ibaM-DAQ

Processor module for stand-alone data acquisition

Manual

Issue 1.5

Measurement Systems for Industry and Energy

www.iba-ag.com

Manufacturer

iba AG

Koenigswarterstrasse 44

90762 Fuerth

Germany

Contacts

Main office	+49 911 97282-0
Fax	+49 911 97282-33
Support	+49 911 97282-14
Engineering	+49 911 97282-13
E-mail	iba@iba-ag.com
Web	www.iba-ag.com

The content of this publication has been checked for compliance with the described hardware and software. Nevertheless, discrepancies cannot be ruled out, and we do not provide guarantee for complete conformity. However, the information furnished 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 www.iba-ag.com.

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1.5	11-2023	Miscellaneous supplements	ms, st	1.0

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Contents

1   About this documentation 6

       1.1   Target group..6

       1.2   Notations 6

       1.3   Used symbols...7

2   Introduction 8

3   Scope of delivery...11

4   Safety instructions 12

       4.1   Intended Use 12

       4.2   Special safety instructions 12

5   System requirements 14

       5.1   Hardware 14

       5.2   Software 14

       5.3   Firmware...14

6   Mounting and dismounting...15

       6.1   Processor module 15

       6.2   Modules..16

       6.3   End cover 17

7   Device description..18

       7.1   View...18

       7.2   Display elements...19

       7.2.1   Operating status 19

       7.2.2   Network/ibaNet interface 20

       7.2.3   Digital input/output...20

       7.3   Operating elements 20

       7.3.1   ON/OFF switch...20

       7.4   Connectors..20

       7.4.1   Power supply X6 20

       7.4.2   Network interfaces X4, X5 21

       7.4.3   ibaNet X8, X9 interfaces 21

       7.4.4   Digital input X3 22

1   About this documentation

This documentation describes the design, application and operation of the device *ibaM-DAQ*.

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 *Logic diagram*
Calling the menu command	*Step 1 – Step 2 – Step 3 – Step x* Example: Select the menu *Logic diagram – Add – New function block*.
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	Filename, Path Example: Test.docx

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.

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.

2   Introduction

The *ibaM-DAQ* processor module is part of the modular system ibaMAQS (Modular Acquisition System). It can be used as a stand-alone device to acquire and record data. *ibaM-DAQ* provides an integrated *ibaPDA* system, a powerful CPU, and hard disk for storing data, as well as two interfaces each for standard Ethernet and ibaNet-E.

The range of applications includes:

- Local, on-site data acquisition on machines and plants (troubleshooting, process analysis)

- Edge analytics (process monitoring, calculation of characteristic values (KPIs))

- Data acquisition at test stands

- Data acquisition on cranes

- ... and anywhere where data should be acquired locally on site

With its independent 1 Gbit/s Ethernet interfaces, *ibaM-DAQ* can be connected to two independent networks. This allows *ibaM-DAQ*, for example, to connect to the IT business network and the PLC network. ibaNet-E-capable devices can be integrated via the ibaNet interfaces, separate from the standard Ethernet.
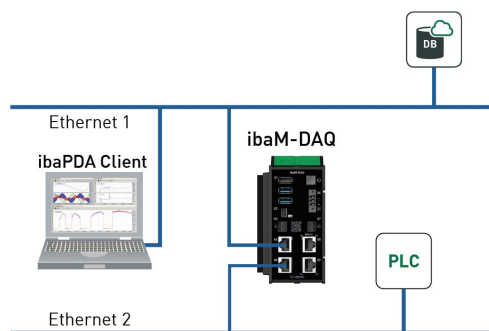
Simple remote configuration

A monitor, mouse, and keyboard can be connected to *ibaM-DAQ* and can be operated as conveniently as an *ibaPDA* system running on a PC. Moreover, it can also be operated from an *ibaPDA* client connected via the network, just like on a PC.

Users can easily configure their measuring task in the software – and can use the full scope of *ibaPDA* functions. The data recording can start automatically with the acquisition and/or be controlled by trigger signals.

Data storage in the device

An internal SSD provides local storage for recorded data. If required, disk space can be expanded by connecting an external hard drive to the USB interface or to a NAS. Recorded data can be transferred via a network connection and can be further processed and analyzed with the license-free ibaAnalyzer software – independently of *ibaM-DAQ*.

Time synchronization

For global time synchronization, all time sources supported by *ibaPDA* (DCF77, PTP) as well as NTP can be used. The time is buffered by means of an internal battery.

Monitoring and alarm

A digital input and output are available on the processor module. The latter can be configured as an alarm output, for example. The input can be used to initiate a safe shutdown of the device, for example from a back-up battery digital signal.

Modular concept

ibaM-DAQ can be combined with up to 15 different I/O modules. Modules are available for discrete input and output signals as well as for special technological features.

Use of additional iba devices via fiber optics

The *ibaM-FO-2IO* module offers the functionality of the proven ibaFOB-io boards and supports the 32Mbit Flex and 32Mbit ibaNet protocols. If corresponding iba devices are already available or no suitable ibaMAQS modules are available for certain tasks, devices like the ibaPADU family, iba bus monitors or system interfaces can be connected to the ibaMAQ system via the *ibaM-FO-2IO*.

The data concentrator *ibaBM-COL-8i-o* can be used to connect also iba devices with the ibaNet protocol 3Mbit.

Currently, only **one ibaM-FO-2IO** module is supported at the *ibaM-DAQ* processor module.

Licenses included

ibaM-DAQ comes with an *ibaPDA* base license for up to 64 signals and two data stores.

In addition, *ibaM-DAQ* includes further licenses. With the license *ibaPDA-Interface-PLC-Xplorer*, *ibaM-DAQ* has direct access to different PLC systems. The access to the PLC systems is established via standard interfaces of the systems without additional hardware for measured value acquisition.

The license *ibaPDA-OPC-UA-Server+* allows the *ibaPDA* system to be operated as an OPC UA server and to acquire all signals configured in *ibaPDA* via an OPC UA client interface. This makes it possible to exchange data directly with other systems that support OPC UA.

With the included *ibaPDA-Data-Store-MQTT-16* license, signal data can be streamed to an MQTT broker.

Following are communication interfaces included in the delivery:

Order no.	Name	Description
30.670051	ibaPDA-OPC-UA-Server+	Advanced OPC UA Server function ibaPDA can be used as OPC UA server. This license allows access to all ibaPDA signals.
30.671000	ibaPDA-Data-Store-MQTT-16	Data streaming via MQTT, 16 signals
31.001042	ibaPDA-Interface-PLC-Xplorer	PLC-Xplorer interfaces (S7, Allen Bradley, ABB, B&R, Bachmann, Beckhoff, Codesys, Logix, Mitsubishi MELSEC, OMRON, Sigmatek)

Other documentation

For the description and configuration of *ibaPDA* and the interfaces, please refer to the corresponding manuals. You can find the manuals on the data medium supplied.

3   Scope of delivery

After having unpacked the delivery, please check it for completeness and possible damage.

The scope of delivery comprises:

- *ibaM-DAQ* device
- Covering caps for USB, Ethernet, and Mini DisplayPort
- 3-pin connector, push-in (power supply)
- End cover ibaM-CoverPlate
- Data medium "Recovery / iba Software & Manuals"

4   Safety instructions

4.1   Intended Use

The device is an electrical operating resource. It must only be used for the following applications:

■ Measurement data acquisition

■ Applications with iba products (*ibaPDA*, etc.)

The device must only be used as specified in chapter ↗ *Technical data*, page 43.

Note

i	If the device is used or operated other than as specified in chapter ↗ *Technical data*, page 43, the protection supported by the device may be impaired.

4.2   Special safety instructions

Warning!

⚠	**Observance of the operating voltage range**
	A higher voltage may destroy the device!
	■ Never supply the device with a voltage other than 24 V DC!

Warning

⚠	This is a class A device. This equipment may cause radio interference in residential areas. In this case, the operator will be required to take appropriate measures.

Caution!

⚠	**Caution**
	The device can overheat.
	■ Make sure that the cooling fins get optimal ventilation.

Note

i	Do not open the device! Opening the device leads to loss of warranty!

Note

Uncontrolled shutdowns, e.g., by disconnecting the power, can lead to data loss. Always shut down the device properly to prevent data loss.

Note

A power supply unit with safety extra-low voltage and appropriate power limitation must be provided as power supply. A disconnecting switch must also be provided for the power supply unit to disconnect it from the power supply.

Note

Protect the device against uncontrolled power dips/drops with a UPS.

Note

Only clean the device on the outside with a dry or slightly damp statically discharged cleaning cloth.

5   System requirements

5.1   Hardware

For operation

■ Power supply 24 V DC, ca. 0.7 A as stand-alone device,
   up to 4 A with modules

For device parameterization and operation

■ Monitor (via the Mini DisplayPort), mouse, and keyboard (via the USB ports)

   or

■ *ibaPDA* client via network connection

5.2   Software

■ *ibaPDA* version 8.5.0 or higher for device configuration and for measuring and recording the data

---

Note

i

The *ibaM-DAQ* device runs *ibaPDA* by default. The license for 64 signals is included in the delivery. The number of signals can be extended up to 1024 with additional licenses. A further increase of the number of signals is possible on request and depends on your application. See also chapter *Introduction*, section ⌐ *Licenses included*, page 9.

Note

i

The *ibaFOB-io-USB* adapter cannot be used in connection with the devices of the ibaMAQ system. Devices with the communication protocol 32Mbit or 32Mbit Flex can be connected using the *ibaM-FO-2IO* module. See also chapter *Introduction*, section ⌐ *Use of additional iba devices via fiber optics*, page 9.

5.3   Firmware

■ ibaMAQS version 01.02.001 or higher

6 Mounting and dismounting

Caution

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

To do this, disconnect the power supply unit from the voltage supply and pay attention to any other current or voltage measurement modules, for which further steps are required for disconnection. These steps can be found in the respective manual of the module.

The modular system is designed to be mounted onto the DIN rail as follows:

- Mount the processor module in the left-most position.

- Add up to 15 I/O modules to the right of the processor module.

- Add an end cover to the last module to protect the contacts.

Make sure that the modules

- are properly secured to the rail and

- are correctly positioned in the side guide rails.

Check the correct fitting of the modules after mounting by a visual inspection.

Note

ℹ Ensure a minimum clearance of the entire system of 30 mm upwards and downwards and 10 mm to the right and left for sufficient ventilation of the device.

6.1 Processor module

Mounting

- Lift the green lever upwards and place the device onto the rail.

- Hold the device firmly and push the lever down again to lock the device onto the rail.

- If no further modules are mounted, mount the end cover.

Connecting

- Connect the Ethernet cable(s) to one of the network interfaces X4 or X5[1].

- Connect the 24 V DC power supply with the correct polarity and switch on the device.

Dismounting

- Shut down the processor module and switch off the power supply.

- Remove all connections from the processor module.

- Grasp the module at the top and bottom with one hand and lift the green lever upwards to release the lock on the top-hat rail.

- Pull the module forward.

- Push down the green lever.

6.2   Modules

Mounting

- Shut down the system.

- Switch off the power supply.

- Remove the end cover, if present.

- Lift the green lever of the module upwards.

- Push the module backwards along the guide rails onto the DIN rail.

- Push down on the green lever.

- To protect the side contacts from dirt and damage, install the end cover on the last module.

[1]   The interfaces marked with ibaNet are reserved for later use and are currently without function

- Switch on the power supply.

- Start the system.
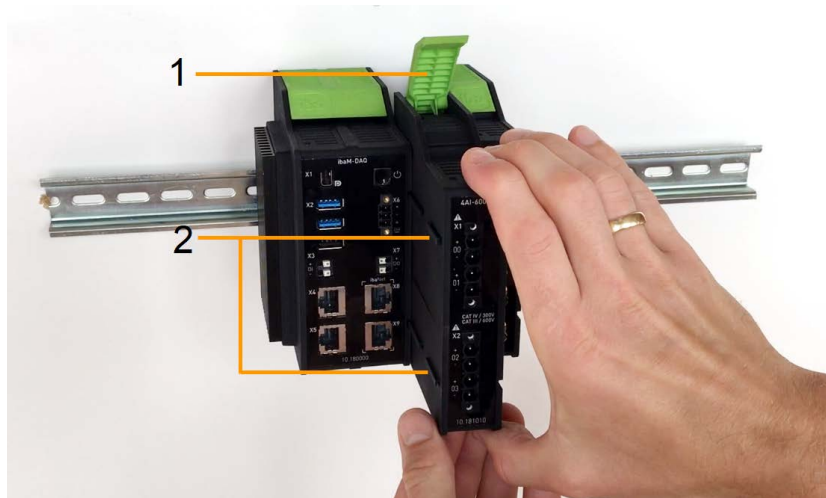
1   Green lever for locking and releasing the modules

2   Guide rails

Dismounting

- Shut down the system and switch it off.

- Remove all connections from the module that is to be dismounted.

- If you want to dismount the module on the far right, first remove the end cover. This is mounted again on the last module on the right after the module has been dismounted.

- Grasp the module at the top and bottom with one hand and lift the green lever upwards to release the lock on the DIN rail.

- Pull the module forward along the guide rails.

- Push down on the lever.

6.3   End cover

The rightmost module is terminated on the right side with the end cover ibaM-CoverPlate.

Mounting

- Push this end cover along the guide rail until the cover snaps into place.

Dismounting

- Push this end cover forward along the guide rail.

7   Device description

7.1   View
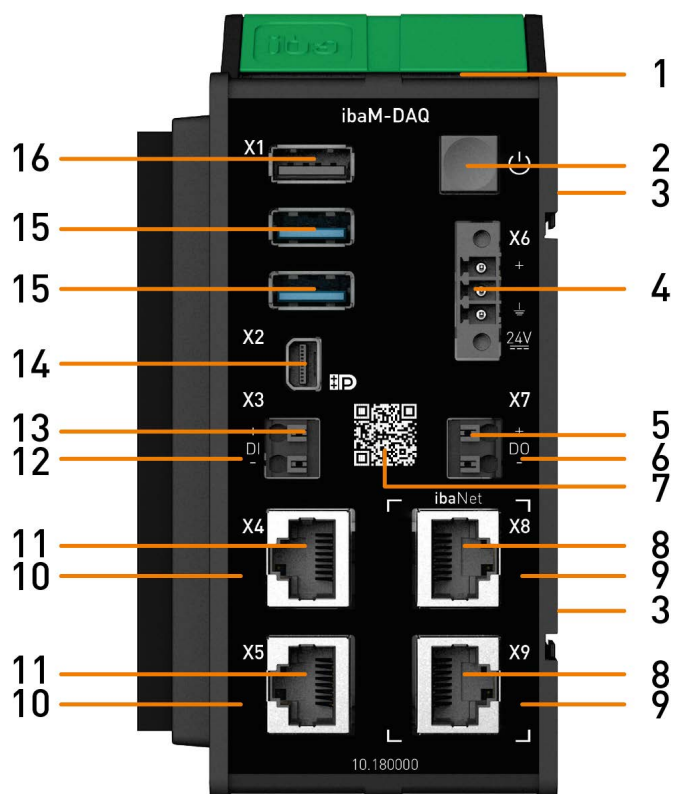
1	Status display	9	Display ibaNet interfaces
2	On/off switch	10	Display network interfaces
3	Contacts module-module interface	11	Connector network interfaces X4, X5
4	Connector 24 V power supply X6	12	Display digital input
5	Connector digital output X7	13	Connector digital input X3
6	Display digital output	14	Connector Mini DisplayPort
7	QR code for installation notes	15	USB 3.0 ports
8	Connector ibaNet interfaces X8, X9	16	USB 2.0 port
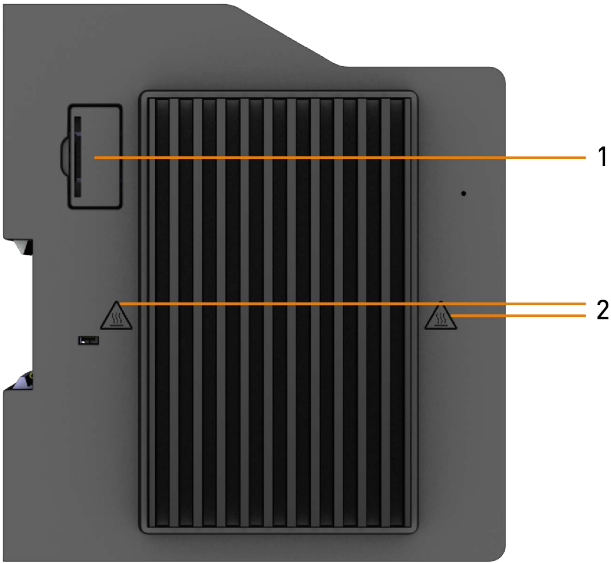
1 Battery compartment

2 Hot surface warning symbol

Attention

The cooling fins of the device may become very hot.

7.2   Display elements

7.2.1   Operating status

Color	Status	Description
	off	Down, no power supply
Green	on	Ready for operation
	flashing slowly	Device is booting
	flashing quickly	Update is running
Red	on	Error, reset

7.2.2   Network/ibaNet interface

LED	Status	Description
Network X4, X5	green on	Connectivity OK
ibaNet X8, X9	green on	Connectivity OK (not currently used)
	off	No connectivity

7.2.3   Digital input/output

LED	Status	Description
DI	green on	Input signal OK
DO	green on	Output controlled
	off	No signal

7.3   Operating elements

7.3.1   ON/OFF switch

Switching the device off and on again switches the supply voltage off and on and reboots the device. The switched-on device can be switched off or shut down with one of several methods:

■ Press briefly: System shuts down (controlled)

■ Press and hold (> 5 s): System switches off (without controlled shutdown)

Please note when switching off or shutting down by briefly pressing the on/off switch:

If the device is in an energy-saving state, e.g. because the monitor has been switched off, the on/off switch must be pressed a second time to shut down the device in a controlled manner. Pressing once first wakes the device from energy-saving state.

If the device should not shut down when the on/off switch is pressed briefly, this function can be can be disabled as described in chapter ↗ *On/off switch function*, page 56.

7.4   Connectors

7.4.1   Power supply X6

The external power supply is connected using a 3-pin connector.

Caution!

Power supply

Only connect the device to an external power supply 24 V DC!

■ Observe the correct polarity!

Note

ibaM-DAQ is not grounded by mounting on a grounded DIN rail.

ibaM-DAQ can only be grounded via the grounding pole of the 3-pin connector for power supply X6.

7.4.2   Network interfaces X4, X5

The device can be integrated into Ethernet networks via the network interfaces X4 and X5.

The two interfaces are **without switch function** and support:

■ 10/100/1000 Mbit

■ Auto-MDI(X)

■ Autonegotiation

■ Jumbo Frames (9.5 KB)

■ APIPA[2]

■ Wake-on-LAN (only at X4)

The default settings of the network connections can be found in chapter ↗ *Default settings*, page 25.

For the integration into Ethernet networks see chapter ↗ *Addressing in the networks*, page 26.

A description of the Wake-on-LAN function can be found in chapter ↗ *Wake-on-LAN*, page 51.

7.4.3   ibaNet X8, X9 interfaces

The ibaNet X8 and X9 interfaces are intended for dedicated use with high-performance ibaNet-E connection that can acquire data with up to 1 µs accuracy.

The two interfaces are **with switch function** and support:

■ 10/100/1000 Mbit

■ Auto-MDI(X)

■ Autonegotiation

[2] Automatic Private IP Addressing = automatic IP addressing without DHCP server in the IP address space 169.254.x.x

7.4.4   Digital input X3

This is a bipolar and electrically isolated digital input. Due to the reverse polarity protection, the measurement signal is indicated logically correct, even if the connection is polarity-reversed.

The DI input can be used to initiate safe shutdown and powering off if a trigger signal indicates that the power supply is interrupted. This is configured in *ibaPDA*.

Connection diagram for digital input and output:
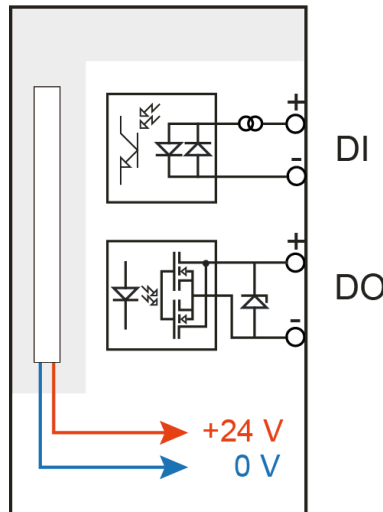
7.4.5   Digital output X7

An alarm signal can be configured in ibaPDA to be sent as a digital output.

Note

i	Due to the protective diode in the output of DO 00, the load to be switched must be connected to the negative pole (-) and the voltage to the positive pole (+).

7.4.6   Mini DisplayPort X2

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

7.4.7   USB ports X1

- 1x USB 2.0: 480 Mbit/s
- 2x USB 3.0: up to 5 Gbit/s

7.4.8   Battery compartment

The battery compartment is located on the heat sink side at the bottom end of the housing.

The internal time is buffered with a 3V Lithium BR2032 battery. The battery can be replaced during operation. Only batteries of type BR2032 may be used as replacements.

Observe the correct polarity of the battery, see figure:
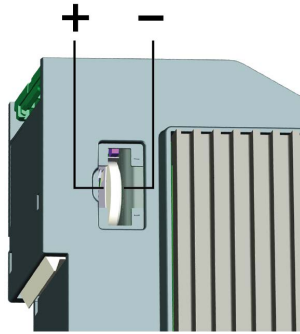
Note

Used batteries and rechargeable batteries must not be disposed of with residual 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 marked by a crossed-out rubbish bin or waste container. You are legally responsible for the proper disposal 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.

7.5   Type label

The type label provides the following information:
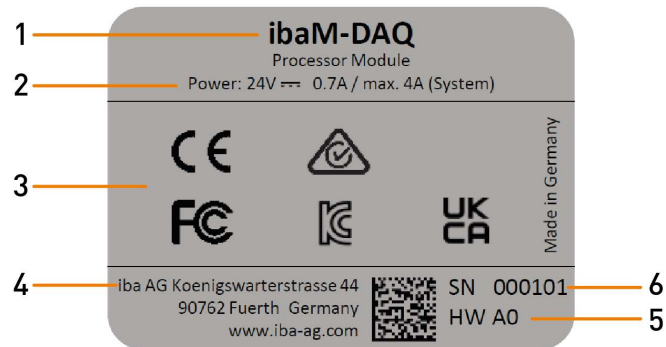
1	Name	4	Manufacturer
2	Power supply	5	Hardware version
3	Standards	6	Serial number

8   System integration

8.1   Default settings

The following parameters are preset in the device at delivery:

8.1.1   Network parameters

Ethernet X4	DHCP active
Ethernet X5	Fixed IP address: 192.168.1.1 Subnet mask: 255.255.255.0
Hostname	MDAQ-xxxxxx xxxxxx = 6-digit serial number, e. g. MDAQ-000036 The serial number can be found on the type label.

8.1.2   User accounts

Users	Password	Rights
DAQ	iba.SNxxxxxx xxxxxx = 6-digit serial number The serial number can be found on the type label. E.g. iba.SN00036	Administrator

Each system installation also creates an administrator account (without password) by default. However, the account is not visible. To make the account visible, proceed as follows:

1. Run cmd as administrator

2. net user administrator /active:yes

3. Start menu - account screen - "Administrator" account

Note

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

8.1.3   Other system settings

■ Auto login is disabled

■ The Windows "Account Lockout Threshold" feature is enabled:
   After 5 times of incorrect password entry, the login function is blocked for 30 minutes.

■ The ScreenSaver lock is set to 5 minutes and password entry.

These settings can only be changed at the operating system level, either via a remote desktop connection or when input devices (monitor, mouse, keyboard) are connected directly.

8.2   Initial commissioning

First connect to the device or connect monitor, keyboard and mouse. When setting up via network, also refer to chapter ↗ *Addressing in the networks*, page 26.

The following options for initial commissioning are available:

■ Connection with external *ibaPDA* client, see chapter ↗ *Connection with an external ibaPDA client*, page 27

■ Connectio via Remote Desktop, see chapter ↗ *Connection via Remote Desktop*, page 28

■ Set up with monitor, keyboard and mouse, see chapter ↗ *Set up with monitor, keyboard and mouse*, page 29

8.2.1   Addressing in the networks

In the factory setting, DHCP is enabled for the network interface X4. Thus, an IP address is automatically assigned to the device, as soon as it is connected to a network with a DHCP server. If the IP configuration is successful, *ibaM-DAQ* can be accessed via the host name MDAQ-<serial number>, e.g. MDAQ-000036.

The network interface X5 is set to the fixed IP address 192.168.1.1 in the factory setting. If no DHCP server is available in your network, you can connect the device to the network via X5. To access the device via the fixed IP address, your PC also needs a free IP address in the same address space: 192.168.1.x (Note: x ≠ 1, since this is the address of *ibaM-DAQ*).

Note

i	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 safety reasons. In this case, please contact your IT department to obtain network approval for the device.

8.2.2 Connection with an external ibaPDA client

If you are using an external *ibaPDA* client for the configuration, the *ibaPDA* client and *ibaM-DAQ* have to be connected via the network.
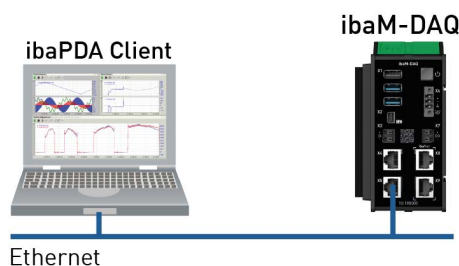
Start *ibaPDA* on the external *ibaPDA* client and select *ibaM-DAQ* as *ibaPDA* server.

Click the button [PDA icon] on the toolbar or click *"Select server..." in the Configuration* menu.
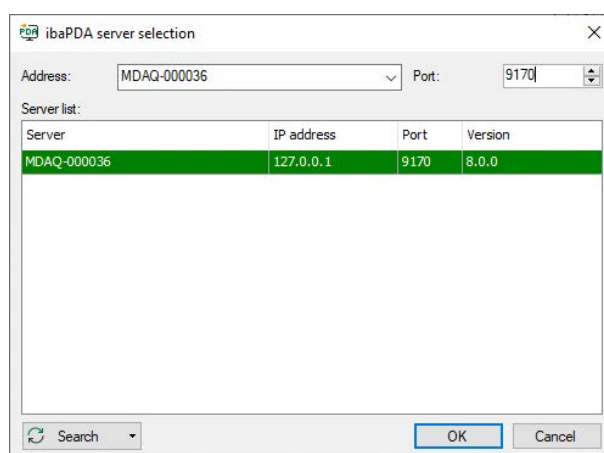
Address
Enter the name or the IP address of the *ibaM-DAQ* device in the *address* bar. The name is composed of MDAQ-<six-digit serial number>. The serial number is found on the device type label. Example: MDAQ-000036.

Port number
The port number is entered automatically.

<Search> button
This button starts and stops the search for active *ibaPDA* servers in the network. If the *ibaPDA* client and *ibaM-DAQ* are located in the same network, the device should be displayed in the server list. 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 proceed as described in chapter ↗ *Configuration in ibaPDA*, page 30.

8.2.3 Connection via Remote Desktop

Operation is carried out via the network using Remote Desktop.

Notebook/PC   **ibaM-DAQ**

Ethernet
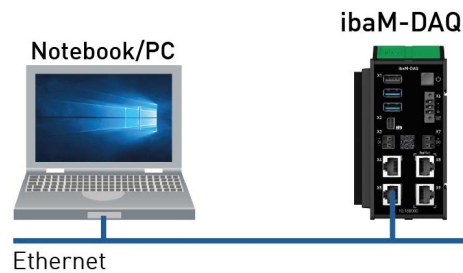
Open the Remote Desktop Connection on the system used to configure *ibaM-DAQ*. You can find this in the *Start* menu under Windows Accessories.

There is another option to open the Remote Desktop Connection:

Press the keys <Windows>+<R> and enter "mstsc" in the field.
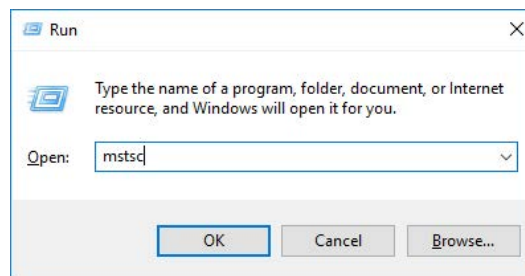
Enter the host name or the IP address of the *ibaM-DAQ* device in the field "Computer".
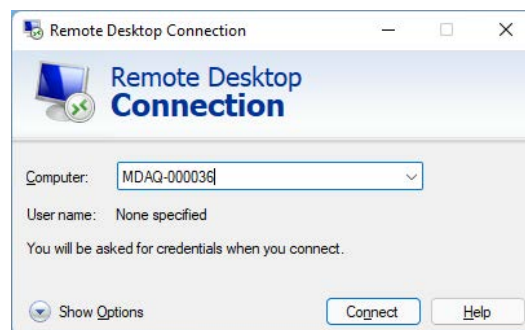
If you are requested to enter login information, use the information given in chapter ↗ *User accounts*, page 25.

Start the *ibaPDA* client from the Windows Start menu.

For further configuration, proceed as described in chapter ↗ *Configuration in ibaPDA*, page 30.

8.2.4   Set up with monitor, keyboard and mouse

Connect a monitor to the Mini DisplayPort port and a keyboard and mouse to the USB ports of *ibaM-DAQ*. If necessary use an adapter.
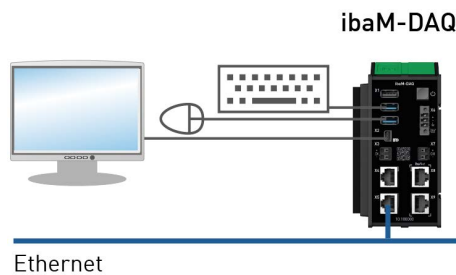
If required, log in to the system. You can find the login data in chapter ↗ *User accounts*, page 25.

Start the *ibaPDA* client from the Windows Start menu.

For further configuration proceed as described in chapter ↗ *Configuration in ibaPDA*, page 30.

8.3   Connection to different networks

ibaM-DAQ can be operated in two different networks, for example, to separate the network that transmits and acquires measurement data from the rest of the network. For this purpose, the 2 Ethernet interfaces X4 and X5 are available.

Settings for addressing in the networks, see chapter ↗ *Addressing in the networks*, page 26.
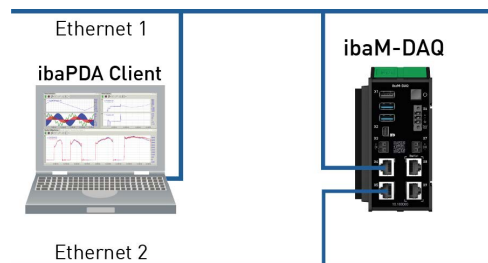
8.4   Operation with compact UPS

In order to secure an optimal operation, it is recommended to buffer the power supply of the *ibaM-DAQ* 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 operating system. The UPS should be designed in such a way that the system is buffered for at least 5 minutes.
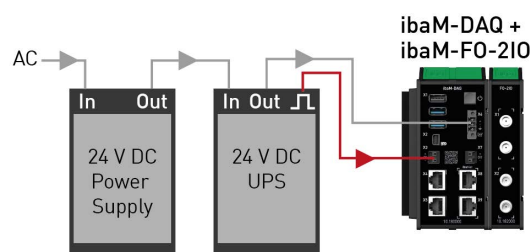
9 Configuration in ibaPDA

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 device. In this case, continue with chapter ↗ *Configure ibaM-DAQ*, page 30.

9.1 Configure ibaM-DAQ
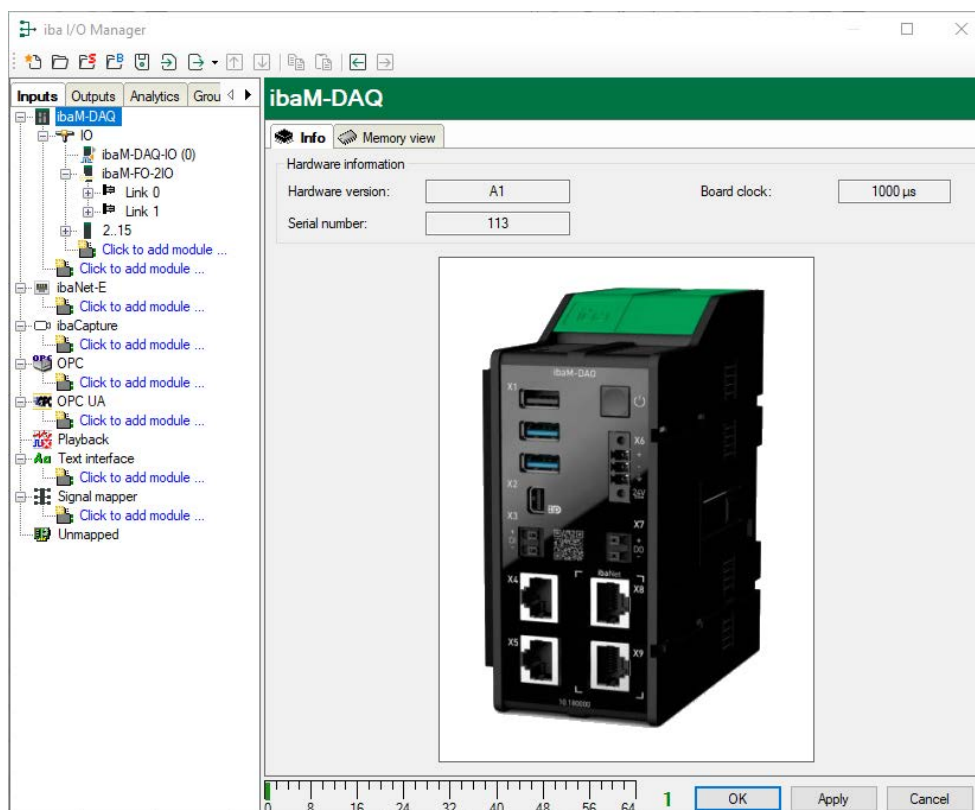
If the *ibaM-DAQ* interface is marked, the *Info* tab is displayed.

The "Hardware information" section provides information on the hardware version, serial number, and the board clock display.

9.1.1 IO - General tab
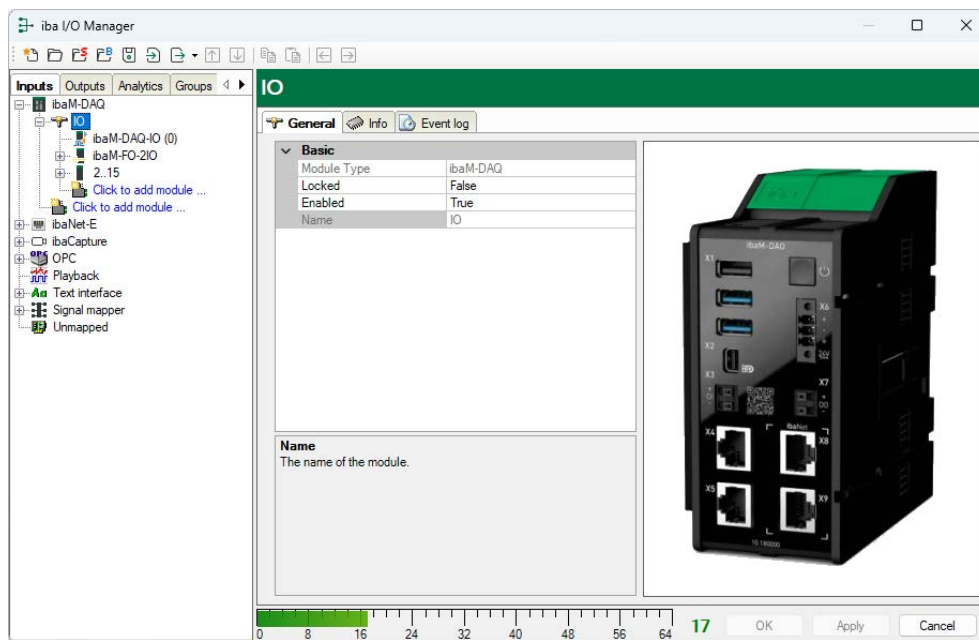
Basic settings

Module Type (information only)
Indicates the type of the current module.

Locked
A module can be locked to avoid unintentional or unauthorized changing of the module settings.

Enabled
Enable the module to record signals.

Name (information only)
Indicates the name of the module.

9.1.2   IO - Info tab
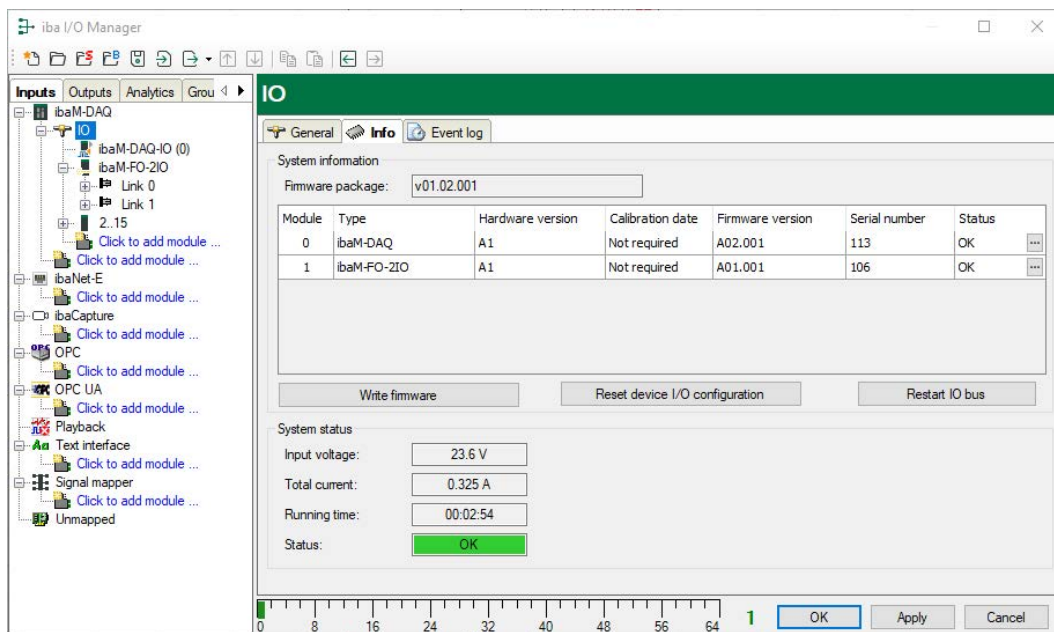
You can find the firmware version and information about the individual modules connected to the IO bus in the "System information" area.

Write firmware

With this button it is possible to perform firmware updates. Select the update file "ibaM_v[xx.yy.zzz].iba" in the browser and start the update process by clicking <Open>.

In the following dialog, you can specifically select which modules you want to update or whether you want to update the overall system.
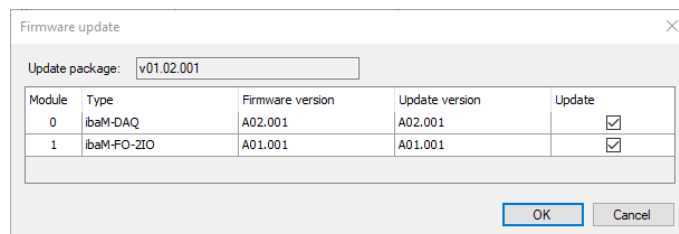
The update process is started by clicking on <OK>. The following dialog informs you about the progress of the update.
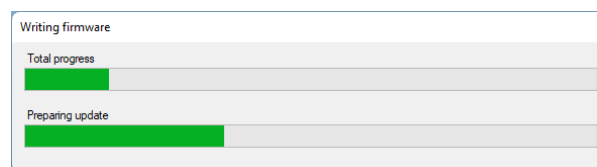
Note

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

Reset device I/O configuration
You can use this button to reset the entire module configuration.

Restart IO bus
You can use this button to restart the IO bus and the modules within it.

The successful restart is confirmed with the following notification.
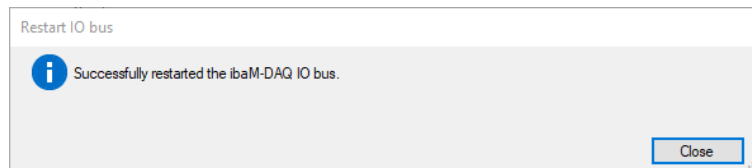
The following information is displayed in the "System status" area:

Input voltage
Internal supply voltage, deviates minimally from the supply voltage at X6 due to the internal circuitry.

Total current
The power consumption of the entire system including all modules.

Running time
The total running time of the IO bus since the last start in the format [d].hh:mm:ss

Status
The status of the entire system incl. all modules.

9.1.3   IO - Event log tab

In the event log, the status changes of the *ibaM-DAQ* device are documented in a list.
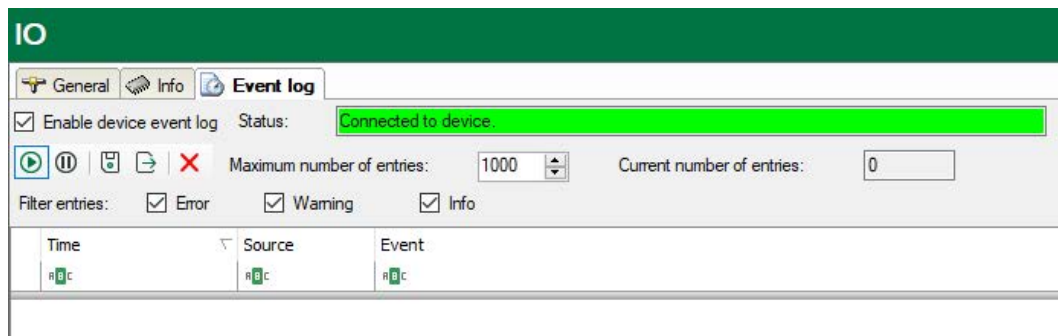
The following settings and operation modes are available:

Enable device event log
Here, you enable the event log for the device. You have to enable the event log separately for each individual device.

Status
The status of the connection between *ibaPDA* and *ibaM-DAQ* for reading the events is displayed here.

Maximum number of entries
Here you can set the maximum number of saved entries (100 - 100,000).

Current number of entries
The currently saved number of entries.

Operating elements

▶	When pressing the button, the list of events is automatically updated.
⏸	The automatic update is paused.
💾	Continuously save messages in a file.
➡	Export visible entries to a text file.
✖	Clear diagnostic buffer

The list of events can be filtered in a customized way. If you want to filter the events according to a type, just select one or more types above the list: error, warning, info

For further filtering, enter the filter text you are searching for in the desired field in the top line. All events containing the entered search text, will be displayed.

9.1.4   Configuring inputs

9.1.4.1   ibaM-DAQ-IO - General tab
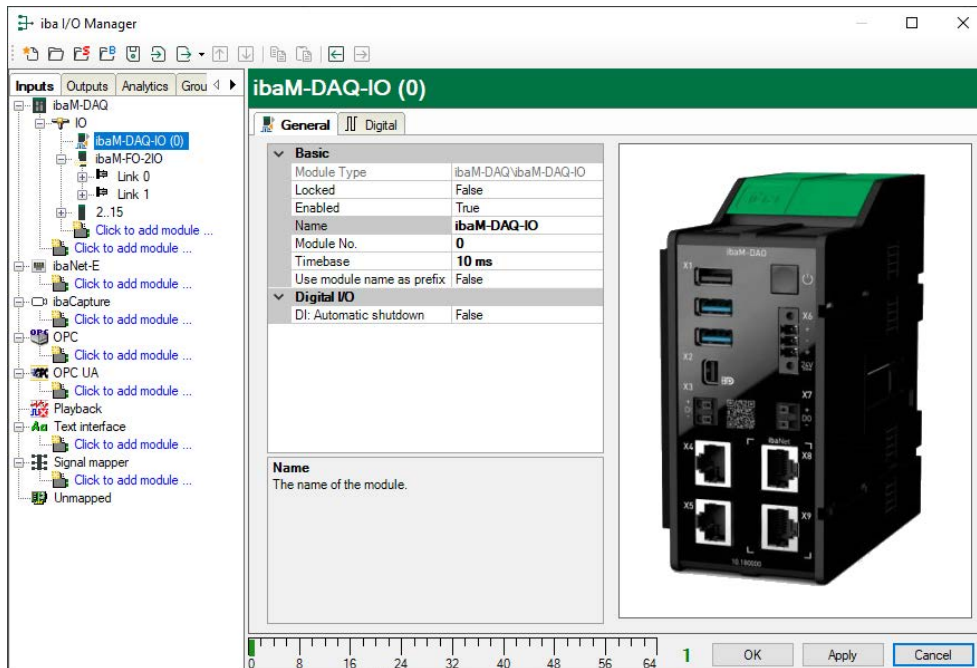
Basic settings

Module Type, Locked, Enabled
see chapter ⁊ *IO - General tab*, page 31

Name
Here you can enter a name for the module.

Module no.
Internal reference number of the module. This number 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 time base.

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

Digital I/O

DI: Automatic shutdown
TRUE: *ibaM-DAQ* is shut down automatically if DI is asserted.

Note

> **i** If TRUE is selected here, the automatic shutdown function is active even if the signal in the *Digital* tab is disabled.

9.1.4.2 ibaM-DAQ-IO – Digital tab
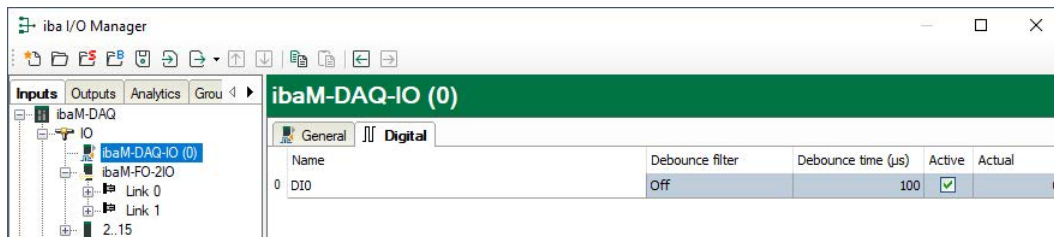
Name
Here you can enter a signal name and additionally two comments when clicking the icon in the Name field.

Debounce filter
In the drop-down 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.

Debounce time (µs)
Here you can define the debounce time in µs

Active
Enabling/disabling the signal

Actual
Display of the currently measured value

9.1.5   Configuring outputs

Select the *Outputs* tab in the module tree to configure the output signals. The following parameters can be set on the *Digital* tab:
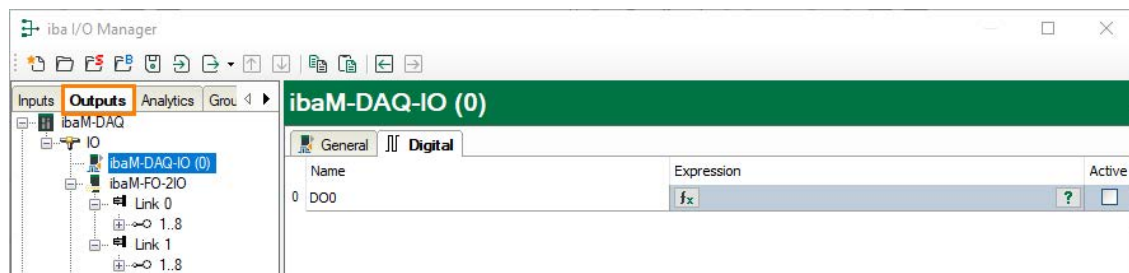
Name
Here you can enter a signal name and additionally two comments when clicking the icon in the Name field.

Expression
You can use the expression builder to assign signals to the outputs or to combine signals through logical or mathematical operations.

Active
Enabling/disabling the signal

9.2   Adding I/O modules

Up to 15 I/O modules from the ibaMAQ system can be added to *ibaM-DAQ*.

9.2.1   Automatically

To do this, select the "IO" link in the I/O Manager. Right-click on 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.
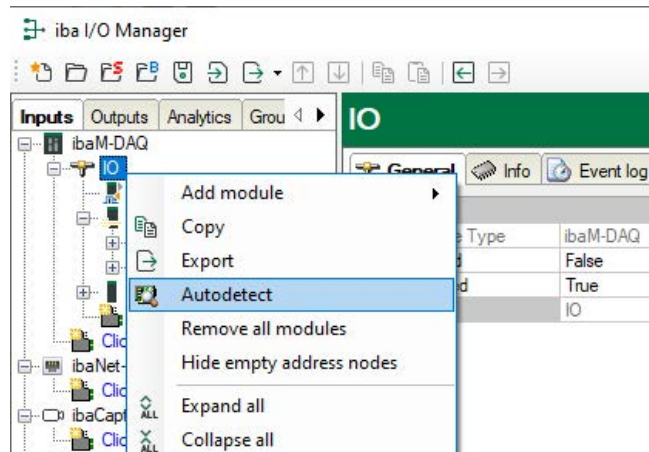
9.2.2   Manually / offline

Modules can also be added manually. Right-click on the "IO" link and select "Add module". Select the desired modules from the list.
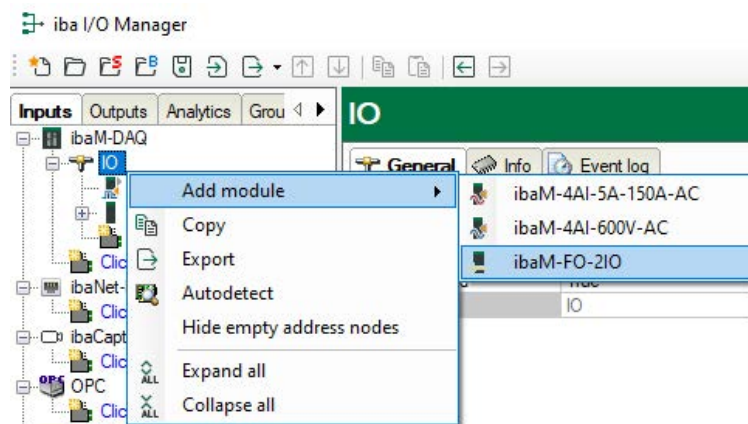
An offline configuration makes it possible, for example, to export a module configuration without existing or connected modules or to save the entire I/O configuration of the I/O manager.

Other documentation

For detailed information, refer to the corresponding device manuals.

9.3   ibaPDA interfaces

Communication interfaces are additionally available for the connection of the field level (e.g., Modbus, etc.) as well as standard interfaces to communicate data to superordinate IT systems (DB-Datastore, Kafka, ...). The interface *ibaPDA-OPC-UA-Server+* is already included in the standard scope of delivery. Further communication interfaces require separate licenses. If you have licensed additional communication interfaces, they appear as nodes in the tree structure.
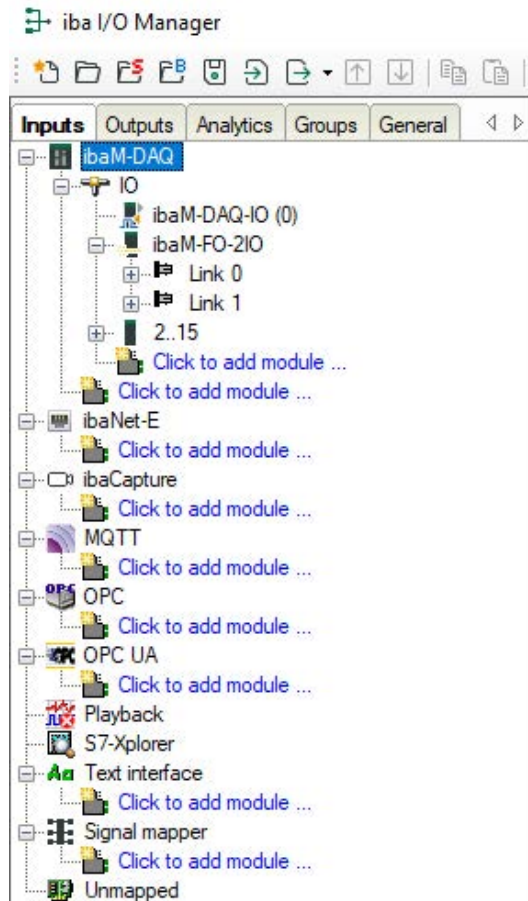
Other documentation

The description and configuration of the individual communication interfaces can be found in the corresponding interface manuals.

9.4   Setting up file sharing

To comfortably access measurement files recorded with *ibaPDA* through the network, the *ibaPDA* client allows setting up read-only access. Open the data storage dialog in *ibaPDA* and mark the *Files* node.
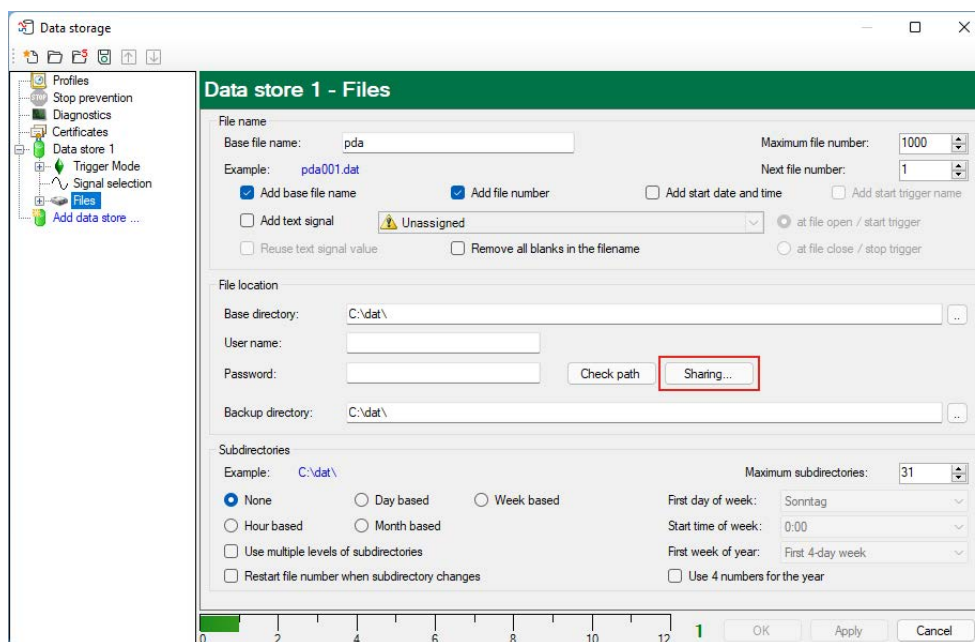
Select a folder to be released for access.
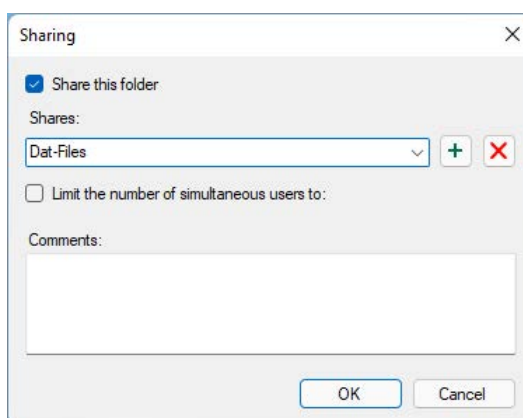
Note

When running *ibaM-DAQ* in a so-called work group, you need the user name and the password to access it.

If *ibaM-DAQ* and the accessing PC are in the same domain, a separate authentication is usually not necessary.

9.4.1   Troubleshooting

If you cannot access the shared directory from another system, file and printer sharing may not be enabled.

You can activate it as follows:

1. Right-click the network icon in the notification area of the taskbar to open the "Network and Sharing Center."
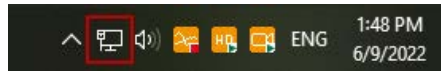
2. In the "Network and Sharing Center" open the "Advanced Sharing Settings."
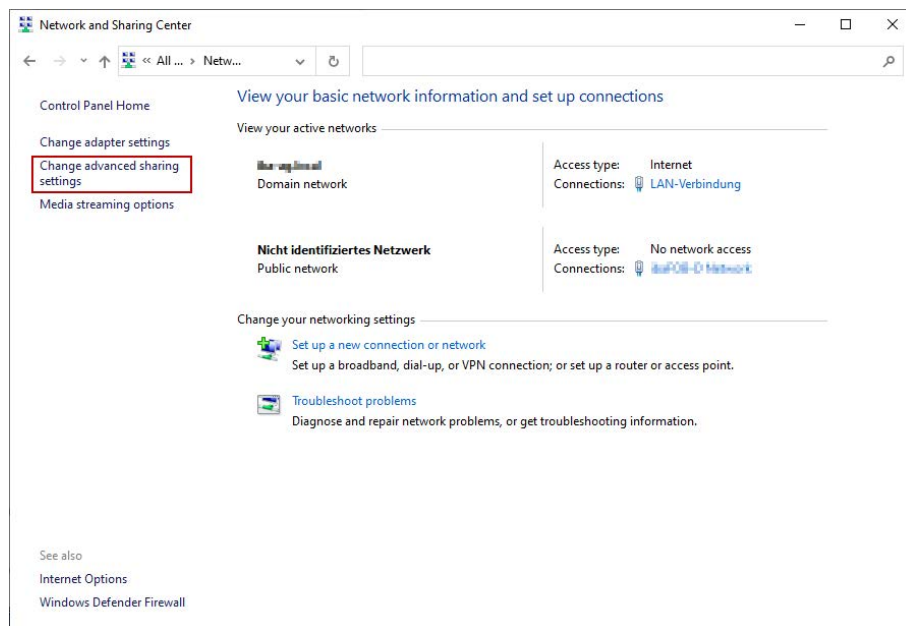
3. Select the profile you are using. This is indicated by the addition "(current profile)."
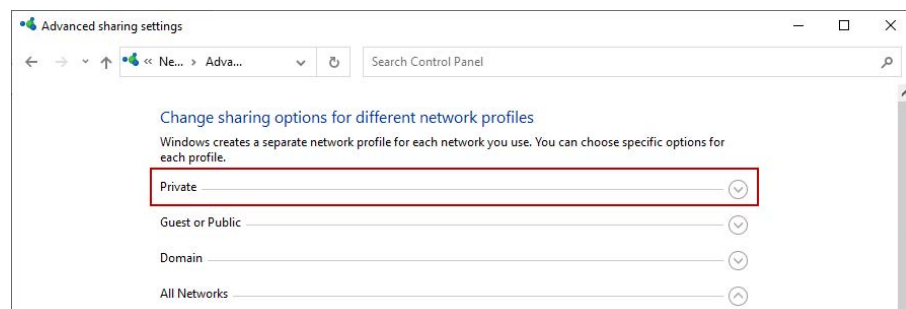
4. Make sure that the "Turn on network discovery" and "Turn on file and printer sharing" settings are enabled.
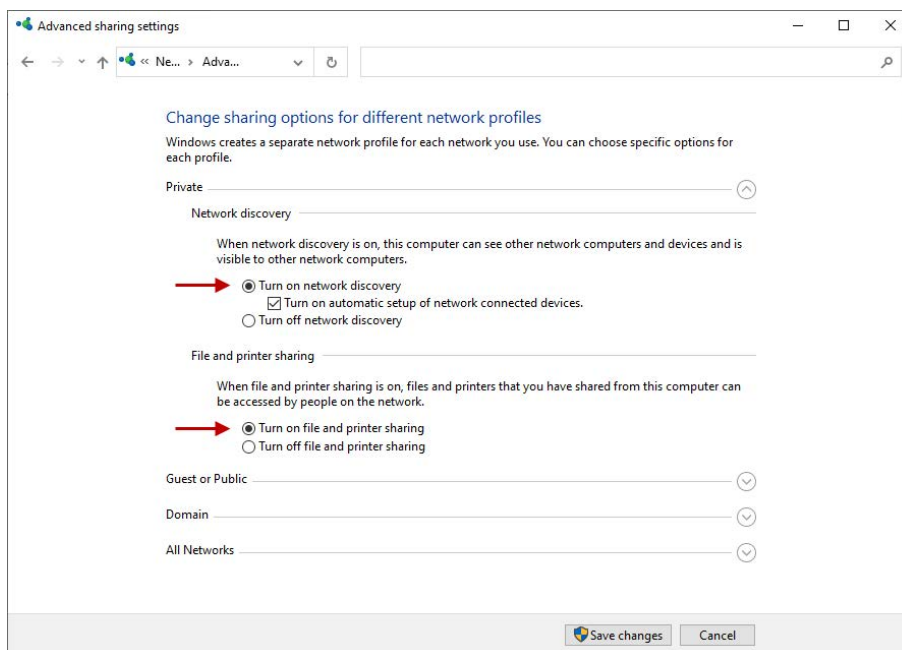
10   Technical data

Note

[i]	If the device is used or operated other than according to the technical data described in this chapter, the protection supported by the device, but also the function itself, may be impaired.

10.1   Main data

Short description	
Name	ibaM-DAQ
Module label	ibaM-DAQ
Description	Processor module for stand-alone data acquisition
Order number	10.180000
Processor unit	
Processor	Intel Atom x7-E3950 4x 1.6 GHz (2.0 GHz boost)
Operating system	Windows 10 IoT Enterprise x64 LTSC 2021/v21H2 (Long-Term Servicing Version)
Main memory	8 GB
Flash memory	Solid state drive 512 GB
Clock	Buffered by battery, (3 V, lithium BR2032) Only batteries of type BR2032 may be used.
Module-module interface	
Number	1
Connection technology	2x 8 sliding contacts
Number of modules	15
Power supply	
Power supply	24 V DC SELV; 4 A; UPS recommended
Current consumption	
ibaM-DAQ stand-alone	max. 0.7 A
ibaM-DAQ with modules	max. 4 A
Electrical isolation	
Supply - system	none
Connection technology	3-pin multi-pin connector, pitch 3.81 mm; included in delivery, push-in, conductor max. 1.5 mm^2, (stripping length 9 mm) protected against reverse polarity, screw connection
Further interfaces, operating and indicating elements	
Indicators	LEDs for operation, channel states and errors
Switch	1 momentary switch for ON/OFF
Graphics	1 Mini-DisplayPort (4K/UHD)

USB	3 (1x USB 2.0; 2x USB 3.0)
Operating and environmental conditions	
Temperature range	
Operation	14 °F to 131 °F (-10 °C to +55 °C)
Storage	-13 °F to 185 °F (-25 °C to +85 °C)
Mounting	DIN rail according to EN 50022 (TS 35, DIN Rail 35)
Cooling	Passive
Humidity class	F, no condensation
Operating altitude	0 … 2000 m above sea level
Protection type	IP20
Standards	CE, C-Tick, UKCA, FCC
MTBF[3]	317,489 hours / 36 years
Dimensions	
Width x height x depth	69 mm x 132 mm x 120 mm
Height with open lever	160 mm
Height units	3
Installation clearances	
Bottom / top	30 mm / 30 mm
Left / right	10 mm / 10 mm
Mounting position	vertical, lever up
Weight / incl. packaging	0.55 kg / 0.78 kg
Licenses	
Type	WIBU CmDongle (internal)
ibaPDA	ibaPDA-64 with 2 data stores
	ibaPDA-Interface-PLC-Xplorer
	ibaPDA-OPC-UA-Server+
	ibaPDA-Data-Store-MQTT-16

[3] according to: Telcordia 4 SR332 (Reliability Prediction Procedure of Electronic Equipment; Issue Mar. 2016) and NPRD (Non-electronic Parts Reliability Data 2011)

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

Unique Identifier: 10.180000, ibaM-DAQ

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

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.

10.2   Interfaces

Ethernet interface	
Number	2
Connection technology	2 RJ45 socket; 1GbE, Base-T
ibaNet interface[4]	
Number	2
Design	Copper
Protocol	ibaNet-E
Synchronization	ibaNet-E High Performance
Connection technology	2 RJ45 socket; 1GbE, Base-T, switched
Cable length (PTP)	Max. 100 m
Cable type	Min. CAT 5e, UTP

10.3   Digital input and output

Digital input	
Number	1
Design	Galvanically isolated, protected against reverse polarity, 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

[4]   available in a later firmware version

Hysteresis	none
Input current	1 mA, constant
Debounce filter	Optional, 4 operating modes
Sampling rate	max. 10 kHz, freely adjustable
Electrical isolation	
Channel - system	Functional isolation: 1 kV AC
Connection technology	2-pin socket, push-in, grid 5 mm, conductor max. 1.5 mm^2 (stripping length 8 mm)
Additional function	Shutdown
Digital output	
Number	1
Design	Galvanically isolated, solid-state DC switch
Switching voltage max.	200 V DC; protection against surge voltages
Switching current max.	up to 350 mA (permanent), overcurrent protection
Switching delay	< 2 ms (at 100 mA)
OFF resistance (log. 0)	> 100 MOhm
ON resistance (log. 1)	< 3.75 Ohm (at 100 mA)
Electrical isolation	
Channel - system	Functional isolation: 1 kV AC
Connection technology	2-pin socket, push-in, grid 5 mm, conductor max. 1.5 mm^2 (stripping length 8 mm)

10.4   Dimensions
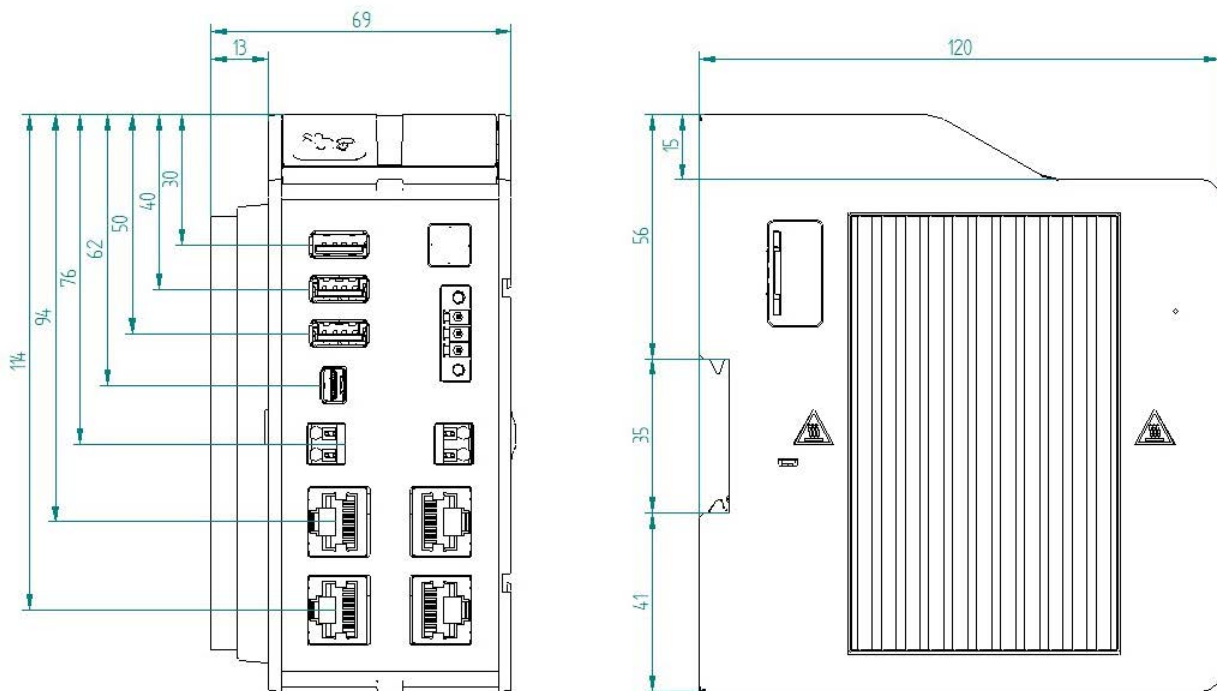
ibaM-DAQ dimensions, dimensions in mm

Note
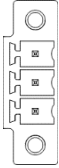
Ensure a minimum clearance of 30 mm above and below the housing and 10 mm to the left of the cooling fins to ensure adequate ventilation of the device.

If the device has been extended with further modules, the above-mentioned clearances apply to the entire system.
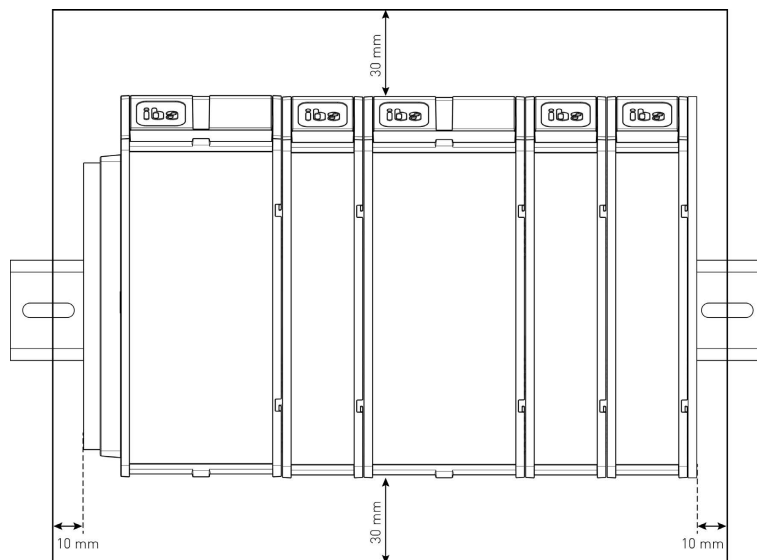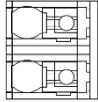
10.5   Connection diagrams
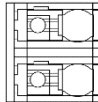
Pin assignment power supply X6

Pin	Connector	
1	+ 24 V	
2	0 V	
3	Ground	

Pin assignment digital input X3

Pin	Connector	
1	Digital input 00+	
2	Digital input 00-	

Pin assignment digital output X7

Pin	Connector	
1	Digital output 00+	
2	Digital output 00-	

11   Accessories

End cover for MAQS modules
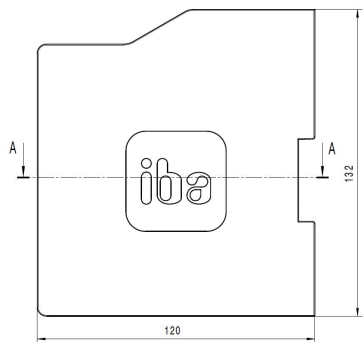
Short description	
Name	ibaM-CoverPlate
Description	End cover for MAQS modules
Order number	90.000663
Design	
Dimensions (w x h x d)	3 mm x 132 mm x 120 mm

Connector for power supply
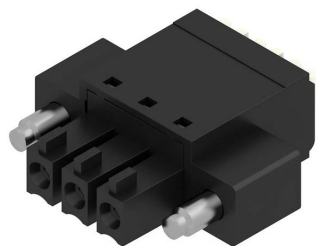
Short description	
Name	MAQS / GEH / MDAQ connector PWR
Description	3-pin socket connector/plug for power supply, push-in, screw connection
Order number	90.000711

12   Appendix

12.1   Ping function (ICMP echo request)

The ping function, the ICMP echo request, is disabled by default in the Windows 10 installation of *ibaM-DAQ*. If you need the ping function and your company's security policy allows it, you can enable it as follows.

1. Open Windows Defender Firewall (e.g. via settings and searching for "firewall").
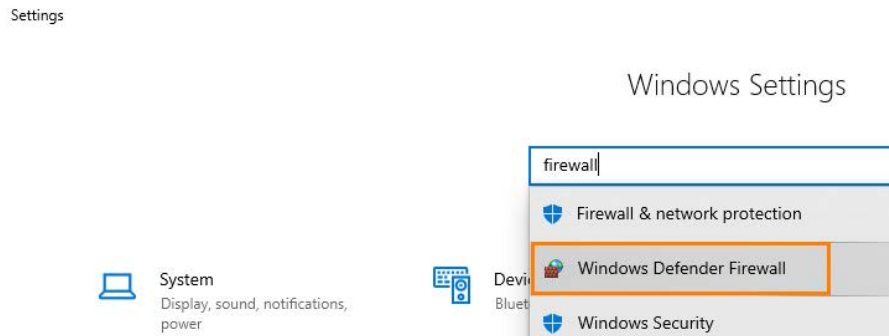
2. Select the advanced settings.
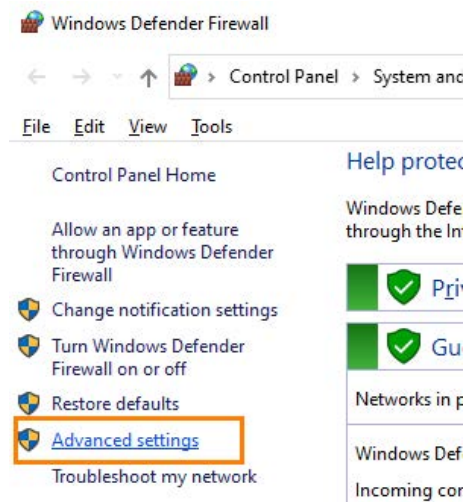
3. First select the inbound rules and select from the list of inbound rules according to these two rules:

   • ICMP Allow incoming V4 echo request

   • ICMP Allow incoming V6 echo request
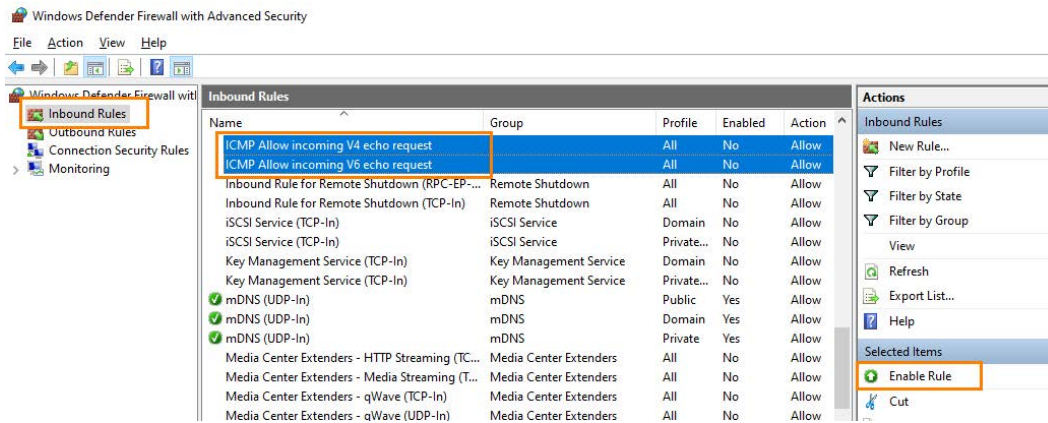
4. Select both rules and activate them together via the "Enable rule" menu item.

5. Afterwards, both rules are marked as enabled in the list via the green checkmark and *ibaM-DAQ* can now be found in the network via a *ping* command or the *ICMP echo request*.
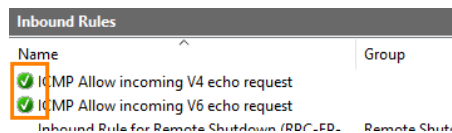
12.2   Wake-on-LAN

The Wake-on-LAN function described here is based on the wake-up via sent Ethernet telegrams of the so-called "Magic Packet" type.

Note

The Wake-on-LAN function is only possible via the X4 network interface.

12.2.1   WoL – BIOS settings

The Wake-on-LAN function must be enabled in the BIOS settings. BIOS settings can only be made if monitor, keyboard and mouse are connected to the *ibaM-DAQ* device and the device is operated via these.

To enter the BIOS, press the <del> remove key during bootup.

The Wake-on-Lan setting can be enabled via Chipset, South Cluster Configuration and Miscellaneous Configuration:
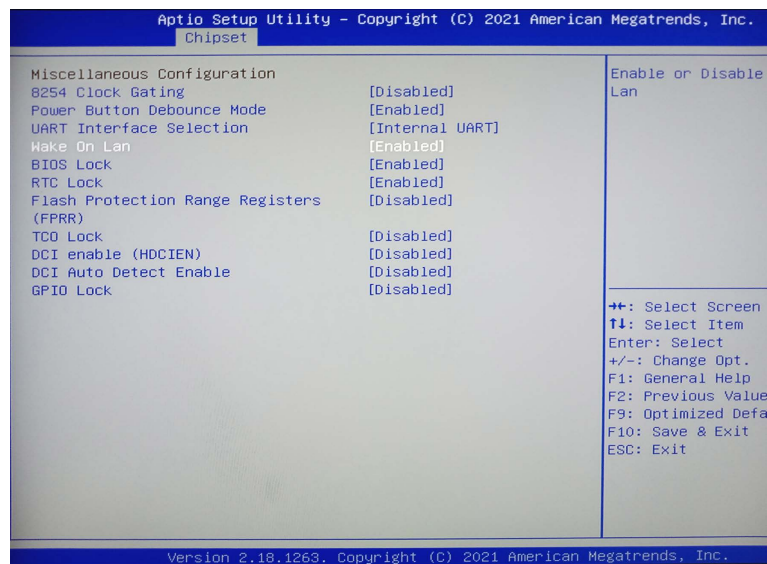
Now exit the BIOS and do not forget to save the change and reboot the system.
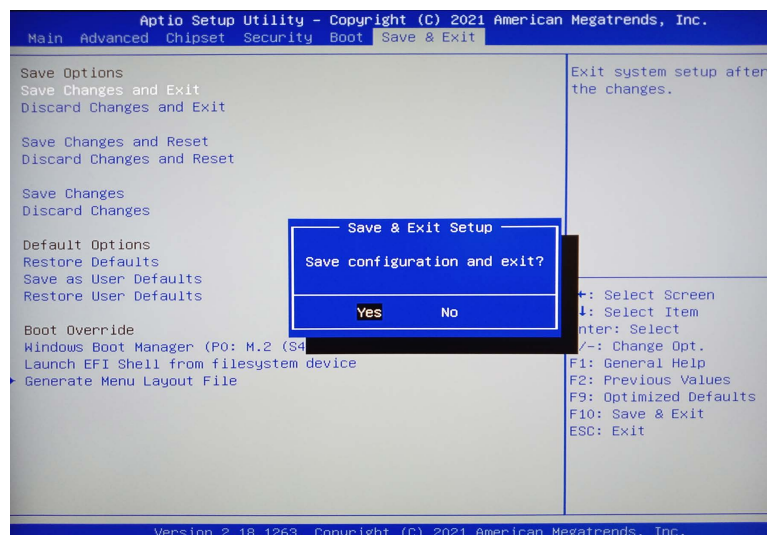
12.2.2   WoL – Operating system settings

In addition, the network card of the X4 network interface requires the following setting in the operating system:

1. Open the network status (e.g. via Settings and the search for "network").
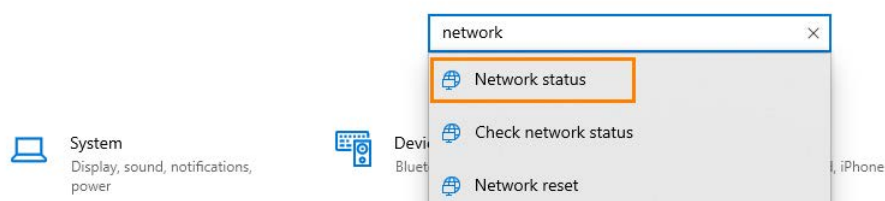
2. Below the advanced network settings, select "Change adapter options" to be able to change the adapter options:

Advanced network settings

Change adapter options
View network adapters and change connection settings.

Network and Sharing Center
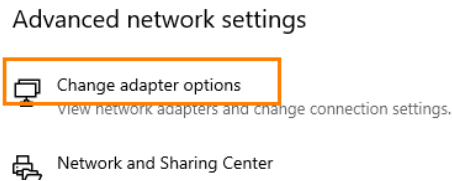
3. At the network interface X4, open the menu for this interface with the right mouse button:
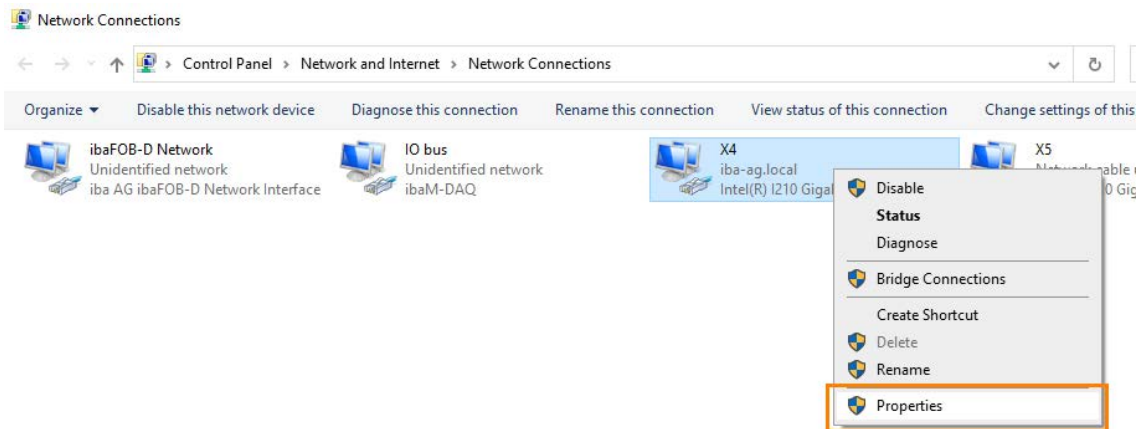
4. Open the properties of this interface. Open the configuration option in the properties window with the <Configure> button:
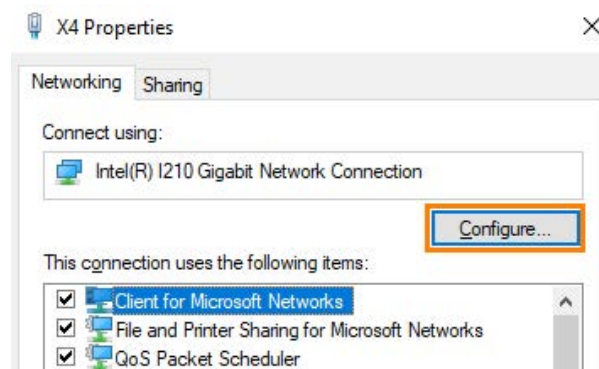
5. First, enable the following options in the power management area:

6. Switch to the advanced area and enable the following properties:
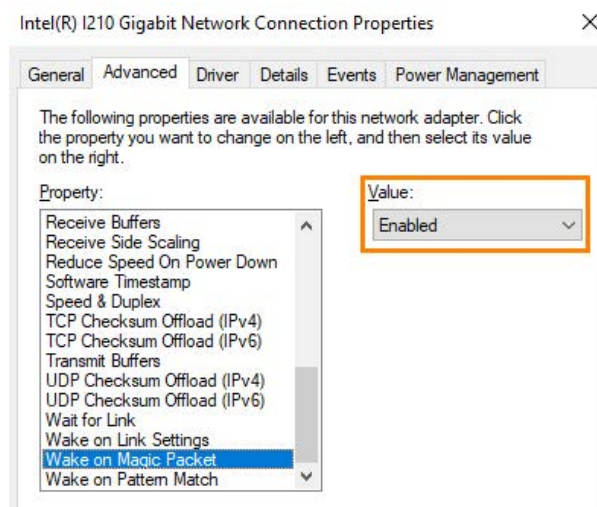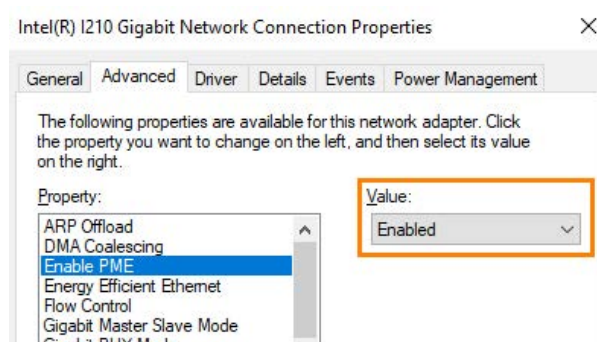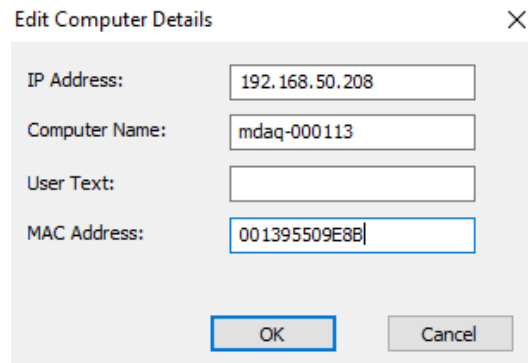
12.2.3   WoL – WakeMeOnLan-Utility

An initial check of the fully activated Wake-on-LAN function on X4 can be realized e.g. with the freeware program *WakeMeOnLan*.

1. To do so, download this program from the manufacturer's site and run it.

2. Add a new computer:
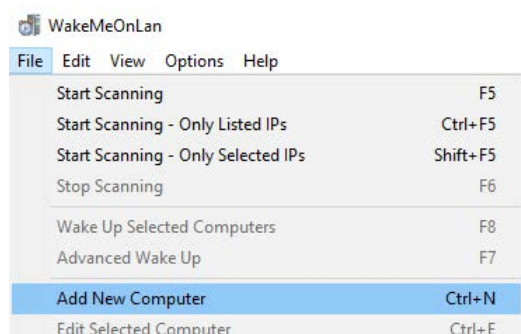
3. Configure the IP address and the MAC address of the network interface X4 and the host name of *ibaM-DAQ*:

Note

The MAC address can be identified by opening a command prompt ("cmd") on the *ibaM-DAQ* device and entering "ipconfig /all" as command:

4. In the overview, open the menu with the right mouse button and select "Wake Up":
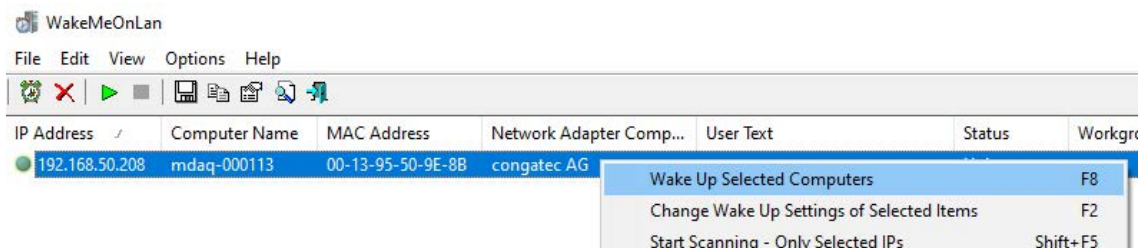
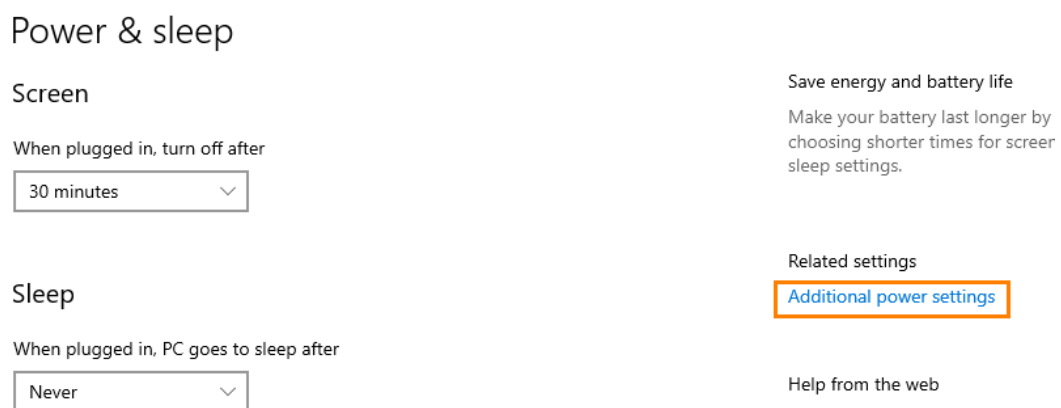5. After confirmation, the switched off *ibaM-DAQ* device should boot up.
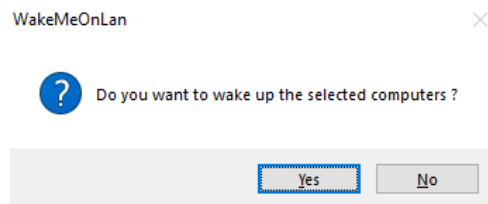
12.3   On/off switch function

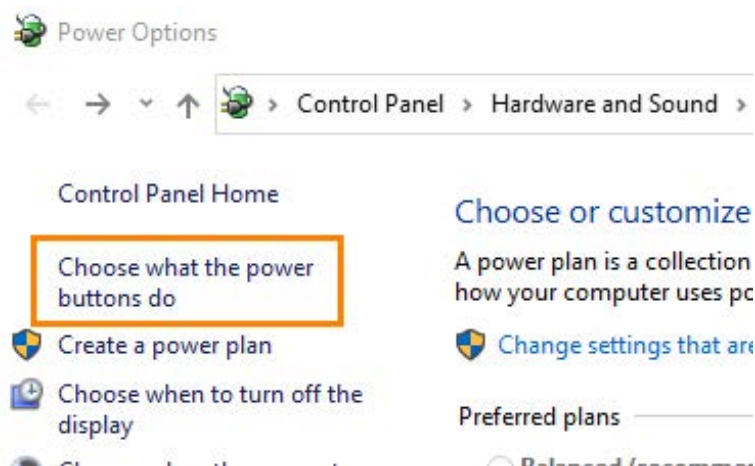The system shuts down by default when the on/off switch is briefly pressed. This setting can be changed via the operating system. Proceed as follows:

1. Open the "Power & sleep settings" (e.g. via Settings and search for "power"):
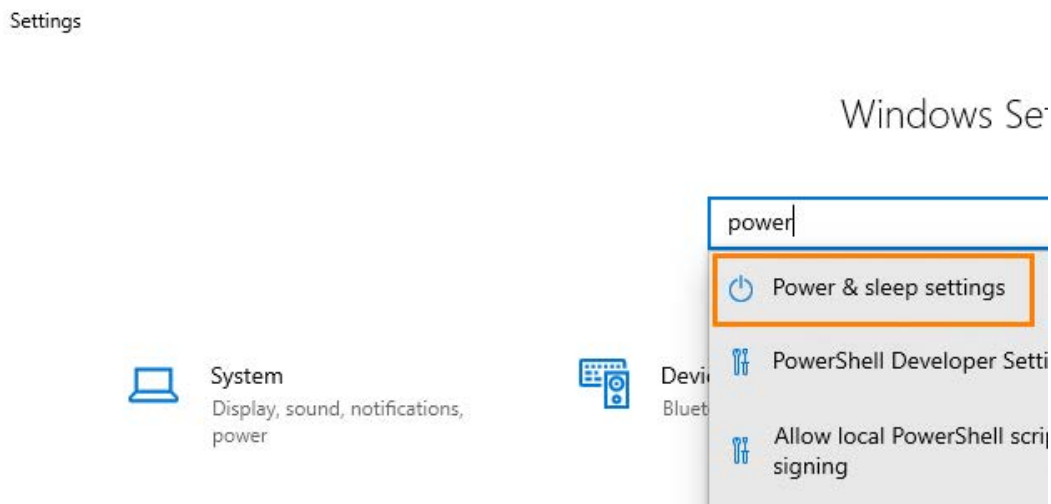
2. Select "Additional power settings":

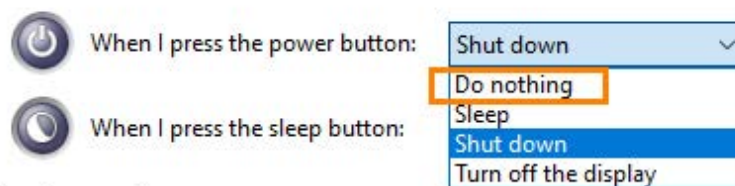3. Select the menu item "Choose what the power buttons do".

The default setting "When I press the power button" is shut down and "When I press the sleep button" is do nothing.

4. Also select "Do nothing" from the drop-down menu for the power button.

5. Finally, save the changes.

The default function of shutting down when the on/off switch is briefly pressed is now disabled.

Note

Please note that switching off (without controlled shutdown) is still active if you press and hold (> 5 s).

This function cannot be configured due to the system.

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13   Support and contact

Support

Phone: +49 911 97282-14

Fax: +49 911 97282-33

Email: support@iba-ag.com

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.

Contact

Headquarters

iba AG
Koenigswarterstrasse 44
90762 Fuerth
Germany

Phone: +49 911 97282-0

Fax: +49 911 97282-33

Email: iba@iba-ag.com

Mailing address

iba AG
Postbox 1828
D-90708 Fuerth, Germany

Delivery address

iba AG
Gebhardtstrasse 10
90762 Fuerth, Germany

Regional and Worldwide

For contact data of your regional iba office or representative please refer to our web site:

www.iba-ag.com