximum number of power measurement terminals**

The maximum number of power measurement terminals on an ibaW-750 device is not normally restricted.

The maximum number is based on the usual bus terminal limitation and the terminal bus supply, see chapter ↗ *Main data*, page 73, and on the update times of the process data of the terminal and the measured values in *ibaPDA*.

**Inrush current**

Even if the current consumption of a power measurement terminal specified in the technical data does not indicate an undersupply of the system, it is nevertheless recommended not to use more than six power measurement terminals without an additional potential supply (with bus power supply unit, e.g. 750-613) due to the higher inrush currents of the power measurement terminals.

**The following generally applies to the update times of the measured values:**

Since the measured values are retrieved from the terminals serially via the K-bus, the update time of the measured values in *ibaPDA* depends on the number of values to be transmitted. The more values are to be transmitted, the longer the K-bus cycle time takes. See chapter ↗ *Cycle times of the K-bus*, page 65.

However, the update time also depends on the update time of the process data in the terminal. See chapter "Process data update" in the original documentation for the WAGO terminal blocks.

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**Other documentation**

For a detailed description of the single WAGO terminals with information on pin assignment, data format, measured value collection and process data update, please refer to the original WAGO documentation.

Data sheets and documentations for WAGO components are available for download at [www.wago.com](http://www.wago.com).

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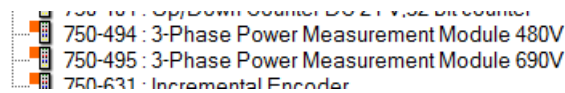
**Note****Restrictions when operating with ibaW-750**

The scope of functions is limited when operating with *ibaW-750* compared to the guaranteed scope of functions of WAGO:

- Only the measured values of the AC measured value collections are transmitted.
- Measured values of the harmonic analyses (harmonic measured values) for both terminal types, but also the DC measured values for the WAGO750-494 terminal, are omitted.

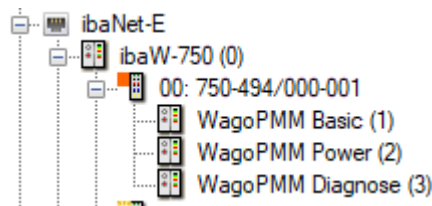
If one of the two terminals is added manually in the I/O manager, two basic types are available for selection:

- 3-Phase Power Measurement Module 480V
- 3-Phase Power Measurement Module 690V



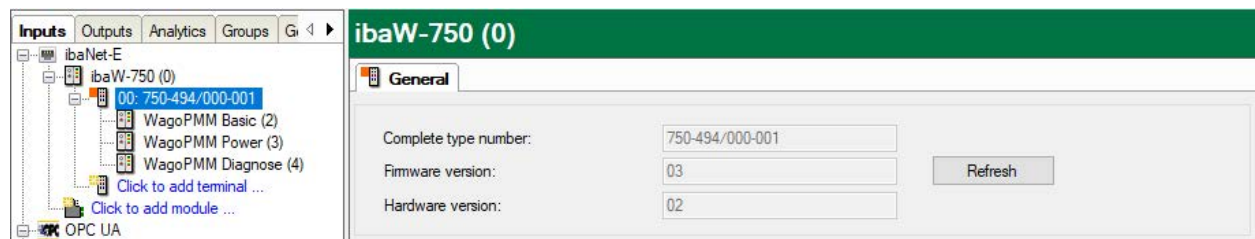
### Selection of basic types

If the terminal is detected via automatic detection or the manually added terminal is applied in the I/O Manager, the corresponding terminal type is also updated.



### Terminal in the module tree

In addition to the detection of the terminal type, the firmware and hardware versions are also detected and displayed in the *General* tab.



Via <Refresh> you can also read this information directly from the terminal at any time.

According to the detected terminal type, the input dialog is automatically adjusted.

**General**

Complete type number: 750-494/000-001  
 Firmware version: 03  
 Hardware version: 02

Reference signal: L1  
 Nominal frequency: 50 Hz

Unsupported by 750-494/000-005

Transformation ratio I1: 1  
 Transformation ratio I2: 1  
 Transformation ratio I3: 1

Undervoltage threshold: ☐ Enable U1: 200,000 U2: 200,000 U3: 200,000 V  
 Overvoltage threshold: ☒ Enable 250,000 250,000 250,000 V  
 Overcurrent threshold: ☒ Enable 5,000 5,000 5,000 A

Energy unit: Wh  
 Power unit: W - var - VA

Min/max value reset interval: ☐ Enable 0,2 s  
 Peak interval: 10 Half periods  
 Energy interval: 60 s  
 Arithmetic mean interval: 60 s

Unsupported by 750-494/000-005

No-load threshold active power: ☐ Enable 1,000 W  
 No-load threshold reactive power: ☐ Enable 1,000 var  
 No-load threshold apparent power: ☐ Enable 1,000 VA

Supported by 750-494/000-005

Shunt voltage: 60 mV

### Parameterization using the example of terminal 750-494/000-001

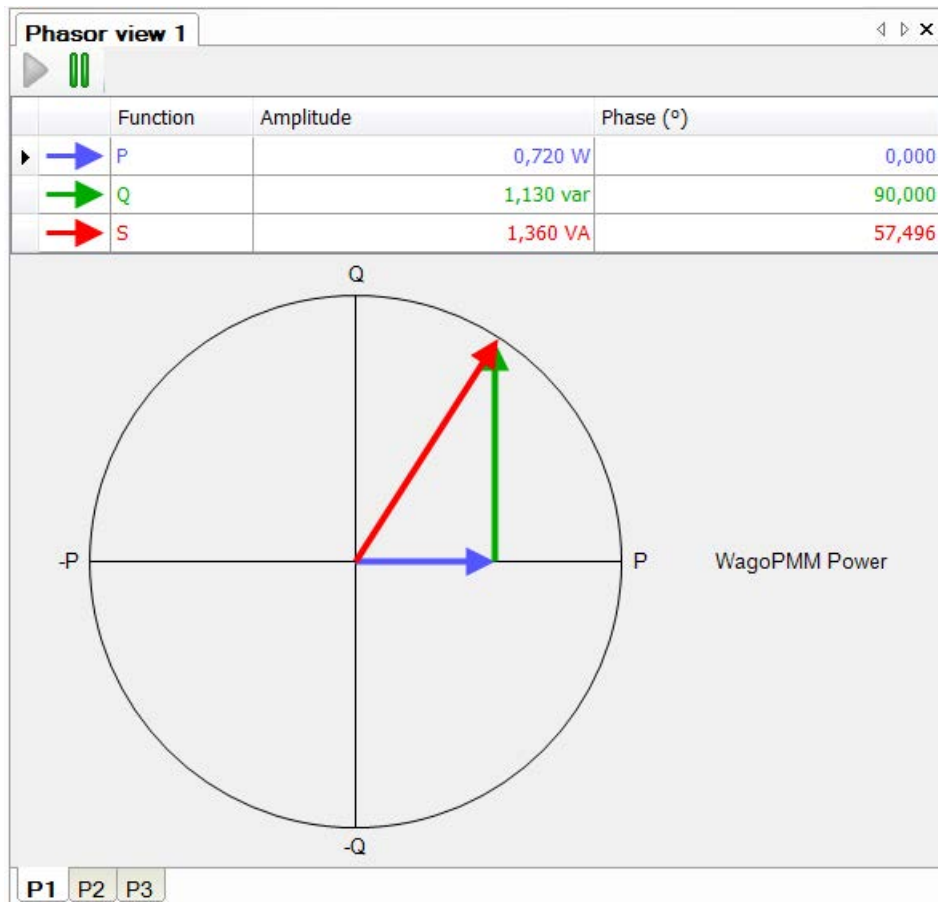
Three "WagoPMM" modules with corresponding assigned signals are available below the terminal:

**WagoPMM Basic (2)**

**Analog**

Name	Active	Actual
00: 750-494		
0 U1N RMS	<input checked="" type="checkbox"/>	
1 U2N RMS	<input checked="" type="checkbox"/>	
2 U3N RMS	<input checked="" type="checkbox"/>	
3 U1N RMS Max.	<input checked="" type="checkbox"/>	
4 U2N RMS Max.	<input checked="" type="checkbox"/>	
5 U3N RMS Max.	<input checked="" type="checkbox"/>	
6 U1N RMS Min.	<input checked="" type="checkbox"/>	
7 U2N RMS Min.	<input checked="" type="checkbox"/>	
8 U3N RMS Min.	<input checked="" type="checkbox"/>	
9 U12 RMS	<input checked="" type="checkbox"/>	

The special feature of the "WagoPMM Power" module is that it can be used for a phasor view.



### Special behavior in ibaPDA

- Due to the system, the terminal parameterization is not reset if *ibaW750* is reset to default settings.

The parameterization is stored in the terminal, even if it is switched off.

- All values of this terminal type are transmitted to *ibaPDA* in 32 bit format, regardless of the format of this value in the terminal.



# 11 Useful information about the K-bus

## 11.1 Cycle times of the K-bus

The K-bus on the *ibaW-750* device is asynchronous, i. e. independent of the *ibaNet-E* sampling rate or the time base set in the *ibaPDA*.

The K-bus cycle time depends on the number and the type of the connected terminals and may vary. Digital modules have less influence on the K-bus, analog modules have more and the complex and parameterizable modules have the greatest influence.

The current cycle time on the K-bus is measured with each cycle and is displayed on the *Diagnostics* tab in the *Current cycle time* field.

With the *ibaW-750* device, however, it should be noted that the K-bus cycle time can only be a minimum of 1 ms (1000 µs) due to the system.

Unfortunately, the cycle time cannot be calculated in advance in *ibaW-750*.

The actual K-bus cycle time can be seen in *ibaPDA* only after initial operation.

Here are some examples with measured cycle times:

### Digital terminals

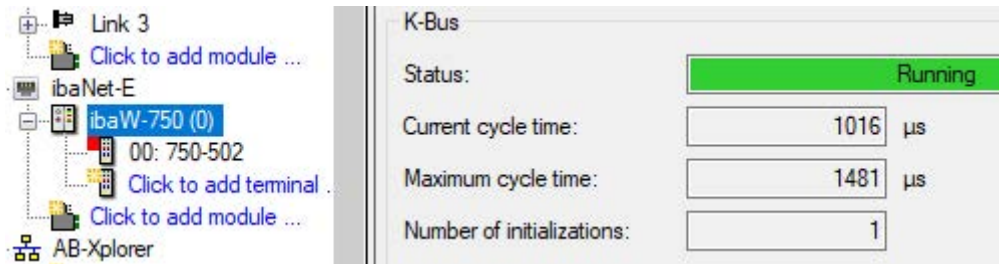
- 1 x 2-channel digital input terminal WAGO750-405

K-Bus	
Status:	Running
Current cycle time:	1000 µs
Maximum cycle time:	1298 µs
Number of initializations:	1

- 2 x 2-channel digital input terminal WAGO750-405

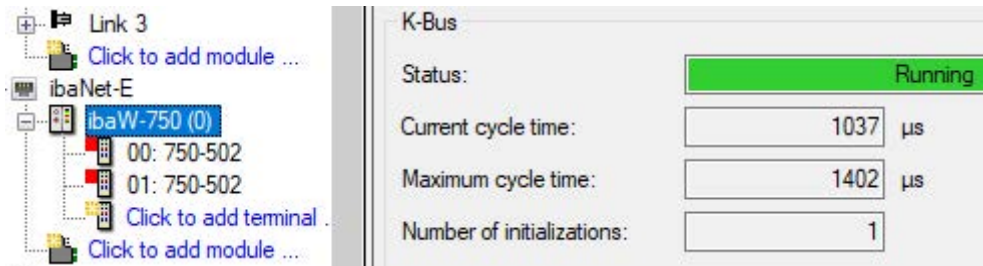
K-Bus	
Status:	Running
Current cycle time:	1000 µs
Maximum cycle time:	1393 µs
Number of initializations:	1

■ 1 x 2-channel digital output terminal WAGO750-502



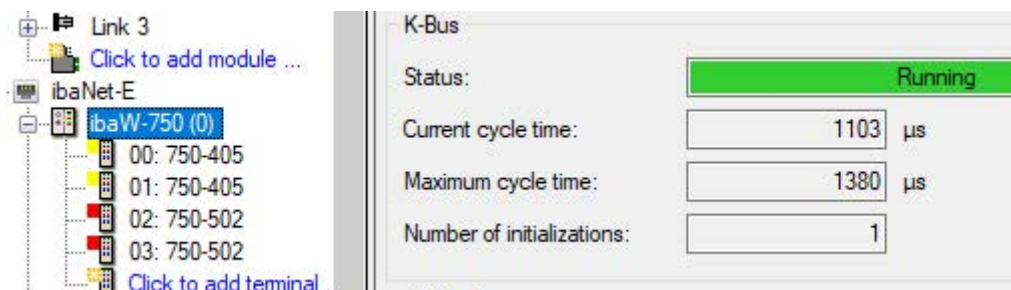
K-Bus	
Status:	Running
Current cycle time:	1016 $\mu$ s
Maximum cycle time:	1481 $\mu$ s
Number of initializations:	1

■ 2 x 2-channel digital output terminal WAGO750-502



K-Bus	
Status:	Running
Current cycle time:	1037 $\mu$ s
Maximum cycle time:	1402 $\mu$ s
Number of initializations:	1

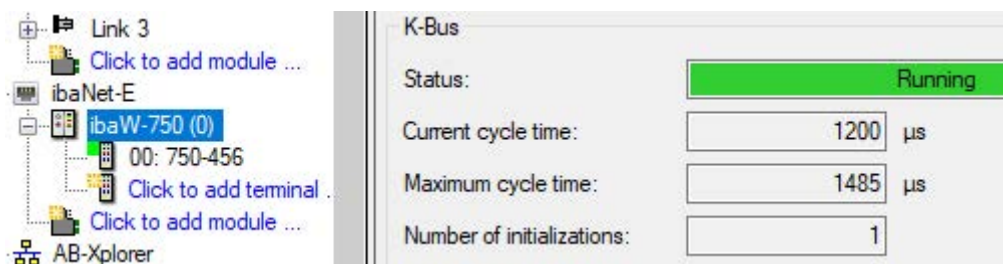
■ 2 x 2-channel digital input terminal WAGO750-405 and 2 x 2-channel digital output terminal WAGO750-502



K-Bus	
Status:	Running
Current cycle time:	1103 $\mu$ s
Maximum cycle time:	1380 $\mu$ s
Number of initializations:	1

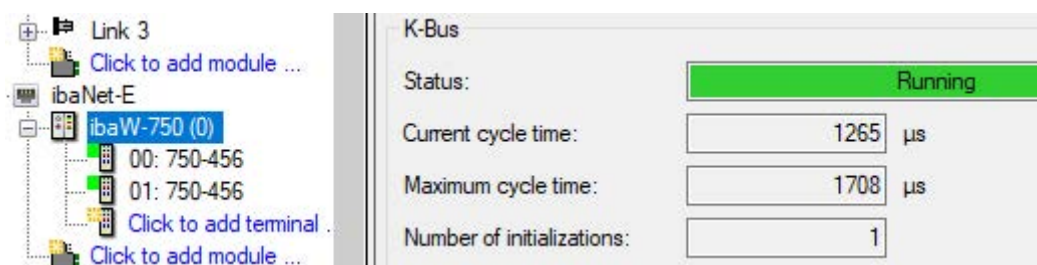
## Analog terminals

■ 1 x 2-channel analog input terminal WAGO750-456



K-Bus	
Status:	Running
Current cycle time:	1200 $\mu$ s
Maximum cycle time:	1485 $\mu$ s
Number of initializations:	1

■ 2 x 2-channel analog input terminal WAGO750-456



K-Bus	
Status:	Running
Current cycle time:	1265 $\mu$ s
Maximum cycle time:	1708 $\mu$ s
Number of initializations:	1

### ■ 1 x 2-channel analog output terminal WAGO750-556

K-Bus

Status:	Running	
Current cycle time:	1229	µs
Maximum cycle time:	1577	µs
Number of initializations:	1	

### ■ 2 x 2-channel analog output terminal WAGO750-556

K-Bus

Status:	Running	
Current cycle time:	1373	µs
Maximum cycle time:	1700	µs
Number of initializations:	1	

### ■ 2 x 2-channel analog input terminal WAGO750-456 and 2 x 2-channel analog output terminal WAGO750-556

K-Bus

Status:	Running	
Current cycle time:	1548	µs
Maximum cycle time:	1885	µs
Number of initializations:	1	

### Digital and analog terminals

K-Bus

Status:	Running	
Current cycle time:	1614	µs
Maximum cycle time:	1988	µs
Number of initializations:	1	

ibaNet-E

Connection	Phase	Connections Established

Complex and configurable terminals

■ 1 SSI encoder interface WAGO750-630

Link 3

Click to add module ...

ibaNet-E

ibaW-750 (0)

00: 750-630

Click to add terminal ...

Click to add module ...

AB-Xplorer

K-Bus

Status: Running

Current cycle time: 1901 μs

Maximum cycle time: 2251 μs

Number of initializations: 1

■ 1 x 3-phase power measurement terminal WAGO750-494

Link 3

Click to add module ...

ibaNet-E

ibaW-750 (0)

00: 750-494/000-005

WagoPMM Basic

WagoPMM Powe

WagoPMM Diagr

Click to add terminal ...

K-Bus

Status: Running

Current cycle time: 2577 μs

Maximum cycle time: 2766 μs

Number of initializations: 1

■ 2 x 3-phase power measurement terminal WAGO750-494

Link 3

Click to add module ...

ibaNet-E

ibaW-750 (0)

00: 750-494/000-005

WagoPMM Basic

WagoPMM Powe

WagoPMM Diagr

01: 750-494/000-001

WagoPMM Basic

WagoPMM Powe

WagoPMM Diagr

Click to add terminal ...

K-Bus

Status: Running

Current cycle time: 3015 μs

Maximum cycle time: 3299 μs

Number of initializations: 1

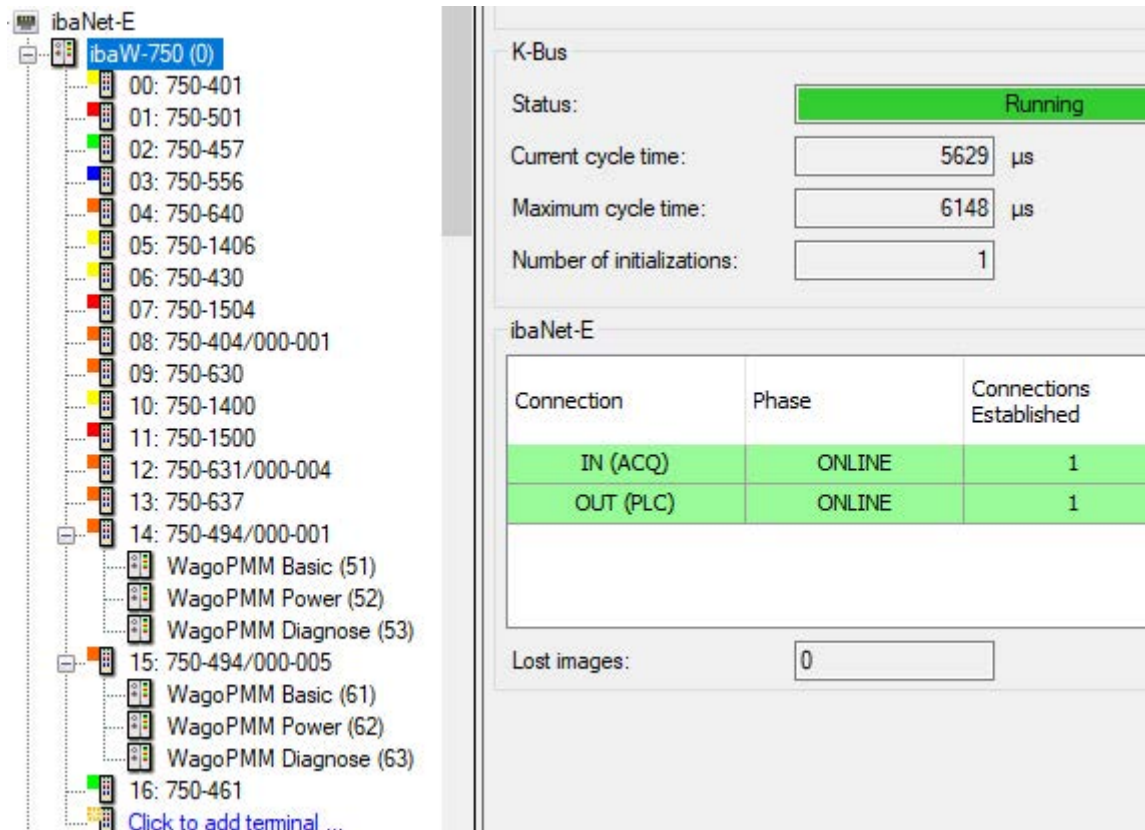
ibaNet-E

Connection	Phase	Connections Established
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Digital, analog, complex and configurable terminals combined

When operating with mixed bus terminals (digital, analog, complex and configurable), the K-bus cycle time increases to over 5 ms with only 16 bus terminals connected.





The screenshot displays the configuration interface for ibaNet-E. On the left, a tree view shows the hierarchy of devices connected to the K-bus, including various WagoPMM modules and terminal blocks. The right pane shows the K-Bus status and connections.

**K-Bus Status:**

- Status: Running
- Current cycle time: 5629  $\mu$ s
- Maximum cycle time: 6148  $\mu$ s
- Number of initializations: 1

**ibaNet-E Connections:**

Connection	Phase	Connections Established
IN (ACQ)	ONLINE	1
OUT (PLC)	ONLINE	1

Lost images: 0

## 11.2 Update rate of the signals

Independent from the K-bus cycle time, the input filters of the digital terminals and the conversion time of the analog terminals have to be considered.

These two factors mainly affect the update rate of the single input signals.

The following is essential:

If you want to enter a new, changed value in *ibaPDA* without a major time delay, you should select the smallest possible time base in *ibaPDA*. It has also to be considered, that the data volume in the *ibaNet* is limited.

The difference between the value conversion in the K-bus and the ibaNet is the least, when a small time base is used.

## 12 Useful information about ibaNet-E

In the following you will find information on the connections with the ibaNet-E protocol.

### 12.1 Connection phases

Each ibaNet-E connection can be in different connection phases. The connection phases are displayed in different colors in the *Connections* tab.

ibaNet-E connection phase	Color	Description
ONLINE	green	Connection; connection quality is OK
	orange	Connection; connection quality is not optimal
STOP_WAIT	red	Connection timeout; waiting for reinitialization
SEND_TADJUST	red	Connection setup; time synchronization
WAIT	red	Connection setup
WAIT_SYNCRESP	red	Connection interruption

#### Phase ONLINE

ibaNet-E							
Connection	Phase	Connections Established	Connection Attempts	Disconnects	Ping time		
					Actual	Min	Max
IN (ACQ)	ONLINE	1	1	0	5,069 ms	2,384 ms	88,354 ms

ibaNet-E							
Connection	Phase	Connections Established	Connection Attempts	Disconnects	Ping time		
					Actual	Min	Max
IN (ACQ)	ONLINE	1	1	0	25,108 ms	2,384 ms	88,354 ms

#### Phase STOP\_WAIT

ibaNet-E							
Connection	Phase	Connections Established	Connection Attempts	Disconnects	Ping time		
					Actual	Min	Max
IN (ACQ)	STOP_WAIT	2	1	2	3,084 ms	2,434 ms	80,104 ms

### Phase SEND\_TADJUST

ibaNet-E							
Connection	Phase	Connections Established	Connection Attempts	Disconnects	Ping time		
					Actual	Min	Max
IN (ACQ)	SEND_TADJUST	6	0	6	5,485 ms	2,395 ms	17,557 ms

### Phase WAIT

ibaNet-E							
Connection	Phase	Connections Established	Connection Attempts	Disconnects	Ping time		
					Actual	Min	Max
IN (ACQ)	WAIT	5	1	5	7,252 ms	2,347 ms	26,804 ms

### Phase WAIT\_SYNCRESP

ibaNet-E							
Connection	Phase	Connections Established	Connection Attempts	Disconnects	Ping time		
					Actual	Min	Max
IN (ACQ)	WAIT_SYNCRESP	1	0	1	0,000 ms	0,000 ms	0,000 ms

## 12.2 Connection type

There are different connection types of an ibaNet-E connection:

- **ACQ:** Connection for receiving data  
All values are received, acquired isochronously and also repeated if there are transmission errors.
- **PLC:** Connection for sending data  
Only the most recent value is sent without any repetitions if there are transmission errors.
- **MGT:** Configuration connection

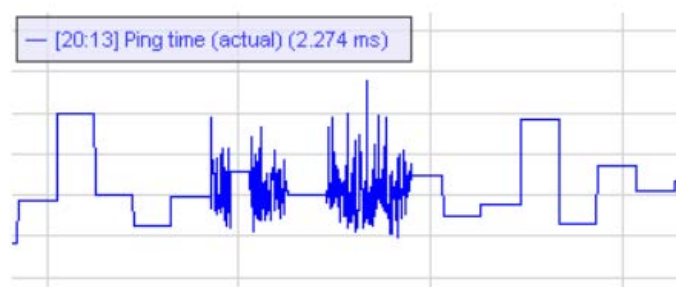
## 12.3 Ping time / connection quality

The ping time is a characteristic of the connection quality for the Ethernet network used by the ibaNet-E connection.

During a valid ibaNet-E receiving connection, a ping to the ibaNet-E device is executed cyclically.

The measured duration, i.e. the round trip time of the ping telegram, is a marker for the physical condition of the network and therefore a benchmark for the connection quality of the Ethernet connection. The shorter this time is, the better the connection quality and the more secure the data transmission.

For synchronization at the start of acquisition and sporadically during acquisition, this ping is executed at a much higher frequency:



If the ping time is longer and therefore the connection quality of the Ethernet connection is not optimal, the corresponding connection is no longer highlighted in green in the connection overview, but in orange:

ibaNet-E

Connections

Discovery

☐ Stop acquisition when a broken connection is detected
 ☐ Set signals to zero when no data is available

	Module	Destination	Type	Direction	Messages	Ping time
0	ibaW-750-DHCP (0)	ibaW-750-DHCP	ACQ	IN	3139	3,296 ms
1	ibaW-750-DHCP (0)	ibaW-750-DHCP	PLC	OUT	233	2,044 ms
2	ibaW-750-WLAN (5)	192.168.41.201	ACQ	IN	2977	74,049 ms
3	ibaW-750-LAN (10)	192.168.1.50	ACQ	IN	3141	3,108 ms
4	ibaW-750-LAN (10)	192.168.1.50	PLC	OUT	233	1,782 ms
5	?	?	?	?	?	?
6	?	?	?	?	?	?

If the connection is highlighted in orange, it is more likely that measured values may be lost.



## 13 Technical data

In the following you will find the technical data and dimensions for *ibaW-750*.

### 13.1 Main data

#### Short description

Name	ibaW-750
Description	bus module for WAGO I/O system 750
Order number	15.140020

#### System supply

Power supply	24 V DC ( $\pm 10\%$ )
Power consumption max.	550 mA
Connection technology	2 CAGE CLAMP® contacts, 0.08 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> , AWG 28-14
Total current for I/O modules max.	1700 mA (5 V DC)

#### Field supply

Power supply	24 V DC ( $\pm 10\%$ ), without protection
Power consumption max.	10 A
Connection technology	2 x 2 CAGE CLAMP® contacts, 0.08 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> , AWG 28-14

#### Further interfaces, operating and indicating elements

Indicators (LEDs)	status indicators for operation, <i>ibaPDA</i> 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 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> , AWG 28-14

#### Operating and environmental conditions

Temperature ranges	
Operation	32° F ... 131° F (0 °C ... +55 °C)
Storage/transport	-13° F ... 185° F (-25 °C ... +85 °C)
Mounting	DIN rail according to EN 50022 (TS 35, DIN rail 35)
Cooling	passive
Relative humidity	up to 95 %, no condensation
Protection class	IP20
Norms and standards	CE, EMC (EN 61000-6-2 / EN 61000-6-3), UL508

Dimensions (width x height x depth/from upper edge of rail)	62 mm x 100 mm x 72/65 mm
Weight/ incl. packaging	0.16 kg / approx. 0.3 kg

## 13.2 Interfaces

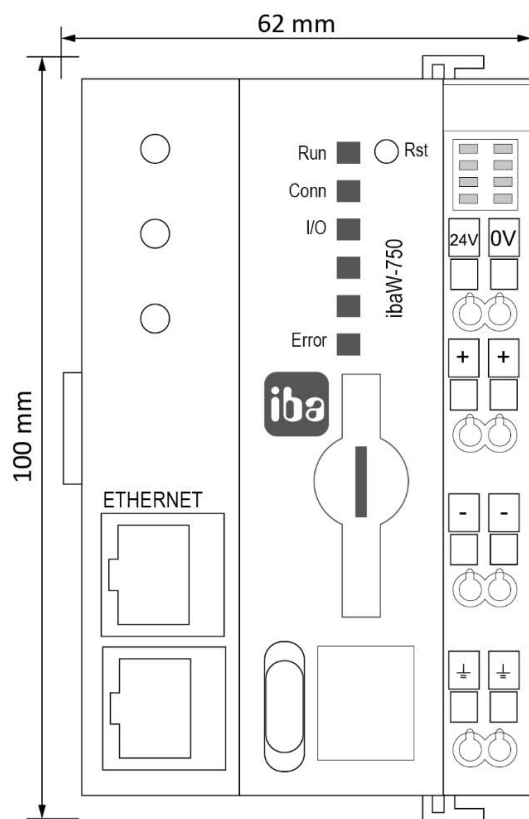
### Bus interface (K-bus)

Number	1
Design	terminal bus
Data volume	up to 2048 bytes
Number of bus terminals	up to 64, with terminal bus extension 250
Sampling rate	according to bus cycle time, system-dependent minimum 1 ms;  The update time of the signals may vary due to terminal-specific properties.
Connection technology	6 sliding contacts, according to WAGO I/O system 750, incl. power supply

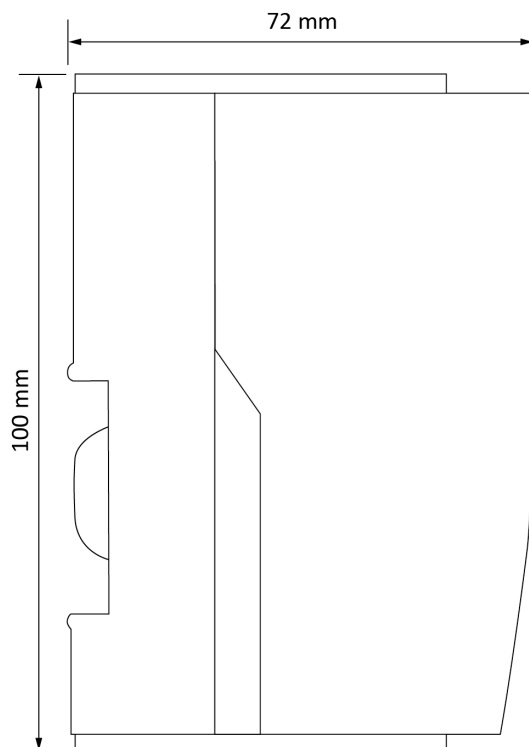
### ibaNet interface

Number	2; switched
Design	copper
ibaNet protocol	ibaNet-E
Number of <i>ibaPDA</i> 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
Connection technology	2 RJ45 sockets (10/100 Mbit/s)

### 13.3 Dimensions



Dimensions *ibaW-750* front (dimensions in mm)



Dimensions *ibaW-750* side (dimensions in mm)

## 14 Support and contact

### Support

Phone: +49 911 97282-14  
Email: [support@iba-ag.com](mailto:support@iba-ag.com)

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#### Note



If you need support for software products, please state the number of the license container. For hardware products, please have the serial number of the device ready.

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### Contact

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**[www.iba-ag.com](http://www.iba-ag.com)**