



# ibaBM-COL-8i-o

Data concentrator

Manual

Issue 1.2

Measurement Systems for Industry and Energy

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

The current version is available for download on our web site [www.iba-ag.com](http://www.iba-ag.com).

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## Certification

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

Further international customary standards and directives have been observed.



This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment of and on, the user is encouraged to try to correct the interference by one of more of the following measures:

- Reorient or relocated the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that which the receive is connected.

Consult the dealer or an experienced radio / TV technician for help.

Issue	Date	Revision - chapter / page	Author	Version SW
1.2	04-2023	Hardware version A3 without on/off switch	Ms, st	

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# 1 About this manual

This manual describes the construction, the use and the operation of the device ibaBM-COL-8i-o.

## 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 to 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	Notations
Menu command	Menu <i>Logic diagram</i>
Call of menu command	<i>Step 1 – Step 2 – Step 3 – Step x</i> Example: Select menu <i>Logic diagram – Add – New logic diagram</i>
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!

If you do not observe the safety instructions regarding the process and the system or machine to be controlled, there is a risk of death or severe injury!



### **⚠ 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.



### **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 Scope of delivery

After unpacking check the completeness and intactness of the delivery.

The scope of delivery includes:

- Device ibaBM-COL-8i-o
- 2-pole connector (WAGO order no. 231-532/108-000)

## 3 Safety instructions

### 3.1 Designated use

The device is electrical equipment. It may be used only in the following applications:

- Automation of industrial systems
- Measurement data logging and analysis
- Applications of ibaSoftware products (ibaPDA, ibaLogic etc.)

The device may not be operated in mains supply circuits!

## 4 Product features

### 4.1 Description

- Data concentrator
- Concentrates 8 ibaNet lines into one line
- The inputs support 2 Mbit/s and 3.3 Mbit/s
- The output supports 32 Mbit/s
- Compatible to ibaFOB-X and ibaFOB-D-cards
- 24 V power supply
- Assembly on the mounting rail
- Robust housing

The device ibaBM-COL-8i-o can be used to connect devices with low transmission rates (2 or 3.3Mbit/s) with devices using high transmission rates (32 Mbit/s). Moreover, it concentrates the data streams of up to 8 ibaNet fiber optic inputs into one (fiber optic) output. On the input side it is possible to connect all ibaNet devices that support the so called F mode (3.3 Mbit/s). This includes for example the most devices of the ibaPADU series, bus couplers and system interconnections. Since the device also supports the ibaNet protocol with 2 Mbit/s, it is also possible to connect the earlier versions of ibaPADU devices (serial number < 1000).

ibaPADU devices for fast measurements (ibaPADU-8-M, -8-ICP and -16-M) cannot be connected.

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

#### Application

The application of ibaBM-COL-8i-o allows transmitting the 8-fold data volume of a 2/3.3 Mbit/s transmission over a single fiber optic cable with 32 Mbit/s. Thus, it is possible to achieve significant reduction of the number of ibaFOB input cards in the existing systems that have a large number of ibaNet peripheral devices. The free slots resulting from this can be used for new additional measuring cards. Thus, it also allows connecting the earlier versions of devices to the ibaNet technology with 32 Mbit/s.

#### Certificates

The device is certified according to:

- CE
- FCC (Class B)

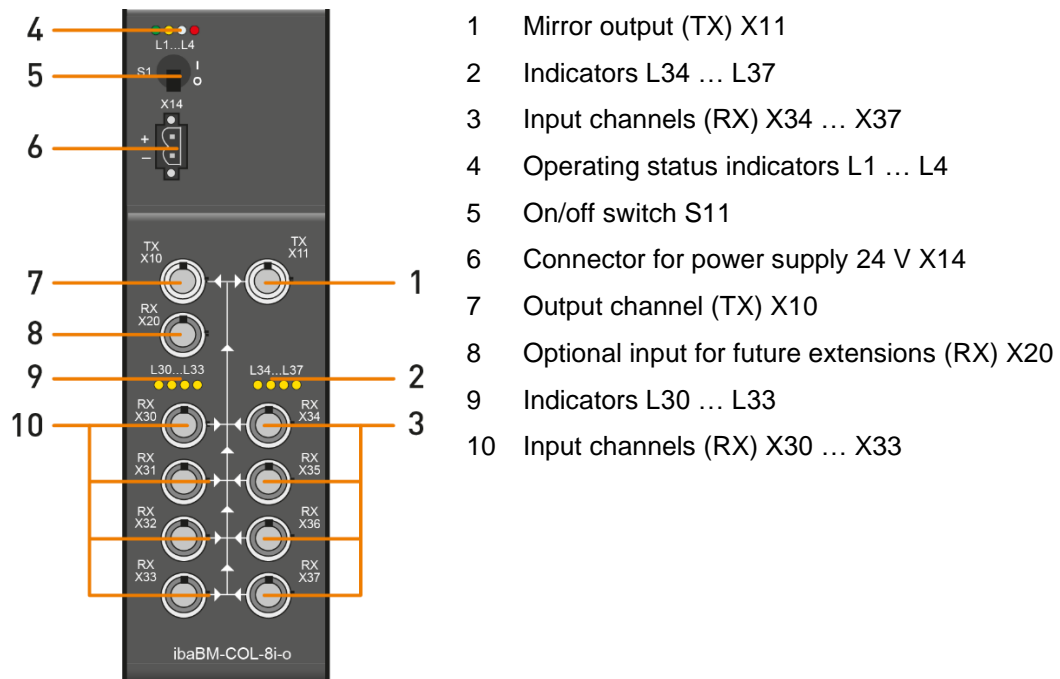
## 4.2 Front view



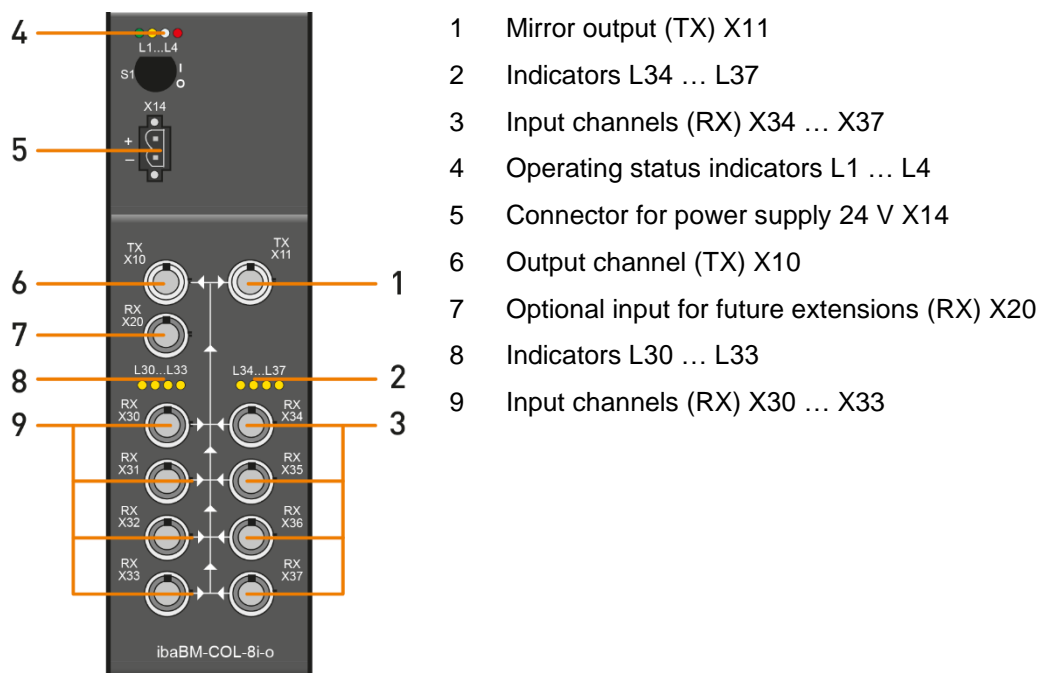
### Note

Beginning with hardware version A3, the on/off switch (S11) is eliminated.

Beginning with hardware version A3, the devices can be switched on or off by connecting them to or disconnecting them from the power supply.



Front view HW version A1, A2



Front view HW version A3



### 4.3 Top view

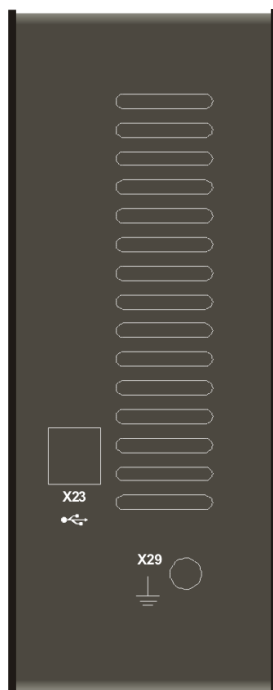
The following data is specified on the upper side of the device:



Manufacturer:	iba AG
Support:	iba@iba-ag.com
Web:	www.iba-ag.com
Certificate:	CE, FCC
Connection drawing	
Power supply:	DC 24 V, ±10 %; 0.1 A
Product name:	ibaBM-COL-8i-o

### 4.4 Bottom view

The bottom side of the device contains:



X23	Service interface (USB)
X29	Earth connection

## 4.5 Display elements

Colored LEDs on the device indicate the operating status and the status of 8 inputs.

### Operating status

LED	Color	Status	Description
L1	Green	Blinking	Ready for operation, power supply is on
		Off	Out of order, no power supply
L2	Yellow	On	Optional input (X20) receives a valid signal
		Off	No signal at the optional input (X20)
L3	White	On	The device is sending a 32 Mbit/s signal, active
		Off	No signals are sent
L4	Red	Blinking	Error message
		Off	Error-free operation

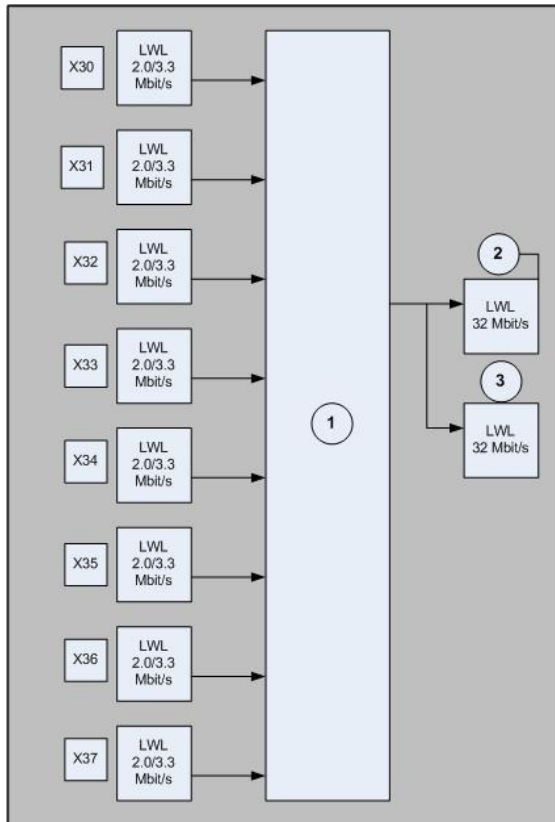
### Status of the 8 inputs

Every input (X) is assigned to an LED (L).

Example: input X30-LED L30

LED	Color	Status	Description
L30 to L37	Yellow	Off	No signal is being received
		On	Receiving an error-free signal
		Blinking	Receiving an incorrect signal

## 4.6 Block diagram



- 1 Data concentrator
- 2 Output
- 3 Mirror output

## 5 Systems and Design

### 5.1 System requirements

In order to be able to connect the devices, they must meet the following requirements:

- ❑ Input side: device with a transfer rate of 2 Mbit/s or 3.3 Mbit/s with a cycle time of 1 ms
- ❑ Output side: iba-card with a transfer rate of 32 Mbit/s, for example ibaFOB-D-card or ibaFOB-X-card



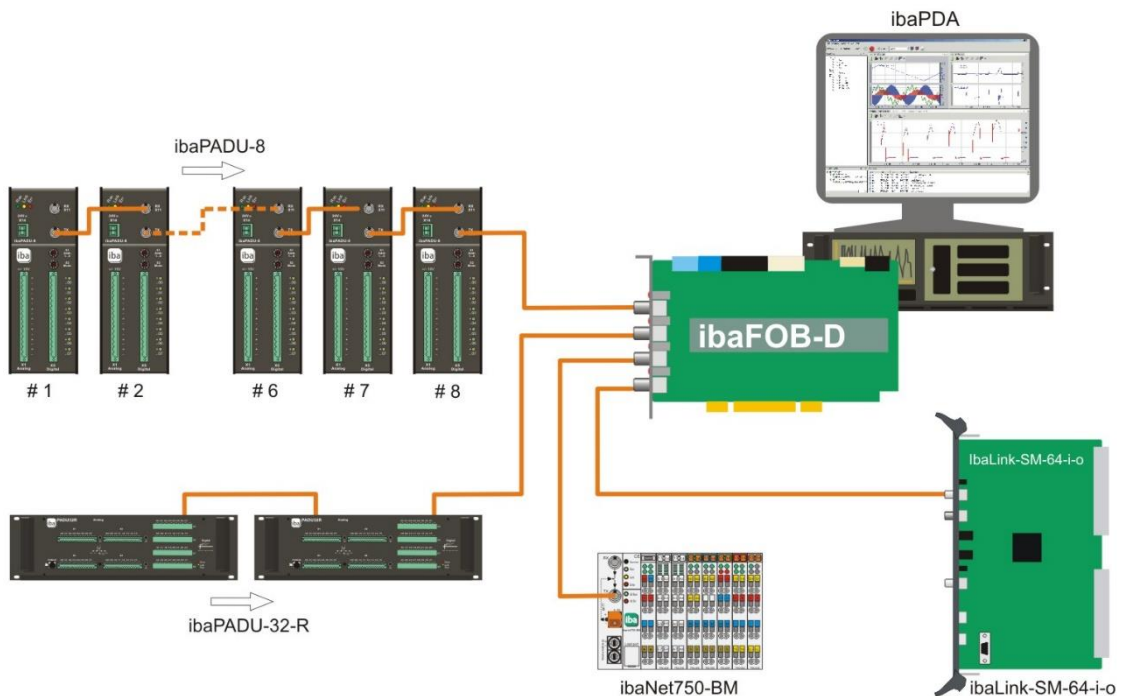
#### Note

If all inputs of an ibaFOB-X-card are operated at the maximum capacity, some values can get lost during data transfer. Therefore, it is recommended to use the latest iba technology standard of the ibaFOB-D-cards with the device.

### 5.2 System topologies

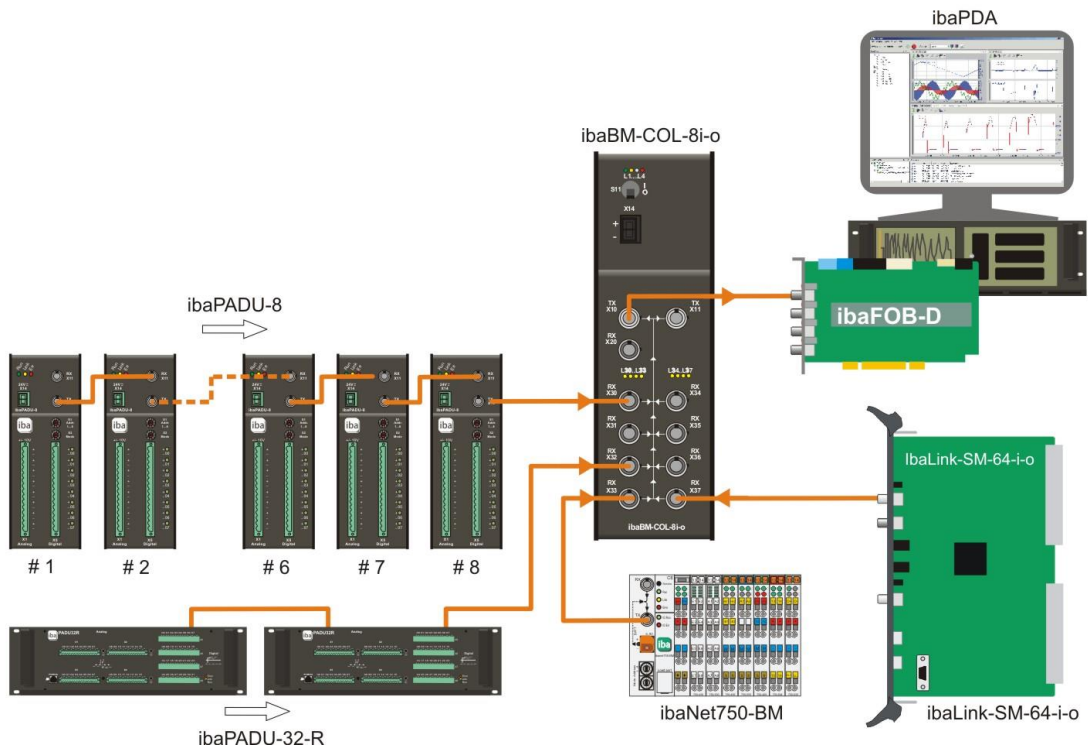
#### 5.2.1 System without ibaBM-COL-8i-o

In this example all 4 inputs of the card are used.



### 5.2.2 System with ibaBM-COL-8i-o

In this example only 1 input is required for the same data volume as in the previous example. The other 3 inputs can be used for further devices.



### 5.2.3 Hardware connection without using iba Software

The figure below shows for example how 2 automation systems can exchange data via a mere hardware connection. There is no need for an iba software application.

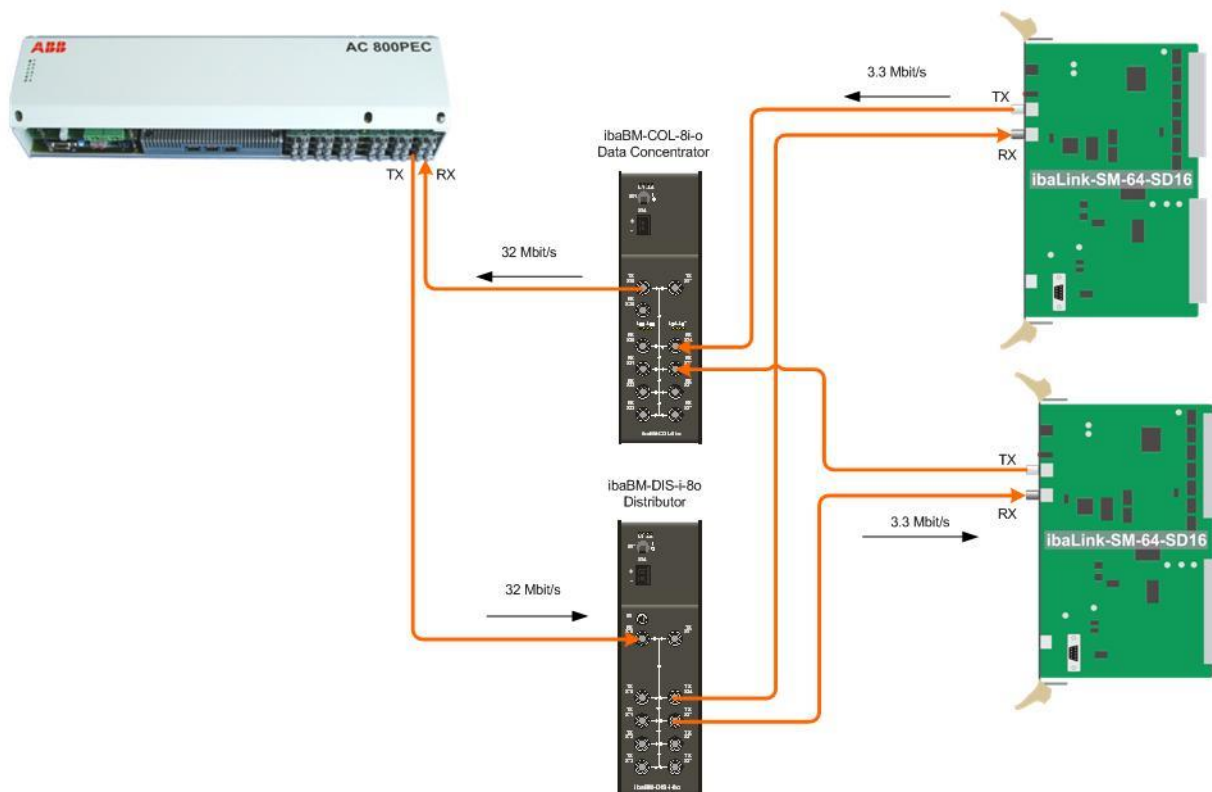
The bidirectional data exchange between an ABB AC 800PEC controller and a SIMADYN D 16bit system is realized by a combination of ibaLink-SM-64-SD16 system interface boards and the devices ibaBM-COL-8i-o and ibaBM-DIS-i-8o.



#### Note

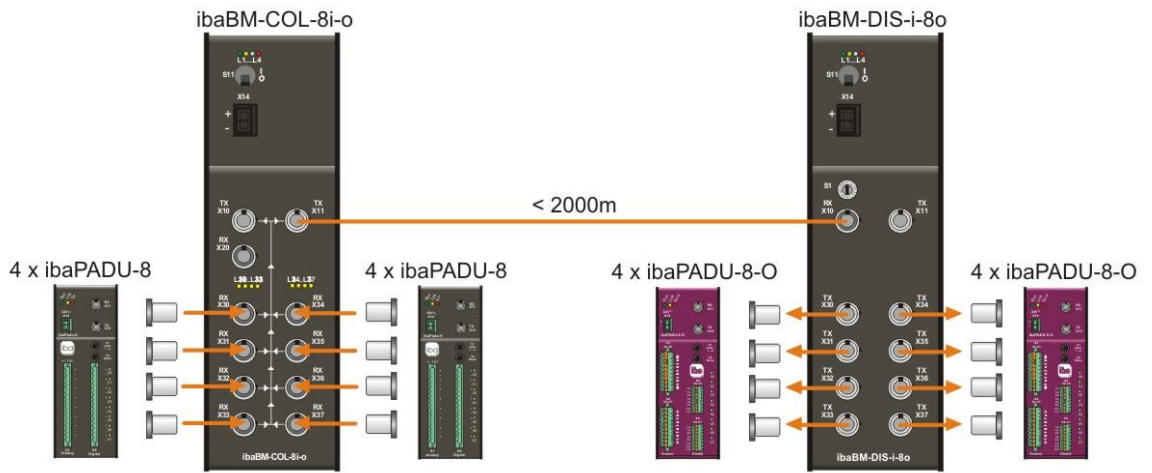
Up to 8 ibaLink-SM-64-SD16-boards can be used.

Software STRUC, version 2.6 or higher is required.



### 5.2.4 Saving FO cables

If you plan to save numbers of fiber optic cables, particularly over long distances, you can connect an ibaBM-DIS-i-8o device on the output side which takes 1 cable with 32 Mbit/s and distributes its signals on 8 cables with 3.3 Mbit/s each. Just one cable is needed for the long distance and you've saved 7 cables.



## 5.3 Configuration in ibaPDA

If the device is connected to the ibaPDA system, then it is automatically detected by the software. The devices connected to ibaBM-COL-8i-o on the input links are also detected.

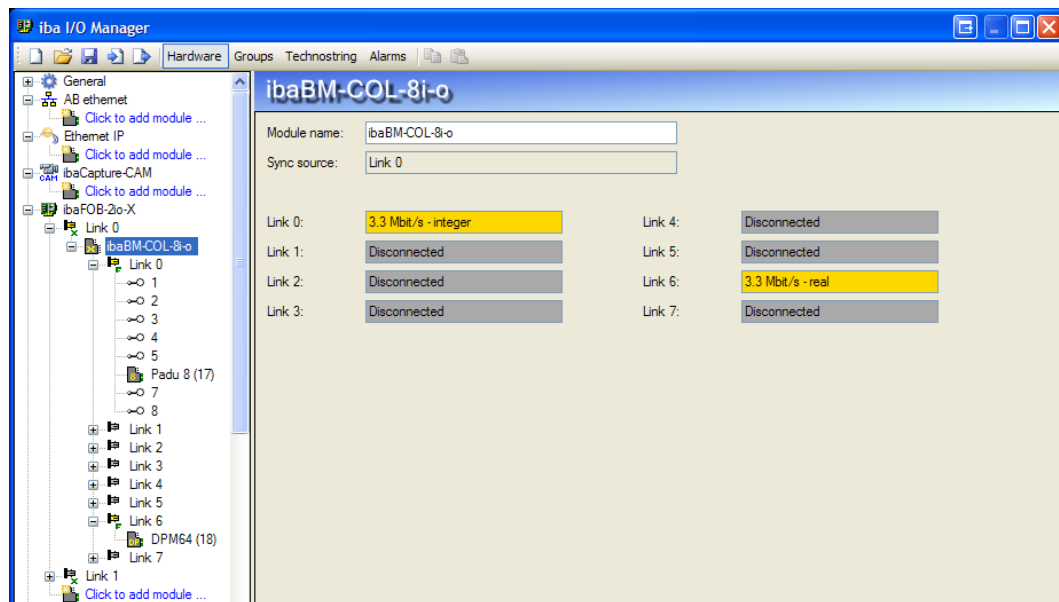
In the I/O manager of ibaPDA-V6 the device is represented in the signal tree as shown on the picture below.

If the device is highlighted in the signal tree, you can specify a name for the device in the dialog on the right. All further fields in the dialog are designed only for information purposes.

The "Sync source" field displays the fiber optic link which is used for the synchronization of the device or clocking of the output link. Usually it is the 1st link which receives a valid and active signal.

The information fields for the 8 input links (link 0 to link 7) indicate the current status of the coupling.

Besides the color identification according to LEDs L30 to L37 on the device you will be informed if the connection is functioning without errors (yellow) or not (gray). There is no blinking status, for example like for the LED. Besides it is displayed what input data rate is used and what is the type of these data (integer or real).





## 6 Installation, Connection, Disassembly

### 6.1 Installation

1. Insert the clip of the mounting rail fastened on the device into the mounting rail.
2. Press the device down in such a way that the clip of the mounting rail engages with a click.

### 6.2 Connection

1. If it is stipulated for the system that the device must be grounded, connect it to earth. Connect the power supply.
2. Observe the correct polarity. Connect the fiber optic cable to the inputs and outputs.
3. If you have connected all the required fiber optic cables, switch on the device.



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**Note**

The device will immediately switch into ready-for-operation mode. The LED L1 is blinking.

During current operation you are able to perform operations on the device. The device can remain switched on.

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### 6.3 Disassembly



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**Note**

If the power supply is interrupted, the device is no longer ready for operation. No LEDs are lit up or blinking.

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1. Switch off the device.
2. Disconnect the power supply.
3. Disconnect it from the earth.
4. Disconnect all cables.
5. Close the open inputs and outputs with a cover.
6. Hold the device to prevent it from falling down and press it slightly downwards.
7. After that pull the device and lift it up. The clip of the mounting rail will disengage with a click.
8. Remove the device.
9. When storing or transporting the device observe the values specified in the chapter "Technical data".

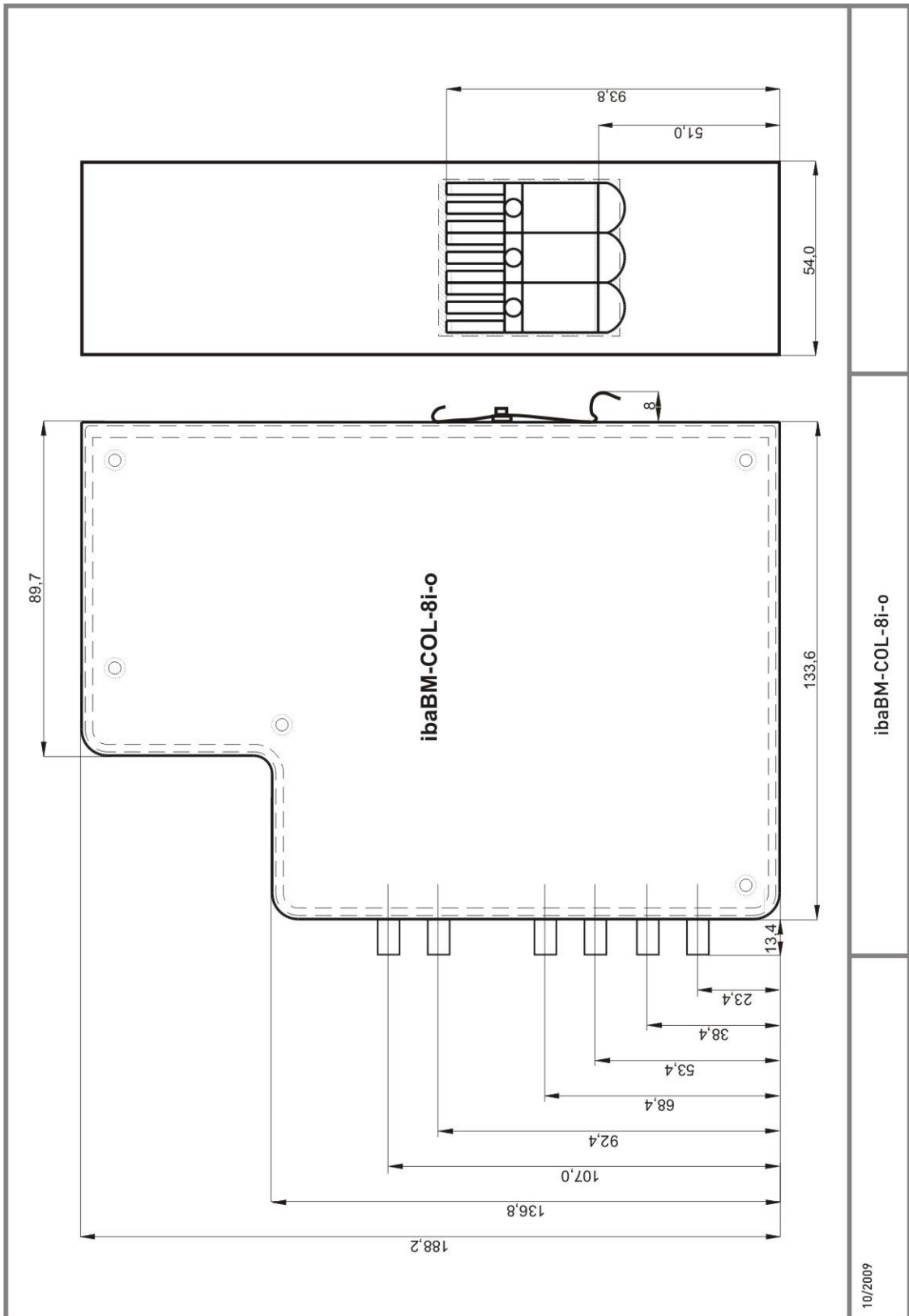
## 7 Technical data

### 7.1 Main data

Manufacturer	iba AG, Germany
Order number	13.114000
Power supply	DC 24 V, $\pm 10$ % unstabilized; 0.1 A
Power consumption	< 3 W
Service interface	USB (bottom side of the device)
Mechanical stability	DIN IEC 68-2-6 (in case of correct installation)
Operating temperature range	32 °F to 122 °F (0 °C to +50 °C)
Storage temperature range	-13 °F to 149 °F (-25 °C to +65 °C )
Transport temperature range	-13 °F to 149 °F (-25 °C to +65 °C )
Humidity class	F, no condensation
Cooling	Self-cooling
Installation	Mounting rail according to DIN EN 60715
Type of protection	IP20
Inputs	8 fiber optic inputs (8 x RX) 1 optional input for future extensions
Outputs	2 fiber optic outputs, 1 of them is the output (1 x TX) and the other one is the mirror output
Data transfer rates at the input	2.0 Mbit/s and 3.3 Mbit/s
Data transfer rates at the output	32 Mbit/s
Synchronization	To the 1st input with the signal
Fiber optic cable	62.5/125 $\mu$ m
Fiber optic coupling	ST
Length of the optical fiber	Maximum 2000 m, without optical amplifiers
Certificates/Standards	CE, FCC (Class B), EMV
Indication	4 LEDs (operational status indicator) 8 LEDs (1 for each state of the input)
Dimensions (Width x Height x Depth)	2.13 inch x 7.40 inch x 6.10 inch (including mounting rail clip) 54 mm x 188 mm x 155 mm
Weight (including packaging and documentation)	1.050 kg

<b>Connectable devices</b>	
Input side	ibaPADU series ibaPADU-8 ibaPADU-8-HI ibaPADU-8-I ibaPADU-16 ibaPADU-32-R ibaPADU-32
	ibaLink series ibaLink-SM-64-i-o ibaLink-SM-128V-i-2o ibaLink-SM-64-SD16
	ibaBM series ibaBM-SLM ibaBM-DDCSM ibaBM-DPM-64 ibaBM-DPM-S-64
	ibaDIG-40 ibaNet750-BM
	ibaFOB cards ibaFOB-io-S ibaFOB-4o ibaFOB-4o-PCI
Output side	ibaFOB-4i-X ibaFOB-2i-X ibaFOB-2io-X ibaFOB-4i-D ibaFOB-2io-D  Automation components with integrated 32 Mbit/s input channel, e. g. AC 800PEC

## 7.2 Dimension sheet



(Dimensions in mm)

## 8 Accessories

Product	iba order number	Comment
Fiber optic cable Simplex with the ST-connectors, length 196.85 inch (5 m)	50.101050	-

For further fiber optic cables and other products refer to iba product catalog on [www.iba-ag.com](http://www.iba-ag.com).

## 9 Support and contacts

### Support

Phone: +49 911 97282-14

Fax: +49 911 97282-33

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



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### Note

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

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