



# ibaDAQ-S

Central Unit for stand-alone Data Acquisition

Manual

Issue 1.2

Measurement Systems for Industry and Energy

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Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Issue	Date	Version History	Chapter	Author	Version HW/FW
1.2	10/27/2020	Miscellaneous, FCC declaration	11.1		

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# 1 About this manual

This manual describes the layout, application and operation of the ibaDAQ-S unit. ibaDAQ-S can be used as a central unit in the iba modular system. For a general description of the iba modular system and additional information about layout, application and operation of the modules, please refer to the dedicated manuals.



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**Note**

The documentation of the iba modular system is part of the DVD included in the delivery.

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The documentation of the iba modular system comprises the following manuals:

**Central units**

The manuals of the central units contain information about:

- Scope of delivery
- System requirements
- Device description
- Mounting/removal
- Start-up
- Configuration
- Technical data
- Accessories

**Modules**

The manuals of the single modules contain specific information about the module. For example:

- Brief description
- Scope of delivery
- Product characteristics
- Configuration
- Description of the functions
- Technical data
- Connection diagram

## 1.1 Target group

This manual addresses in particular the qualified professionals who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded as a 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

The following designations are used in this manual:

Action	Notations
Menu command	Menu „Logic diagram“
Call of menu command	„Step 1 – Step 2 – Step 3 – Step x“ Example: Select menu „Logic diagram – Add – New logic diagram“
Keys	<Key name> Example: <Alt>; <F1>
Press keys simultaneously	<Key name> + <Key name> Example: <Alt> + <Ctrl>
Buttons	<Button name> Example: <OK>; <Cancel>
File names, Paths	„File name“, „Path“ Example: „Test.doc“

## 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:

- By an electric shock!
  - Due to the improper handling of software products which are coupled to input and output procedures with control function!
- 

---

### **WARNING**

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

---

---

### **CAUTION**

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

---



#### **Note**

A note specifies special requirements or actions to be observed.

---



#### **Important note**

Note if some special features must be observed, for example exceptions from the rule.

---



#### **Tip**

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

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#### **Other documentation**

Reference to additional documentation or further reading.

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## 2 Introduction

ibaDAQ-S integrates a complete ibaPDA system and an internal solid state disk (SSD) with sufficient memory space to acquire and record data as a stand-alone unit.

The range of applications includes:

- Mobile measurement acquisition
- Start-up
- Troubleshooting
- Test stands

### Modular concept

The central unit is the heart of the iba modular system. It can be complemented by up to 4 I/O modules. ibaDAQ-S is the new smart central unit in the iba modular system that enables data acquisition with ibaPDA functionality independently of an external computer. All channels are sampled synchronously with a rate of up to 40 kHz.

### Configuration

Equipped with connections for a monitor, mouse and keyboard, ibaDAQ-S is as convenient to operate as an ibaPDA system running on a computer. Moreover, it can be operated with an ibaPDA client connected via the network.

The ibaPDA version in ibaDAQ-S provides the full functional scope of ibaPDA and a license for 64 signals in the standard version.

### Monitoring and alarm

2 digital inputs and 2 digital outputs are available that can be configured for special functions. One output can serve as an alarm output if the watchdog function is activated in ibaPDA. What is more, the device can be shut down and powered off safely if a trigger signal reports that the voltage supply at a digital input is interrupted.

### Connection via ibaNet

The FO input and output functions as an ibaFOB-io card supporting the ibaNet protocols 32Mbit Flex, 32Mbit, 5Mbit and 3Mbit. It allows additional iba devices to be connected such as the ibaPADU family, iba bus monitors or system interface connections.

### 3 **Scope of delivery**

After unpacking, check the delivery for completeness and possible damages.

The scope of delivery comprises:

- The ibaDAQ-S unit
- Covering caps for FO cables, USB and Ethernet
- 8-pin connector with spring terminals (digital inputs and outputs)
- 2-pin connector with spring terminals (voltage supply)
- Manual (German and English)
- "iba Software & Manuals" DVD

## 4 Safety instructions

### 4.1 Intended use

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

- Measurement acquisition
- Applications with iba products (ibaPDA, and others)

The device must only be used as described in chapter 11 Technical data.

### 4.2 Special safety instructions



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**Strictly observe the operating voltage range!**

Never supply the device with a voltage other than 24 V DC  $\pm 10\%$ !  
Excess voltage may destroy the device!

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**ATTENTION!**

Never insert or remove modules and CPU at the subrack under live conditions!  
Switch off ibaDAQ-S and disconnect the power supply before inserting or removing modules.

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**Important note**

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

---



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**Caution!**

Make sure that the cooling fins have sufficient ventilation!

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**Note**

Clean the device only on the outside with a dry or slightly damp and statically discharged cloth.

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## 5 System requirements

### For operation

- Power supply 24 V DC± 10 %, 3 A (fully equipped)
- Installation of the central unit and optionally up to 4 I/O modules in
  - a subrack, e.g. ibaPADU-B4S
  - or in the mobile measuring system ibaMBox<sup>1</sup>

### For device parameterization and operation

- Monitor (connection to DisplayPort), mouse and keyboard (connection to USB ports)

or

- ibaPDA client via network link



#### Note

The ibaDAQ-S central unit runs ibaPDA by default. The license for 64 signals is included in the delivery.

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#### Note

The ibaFOB-io-USB adapter cannot be used with devices of the ibaDAQ family (ibaDAQ/-C/-S).

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<sup>1</sup> The selection of I/O modules to be used in ibaMBox is limited, see chapter 11.4.

## 6 Mounting, connecting, dismantling



### Caution!

Only work on the device when it is de-energized!

### 6.1 Mounting on the subrack

1. Mount the subrack on a suitable structure.
2. Connect the ground terminal.
3. Plug the device into the left slot.  
Make sure that the guide bolts on the rear side of the device are inserted into the corresponding holes on the subrack.
4. Press the device firmly against the subrack and secure it with the fixing screws.



### Important note

Always screw tight the device and the modules. Otherwise, you might damage the unit when inserting or removing the input/output connectors.



Figure 1: Mounting the device

### 6.2 Dismounting

1. Switch off the device.
2. Remove all cables.
3. Hold the device and remove the upper and lower fixing screw.
4. Pull the device off the subrack.

### 6.3 Operation with ibaMBox

The ibaMBox mobile measuring system is based on the iba modular system that is integrated in a compact, rugged aluminum case. ibaMBox comes with the ordered central unit and the I/O modules installed. ibaMBox is only delivered fully pre-configured.

## 6.4 First configuration

### 6.4.1 Setup via network

In the factory setting of the network interface, DHCP is active (rotary switch S1 position = 1). Thus, an IP address is automatically assigned to ibaDAQ-S, as soon as the device is connected to a network with a DHCP server. If the IP configuration is successful, ibaDAQ-S can be accessed via the host name daq-s-*<serial number>*, e. g. daq-s-000002.

In case the network does not have a DHCP server, ibaDAQ-S can be set to the fixed IP address 192.168.1.1 via the rotary switch S1 position = 2.



#### Note

The first configuration with a fixed assigned IP address (S 1 = 2) should only be carried out by means of a point-to-point connection, in order to avoid IP address conflicts.

---



#### Important note

In administrated network environments, it may occur that the device does not receive an IP address even if a DHCP server is available. This is usually due to the fact that unknown network devices are not allowed in the network for reasons of safety. In this case, please contact your IT department to obtain network approval for the device.

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#### 6.4.1.1 ibaPDA client

If not already existing, please install ibaPDA on the system you have selected for the configuration of ibaDAQ-S.

Start the ibaPDA client.

Click on the icon  to start the dialog “ibaPDA server selection” and enter the host name or the IP address of ibaDAQ-S as address. By default, the port number is 9170. If ibaDAQ-S is already in the list of servers, you can also select the device there.

Exit the dialog with <OK>.

Providing that the ibaPDA versions correspond, ibaPDA directly connects to the ibaDAQ-S system. In case the ibaPDA versions do not correspond, it might be necessary to install the suitable ibaPDA version.

For a further configuration of the system, proceed as described in chapter 10.

#### 6.4.1.2 Remote Desktop

Open the Remote Desktop Connection on the system you want to configure ibaDAQ-S. You can find this in the Windows task bar under “Accessories”.

There is another option to open the Remote Desktop Connection:

Press the keys <Windows>+<R> and enter “mstsc” in the field.

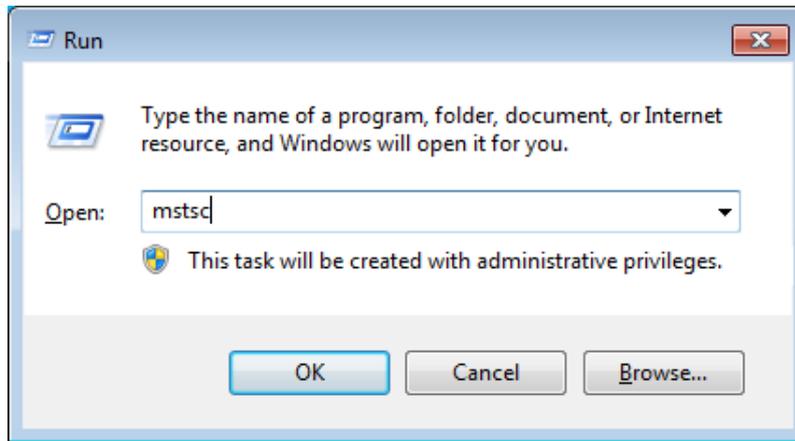


Figure 2: Run dialog (Windows 10)

In the field “Computer”, enter the host name or the IP address of the ibaDAQ-S system.



Figure 3: Remote Desktop Connection

If you are requested to enter login information, use the information specified in chapter 7.9.

Start the ibaPDA client from the Windows Start menu.

For further configuration, proceed as described in chapter 10.

#### 6.4.2 Set up via monitor, keyboard and mouse

Connect a monitor, if necessary via an adapter, to the DisplayPort connection of ibaDAQ-S.

Connect a keyboard and a mouse to the USB ports of ibaDAQ-S.

If required, log in to the system. You can find the login data in chapter 7.9.

Start the ibaPDA client from the Windows Start menu.

For further configuration, proceed as described in chapter 10.

## 7 Device description

### 7.1 Views

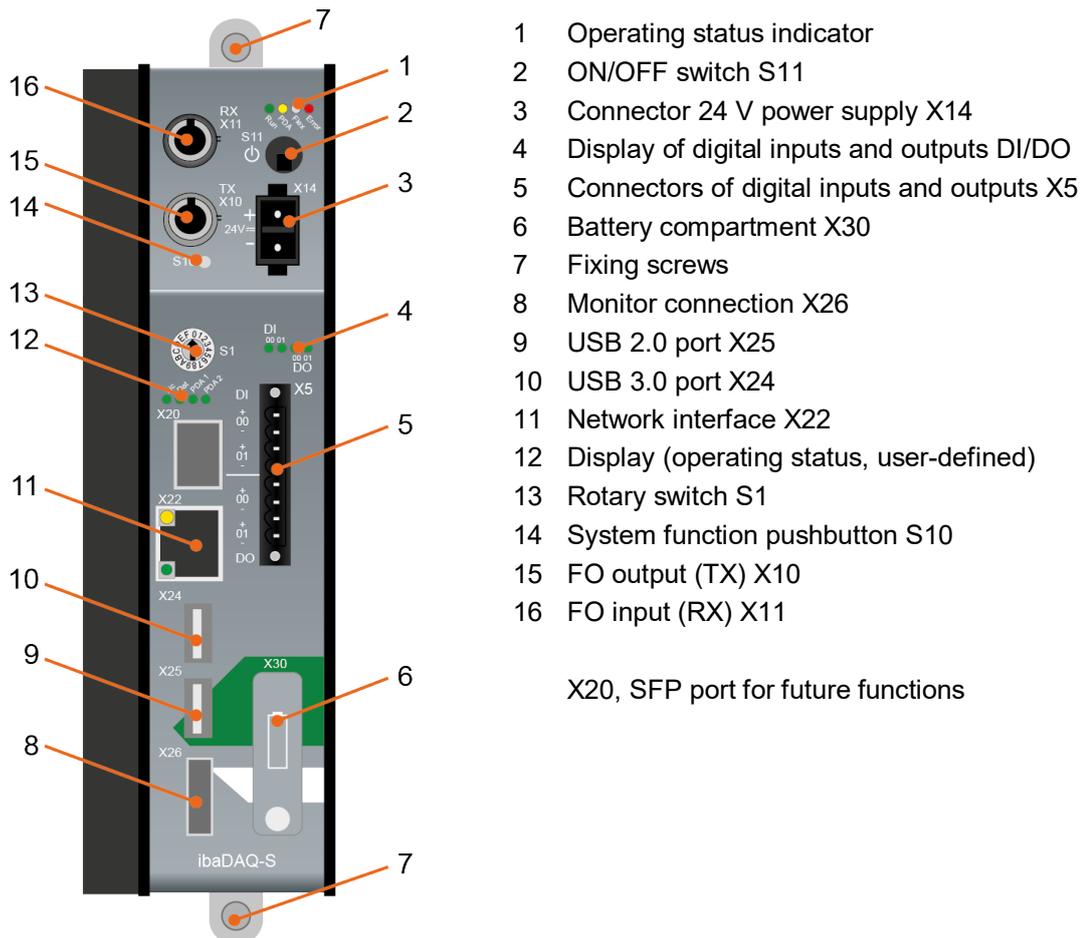


Figure 4: Front view

## 7.2 Display elements

### 7.2.1 Operating status

The operating status of the device is indicated by colored LEDs.

LED	Color	Status	Description
Run	Green	Off	Device down, no power supply Hardware error, controller stopped
		Flashing	Ready
		On	Device powering down
PDA	Yellow	On	ibaPDA server running
		Flashing	Updating
Flex	White	Flashing	FO input ready
		On	FO input ready and configured
	Red	Off	No error
Error		Flashing	Malfunction, internal device applications not running
		On	Hardware errors



### Important note

Contact the iba Support when the Error LED indicates a fault.

## 7.2.2 Operating status and user-defined displays

Multi-colored LEDs (Lic and Dat) indicate the status of the license and of data recording. It is possible to assign signals to 2 multi-colored LEDs in ibaPDA to display user-defined states.

LED	Color	Status	Description
Lic	Yellow		Demo licenses on dongle released
	Green		Dongle OK
	Red		No dongle or no license
Dat	Off		No data recording configured
	Yellow		Waiting for start trigger
	Green		Recording data
	Red		Data recording interrupted/stopped
PDA1	Yellow		
	Green		User-defined display
	Red		
	Off		
PDA2	Yellow		
	Green		User-defined display
	Red		
	Off		

## 7.2.3 Status of the digital inputs

The green LEDs indicate whether a digital input is active or not.

LED	Status	Description
DI 00, DI 01	Off	No signal, logical 0
	On	Signal active, logical 1

## 7.2.4 Status of the digital outputs

LED per channel <sup>2</sup>	Status	Description
DO 00, DO 01	Off	No signal, logical 0
	On	Signal active, logical 1

<sup>2</sup> If an output is deactivated by ibaPDA, the corresponding channel LED will remain off.

## 7.3 Operating elements

### 7.3.1 ON/OFF switch S11

By switching the device off and back on, the supply voltage is disconnected / reconnected and the device reboots. There are different ways to shut down or switch off the running device:

- Press briefly: system shuts down
- Hold pressed (> 5 s): system switches off (no controlled shut-down)

### 7.3.2 Rotary switch S1

The S1 rotary switch is used to specify IP address settings:

Position	Description
0	A user-defined IP address is used. The IP address can be configured in ibaPDA or in the system settings.
1	DHCP active (factory setting)
2	192.168.1.1 (fixed IP address)
3...F	Not allowed

### 7.3.3 System function pushbutton S10

The S10 pushbutton has 2 functions:

#### Reset function

If S10 is pressed longer than 3 s during operation, the measuring files are closed, all applications are shut down and the device is restarted.

#### Booting without starting data acquisition

If you press S10 during the boot process, data acquisition is not started automatically after the device has booted up. Any signal applying at DI00 to shut down the system will equally be ignored.

## 7.4 Communication interfaces

### 7.4.1 FO cable connections X10 and X11

The optical fiber (FO) ports X10 and X11 have the function of an ibaFOB-io card. They allow additional iba devices to be connected such as the ibaPADU family, iba bus monitors or system interface connections. Moreover, connection to a PC is possible with ibaFOB-D card or to a notebook with ibaFOB-io ExpressCard.

Connection	Description
X10 output (TX)	FO send interface
X11 input (RX)	FO receive interface

All current ibaNet protocols are supported:

- 3Mbit
- 5Mbit
- 32Mbit
- 32Mbit Flex

### 7.4.2 Network interface X22

The X22 network interface allows you to integrate the device into an Ethernet network. Settings for the IP address can be made at the S1 rotary switch.

➤ See chapter 7.3.2

Upon delivery, DHCP is activated.

Moreover, the integration of ibaNet-E capable devices is possible via this interface.

### 7.4.3 USB ports

- USB 2.0 (X25): 480 Mbit/s
- USB 3.0 (X24): 5 Gbit/s

### 7.4.4 DisplayPort X26

DisplayPort to connect a monitor. If the monitor does not have a DisplayPort, an adapter can be used, e. g. CSL - 3in1 DisplayPort to VGA + HDMI + DVI adapter.

## 7.5 Digital inputs X5

You can connect 2 input signals here, each bipolar and electrically isolated. Each channel is connected using twin leads. Due to the polarity reversal protection, the measuring signal is displayed with the correct logic even if the connection is polarity-reversed.

The DI 00 input can be used to initiate save shut-down and powering off if a trigger signal indicates that the voltage supply is interrupted. This is configured in ibaPDA.

<b>Basic</b>	
Module Type	Backplane bus
Locked	False
Enabled	True
Name	<b>ibaDAQ-S</b>
Module No.	<b>0</b>
Timebase	0,5 ms
Use name as prefix	False
<b>Digital I/O</b>	
DI00: Automatic shutdown	False
DO00: Watchdog output	False
<b>DI00: Automatic shutdown</b> Automatically shutdown the ibaDAQ-S when DI00 is asserted	

Figure 5: Digital input for automatic shut-down

### 7.5.1 Pin assignment

Pin	Connection	LED
1	Digital input 00 +	DI 00
2	Digital input 00 –	
3	Digital input 01 +	DI 01
4	Digital input 01 –	

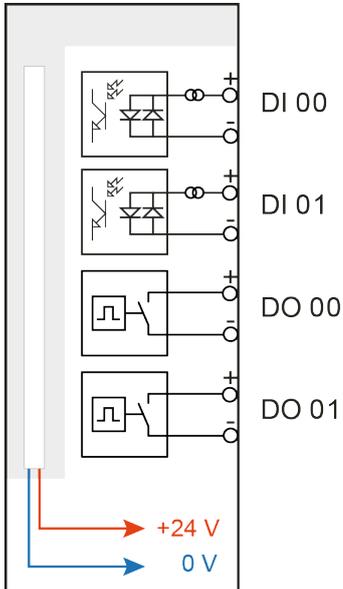


Figure 6: Connection diagram for digital inputs and outputs X5

### 7.5.2 Debounce filter inputs

There are four debounce filters for each digital input. They can be chosen and configured independently of each other for each signal. The following filters are available:

- "Off" (no filter)
- "Stretch rising edge"
- "Stretch falling edge"
- "Stretch both edges"
- "Delay both edges"

For each filter, a debounce time ranging between [1 $\mu$ s...65535 $\mu$ s] has to be defined in  $\mu$ s.

#### “Off”

The measured input signal is forwarded directly without filtering.

#### "Stretch rising edge"

The first rising edge sets the output signal (red) to logical 1 and it remains logical 1 for the set debounce time. Subsequently, the channel is transparent again and waits for the next rising edge.

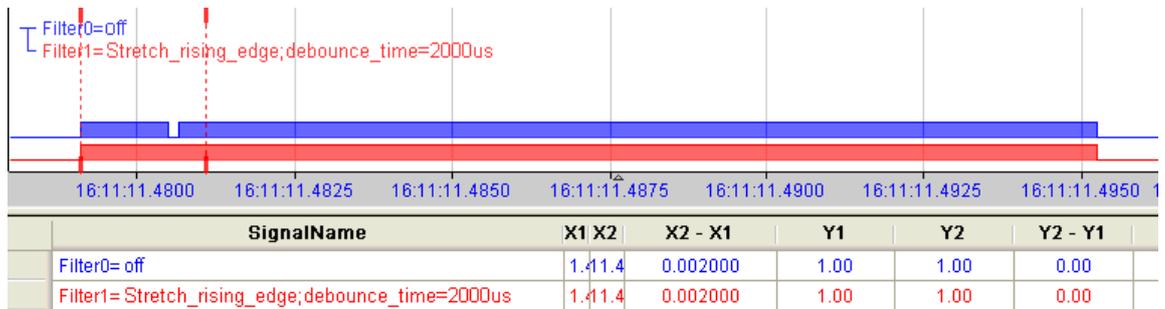


Figure 7: Debounce filter: "Stretch rising edge"

### "Stretch falling edge"

The first falling edge sets the output signal (green) to logical 0 and it remains logical 0 for the set debounce time. Subsequently, the channel is transparent again and waits for the next falling edge.



Figure 8: Debounce filter: "Stretch falling edge"

### "Stretch both edges"

With the first edge, the output signal (ochre) follows the initial signal (blue) and keeps the logical level for the duration of the defined debounce time. Subsequently, the channel is transparent again and waits for the next (rising or falling) edge.

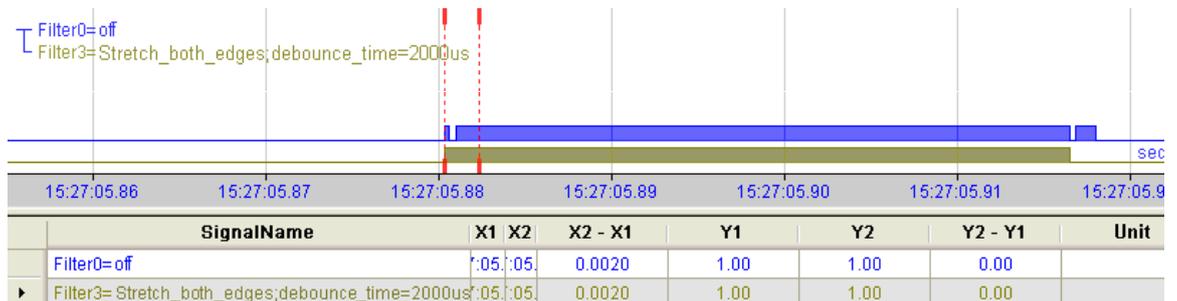


Figure 9: Debounce filter: "Stretch both edges"

### "Delay both edges"

Beginning with the first edge, the output signal (purple) blocks the input and keeps the logical value of the edge for the duration of the defined debounce time. After the debounce time has elapsed, the channel is transparent again, directly assumes the logical level of the input signal and waits for the next (rising or falling) edge.

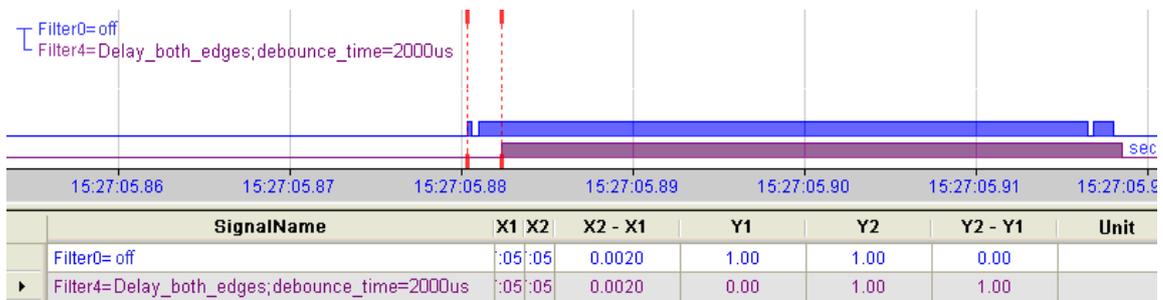


Figure 10: Debounce filter: "Delay both edges"

## 7.6 Digital outputs

Pin	Connection	LED
5	Digital output 00 +	DO 00
6	Digital output 00 -	
7	Digital output 01 +	DO 01
8	Digital output 01 -	

### 7.6.1 Alarm function

If the watchdog function is enabled in ibaPDA, the output DO 00 can be configured as an alarm output.

Basic	
Module Type	Backplane bus
Locked	False
Enabled	True
Name	<b>ibaDAQ-S</b>
Module No.	<b>0</b>
Timebase	0,5 ms
Use name as prefix	False
Digital I/O	
DI00: Automatic shutdown	False
DO00: Watchdog output	False

**DO00: Watchdog output**  
Assert DO00 when, during acquisition, ibaPDA fails to read data from the ibaDAQ-S hardware

Figure 11: Watchdog output

## 7.7 Voltage supply X14

The external voltage supply is connected with a 2-pin connector.



### Caution!

Only connect the device to an external voltage supply 24 V DC ( $\pm 10\%$  unregulated)!  
Observe the correct polarity!

## 7.8 Battery compartment X30

A type 3V lithium CR2032 battery backs up the internal time. The battery can be replaced during operation.

Observe the correct polarity of the battery.




---

### Important note

Do not dispose of spent batteries in the general waste.

---

Batteries contain valuable raw materials that can be recycled and reused. Devices with the  symbol are subject to EU Directive 2002/96/EC on waste electrical and electronic equipment. As a manufacturer we are obliged under the above directive to make you aware of this directive in the context of selling batteries or rechargeable batteries.

Batteries must not be disposed of in the household waste. This is highlighted by a crossed-out rubbish bin or waste container. You are legally required to properly dispose of batteries. Please dispose of spent batteries as required by law at municipal collection centers or return them to your local retailer free of charge. It is expressly forbidden to dispose of batteries in the household waste; this is harmful for the environment. Batteries delivered by us can be returned free of charge or returned by mail with sufficient postage.

## 7.9 User accounts

Upon delivery, 2 users are configured:

User	Password
daqs	daqs
Administrator	xadmin




---

### Important note

Change the default passwords after you have started up ibaDAQ-S! This makes unauthorized use of the system more difficult.

---

## 8 System integration

### 8.1 Configuration with ibaPDA client

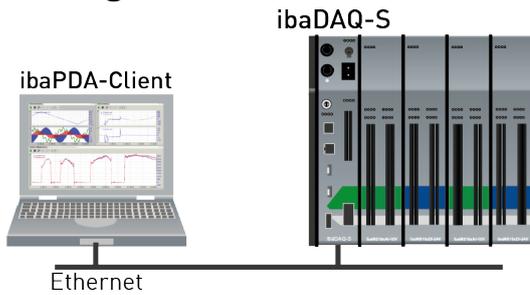


Figure 12: Configuration with ibaPDA client

- The ibaPDA client is connected to the central unit via Ethernet.

### 8.2 Configuration of the central unit

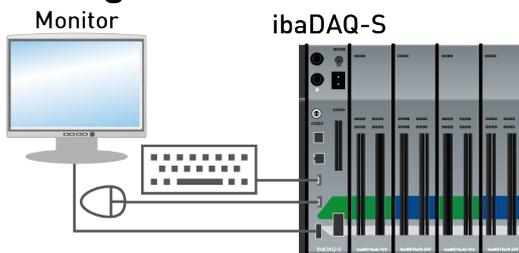


Figure 13: ibaDAQ-S with input devices

- The monitor, mouse and keyboard are connected directly to the central unit.

### 8.3 Remote Desktop

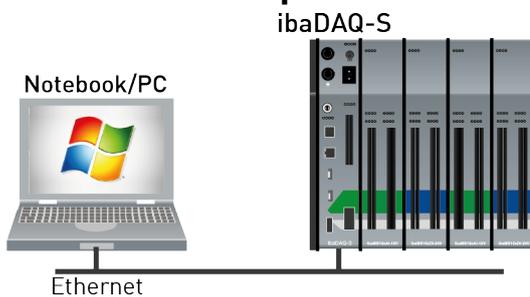


Figure 14: Configuration via Remote Desktop

- Operation through the network using Remote Desktop

## 8.4 Connection with USB-WLAN/RJ45 adapter

In order to operate ibaDAQ-S in 2 different networks, the device can be integrated into another network via an USB-WLAN or USB-RJ45 adapter. There is no need for a special adapter type. Any commercial adapter that supports Windows 7 or higher can be used for this purpose. However, the corresponding drivers need to be installed on the device.

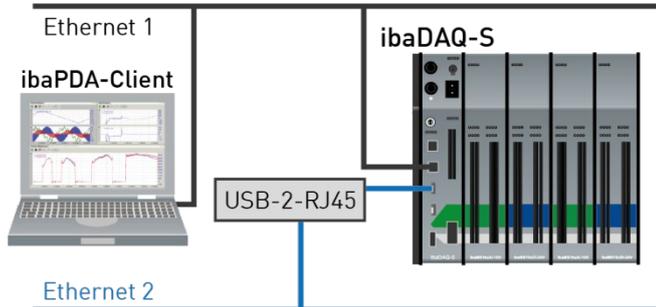


Figure15: USB Ethernet adapter

## 8.5 Operation with compact UPS

In order to secure an optimal operation, it is recommended to buffer the power supply of the ibaDAQ-S system via an uninterruptible power supply (UPS) with additional digital output. For this purpose, the digital output of the UPS serves as signal for securely shutting down the ibaDAQ-S operating system.

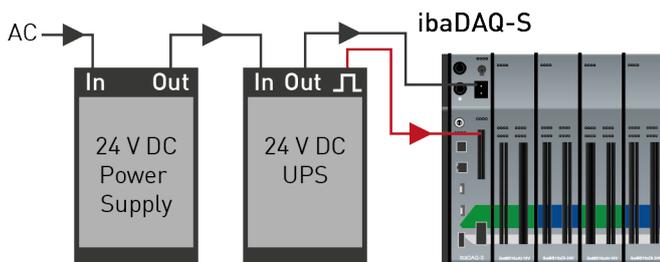


Figure 16: Operation with UPS

The UPS should be designed in such a way that the system is buffered for at least 5 minutes.

The digital input DI00 of the ibaDAQ-S device needs to be appropriately configured for this functionality in ibaPDA.

For further references, see chapter 10.4.1.

## 8.6 Supported ibaNet communication protocols

Protocol	Min. telegram cycle ( $T_{cycl}$ )	Max. signal sampling frequency	Direction of communication x-directional	Max. data volume (in bytes)	Max. number of participants in the FO connection
ibaNet 3Mbit	1 ms	1 kHz	uni	136 B (64 integer values, 64 binary values)	8 (line topology)
ibaNet 32Mbit 50 $\mu$ s	50 $\mu$ s	20 kHz	uni	144 B (64 integer values, 64 binary values)	1
ibaNet 32Mbit 100 $\mu$ s	100 $\mu$ s	10 kHz	uni	288 B (128 integer values, 128 binary values)	1
ibaNet 32Mbit Flex	Min. 25 $\mu$ s	Max. 40 kHz	bi	64 B at 25 $\mu$ s $T_{cycl}$ 3113 B at 1 ms $T_{cycl}$	15 (ring topology)

### 8.6.1 Sample applications

#### 8.6.1.1 Measured data acquisition with 3Mbit protocol

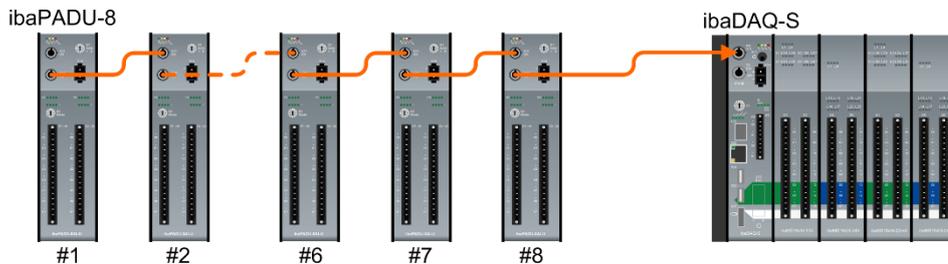


Figure 17: Connection of 3Mbit devices (unidirectional)

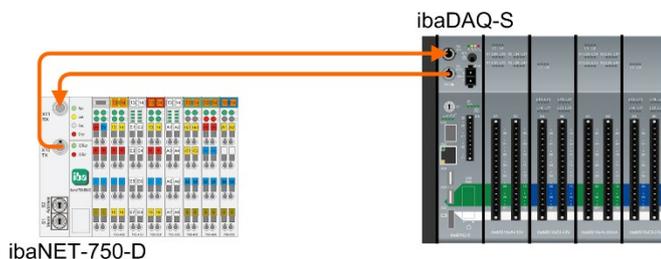


Figure 18: Bidirectional connection of 3Mbit devices

### 8.6.1.2 Measured data acquisition with 32Mbit protocol

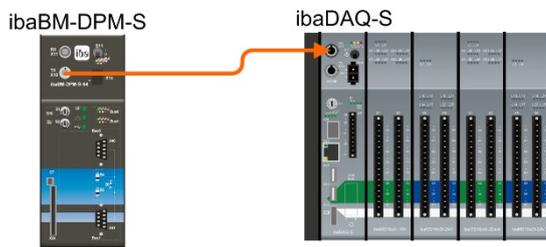
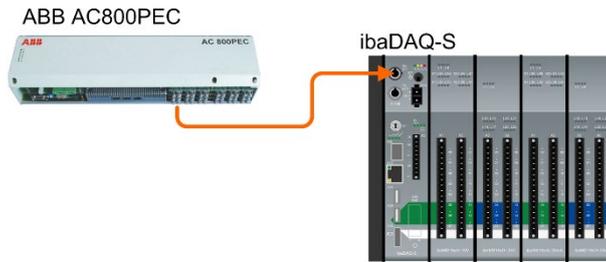


Figure 19: Unidirectional connection of 32Mbit devices

### 8.6.1.3 Measured data acquisition with 32Mbit Flex protocol

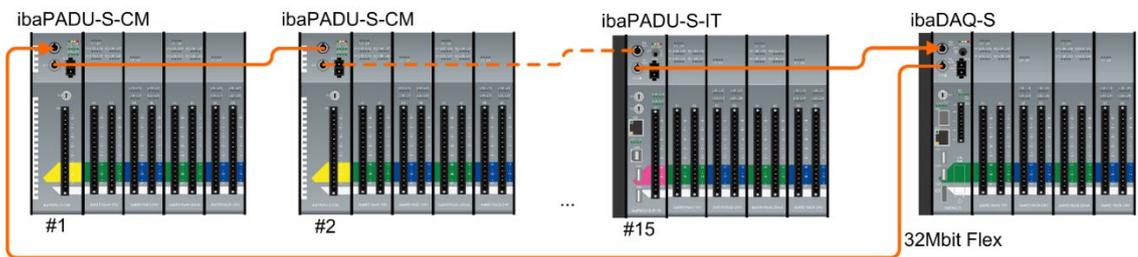


Figure 20: 32Mbit Flex devices in a ring topology

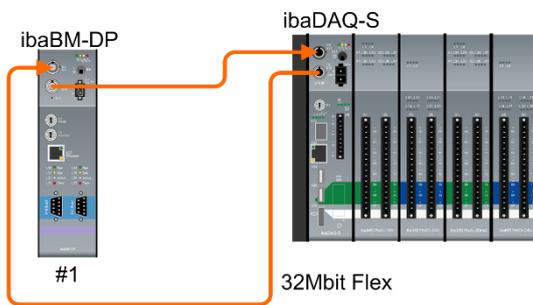


Figure 21: Connection of ibaBM-DP

## 9 Updates

### 9.1 Firmware update

A firmware update always upgrades the entire iba modular system, i.e. the central unit and the plugged-in I/O modules.



#### Caution!

Do not switch off the device during an update. This might damage the device. Installing an update can take several minutes.

- Open the ibaPDA I/O Manager and navigate to the main node of your ibaDAQ-S system.
- Click the <Write firmware> button on the "Info" tab and select the "daqs\_v[xx.yy.zzz].iba" update file.
- Click <OK> to start the update.

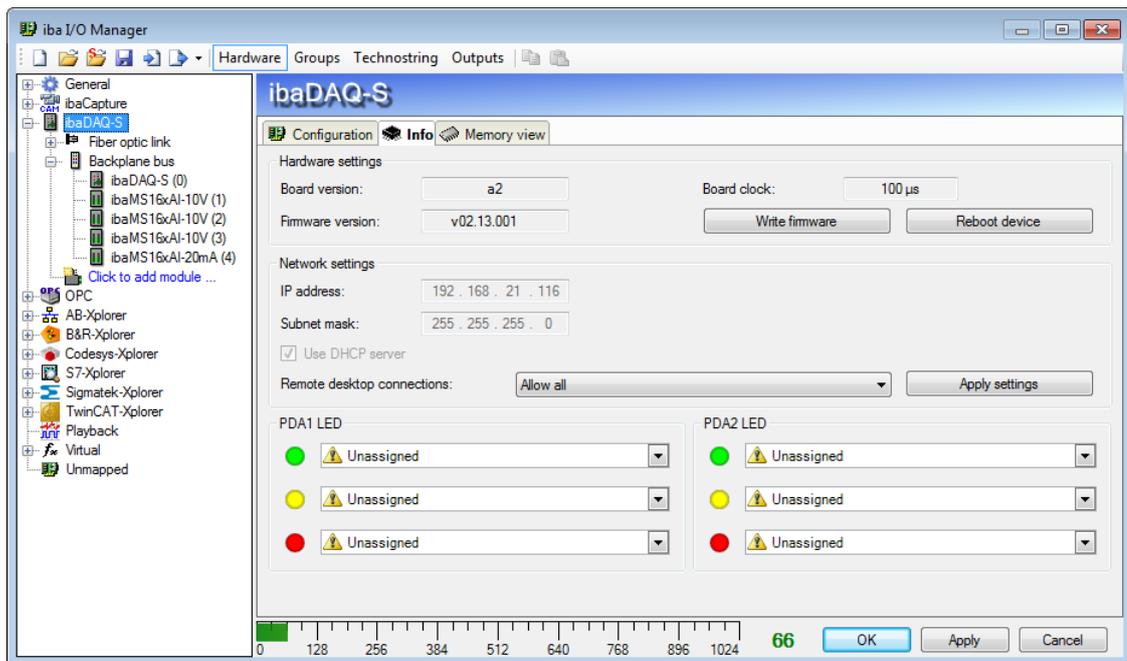


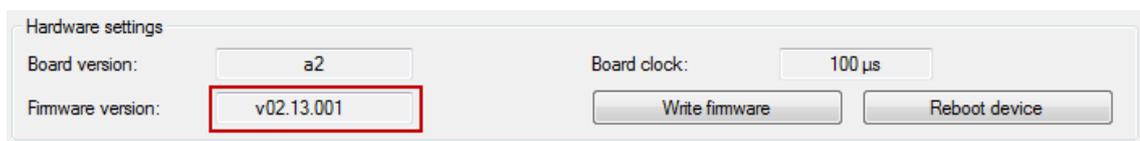
Figure 22: Update via ibaPDA

### 9.2 Auto-updating the modules

After installing the modules and applying the voltage to the central unit, ibaDAQ-S detects the modules and checks the firmware version.

ibaDAQ-S has a so-called "overall release version". This version contains the current firmware version of the central unit as well as the firmware versions of the modules.

The overall release version is displayed in ibaPDA in the "Info" tab (here referred to as the "firmware version").



If the firmware version of a module does not match the "overall release version" of the central unit, ibaDAQ-S will run an automatic upgrade or downgrade of the module. Afterwards, the module is ready for use.

**Important note**

Do not switch off the device during an auto-update.

---

**Important note**

The "overall release version" contains all modules known until then and the associated firmware versions. If a module is not yet known (i.e. it is more recent than the central unit's firmware version), it will be ignored and not displayed in ibaPDA.

In this case, a new update file has to be installed for the "overall release version". Contact the iba Support.

---

## 10 Configuration in ibaPDA

ibaPDA allows you to configure, acquire and record the analog and digital signals of the connected modules.

For the configuration you can connect the input devices (monitor, mouse, keyboard) directly to the unit. In this case, continue with chapter 10.2.

If you are using an external ibaPDA client for configuration, continue with the next chapter 10.1.

### 10.1 Connection with an external ibaPDA client

If you are using an external ibaPDA client for the configuration, the ibaPDA client and ibaDAQ-S have to be connected through the network.

Start ibaPDA and select ibaDAQ-S as the ibaPDA server.

Click the  button on the toolbar or click "Select server..." in the Configuration menu.

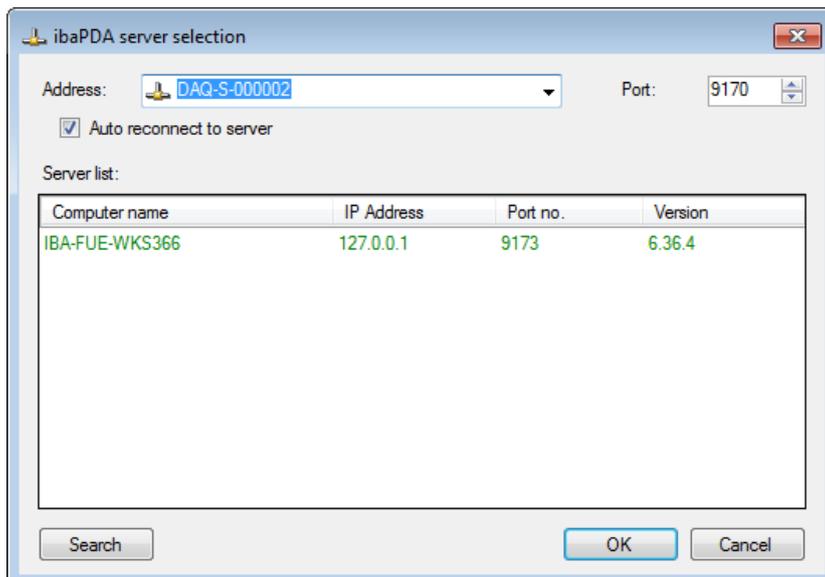


Figure 23: Selecting the ibaPDA server

#### Address

In the "Address" box enter the name or the IP address of the ibaDAQ-S device. The name is composed of the DAQ-S <six-digit serial number>. The serial number is found on the device name plate.

Example: DAQ-S-000002.

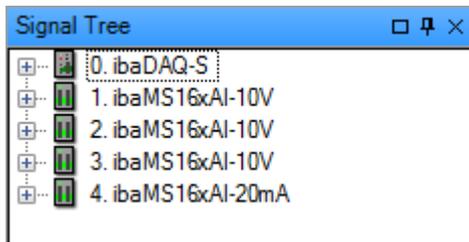
#### Port-no.

The port number is assigned automatically.

#### The <Search> button

This button starts and stops the search for active ibaPDA servers in the network. If the ibaPDA client and ibaDAQ-S are located in the same network, the device should be displayed in the list of servers. The device can be selected either by double-clicking the device or by selecting it and subsequently clicking <OK>.

After the connection has been established, the device is displayed in the ibaPDA signal tree.

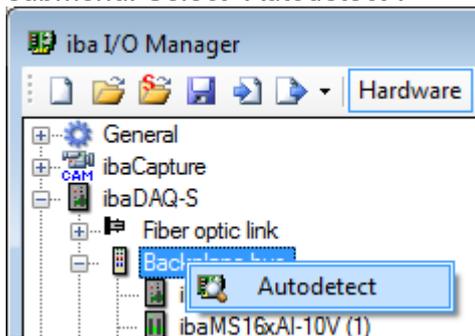


For further configuration activities, open the I/O Manager as described in the next chapter.

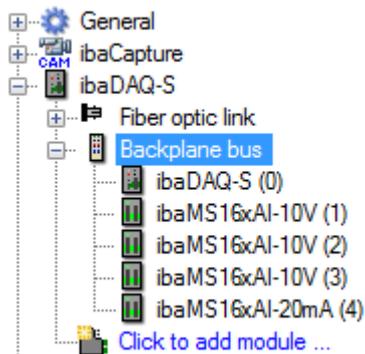
## 10.2 Adding I/O modules

Start ibaPDA, open the I/O Manager and proceed as follows:

1. Select the "Backplane bus" link in the I/O Manager. Right-click the link to open a submenu. Select "Autodetect".

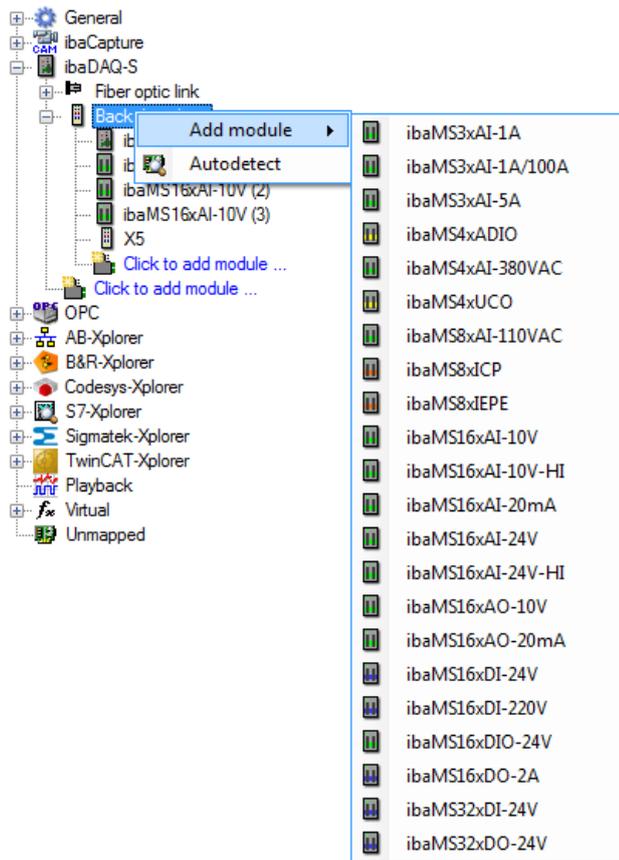


If ibaPDA detects the device automatically, the device and the connected modules are listed in the module tree.

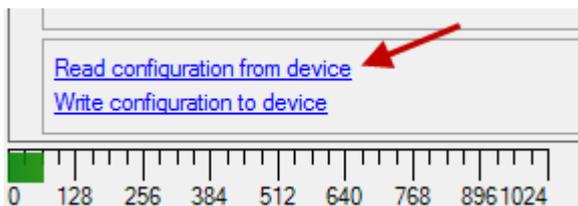


2. If ibaPDA does not detect the modules automatically, you can add the modules manually.
3. Right-click the "Backplane bus" link.

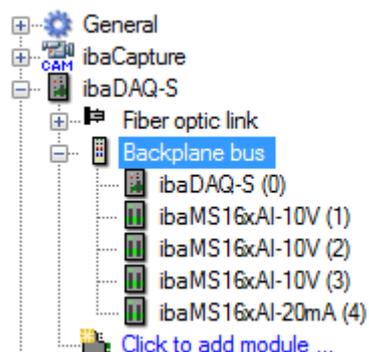
4. Select "Add module". Select the desired modules from the list.



5. Optionally, an existing configuration can be read from the the device by clicking "Read configuration from device" on the "General" tab.



The connected modules are detected automatically and displayed in the signal tree.



6. Configure ibaDAQ-S and the modules, e.g. assign a name, debouncing, etc. (see chapter 10.3.1 "Backplane bus – General tab" and following).
7. Click <Apply> or <OK> to apply the new configuration.

## 10.3 General Settings

### 10.3.1 Backplane bus – General tab

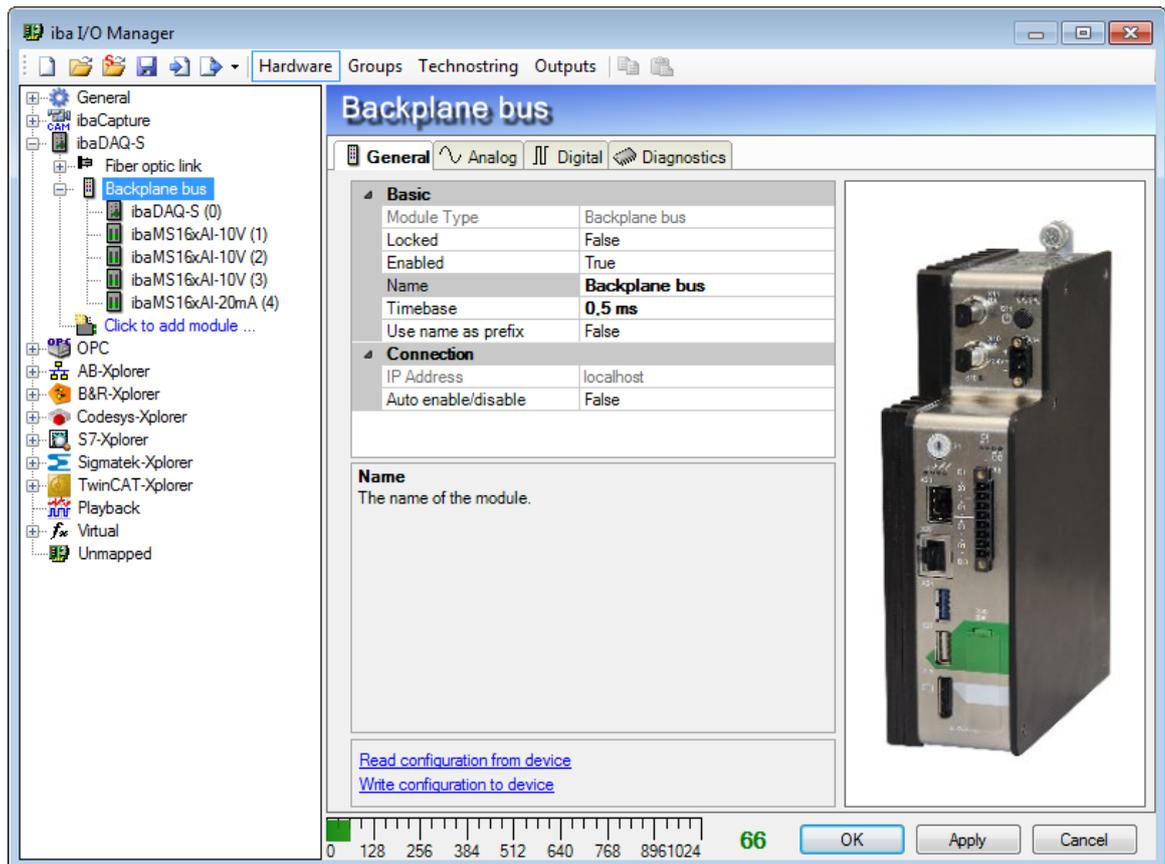


Figure 24: Backplane bus module – General tab

#### Basic settings

- Module type**  
Display of the module type (read only)
- Locked**  
A locked module can only be modified by an authorized user.
- Enabled**  
Data acquisition is enabled for this module.
- Name**  
You can enter a module name.
- Timebase**  
Specifies the acquisition time base used for ibaDAQ-S and the connected modules.
- Use name as prefix**  
If "True" is selected, the module name is prefixed to the signal names of this module.

#### Connection

- IP address**  
IP address or host name of the ibaDAQ-S device (read only).
- Auto enable/disable**  
If this option is enabled and ibaPDA cannot establish a connection to this device

when starting the measurement, it will disable this module and start the measurement without the module. During the measurement it tries to restore the connection. If this attempt is successful, the measurement is restarted automatically with the enabled module. If this option is not enabled, ibaPDA will not start the measurement if it cannot establish a connection to the device.

### More functions

#### Read configuration from device

Reads the configuration saved most recently from the device.

Click <OK> or <Apply> to apply the modified settings.

## 10.3.2 Backplane bus – Diagnostics tab

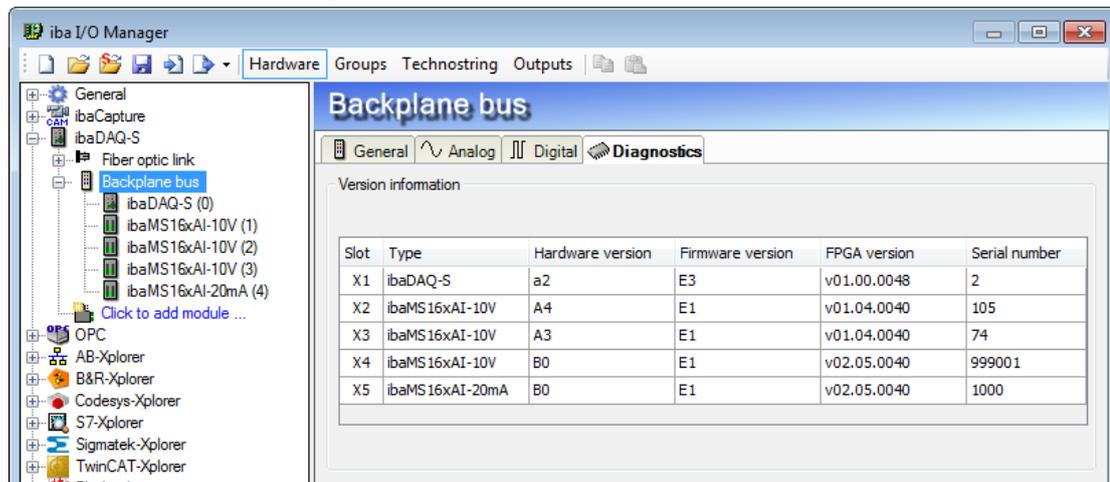


Figure 25: Backplane bus module – Diagnostics tab

The "Diagnostics" tab contains information on hardware, firmware and FPGA version as well as the serial number of the central unit and of the connected modules.

## 10.3.3 Backplane bus – Analog tab

The "Analog" tab is only displayed when acquisition with analog input modules has been started.

In the list, you can see the configured analog signals and the current values.

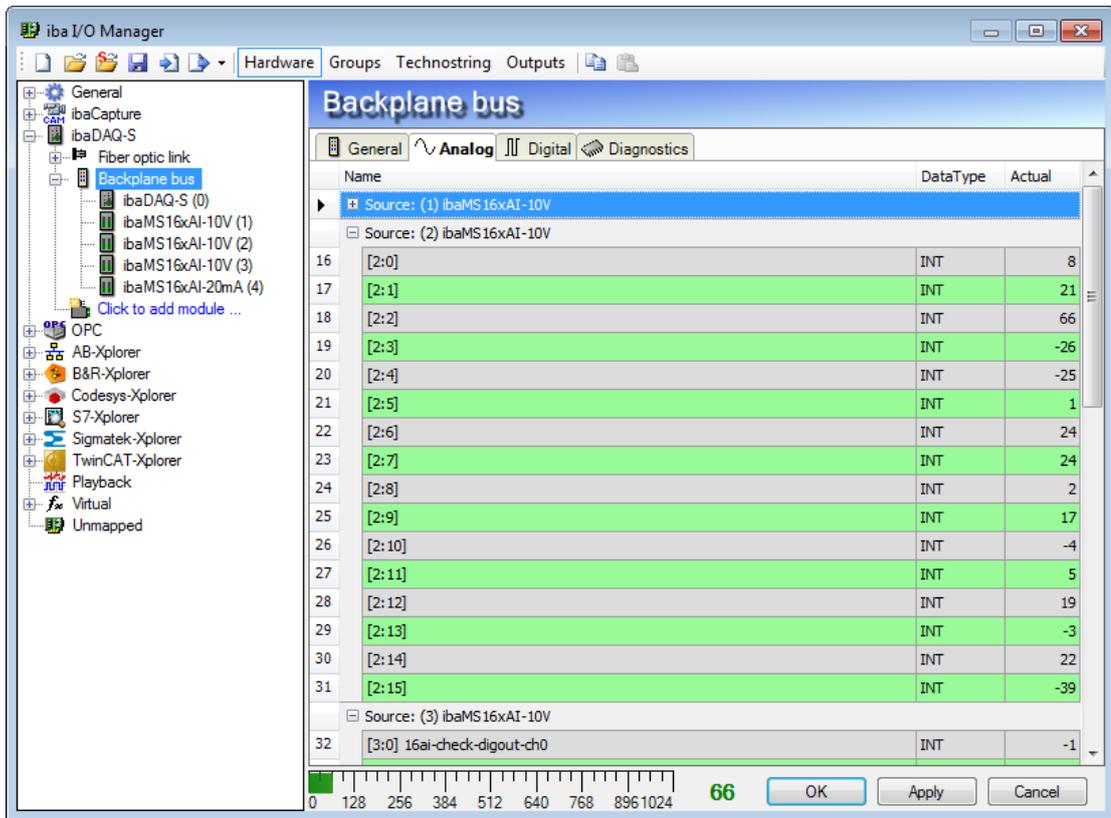


Figure 26: Backplane bus module – Analog tab

### 10.3.4 Backplane bus – Digital tab

The "Digital" tab is only displayed when acquisition with digital input modules has been started.

The list shows the configured digital signals of ibaDAQ-S and of the digital input modules and the current values.

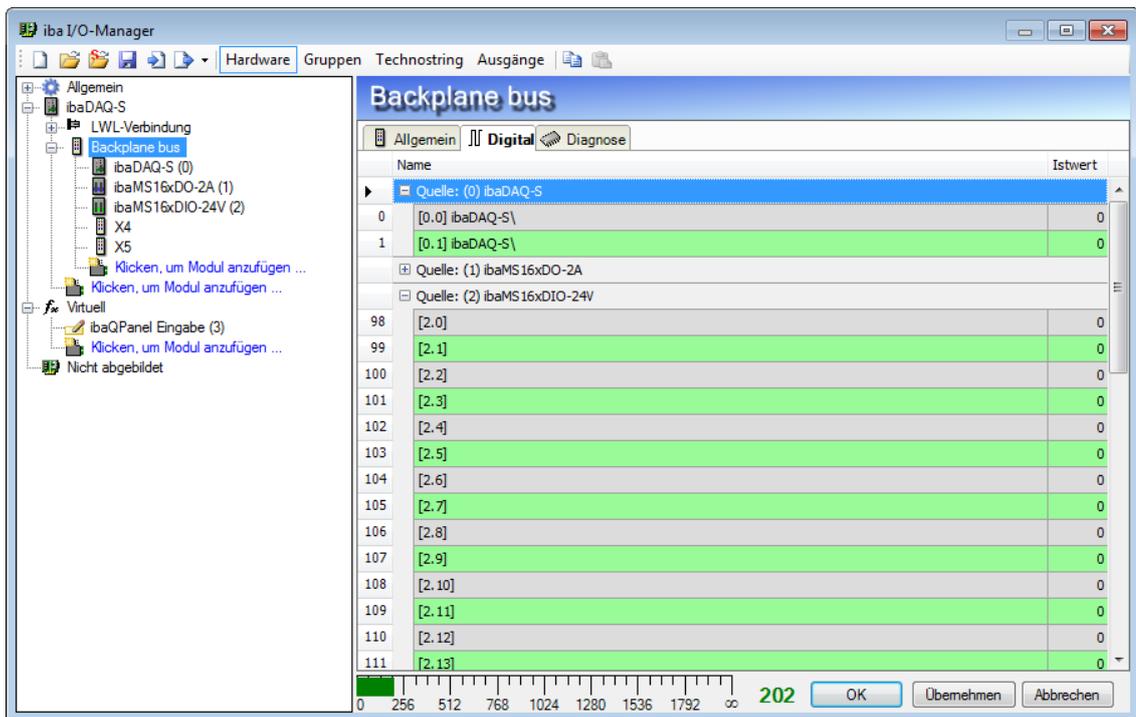


Figure 27: Backplane bus module – Digital tab

### 10.3.5 Diagnose signals

The “Diagnose” module provides diagnosis signals. The module has to be added manually by right-clicking the “Backplane bus” module and selecting “Diagnose” from the context menu.

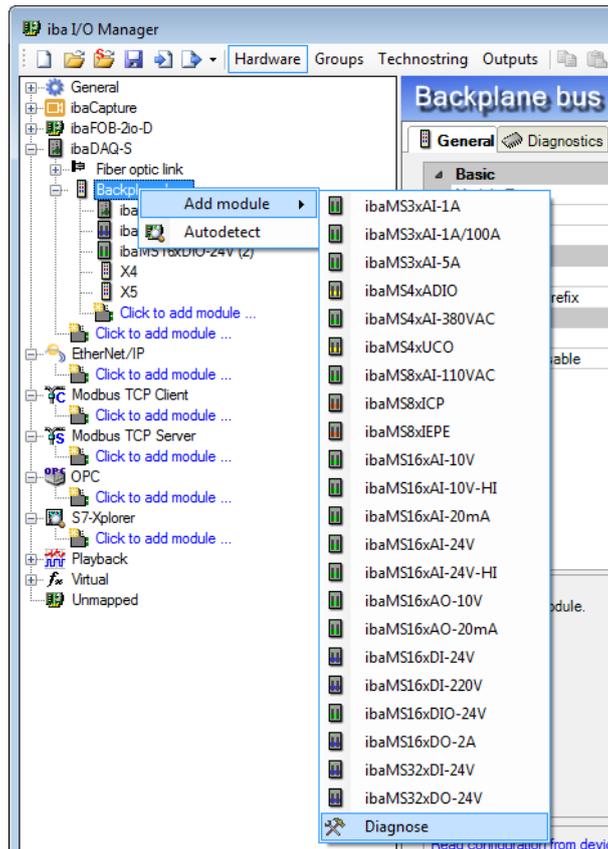


Figure 28: Add the Diagnose module

#### 10.3.5.1 Diagnose – General tab

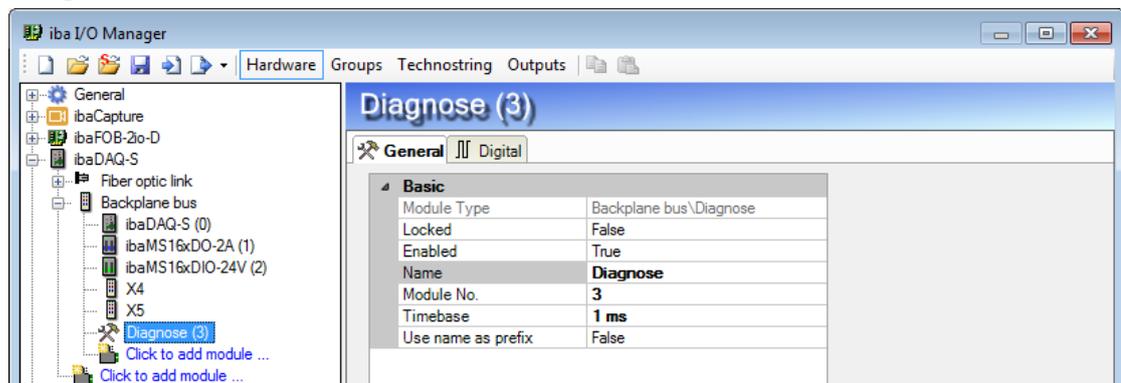


Figure 29: Diagnose module – General tab

#### Basic settings

Module type, Locked, Enabled, Name, Timebase, Use name as prefix see chapter 10.3.1.

#### Module No.

Logical module number for the unambiguous referencing of signals, e.g. in expressions and ibaAnalyzer. Is assigned by ibaPDA in ascending order, but can be changed by the user.

### 10.3.5.2 Diagnose – Digital tab

In the “Digital” tab, you can activate the diagnosis signals.

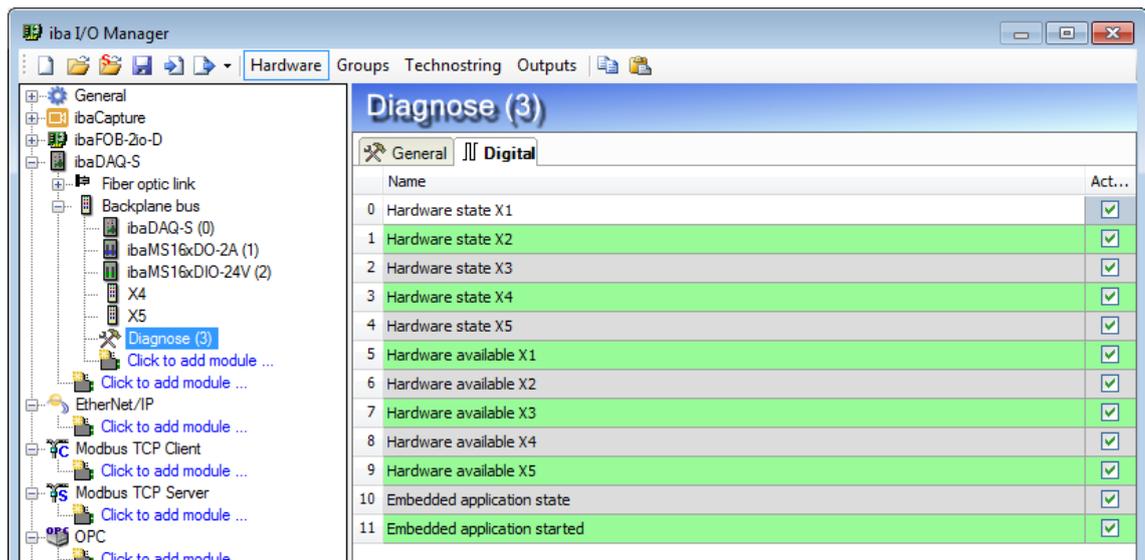


Figure 30: Diagnose module – Digital tab

Signal	Meaning
Hardware state X[...]	Module on slot X[...] is OK
Hardware available X[...]	Module on slot X[...] was detected and initialized properly
Embedded application state	Embedded application is currently available
Embedded application started	Embedded application has been started. When the embedded application is finished properly, the signal will change to FALSE.

## 10.4 Configuring inputs

### 10.4.1 ibaDAQ-S – General tab

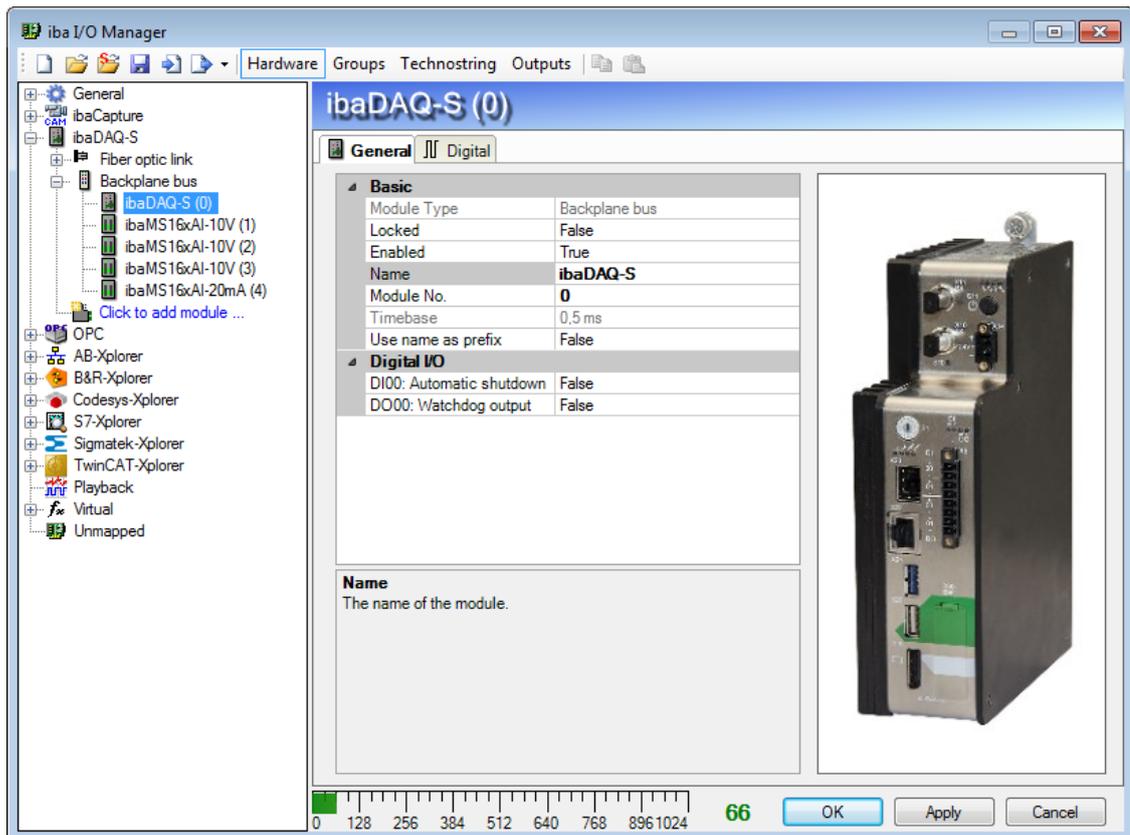


Figure 31: DAQ-S module – General tab

#### Basic settings

- Module type, Locked, Enabled, Name, Timebase**  
see chapter 10.3.1 "Backplane bus – General tab"

- Module No.**  
Logical module number to reference signals unambiguously, e.g. in printouts and ibaAnalyzer.

#### Digital I/O

- DI00: Automatic shutdown**  
TRUE: ibaDAQ-S is shut down automatically if DI00 is set.
- DO00: Watchdog output**  
TRUE: If ibaPDA cannot read data from the ibaDAQ-S hardware during acquisition, DO00 is set.

## 10.4.2 ibaDAQ-S – Digital tab

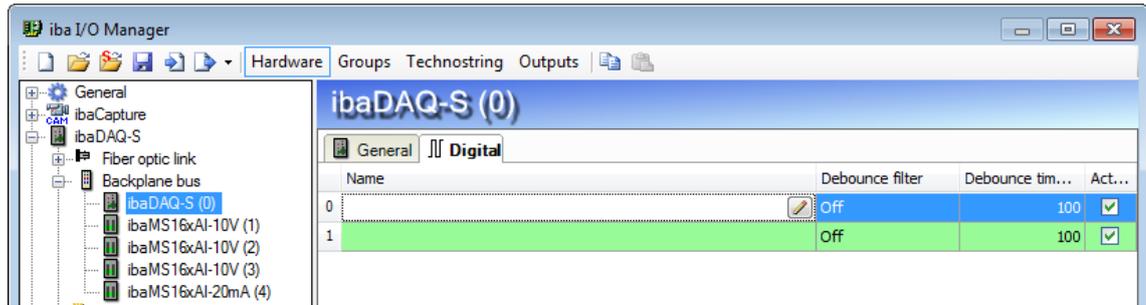


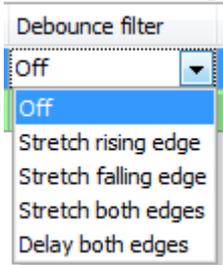
Figure 32: ibaDAQ-S module – Digital tab

### □ Name

Click the  icon in the name field to enter a signal name and additionally two comments.

### □ Debounce filter

In the dropdown menu, you can choose the operating mode for the debounce filter. The following settings are available: Off, Stretch rising edge, Stretch falling edge, Stretch both edges, Delay both edges.



➤ See chapter 7.5.2 "Debounce filter"

### □ Debounce time (µs)

Here you can define the debounce time in µs

### □ Active

Enabling/disabling the signal



### Note

Configure the plugged analog and digital modules. For a detailed description, please read the module manuals.

## 10.5 Configuring outputs

Select the "Outputs" section to configure the output signals. The following parameters can be set on the "Digital" tab:

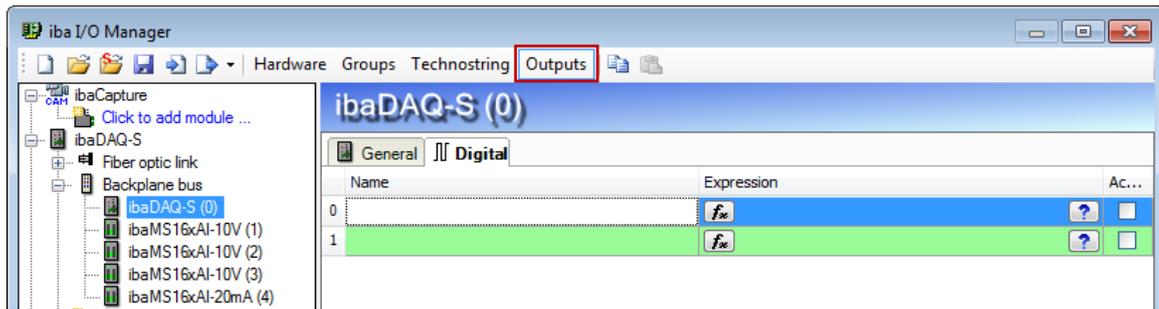


Figure 33: ibaDAQ-S module – "Digital" tab, "Outputs" section

- Name**  
Here you can enter a name for the signal and two additional comments if you click the  icon in the Name field.
- Expression**  
You can use the expression builder  to assign signals to the outputs or to combine signals through logical or mathematical operations.
- Active**  
Used to enable or disable the signal.

## 10.6 Settings for network and FO interface, special functions

The following settings are made in the main branch of ibaDAQ-S:

- Configuration of the FO interface, see chapter 10.6.1
- Network settings of the device, see chapter 10.6.2
- Firmware update and restarting the device, see chapter 10.6.2
- User-defined signal assignment of the LEDs PDA1 and PDA2, see chapter 10.6.2
- Connection of an further iba-devices, see chapter 10.6.3
- Displaying the connection status of the FO link, see chapter 10.6.4
- Operation in mirror mode, see chapter 10.6.5.1
- Calculating the frame size with 32Mbit Flex, see chapter 10.6.5.2

## 10.6.1 ibaDAQ-S – Configuration tab

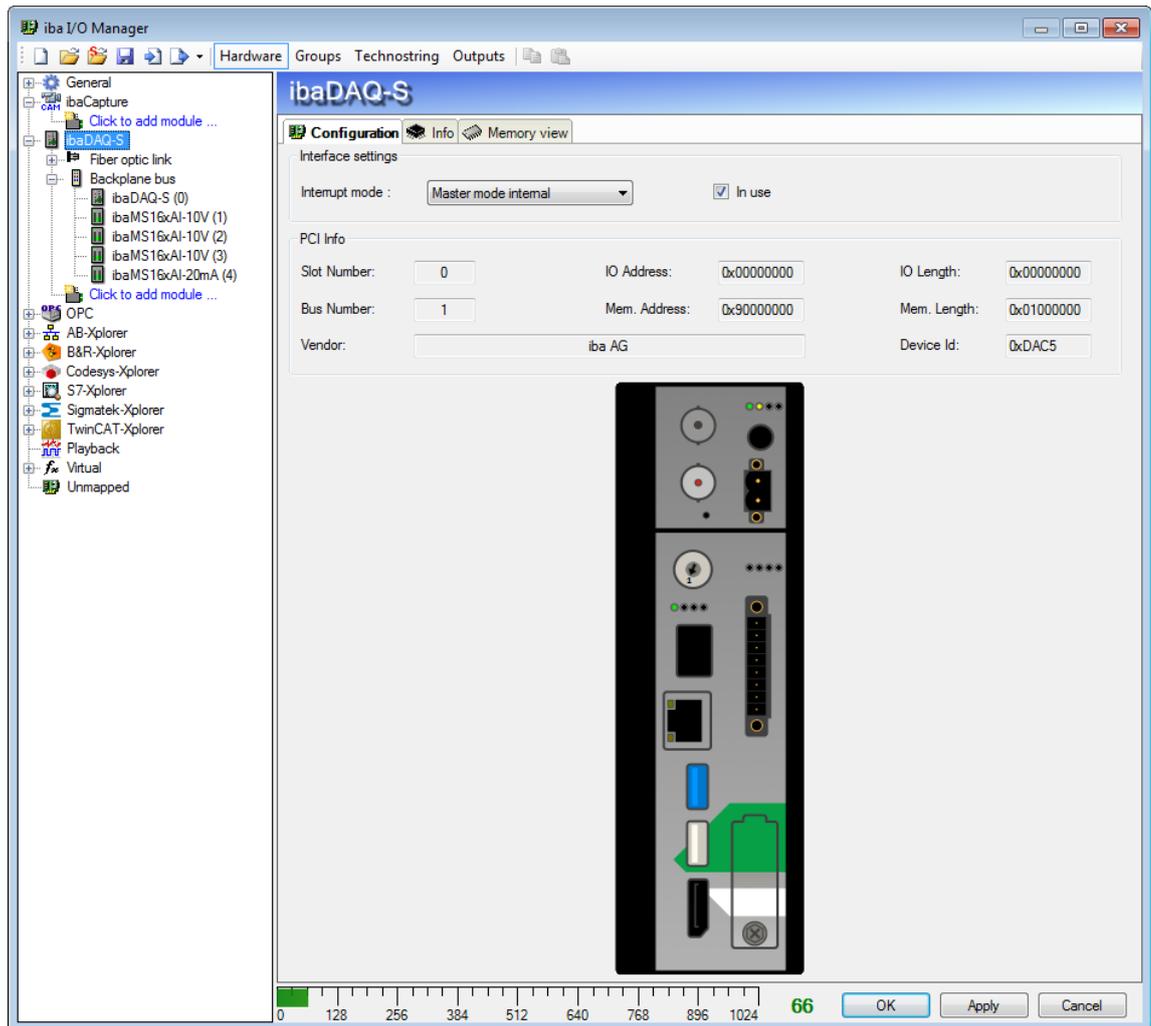


Figure 34: ibaDAQ-S main node – Configuration tab

### □ Interrupt mode

The interrupt mode can be set here.

- Master mode internal (the device is the interrupt master itself)
- Master mode external (external interrupt master)

The option "in use" is enabled by default. This option allows the device to be disabled temporarily while preserving the configuration.

## 10.6.2 ibaDAQ-S – Info tab

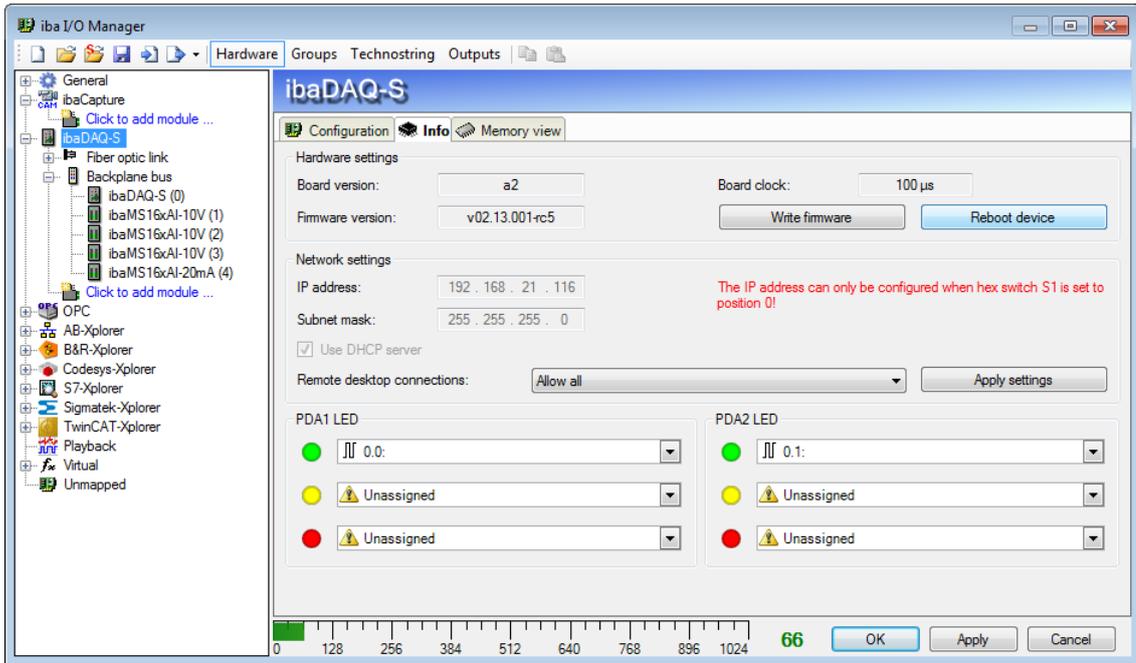


Figure 35: ibaDAQ-S main node – Info tab

The "Hardware settings" section provides information on the board and firmware version of the internal FOB card and the board clock.

### Write firmware

This button allows running firmware updates. Select the update file "daqs\_v[xx.yy.zzz].iba" in the browser and start the update by clicking <Ok>.



### Important note

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

### Reboot device

Click this button to restart the device.

### Network settings

The settings of IP address, subnet mask and DHCP server are only available if the rotary switch S1 is set to "0".

### Use DHCP-Server

Select here whether a DHCP server is used.

### IP address

Here you can enter a user-defined IP address. The option "Use DHCP server" must not be enabled to do so.

### Subnet mask

Enter the suitable subnet mask for you network here.  
The option "Use DHCP server" must not be enabled to do so.

### Remote desktop connections

Here you can allow or deny remote desktop connections. Possible settings:

- Disabled
- Allow all
- Only secure connections

### <Apply settings>

Click <Apply settings> to apply the network settings in the device.



### Important note

Please remember to assign the corresponding user authorizations when setting up the remote desktop connection for the first time.

This is only possible directly at the device and not via the ibaPDA client.

If you run ibaDAQ-S in a domain, you may ask the IT department to assign the authorizations.

### PDA1/2 LED

Here you can assign signals to the LEDs PDA1 and PDA2. 3 colors (green, yellow and red) are available for each LED. Select one input signal respectively from the dropdown menu. If the corresponding signal applies, the LED will light up in the configured color.

PDA1 LED		PDA2 LED	
	<input type="text" value="0.0"/>		<input type="text" value="0.1"/>
	<input type="text" value="0.0"/>		<input type="text" value="Unassigned"/>
	<input type="text" value="Unassigned"/>		<input type="text" value="Unassigned"/>

Figure 36: User-defined signal assignment

### 10.6.3 Connection of an external iba-device

For measured data acquisition, an external iba device can be connected to the FO input and output.

To integrate the device in ibaPDA, right-click the link „Fiber optic link“ and select „Autodetect“. The device and the used ibaNet protocol will be automatically detected and displayed in the module tree.

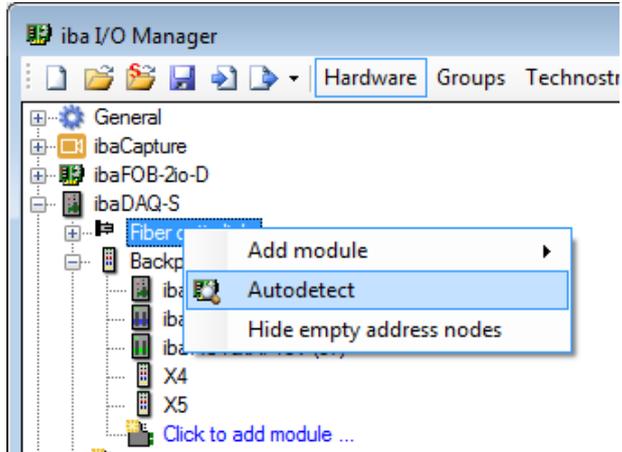
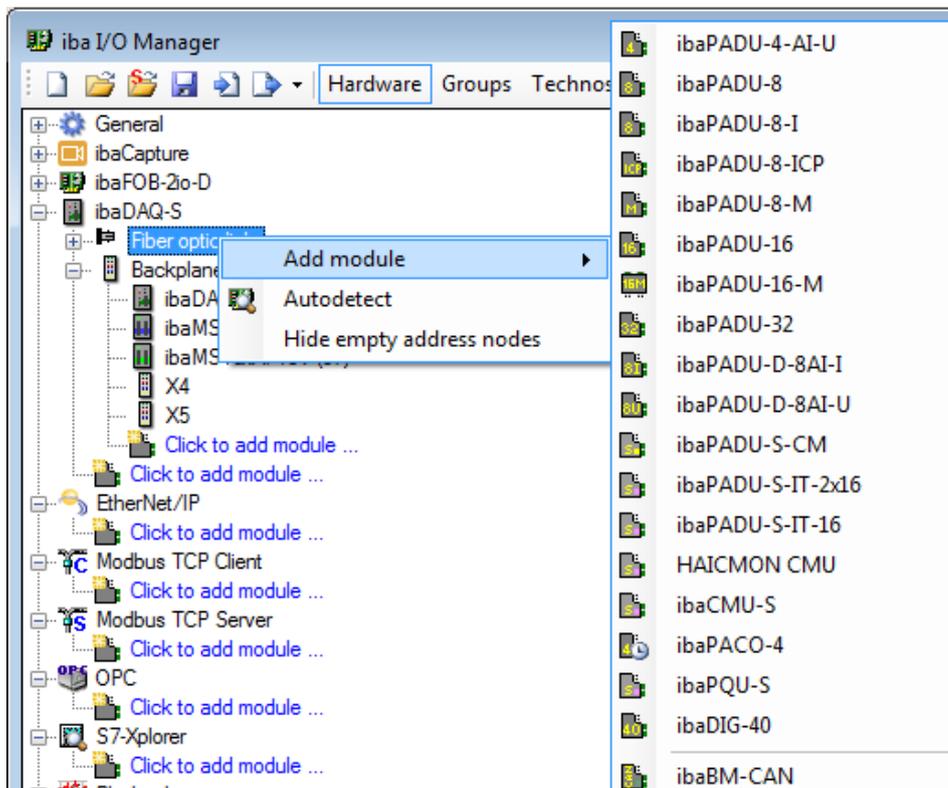


Figure 37: Automatic detection of an external iba-device

Alternatively, the device can be manually added. Select „Add module“ in the context menu and then the corresponding device.



For further information regarding the configuration of the external iba-device, please refer to the corresponding device manual.

## 10.6.4 Link – Info tab

The left-hand part of the "Info" tab shows information on FO communication. The displayed information depends on the protocol used.

### 10.6.4.1 3Mbit protocol

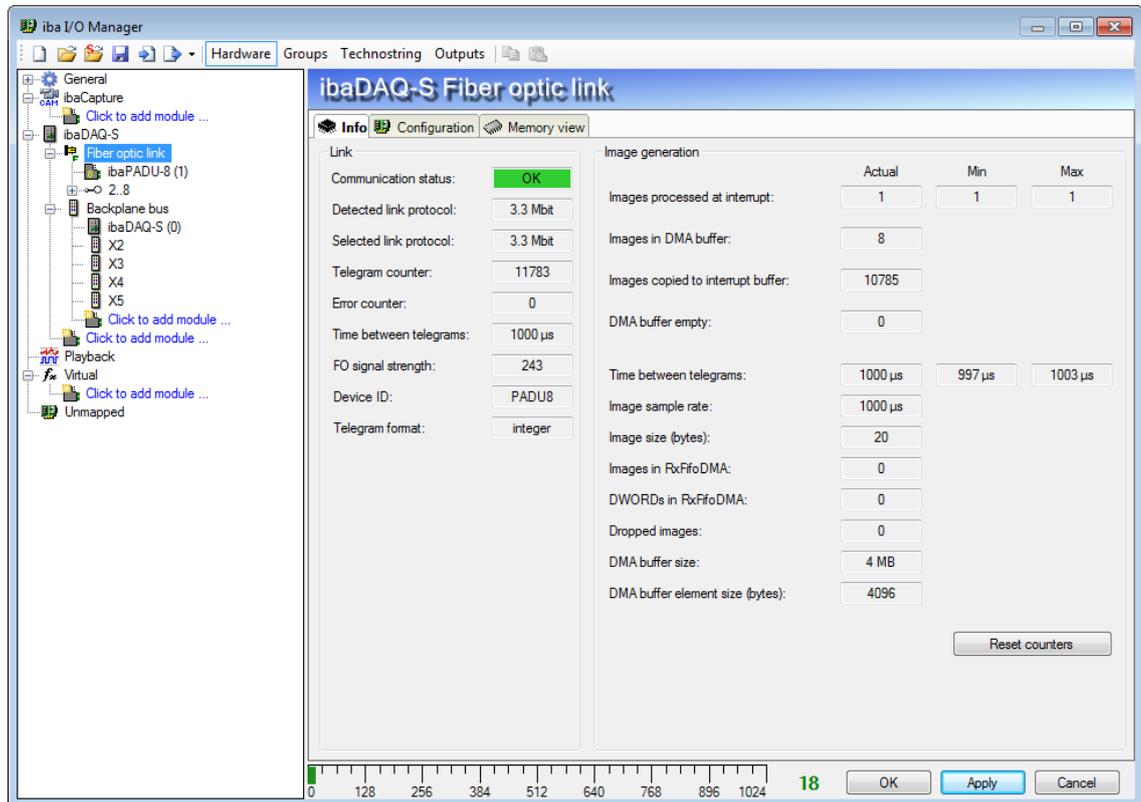


Figure 38: FO link with 3Mbit protocol

#### "Link" area

##### ❑ Communication status

OK when FO communication is working properly. This means that the telegrams received correspond to the mode configured on the link. The transmission mode is determined by the device (module) connected to the FO interface. For example, if an ibaPADU-8AI is connected, the link will be set to 3Mbit mode. If an ibaPADU-D-8AI is connected, the link will be set to 32Mbit Flex.

##### ❑ Detected link protocol

This is the detected transmission protocol. Possible values: 2Mbit, 3Mbit, 5Mbit, 32Mbit, 32Mbit Flex or "?" (no device connected).

##### ❑ Selected link protocol

This is the transmission protocol set for this FO interface. It is determined by the connected module.

##### ❑ Telegram counter

Counter of correctly received telegrams

##### ❑ Error counter

Counter of received faulty telegrams (e.g. checksum error). If this counter changes, FO communication is not working properly.

##### ❑ Time between telegrams

The time between the last 2 correctly received telegrams.

**FO signal strength**

This is the difference between the maximum value and the minimum value received from the FO unit. It can be 255 max. The higher this value, the stronger the FO input signal.

**Device ID**

The ID of the last device in an FO series connection at this FO interface.

**Telegram format**

This is the format of the analog data transferred in the telegram. "Integer", "Real" and "S5 real" are possible formats.

**"Image generation" area**

The information on the right side of the dialog describes the image generation (process image). An image is a collection of bytes that the board writes into the computer memory via DMA. This image includes all data of the measured signals on that link.

The following list explains the image generation information:

**Images processed at interrupt**

These counters show how many images were available in the DMA buffer when the last interrupt fired. This should normally correspond with the interrupt time divided by the image sampling rate.

**Images in DMA buffer**

This is the number of images available in the DMA buffer. The number should be constant. If this number increases, the system does not work correctly. This can be a missing interrupt for example.

**Images copied to interrupt buffer**

This counter shows how many images have been read from the DMA buffer and processed by ibaPDA. This counter should gradually count upwards.

**DMA buffer empty**

This counter increments each time when the interrupt fires while the DMA buffer is empty. If this is the case, the driver will set all signal values of the respective port to zero (0). This can happen for example if the FO link is interrupted.

**Time between telegrams**

The time between the last 2 correctly received telegrams. It is the same value as in the left section of the dialog box, but additionally specifies the maximum and minimum distance. The differences between min. and max. value should not deviate significantly from each other.

**Image sample rate**

The rate at which the board writes images to the DMA buffer. It should be greater than or equal to the fastest acquisition rate of the modules connected to this link.

**Image size**

This is the image size in bytes. If you multiply the image size with the image sample rate, you know how many bytes per second are transferred by this link over the PCI bus.

**Images in RxFifoDMA**

This is the number of images that are in the board's DMA fifo waiting to be transferred over the PCI bus. This value should usually be zero (0) or 1. An increase of this value indicates PCI bus overload.

**DWORDS in RxFifoDMA**

This is the same value as Images in RxFifoDMA, but stated as DWORDS.

**Dropped images**

This counter increments when the card's DMA fifo is full and additional images are added. This is a serious problem. The card cannot transfer images over the PCI bus.

**DMA buffer size**

Size of the DMA buffer for this interface.

### 10.6.4.2 5Mbit protocol

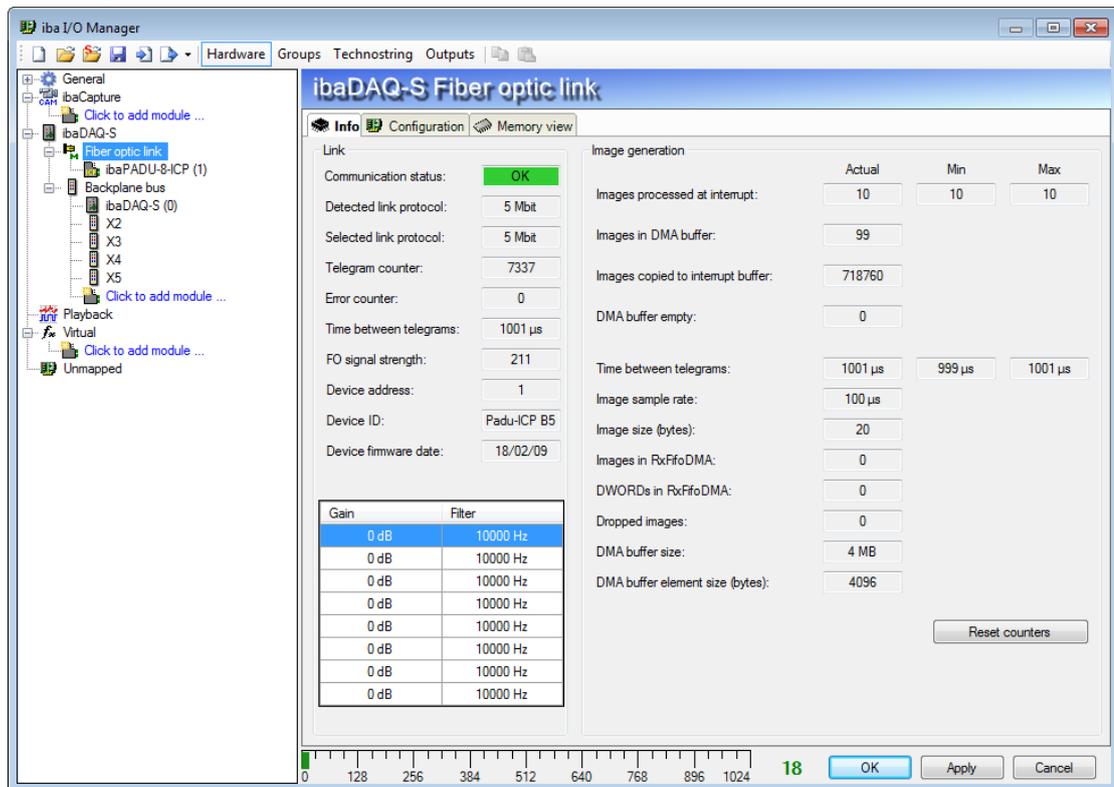


Figure 39: FO link with 5Mbit protocol

The screenshot above shows the information you receive when the FO link operates with 5Mbits, e.g. with ibaPADU-8-ICP. Additional items:

**Device firmware date**

The date of the firmware loaded in the currently connected device.

**Gain and Filter table**

Gains and filter factors are configured in the device. This applies only to ibaPADU-8-ICP devices.

### 10.6.4.3 32Mbit protocol

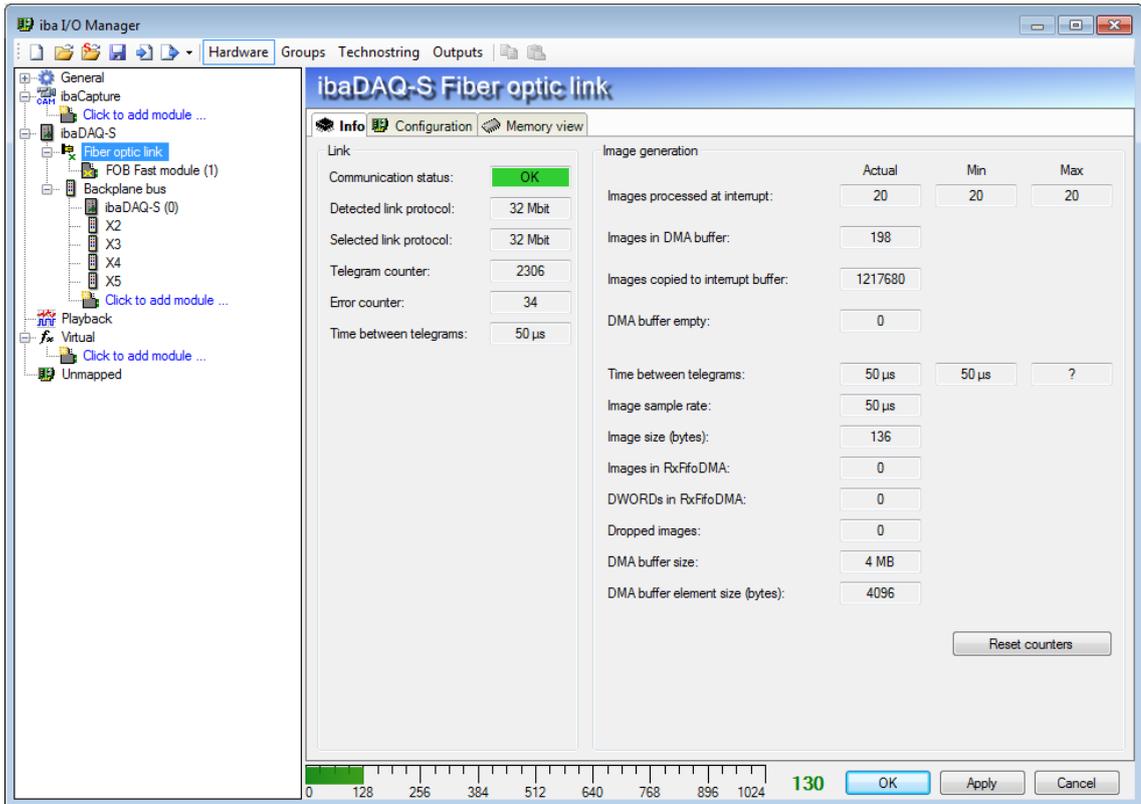


Figure 40: FO link with 32Mbit protocol

For the display, see 3Mbit protocol.

### 10.6.4.4 32Mbit Flex protocol

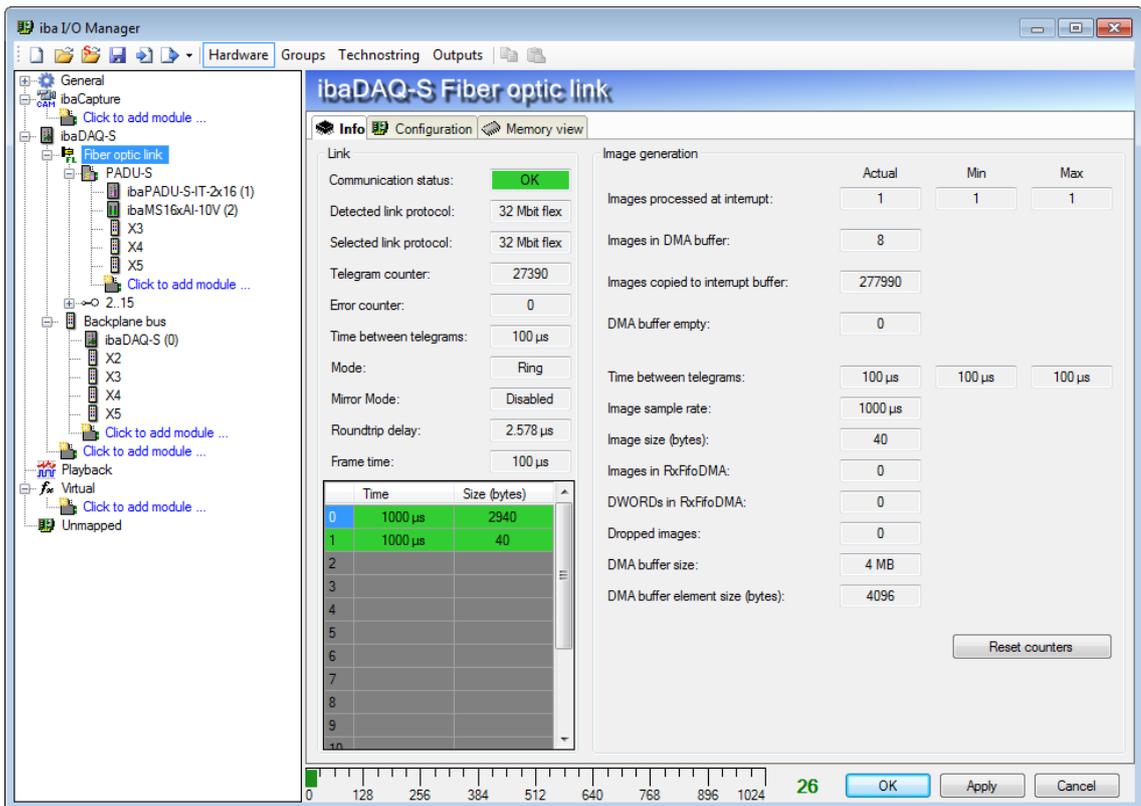


Figure 41: Link information for 32Mbit Flex protocol

The screenshot above shows the information you see when the link is in 32Mbit Flex mode. Up to 15 devices can be connected in a ring topology per FO link. In the signal tree on the left, the links 1 - 15 below the FO link correspond to the address set at the connected device by means of the rotary switch.

Additional items:

### In the Link area

#### Mode

The status of the link is shown:

**Ring:** One or more devices (cascade) are connected bidirectionally and the FO ring is closed.

**Open chain:** Only the FO input is connected to a device. The output is not connected or the FO ring is interrupted in one place.

#### Time between telegrams

Time between two telegrams measured by the ibaFOB-D card. It should be equal to the configured frame time.

#### Roundtrip delay

Telegram cycle in the closed FO ring. The time depends on the number of connected devices in the ring (approx. 2  $\mu$ s per device).

Due to the roundtrip delay, the data of the connected devices might be captured asynchronously (by up to one telegram cycle).

#### Frame time

Cycle time during which the frames are being sent. (Smallest configurable timebase of the connected devices or 100  $\mu$ s if this timebase is an integer multiple of 100  $\mu$ s. The timebase of all devices must be a multiple of the smallest timebase).

#### Table

The table shows the cycle time and the data volume for the corresponding channels:

Line 0: Ethernet channel

Line 1-15: connected devices with the respective address 1-15.

## 10.6.5 Link – Configuration tab

### 10.6.5.1 Mirror mode with 32Mbit Flex

The mirror mode allows multiple ibaPDA systems to simultaneously acquire the data of the same 32Mbit Flex devices. For this purpose, one ibaPDA system is configured as the master. It is the only system that configures the connected Flex devices. The other ibaPDA systems are configured as slaves and they can only acquire the data of the Flex devices, but not change the configuration. Since ibaDAQ-S has an integrated ibaPDA system, the device can equally be operated as master or slave in mirror mode.

The master ibaPDA system requires a bidirectional fiber optic connection to receive and send data to the Flex devices. The slave ibaPDA only needs a one-way FO link to receive data from the Flex devices and the device configuration.



#### Note

The slave system cannot output data via fiber optics.

## Possible connections

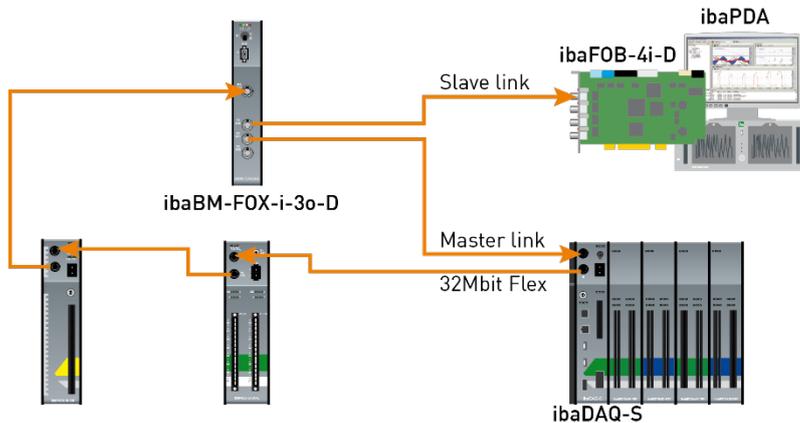


Figure 42: Connection in mirror mode with ibaBM-FOX-i-3o-D

The FO output of the last Flex device is connected to the FO input of an ibaBM-FOX-i-3o-D device. One FO output of ibaBM-FOX-3o-D is connected to the FO input of the ibaPDA master (ibaDAQ-S in the example) and of the ibaPDA slave.

This connection allows the ibaPDA slave to still acquire data when the ibaPDA master has been shut down.

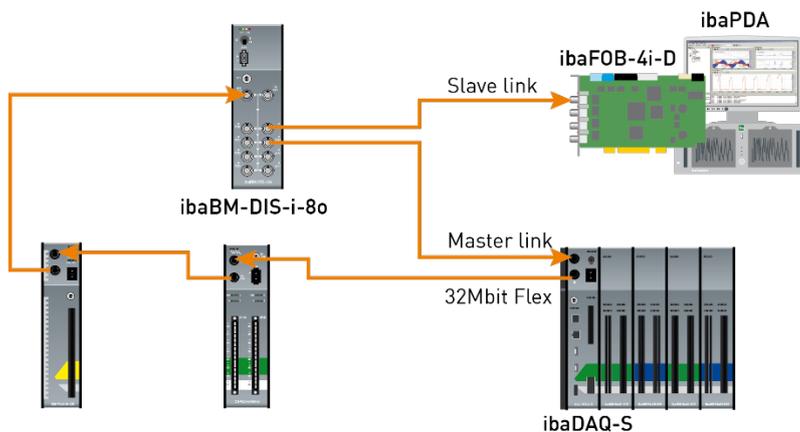


Figure 43: Connection in mirror mode with ibaBM-DIS-i-8o

For the above connection example with ibaBM-DIS-i-8o, the same applies as to ibaBM-FOX-i-3o-D. The ibaBM-DIS-i-8o device must be set to copy mode (S1 = 0) for this purpose.

## Configuration in ibaPDA

Open the "Configuration" tab in the Link view.

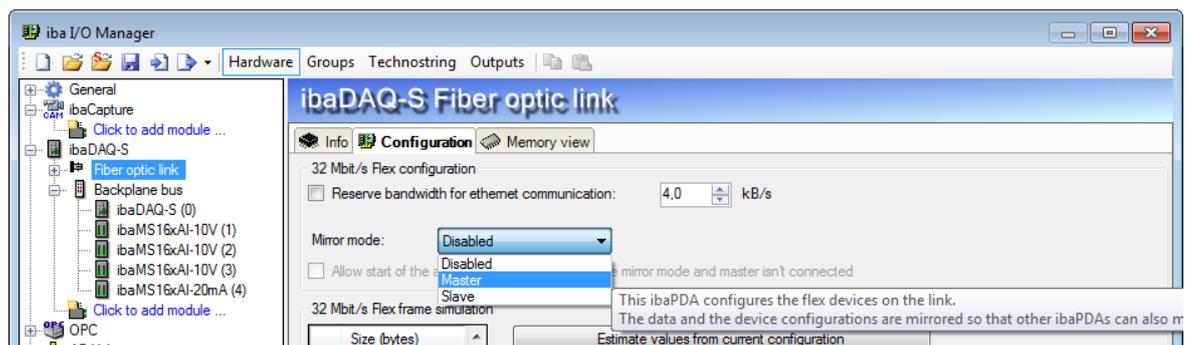


Figure 44: Mirror mode configuration

3 settings are available for mirror mode:

- Disabled:** The data is not mirrored so that this ibaPDA system is the only system capable of configuring the devices and acquiring data.
- Master:** This ibaPDA system configures the Flex devices on the link. The data and the device configurations are mirrored so that other ibaPDA systems can also acquire the data.
- Slave:** This ibaPDA system receives the device configuration from the master ibaPDA so that it can acquire the data configured by the ibaPDA master.

The slave ibaPDA can get the device configuration from the master ibaPDA using the "autodetect" function. A slave ibaPDA cannot change the device configuration. The modules in the signal tree are displayed with a padlock symbol in the slave ibaPDA.

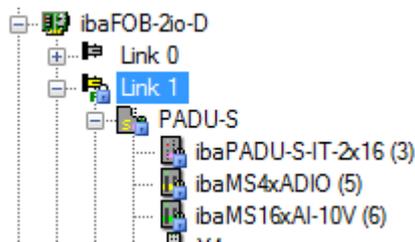


Figure 45: Modules in the signal tree

When acquisition has been started on the slave ibaPDA, the slave waits until it receives the configuration from the master. If this configuration is different from the current configuration, the slave will load the new configuration.

If the slave does not receive a configuration from the master within 6 s, ibaPDA will generate an error message. If the option "Allow start of the acquisition when the link is in slave mirror mode and master isn't connected" is enabled, acquisition will be started anyway with the last configuration.

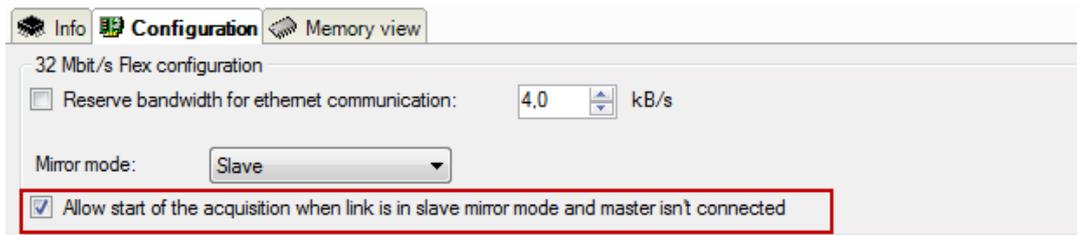


Figure 46: Link – Configuration tab

When the master ibaPDA changes the configuration while the slave ibaPDA is acquiring data, the slave will automatically restart acquisition.

### 10.6.5.2 Calculating the telegram size with 32Mbit Flex

The data size per participant is dynamically allocated in a 32Mbit Flex ring and is calculated by ibaPDA. The data size depends on the configured number of analog and digital signals and the smallest configured timebase in the ring.

ibaPDA version 6.33.1 and higher provides a simulator (32 Mbit/s Flex frame simulation) which calculates the data size that can be transmitted by each participant via the FO link using the 32Mbit Flex protocol. Open the "Configuration" tab for this purpose.

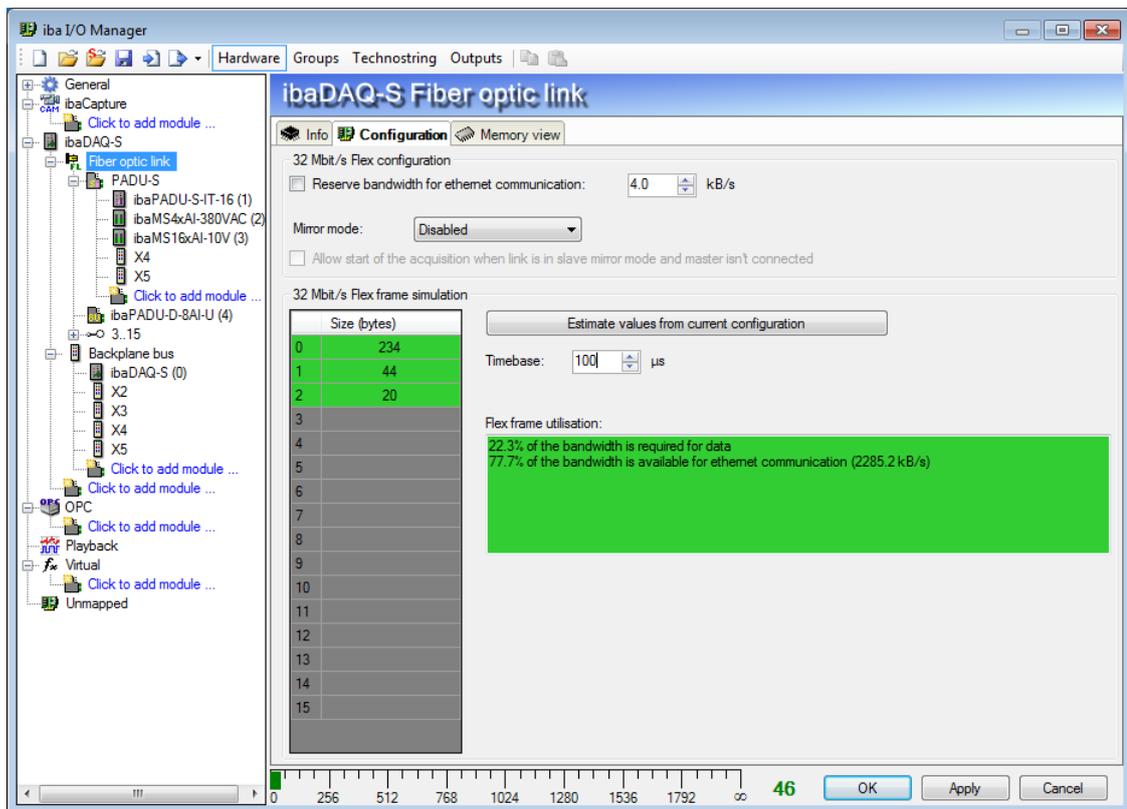


Figure 47: Simulation of the bandwidth distribution in the 32Mbit Flex telegram.

The data size in bytes of each device on the link and the timebase of the data acquisition on the link (in  $\mu\text{s}$ ) is needed for the calculation.

The values can be entered manually or retrieved automatically from the current configuration either by clicking the button <Estimate values from current configuration> or by selecting the corresponding link of the ibaFOB card in the module tree.

The devices in the Flex ring and the corresponding data sizes are listed in the table on the left. Address 0 is reserved for the Ethernet channel and is not editable.

The "Flex frame utilisation" section shows how much bandwidth is still available. The color of the section changes with the utilization rate.

- Green: OK
- Orange: bandwidth for the Ethernet channel < 3 kB/s
- Red: too much data

The data values obtained automatically are estimated first. When the configuration is applied by clicking <OK> or <Apply>, the actual data sizes are shown on the "Info" tab.

If too much data is configured, you can either reduce the number of signals to be measured or increase the timebase.

### Simulating the load

Even when no devices have been connected and configured, the calculation of the telegram size can be used for calculating the expected data load in advance.

Open the I/O Manager in ibaPDA, click on the link of the card and select the "Configuration" tab.

Set the smallest scheduled sampling rate in the "Timebase" field. Now, you can enter the scheduled or expected data volume (in bytes) manually in the table rows 1 to 15. Each new entry causes the result values in the "Flex frame utilisation" field to be recalculated.

This allows you to estimate whether the planned number of signals or devices can be processed on one Flex link or whether an additional Flex link should be used.

### Reserved bandwidth in the Ethernet channel for configuration data

The Ethernet channel (address 0) is used to transmit configuration data, to communicate with a web interface and especially for ibaBM-DP to display the Profibus diagnosis. If many devices are configured with a lot of signals, it may happen that only the minimum size of 1 kB/s is reserved for the Ethernet channel. This minimum size is often not sufficient and the Profibus diagnosis may not be displayed as a result or communication with the web interface may become very slow.

The option "Reserve bandwidth for Ethernet communication" allows you to reserve a fixed bandwidth for the Ethernet channel. The default value of 4 kB/s is usually sufficient for configuration data and Profibus diagnosis.



Figure 48: Reserving bandwidth for Ethernet communication.

## 10.7 Setting up file sharing

To comfortably access recorded data through the network, the ibaPDA client allows setting up read-only access.

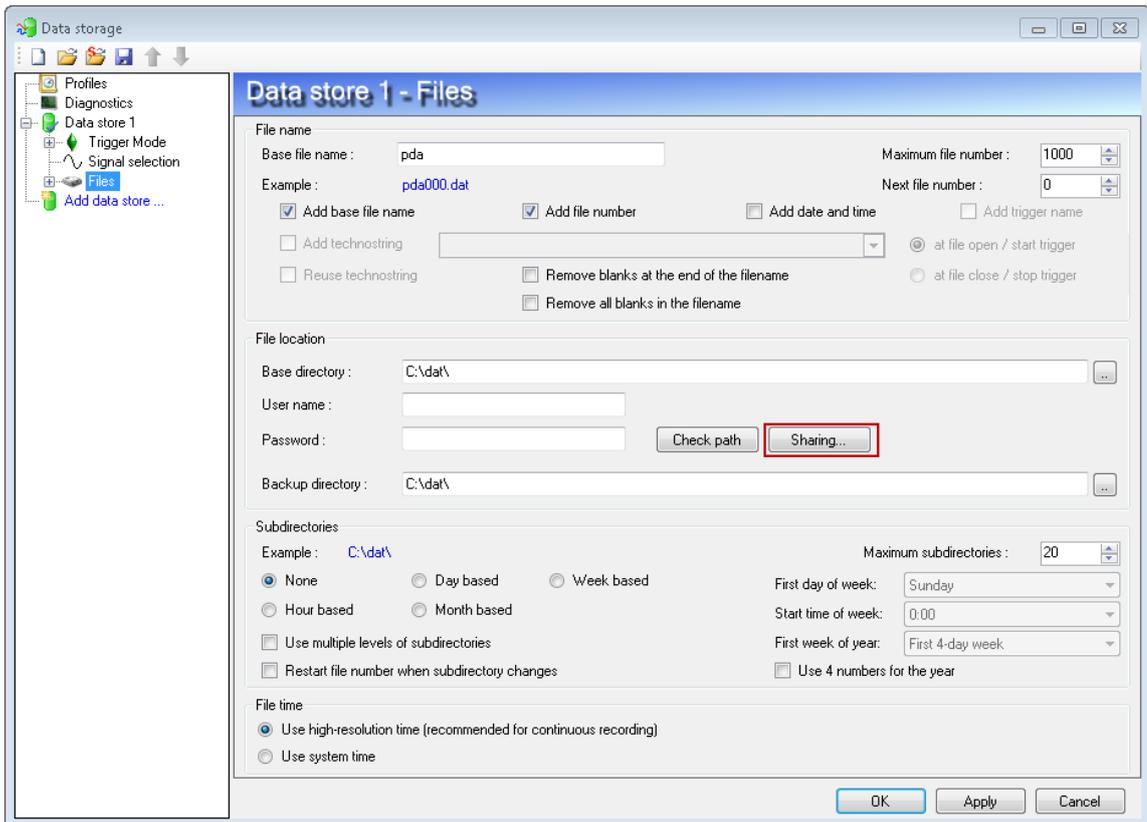


Figure 49: Configuring data recording

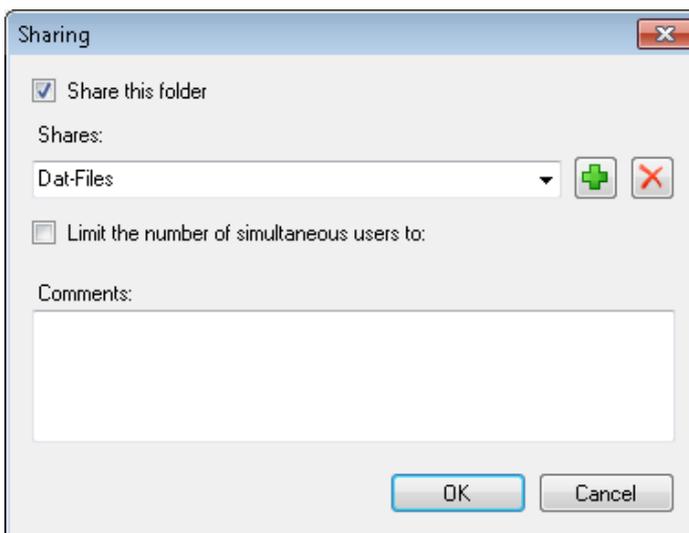


Figure 50: Sharing folders



### Note

When running ibaDAQ-S in a so-called workgroup, you need the user name and the password to access it.

If ibaDAQ-S and the accessing PC are in the same domain, a separate authentication is usually not necessary.

## 11 Technical data

### 11.1 Main data

<b>Brief description</b>	
Description	ibaDAQ-S
Description	Central unit for iba modular system
Order number	10.170000
<b>Processor unit</b>	
Processor	Intel Atom E3845 quad core CPU 1.91 GHz
Operating system	Windows Embedded Standard 7
RAM	2 GB
Flash memory	Solid state drive 128 GB
Clock	With battery back-up, can be replaced during operation (3V lithium CR2032) Synchronization possible via DCF77 (digital input) or NTP
<b>Supply, operator and indicator elements</b>	
Voltage supply	24 V DC, $\pm 10\%$ not stabilized, 1 A (without I/O modules), 3 A (with up to 4 I/O modules)
Power consumption	Max. 36 W
Displays	6 LEDs for operating state 2 LEDs for digital inputs 2 LEDs for digital outputs 2 LEDs for customized applications, configurable in ibaPDA
<b>Operating and environmental conditions</b>	
Cooling	Passive
Operating temperature	0°C ... 50 °C
Storage and transport temperature	-25°C ... 70°C
Installation position	vertical or horizontal
Installation height	Up to 2000 m
Humidity class acc. to DIN 40040	F, no condensation
Protection class	IP20
Certification/Standards	EMC: IEC 61326-1 FCC part 15 class A
MTBF <sup>3</sup>	152352 h (ca. 17 years)
<b>Dimensions and weight</b>	
Dimensions (width x height x depth)	56 mm x 214 mm x 148 mm with subrack: 229 mm x 219 mm x 156 mm
Weight	1.5 kg (incl. packaging and documentation)

<sup>3</sup> MTBF (mean time between failure) according to Telcordia 3 SR232 (Reliability Prediction Procedure of Electronic Equipment; Issue 3 Jan. 2011) and NPRD (Non-electronic Parts Reliability Data 2011).

**Supplier's Declaration of Conformity  
47 CFR § 2.1077 Compliance Information**

**Unique Identifier:** 10.170000, ibaDAQ-S

**Responsible Party - U.S. Contact Information**

iba America, LLC  
370 Winkler Drive, Suite C  
Alpharetta, Georgia  
30004

(770) 886-2318-102  
[www.iba-america.com](http://www.iba-america.com)

**FCC Compliance Statement**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## 11.2 Interfaces

<b>ibaNet</b>	
ibaNet protocols	ibaNet 32Mbit Flex (bidirectional) ibaNet 32Mbit 50µs / 100µs / 800µs ibaNet 3Mbit
FO cable	2 ST plug connectors (62.5/125 µm) for RX and TX; max. 2000 m cable length without repeater
<b>Additional interfaces</b>	
Ethernet	1 Gbit/s
USB	1x USB 3.0, 1x USB 2.0
DisplayPort	Port for monitor

## 11.3 Digital inputs/outputs

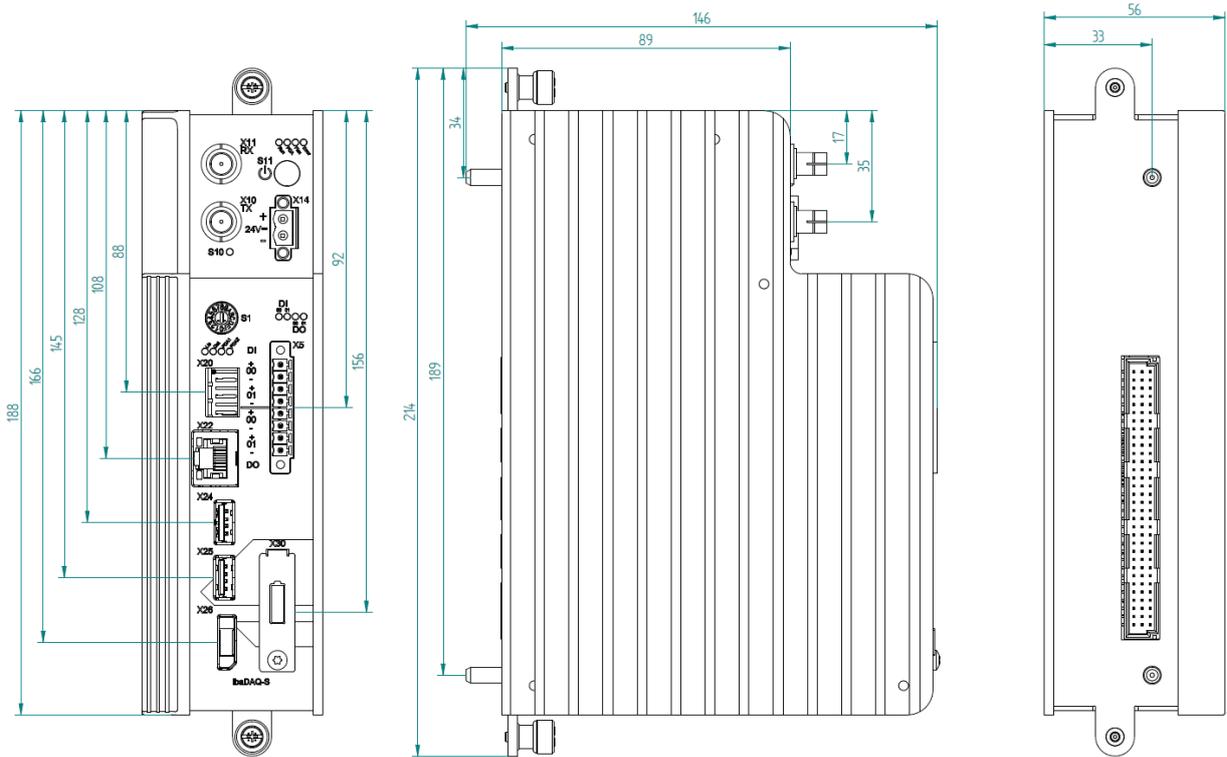
<b>Digital inputs</b>	
Number	2
Version	Electrically isolated, protected against polarity reversal, single ended
Input signal	24 V DC
Max. input voltage	±60 V permanent
Signal level log. 0	> -6 V; < +6 V
Signal level log. 1	< -10 V; > +10 V
Input current	1 mA, constant
Debounce filter	Optionally with 4 different operating modes, configurable in ibaPDA
Sampling rate	Max. 40 kHz, freely adjustable
Delay	typ. 10 µs
Electrical isolation	
Channel-channel	2.5 kV AC
Channel-housing	2.5 kV AC
Connection technology	Screw-type terminal (0.14 mm <sup>2</sup> to 1.5 mm <sup>2</sup> ), screw connection, included in delivery
<b>Digital outputs</b>	
Number	2
Version	Electrically isolated, solid-state DC switch
Switching voltage	max. 200 V DC, protection against surge voltages
Switching current	max. 350 mA (permanent), overcurrent protection
Switch delay	< 2 ms (at 100 mA)
ON resistance (log. 1)	max. 3.75 Ω (at 100 mA)
OFF resistance (log. 0)	min. 100 MΩ
Electrical isolation	
Channel-channel	2.5 kV AC
Channel-housing	2.5 kV AC
Connection technology	Screw-type terminal (0.14 mm <sup>2</sup> to 1.5 mm <sup>2</sup> ), screw connection, included in delivery

## 11.4 Supported I/O modules

I/O module	Order no.	Use in ibaPADU-S-B4S subrack	Use in ibaMBox
ibaMS3xAI-1A	10.124600	✓	✓
ibaMS3xAI-5A	10.124610	✓	✓
ibaMS3xAI-1A/100A	10.124620	✓	✓
ibaMS4xAI-380VAC	10.124521	✓	✓
ibaMS8xAI-110VAC	10.124500	✓	✓
ibaMS16xAI-10V	10.124100	✓	✓
ibaMS16xAI-10V-HI	10.124101	✓	✓
ibaMS16xAI-24V	10.124102	✓	✓
ibaMS16xAI-24V-HI	10.124103	✓	✓
ibaMS16xAI-20mA	10.124110	✓	✓
ibaMS16xDI-220V	10.124200	✓	✓
ibaMS16xDI-24V	10.124201	✓	✓
ibaMS32xDI-24V	10.124210	✓	✓
ibaMS8xICP	10.124300	✓	✓
ibaMS8xIEPE	10.124302	✓	✓
ibaMS4xUCO	10.124310	✓	✓
ibaMS16xAO-10V	10.124150	✓	-
ibaMS16xAO-20mA	10.124160	✓	-
ibaMS16xDO-2A	10.124250	✓	-
ibaMS32xDO-24V	10.124260	✓	-
ibaMS16xDIO-24V	10.124220	✓	✓
ibaMS4xADIO	10.124120	✓	✓

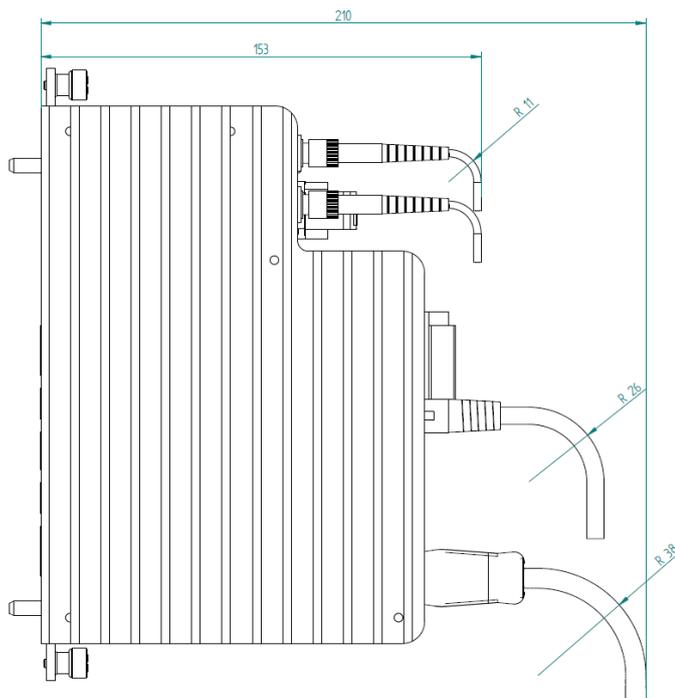
## 11.5 Dimensions

### ibaDAQ-S



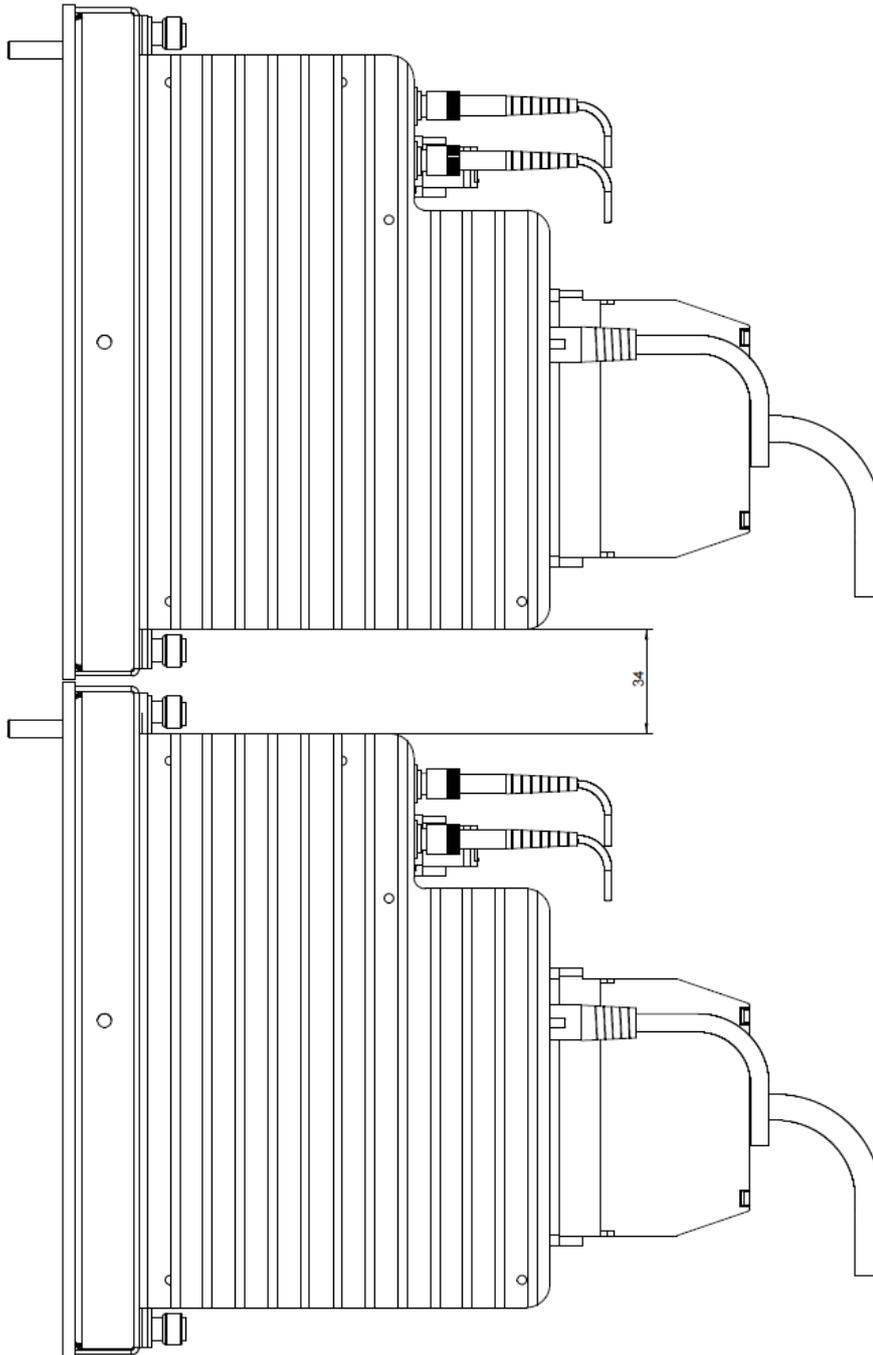
(Dimensions in mm)

Figure 51: Dimensions of ibaDAQ-S



(Dimensions in mm)

Figure 52: Dimensions of ibaDAQ-S with cables

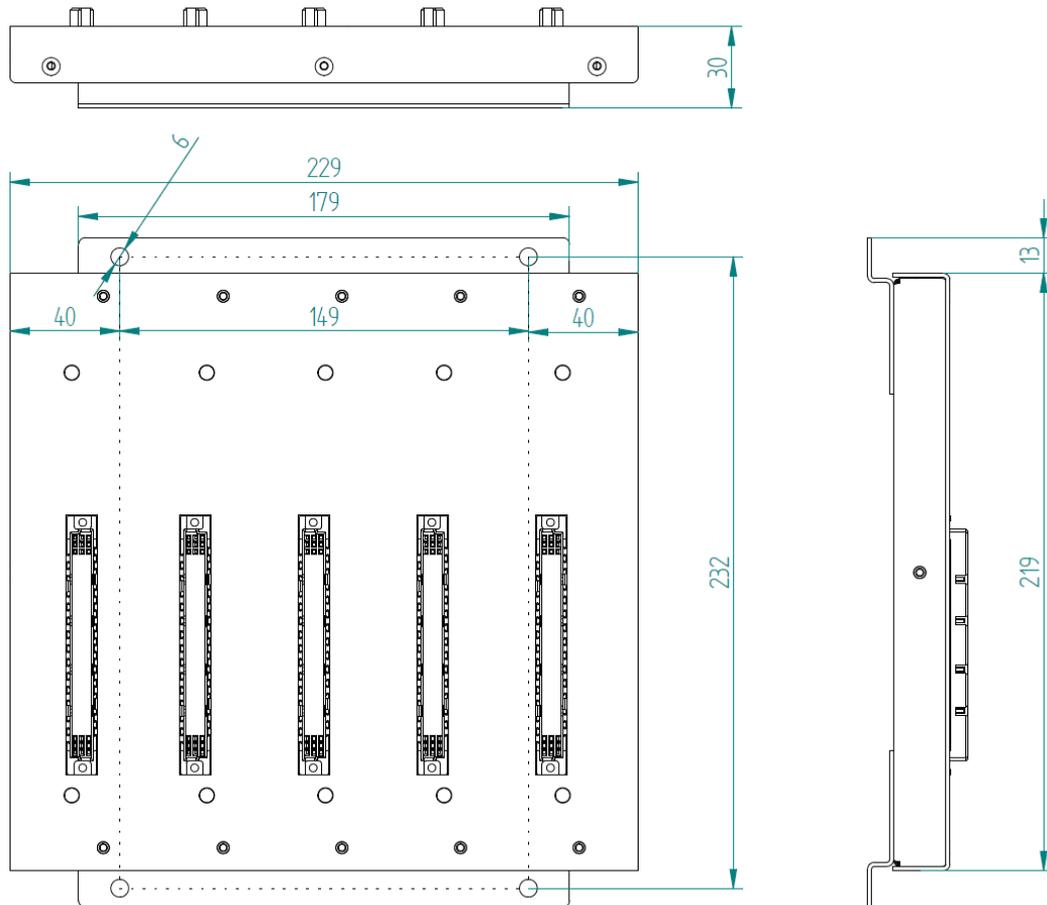
**Distance between 2 central units**

(Dimensions in mm)

Figure 53: Minimum distance between 2 central units



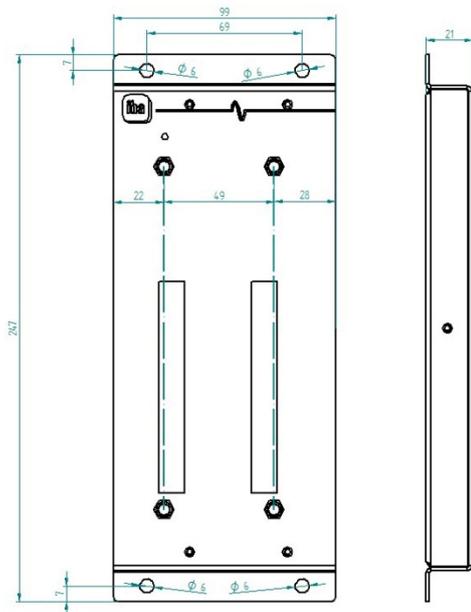
**Subrack ibaPADU-S-B4S with mounting brackets**



(Dimensions in mm)

Figure 55: Dimensions of mounting bracket with ibaPADU-S-B4S

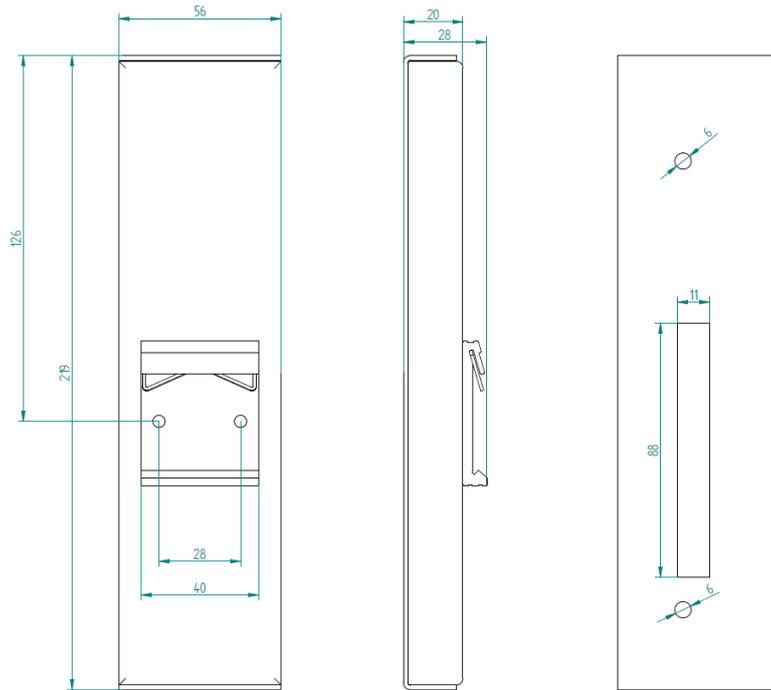
**Subrack ibaPADU-S-B1S for one central unit and one module**



(Dimensions in mm)

Figure 56: Dimensions ibaPADU-S-B1S

**Subrack ibaPADU-S-B for one central unit**



(Dimensions in mm)

Figure 57: Dimensions ibaPADU-S-B

**11.6 Connection diagram**

**11.6.1 Pin assignment voltage supply X14**

Pin	Connection
1	+ 24 V
2	0 V



**11.6.2 Pin assignment digital inputs and outputs X5**

Pin	Connection
1	Digital input 00 +
2	Digital input 00 -
3	Digital input 01 +
4	Digital input 01 -
5	Digital output 00 +
6	Digital output 00 -
7	Digital output 01 +
8	Digital output 01 -



## 12 Accessories and related products

### Subrack

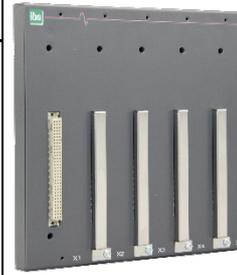
#### ibaPADU-S-B4S

Order number	10.124000
--------------	-----------

Backplane module to accommodate 1 central unit with up to 4 I/O modules

W x H x D: 229 mm x 219 mm x 27 mm

Fitting equipment included



#### ibaPADU-S-B1S

Order number	10.124002
--------------	-----------

Backplane module with mounting bracket for 1 central unit with up to 1 I/O module

W x H x D: 99 mm x 247 mm x 27 mm



#### ibaPADU-S-B

Order number	10.124001
--------------	-----------

Mounting plate with DIN rail clip for 1 central unit (without I/O modules)



### Mounting systems

#### Set of mounting brackets for PADU-S modular

Order number	10.124006
--------------	-----------

2 pieces, matching for ibaPADU-S-B4S (10.124000)

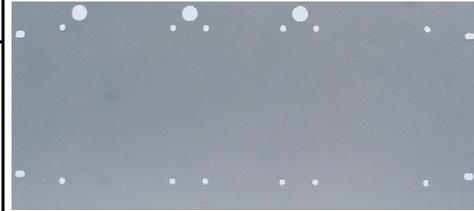
1 set (2 pieces) are needed for one subrack.

W x H x D: 57 mm x 179 mm x 10 mm



**Mounting plate 19" for PADU-S modular**

Order number	10.124005
Mounting plate (483 mm/19") for up to 2 ibaPADU-S-B4S backplanes	
Mounting of 1 backplane module centered or 2 backplane modules left and right	
Mounting equipment included	



**Module carrier for ibaPADU-S modular system**

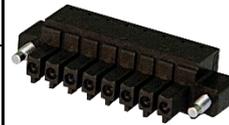
Order number	10.124007
Module carrier to accommodate 1 backplane module ibaPADU-S-B4S	



**Terminal blocks**

**8-pin RM 3.81 terminal block PHOENIX**

Order number	52.000041
--------------	-----------



**2-pin RM 5.08 terminal block WAGO**

Order number	52.000022
--------------	-----------



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## 14 Contact and Support

### Support

Phone: +49 911 97282-14

Fax: +49 911 97282-33

Email: [support@iba-ag.com](mailto:support@iba-ag.com)



### Note

If you require support, indicate the serial number (iba-S/N) of the product.

---

### Contact

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