

ibaPADU-8/ -16/ -32/ -32-R

Parallel-Analog-Digital-Converter for 8, 16 or 32 channels



Manual

Issue 3.3

Measurement and Automation Systems



Manufacturer

iba AG

Koenigswarterstr. 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

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Certification

The device is certified according to the European standards and directives. This device corresponds to the general safety and health requirements. Further international customary standards and directives have been observed.

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1 About this manual

This manual describes in detail the configuration and use of the products ibaPADU-8/ -16/ -32/ -32-R. It serves both as a tutorial and a reference document.

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	Notation
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!

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.



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.



Other documentation

Reference to additional documentation or further reading.

2 Introduction

The devices ibaPADU-8, ibaPADU-16, ibaPADU-32 and ibaPADU-32-R (Parallel Analog Digital Units) are designed for data acquisition and control purposes for up to 1 kHz sampling rate. The four basic device types differ only in the amount of signals per device i.e. ibaPADU-8 = 8 analog plus 8 binary inputs. Concerning resolution and accuracy all devices are similar.

To meet a variety of demands the devices differ in the number of channels and housings:

- ibaPADU-8: Standalone device with 8 A+8 D channels and DIN-rail mount
- ibaPADU-16: Table chassis with 16 A+16 D channels and AC 115 V/250 V power supply
- ibaPADU-32: Similar to ibaPADU-16 but with 32 A+32 D channels
- ibaPADU-32-R: 19" rack mount device with 32 A+32 D channels and AC 115 V/250 V power supply

If no special reference to a device is made in the following text the devices are named as ibaPADU in general. For special measuring tasks devices with different I/O physics (i. e. ± 20 mA) or higher input impedance (ibaPADU-8-HI) are available (see chapter 8.3).

The devices are ideally suited for the following applications:

- Process data acquisition
- Commissioning
- Trouble Shooting and error detection
- Portable measuring devices (e. g. with the table versions)

To guarantee a good dynamic range or SNR ratio of the signals every A/D channel is equipped with its own A/D converter.

All ibaPADU devices can be linked in a daisy-chain on the fiber optic links. A maximum of 64 analog plus 64 digital channels may be connected per link (i. e. 2 x ibaPADU-32, 8 x ibaPADU-8).

For examples for different topologies see chapter 7.2.

3 Contents of delivery

The following components are part of this delivery:

- ibaPADU device
- 115 V/250 V power cord with ibaPADU-16, -32, -32-R
2-pin Phoenix power plug with ibaPADU-8
- Manual
- All necessary Phoenix terminal blocks (spring loaded terminal blocks) for the signal inputs

4 Safety Instructions

The following safety instructions apply particularly to the devices ibaPADU-16 and ibaPADU-32/-32R:

⚠ WARNING

In order to avoid the risk of electrical shock disconnect the power cord or switch off the power supply before installation or dismantling of the device!

In order to avoid the risk of electrical shock prevent the devices from contact with water!

The 3-wire power cord must be connected to a correctly grounded power socket!

For all devices:

⚠ CAUTION

Don't open the device! There are no service parts inside.

Opening the device will void your warranty.

5 System prerequisites

In order to use the ibaPADU devices for data acquisition you need further components or systems.

5.1 Hardware

- IBM-compatible PC with at least one of the following cards:
 - ibaFOB x/4-F (only for ibaPADU devices with S/N <1000)
 - ibaFOB-io or ibaFOB-4i
 - ibaFOB-io-S or ibaFOB-4i-S
 - ibaFOB-4i-X, -2i-X, -2io-X or -io-X (not for ibaPADU devices with S/N <1000)
 - ibaFOB-4i-D, -2i-D, -2io-D or -io-D
- Laptop computer with:
 - ibaCom-PCMCIA-F, copper based RS485 interface (or optic transmission via ibaFO-A adaptor)
- PLC-system with:
 - ibaLink-SM-64-IO (input)
 - ibaLink-SM-128V-i-2o (input)

5.2 Software

For data acquisition, recording or process control you'll need one of the following software applications:

- ibaPDA
- ibaQDR
- ibaLogic
- ibaScope

6 Mounting and Dismounting

6.1 ibaPADU-8

6.1.1 Mounting

Locate the DIN-rail mounting clip on the rear side of the device. Place the device on the DIN rail so that the top part the mounting clip engages the top part of the rail appropriately. Slowly push down and in so that the bottom part of the mounting clips snaps onto the bottom edge of the rail and firmly fixes the device to the DIN-rail.

Then connect power supply (correct polarity!), the analog and/or digital signal connections and the fiber optic cable(s). Shield if required.

6.1.2 Dismounting

Disconnect all external connections from the device.

Grasp the device with one hand firmly on the top side. With your free hand, grasp the bottom of the device so that your index and middle fingers rest on the grounding screw. Lightly push down with the hand on the top side of the device and simultaneously pull forward with your other hand. With this action, the device should free itself from the DIN-rail.

6.2 ibaPADU-32-R

6.2.1 Mounting

Fix the device with the four front panel screws into the cubicle. In case of high mechanical duty (acceleration > 1 g) support the device at the rear end or mount it on rails.

Once fixed, on the rear side connect the power supply cord and switch on the device. Connect fiber optic cable(s) to the TX/RX ports and set device mode and address with the dial switches.

If the rear side of the device is not accessible after mounting, e. g. in case of closed cubicle, back to the wall without a swing rack, take above mentioned actions vice versa. First connect the rear-side cables, dial mode and address and switch on the power switch. Then move the device carefully into the cubicle (FO-cables, watch limited cable bending!) and fix the four front panel screws.

6.2.2 Dismounting

Disconnect all external connections from the device. Unscrew the four front panel screws (and the additional rear holding if present) while holding the device securely. Remove device from cubicle.

If the rear side of the device is not accessible when inside the cubicle, act vice versa.

7 System topologies and addressing

All ibaPADU devices are normally connected in a straight line topology to their respective ibaFOB-cards. In case of using the external synchronization function (ibaPADU-8 only) the devices are linked in a ring topology. The outputs of the devices are to be connected with the input of the following devices until all devices are interconnected and the last device is connected to the ibaFOB-card. All addresses (1...8) within a chain must be unique.

7.1 Addressing

One address represents 8 analog +8 digital channels. Therefore devices which hold 16 A+16 D channels need two addresses, an ibaPADU-32 needs four addresses respectively.

Hence, you may connect chains of:

- 8 ibaPADU-8 or
- 4 ibaPADU-16 or
- 2 ibaPADU-32

with 1 fiber optic link.

It is permitted to combine different ibaPADU devices in one chain.



Note

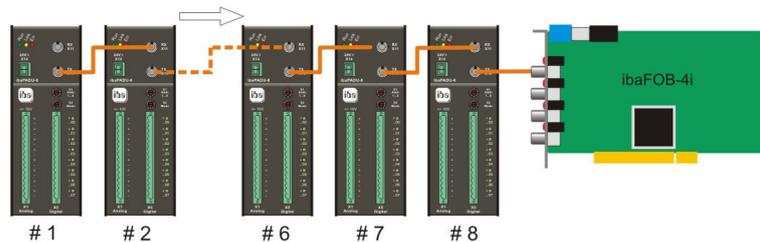
Cascading ibaPADU-16, ibaPADU-32 or ibaPADU-32-R is allowed with serial numbers 1000 or higher of these devices (3Mbit telegram).

ibaPADU-16, ibaPADU-32 and ibaPADU-32-R devices with serial numbers 1000 or higher cannot be connected to ibaCom-PCMCIA or ibaFOB x/4 cards (ISA). ibaPADU devices with S/N <1000 cannot be operated with ibaFOB-io-X cards because these cards do not support the 2Mbit protocol.

In ibaPDA the card type ibaFOB is not allowed for ibaPADU-16, ibaPADU-32 and ibaPADU-32-R devices with serial numbers 1000 or higher.

7.2 Examples for topologies

Example 1: Homogeneous ibaPADU-8 chain



Up to 8 devices in a line structure.

Every device with 8 analog + 8 digital channels must be set to a unique station address between 1...8.

If 2 devices carry the same address the subsequent device in the fiber optic link overwrites the content of the previous device.

The image, left, shows the principle of the data packages in an ibaFOB-telegram. Each box contains 8 analog + 8 digital signals. The device address determines where the data are placed in the telegram. Therefore, the position of a device in the chain is independent of the address setting.

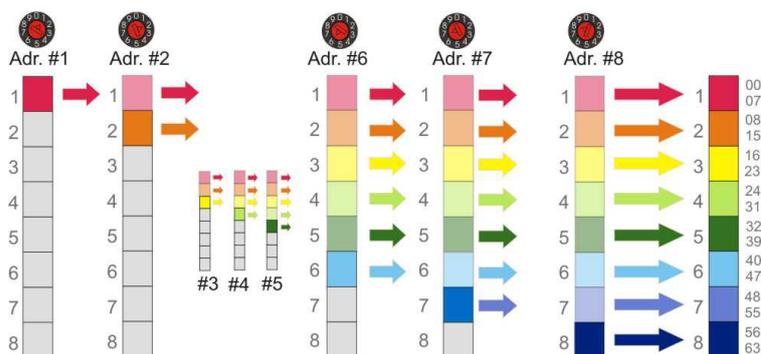
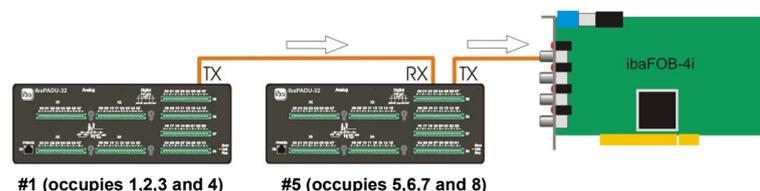


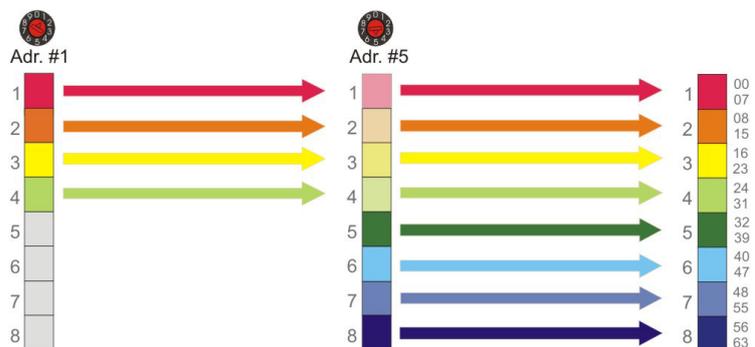
Figure 1: Homogenous ibaPADU-8 chain

Example 2: ibaPADU-32 chain



2 devices in a line structure.

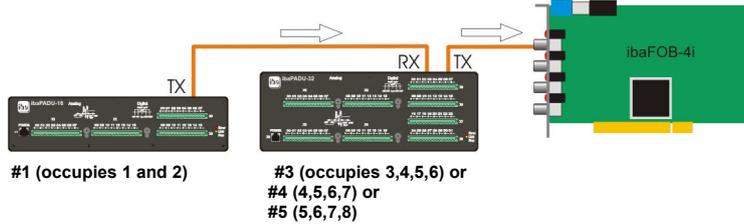
The device addresses are to be set as follows.



Because every device needs four addresses the settings #1 and #5 are correct only in order to use all signals of both devices!

Figure 2: ibaPADU-32 chain

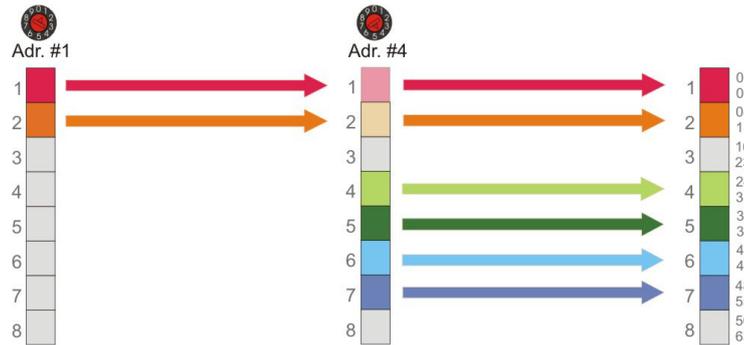
Example 3: Mixed chain with ibaPADU-16 and ibaPADU-32



2 devices in a line structure.

Device settings are to be set as follows:

For example: addresses #1 and #4

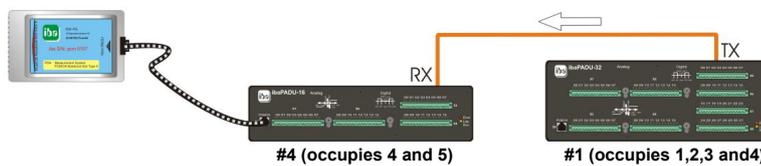


ibaPADU-16: Addr. #1; also the addresses #2 or 3 would be allowed for Padu16.

In the last case the ibaPADU-32 must be set to #5 in order to use all of its signals without overwriting the data from ibaPADU-16

Figure 3: Mixed chain with ibaPADU-16 and ibaPADU-32

Example 4: Connection to Notebooks via ibaCom-PCMCIA-F card



2 devices in a line structure connected to a notebook computer via ibaCom-PCMCIA-F card.

The last device in the chain is connected to the ibaCom-PCMCIA-F card via the RJ11 cable.

Use the fiber optic adapter ibaCom-FO-A to do the same via fiber optics (connected to TX)

Figure 4: Connection to Notebooks via ibaCom-PCMCIA-F card



Note Example 4

The last 8 A + 8 D channels of ibaPADU-32 (package #4) are overwritten by ibaPADU-16 (#4) in this example.

8 Product properties

8.1 Properties

- Power supply (depending on the type DC 18 V/32 V or AC 115 V/250 V)
- Rugged mechanical and electrically shielded metal case (with DIN-rail mount or 19" rack mount)
- 3 LEDs (Run, Link, Error)
- 1 fiber optic input and 1 output to transmit the signals and for daisy chaining multiple devices
- 8, 16 or 32 analog inputs, 14 bits, galvanically isolated against each other and against digital ground
- 8, 16 or 32 digital inputs, galvanically isolated against each other and against digital ground (with eight status LEDs on ibaPADU-8)
- Standard sampling rate for ibaPADU-8, -16 and -32 is 1000 Hz
- Sampling rate for ibaPADU-16 / -32 of version A2 or higher can be set to 800 Hz or 960 Hz; this contributes to operation in a 60 Hz-mains environment
- For ibaPADU-8 only, in externally synchronized operation mode and together with ibaFOB-io or ibaFOB-4i + ibaFOB-4o in ring topology: sampling rate can be changed by program (ibaLogic) in steps of 100 μ s between 1.0 ms and 9.9 ms
- ibaPADU-8, -16 and -32 are operating in the so called F-Mode, using a data transmission rate of 3.3 Mbit/s for fiber optic communication
- ibaPADU-16 and -32 can use an emulation mode for the 2.2 Mbit/s data transmission rate in order to work together with old ibaPADU models
- Service port for (later) firmware updates
- Shield connector(-s)
- Parallel measuring via fiber optical output or RJ11 jack and ibaCom-PCMCIA-F card is supported for all devices.

8.2 Device, operating elements and connectors

8.2.1 ibaPADU-8 (all types)

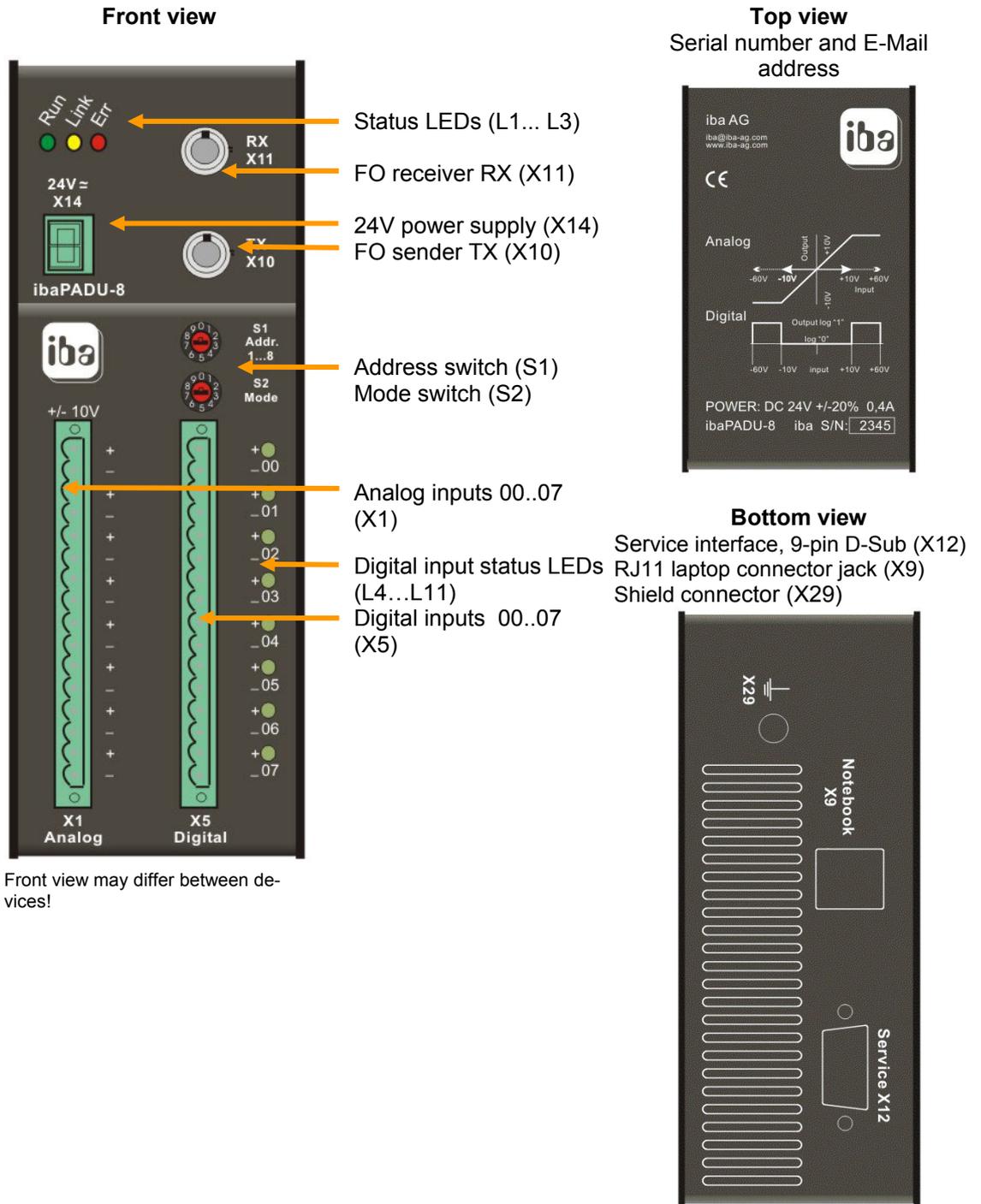


Figure 5: Device, operating elements and connectors

8.2.1.1 Power supply connector X14

A non stabilized DC voltage between 18 V and 32 V is to be connected here.

Pin	Meaning (X14)
1	+24 V
2	0 V

8.2.1.2 Fiber optic input X11 (RX) and output X10 (TX)

The 2 connectors (ST type) serve to connect the device to the fiber optic bus.

The X10 output has all data of the device itself and – in case of a daisy chain – the data from all previous devices. Chaining is done when X10 of a device is connected to X11 of the next device. The last output must then be connected to a fiber optic input of the ibaFOB-card (or ibaLink-SM-card if used as I/O expander). Connecting and disconnecting of devices on the fiber optic links is allowed at all times. Interrupting the fiber optic link leads to missing data for the time period of the interruption.

8.2.1.3 Device address setting with Addr.-switch (S1)

S1 is used to set the device address (1 ... 8). Each address represents 8 A + 8 D channels.



Important note

The position of the address switch S1 must not be "0", since otherwise the link is broken.

8.2.1.4 Device Mode setting with mode-switch (S0)

S0 sets the device mode. Mode = 0 = Run (standard); other modes are not supported.

8.2.1.5 L4...L11; status LEDs for digital inputs

LED	Status	Meaning
Ln : (green)	On	Digital input = on (log „1“, TRUE)
	Off	Digital input = off (log „0“, FALSE)

n = 4...11 (4 represents digital input 00; 11 digital input 07)

8.2.2 ibaPADU-16/ibaPADU-32/ibaPADU-32-R

Front view of ibaPADU-32 (ibaPADU-16 is similar but without X3, X4, X7 and X8)

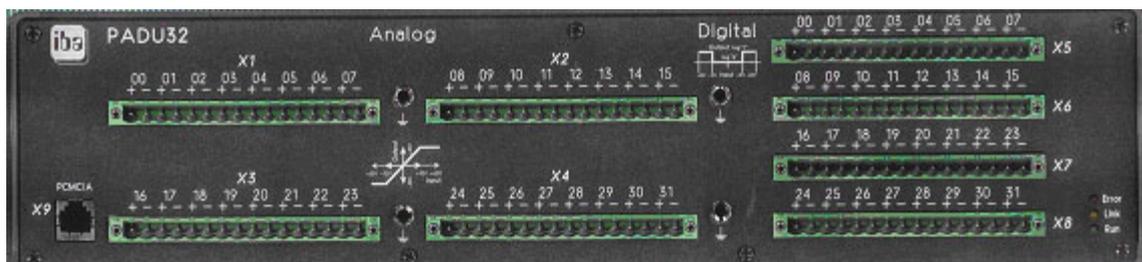


Figure 6: Front view of ibaPADU-32

Rear view of ibaPADU-32 (ibaPADU-16 similar)

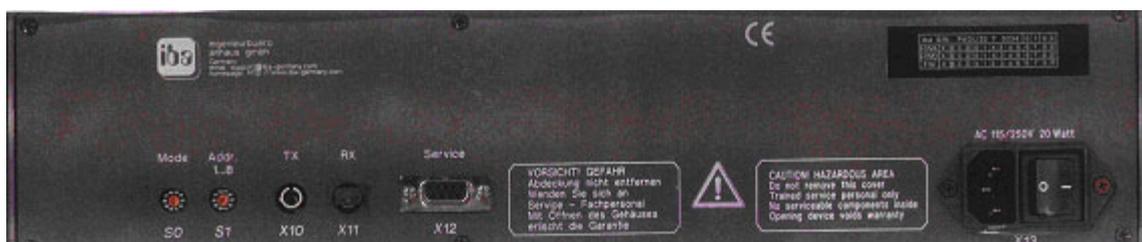


Figure 7: Rear view of ibaPADU-32

8.2.2.1 Power supply plug X13

The device accepts AC voltages between 115 V and 250 V.

8.2.2.2 Fiber optic Input X11 (RX) and output X10 (TX)

The 2 connectors (ST type) serve to connect the device to the fiber optic bus.

The X10 output has all data of the device itself and – in case of a daisy chain – the data from all previous devices. Chaining is done when X10 of a device is connected to X11 of the next device. The last output must then be connected to a fiber optic input of the ibaFOB-card (or ibaLink-SM-card if used as I/O expander). Connecting and disconnecting of devices on the fiber optic links is allowed at all times. Interrupting the fiber optic link leads to missing data for the time period of the interruption.

In order to use all signals of an ibaPADU-16 up to four devices can be operated in a chain on one FO-link, when using ibaPADU-32 up to 2 devices.

8.2.2.3 Device mode setting with mode-switch (S0)

The switch S0 sets the device mode.

Switch S0	Mode	Meaning
	0	Standard; sampling rate 1000 Hz; 1 ms sample time; 14 bit
	1	4-times oversampling; sampling rate 1000 Hz; 1 ms; 16 bit
	6	Sampling rate 800 Hz; for operation in 60 Hz-mains environment; 14 bit for ibaPADU-16/-32/-32R version A2 and higher
	7	Sampling rate 960 Hz; for operation in 60 Hz-mains environment; 14 bit for ibaPADU-16/-32/-32R version A2 and higher
	8	Emulation of 2.2 Mbit/s data telegrams, like old ibaPADU devices sampling rate 1000 Hz, 14 bit

8.2.2.4 Device address setting with Addr.-switch (S1)

S1 is used to set the device to its address (1...8). Each address represents 8 A + 8 D channels. An ibaPADU-16 always needs (occupies) two addresses, an ibaPADU-32 four addresses. Odd addresses are allowed, e. g., if the line begins with a single ibaPADU-8 followed by an ibaPADU-16.

Subsequent devices will overwrite data from previous devices if the same address exists multiple times in a chain.

8.2.3 Run, link and error LED indicators

LED	Status	Indication
L1: Run (green)	Blinking	Power is on and device is ok
	Off	Insufficient power or device failure
L2: Link (yellow)	On	Data is being received on FO-input
	Blinking	No incoming data stream; link broken or previous device in the chain defect or not active
	Off	Link broken (Check if the rotary switch S1 position is "0". The position must not be "0", S1 is used to set the device address 1-8)
L3: Error (red)	On	Device error
	Off	Device healthy, automatically resets when error condition ends

8.2.4 Analog and digital connector pinning

ibaPADU...	Analog Inputs				Digital Inputs			
	8, 16, 32	16, 32	32	32	8, 16, 32	16, 32	32	32
Pin/ Connector	X1	X2	X3	X4	X5	X6	X7	X8
1	+ AI 00	+ AI 08	+ AI 16	+ AI 24	+ DI 00	+ DI 08	+ DI 16	+ DI 24
2	- AI 00	- AI 08	- AI 16	- AI 24	- DI 00	- DI 08	- DI 16	- DI 24
3	+ AI 01	+ AI 09	+ AI 17	+ AI 25	+ DI 01	+ DI 09	+ DI 17	+ DI 25
4	- AI 01	- AI 09	- AI 17	- AI 25	- DI 01	- DI 09	- DI 17	- DI 25
5	+ AI 02	+ AI 10	+ AI 18	+ AI 26	+ DI 02	+ DI 10	+ DI 18	+ DI 26
6	- AI 02	- AI 10	- AI 18	- AI 26	- DI 02	- DI 10	- DI 18	- DI 26
7	+ AI 03	+ AI 11	+ AI 19	+ AI 27	+ DI 03	+ DI 11	+ DI 19	+ DI 27
8	- AI 03	- AI 11	- AI 19	- AI 27	- DI 03	- DI 11	- DI 19	- DI 27
9	+ AI 04	+ AI 12	+ AI 20	+ AI 28	+ DI 04	+ DI 12	+ DI 20	+ DI 28
10	- AI 04	- AI 12	- AI 20	- AI 28	- DI 04	- DI 12	- DI 20	- DI 28
11	+ AI 05	+ AI 13	+ AI 21	+ AI 29	+ DI 05	+ DI 13	+ DI 21	+ DI 29
12	- AI 05	- AI 13	- AI 21	- AI 29	- DI 05	- DI 13	- DI 21	- DI 29
13	+ AI 06	+ AI 14	+ AI 22	+ AI 30	+ DI 06	+ DI 14	+ DI 22	+ DI 30
14	- AI 06	- AI 14	- AI 22	- AI 30	- DI 06	- DI 14	- DI 22	- DI 30
15	+ AI 07	+ AI 15	+ AI 23	+ AI 31	+ DI 07	+ DI 15	+ DI 23	+ DI 31
16	- AI 07	- AI 15	- AI 23	- AI 31	- DI 07	- DI 15	- DI 23	- DI 31

Table 1: Analog and digital connector pinning

8.2.5 Service interface (X12)

A 9-pin SUB-D port, found on the bottom side of the device is dedicated to load new firmware on the device. For loading new firmware from a PC into the device you'll need a standard V.24 interface cable.



Note

Please contact iba regarding loading new firmware. You will get the required files and further information about the loading procedure.



Important note

In normal operation mode the V.24-cable must not be connected.

8.2.6 Shield connector(s) for physical earth

Proper connection of cable shielding to the device should be ensured. The shield connector can be found on the bottom side of the device (or on the right side of each connector on ibaPADU-16/-32/-32-R). It should be connected with any total shield that serves for all cables. In addition, each individual sensor channel shield must be connected to its respective input channel shield pin.



Note

Connect shield on one cable side only to avoid ground loops.



Note

Always ground the DIN rail on which the device is installed.

8.3 Devices for different analog input physics

8.3.1 ibaPADU-8 and ibaPADU-8 High Impedance

8.3.2 ibaPADU-8 (standard)

8 analog inputs with ± 10 V voltage inputs and $R_{ON} = 100 \text{ k}\Omega$ (R_{ON} = device is on) and $R_{OFF} = 50 \text{ k}\Omega$

Derivatives with inputs of up to 60 V are available also in request (see chapter “Technical data”).

8.3.3 ibaPADU-8- (High Impedance)

8 analog inputs with ± 10 V voltage inputs and $R_{ON} = 1 \text{ M}\Omega$ / $R_{OFF} = 500 \text{ k}\Omega$

There are devices also available for up to 60 V and with low pass filter (see chapter “Technical data”).

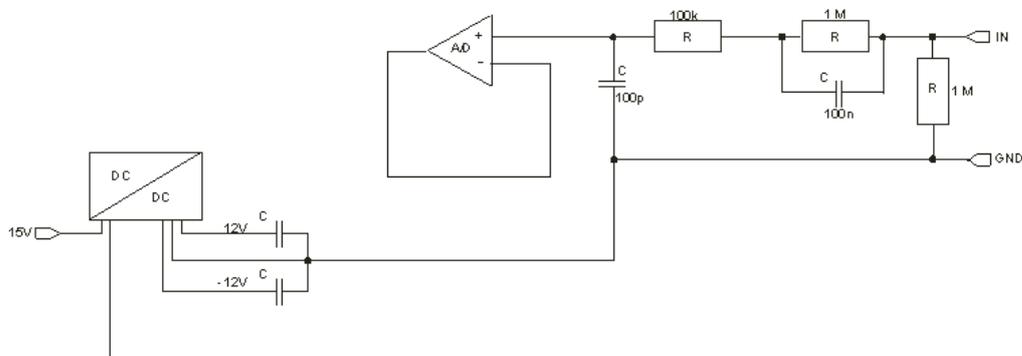


Figure 8: Simplified input circuitry of the ± 10 V input with ibaPADU-HI resistor network

8.3.4 ibaPADU-8-F1

8 analog inputs with +/-10 V voltage inputs and $R_{ON} = 100\text{ k}\Omega$ (R_{ON} = device is on) and $R_{OFF} = 50\text{ k}\Omega$

Low pass filter 250 Hz, 12 dB

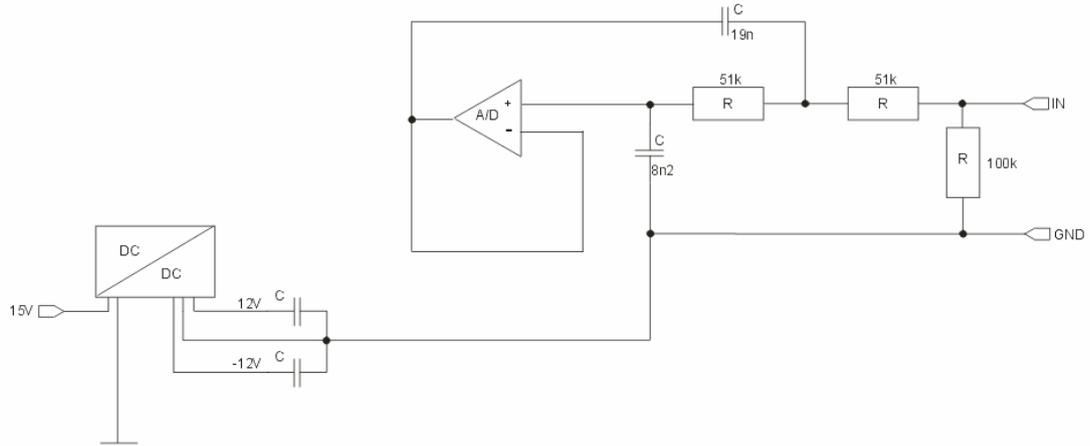


Figure 9: Simplified input circuitry of ibaPADU-8-F1 (250 Hz, 12 dB)

8.3.5 ibaPADU-8-I

8 analog inputs with $\pm 20\text{ mA}$; $R_I = 50\text{ }\Omega$, for current-based signals

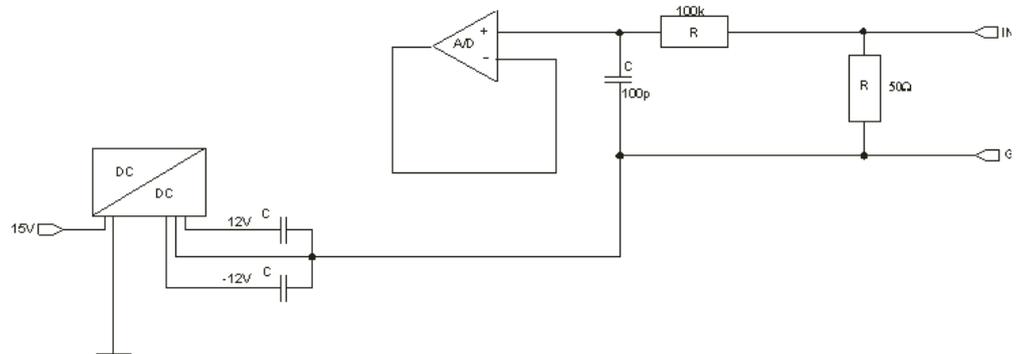


Figure 10: Simplified input circuitry of ibaPADU-8-I ($\pm 20\text{ mA}$)

There are devices also available for currents up to $\pm 50\text{ mA}$ (see chapter “Technical data”).

9 Configuration/Engineering

9.1 Adjustable device parameters and modes of operation

9.1.1 Sampling rate

The normal simultaneous sampling rate for all devices is 1 Hz.

The sampling rate for ibaPADU-8 (only!) may be changed for the devices within one ring topology between 1.0 ms and 9.9 ms in steps of 100 μ s with ibaLogic and ibaFOB-io or ibaFOB-4i + ibaFOB-4o or their successors (except ibaFOB-D). In this case a ring topology is required.

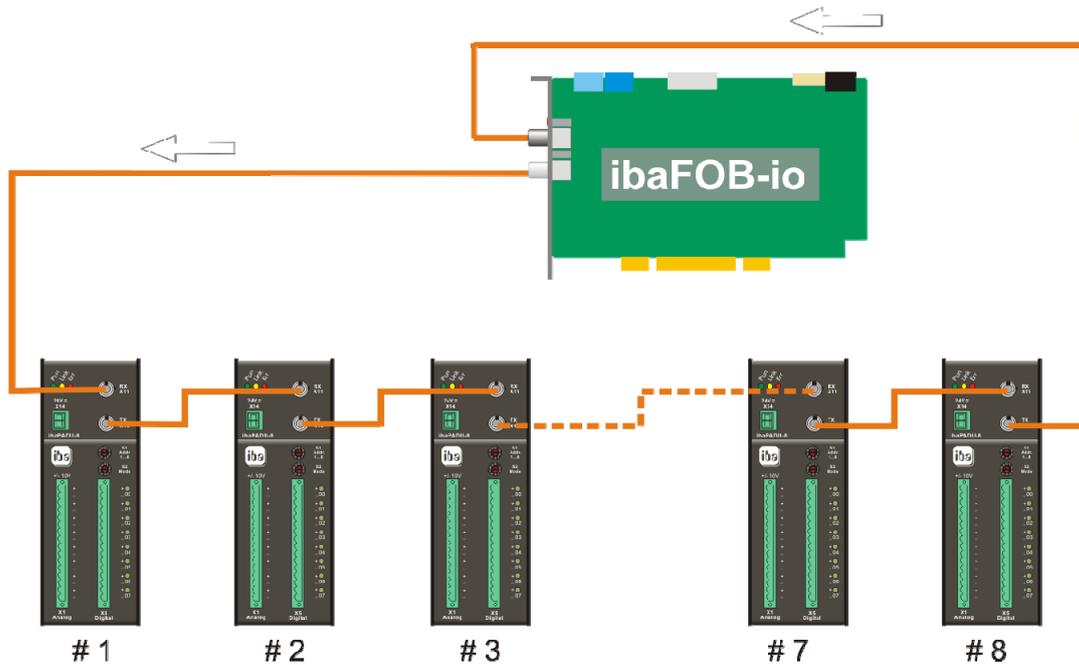
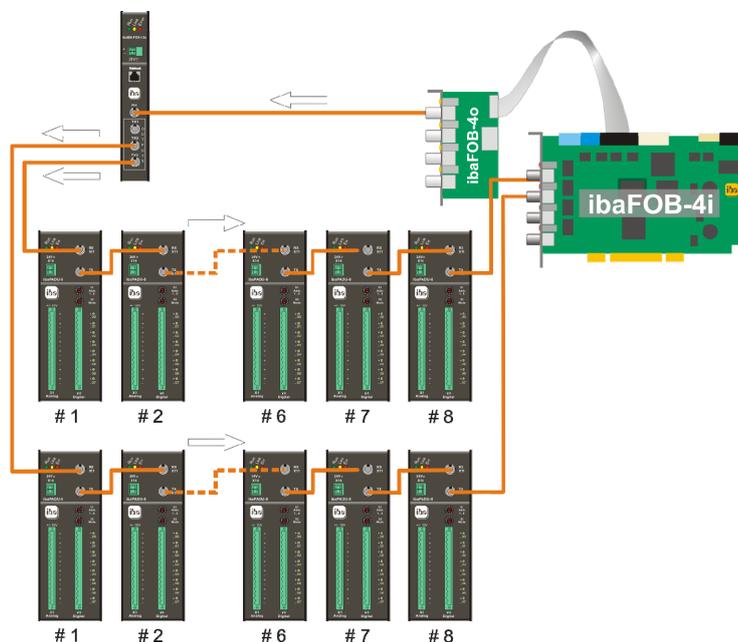


Figure 11: Ring topology for external synchronization of ibaPADU-8 devices

Multiple rings can be synchronized by means of an ibaBM-FOX-i-3o device. The first output of an ibaFOB card is multiplied and distributed to the first device of any chain to be synchronized. Set ibaLogic to ibaPADU-8 buffered mode for this operation.

Example 5: Externally synchronized operation of multiple ibaPADU-8 chains (ibaLogic buffered mode)



The first output of ibaFOB generates the clock for the FO-chains (e. g. 3.3 ms).

ibaBM-FOX-i-3o multiplies the fiber optic output and distributes it to all lines (chains).

The output of the last ibaPADU device of every chain is then connected to an ibaFOB input.

Accuracy of synchronization is better than 2 μ s between any device and any chain.

This mode is only available with ibaLogic and ibaPADU-8. Only ibaLogic is able to address the ibaFOB output module.

Special device settings for the devices are not necessary.

Figure 12: Externally synchronized operation of multiple ibaPADU-8 chains



Tip

All optical signals may be multiplied with an ibaBM-FOX-i-3o device at any position within the fiber optic line.

The signal multipliers ibaFOB-OF-Link can also be used to distribute signals simultaneously to different targets.

The sampling rate of ibaPADU-16/-32 devices (version A2 or higher) can be set to 800 Hz (1.25 ms) or 960 Hz (1.04 ms) by means of mode switch S0. This provides better acquisition quality in a 60 Hz mains environment. A ring topology is not required in this case; i. e. operation with a notebook computer and ibaCom-PCMCIA-F card is possible too.

9.2 Accessing data of ibaPADU devices by software

In the following, data access and configuration of ibaPADU connection is shown with ibaPDA as example.

The ibaPADU devices can be used together with the following software applications:

	Basic mode ²⁾	ibaPDA	ibaLogic	ibaScope
ibaPADU-8	F	✓	✓	✓
ibaPADU-8-HI	F	✓	✓	✓
ibaPADU-8-F1	F	✓	✓	✓
ibaPADU-8-I	F	✓	✓	✓
ibaPADU-16	F	✓	✓	✓
ibaPADU-32	F	✓	✓	✓
ibaPADU-32-R	F	✓	✓	✓
ibaPADU-8-ICP ¹⁾	M	✓	✓	✓
ibaPADU-8-M ¹⁾	M	✓	✓	✓
ibaPADU16-M ¹⁾	F / M	✓/✓	✓	✓
ibaDIG40 ¹⁾	F / M	✓/✓	✓	✓

¹⁾ There are separate manuals about these devices.

²⁾ F-Mode: up to 1 kHz, 3Mbit data telegram, M-Mode: up to 25 kHz, 5Mbit data telegram

Table 2: Accessing data of ibaPADU devices by software



Other documentation

For more information about the configuration of the devices in other software applications like ibaLogic or ibaScope, please refer to the corresponding software manuals.

9.2.1 Settings in ibaPDA-V6

9.2.1.1 I/O-Manager, hardware

The devices are connected via ibaFOB-io card, ibaFOB-4i card or ibaCom-PCMCIA-F to the PC. In the I/O-manager dialog, section “Hardware”, you should add an ibaPADU-8, -16 or -32 module to the corresponding FOB-F-PCI... data interface.

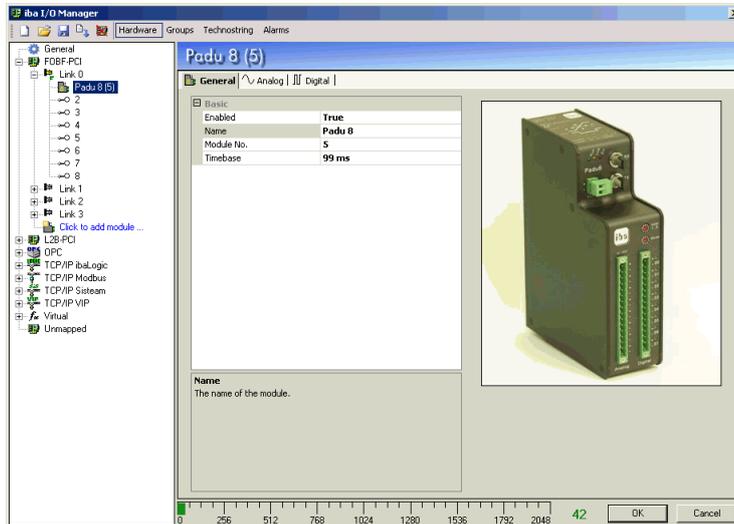
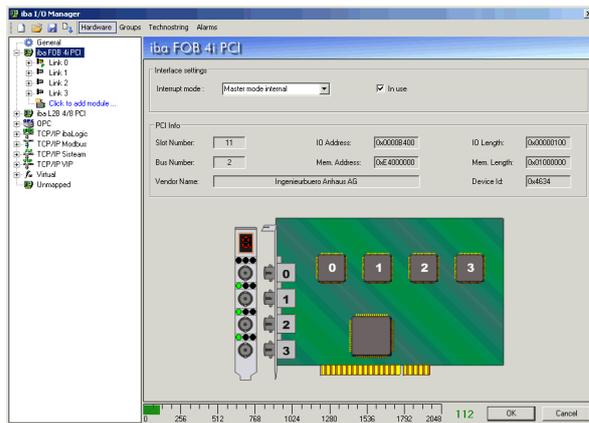


Figure 13: I/O-Manager, hardware

9.2.1.2 ibaPDA diagnostics, check of settings

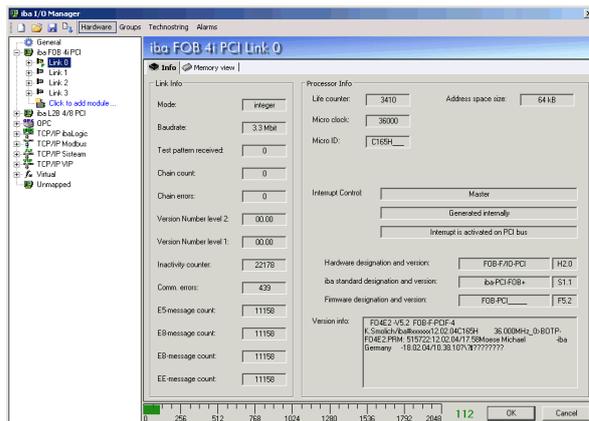
The correct function of the ibaFOB and/or ibaPADU may be checked already in the I/O-manager. The interface card is automatically detected by the ibaPDA system. By means of the automatic detection function (Autodetect) the system detects the peripheral devices connected to the system at this time.



If the branch with the interface card is marked in the tree on the left side, you can see on the right side the view of the board showing the (four) processors which are assigned to the individual FO links. When using an ibaFOB-io card only one processor will be displayed.

The graphic presentation is animated; i. e. the 7-segment display and the LEDs reflect the same status which can also be seen on the board itself.

Furthermore, the most important board addressing parameters and the vendor name are displayed too.



On the next tree level the view provides an overview about the communication parameters of all FO-links.

A permanent change in Baud rate indicates that no telegram is received. This is either due to a missing or faulty fiber optic cable connection or to the fact that the voltage supply is not available for the device connected to the board.



You get further information about the connected devices when you click on the device module in the tree.

In the right part of the dialog you will then get general information (see above) but also the signal tables for analog and digital signals beneath the corresponding tab. Moreover, the actual values are displayed in the tables.

Depending on the ibaPADU device the tables show 8, 16 or 32 lines respectively.

Figure 14: ibaPDA diagnostics, check of settings

10 Technical data

10.1 Main data or all Device types

Manufacturer	iba AG, Germany
Mechanical stability and test parameters (all 3 axes)	DIN IEC 68-2-6; 1 g rms 90 Min @ 0 Hz to 250 Hz/axis (all types) 2 g rms 90 Min @ 0 Hz to 250 Hz/axis (all ibaPADU-8 types), ibaPadu-32-R 2 g with additional rear holder only!
EMI test parameters	EN 55011 (Class A); EN 61000-4-6 (Class 3); EN 61000-4-3/ENV 50204 (Class 3)
Operating temperature	32 °F to 122 °F (0 °C to 50 °C)
Storage temperature	-13 °F to 158 °F (-25 °C to 70 °C)
transport temperature	-13 °F to 158 °F (-25 °C to 70 °C)
Cooling	Self cooling
Humidity Class	F, no condensation
Protection Class	IP20
Length of fiber optics between devices	Max. 6560 ft (2000 m) without repeater

Type	ibaPADU-8/ -8-F1 /-8-1	ibaPADU-8-HI/ -HI-F1/-HI-15/ -HI-24/-HI-25/ -HI-60	ibaPADU-8-I/ -8-I-50	ibaPADU-16/ -16-HI/-16-F1	ibaPADU-32/ -32-HI/-32-HI-60/ -32-R / -32-R-HI-60
Order no.:	10.120000 (-8) 10.120001 (-8-F1) 10.120005 (-8-1)	10.120010 (-HI) 10.120011 (-F1) 10.120013 (-15) 10.120012 (-24) 10.120014 (-25) 10.120015 (-60)	10.120020 (-8-I) 10.120021 (-50)	10.121200 (-16) 10.121201 (-HI) 10.121202 (-F1)	10.122200 (-32) 10.122001 (-HI) 10.122002 (-HI-60) 10.122000 (-R) 10.122002 (-R-HI-60)

10.2 Analog inputs

Number	8	8	8	16	32
Resolution	14 bit				
Dynamics	> 80 dB				
Frequency response	0 Hz to 500 Hz				
	Low pass filter, 250 Hz/12 dB (-8-F1/-8-HI-F1)			Low pass filter, 250 Hz /12 dB (-16-F1)	
Input level / type	± 10 V (-8/-8-F1) ± 1 V (-8-1)	± 10 V (-HI/-HI-F1) ± 15 V (-HI-15) ± 24 V (-HI-24) ± 25 V (-HI-25) ± 60 V (-HI-60)	± 20 mA (-I) ± 50 mA (-I-50)	± 10 V	± 10 V (-32, -32-HI/-32-R) ± 60 V (-32-HI-60/ -32-R-HI-60)
Input impedance	$R_{on} = 100$ k Ω $R_{off} = 50$ k Ω	$R_{on} = 1$ M Ω $R_{off} = 500$ k Ω	$R = 50$ Ω	$R_{on} = 100$ k Ω $R_{off} = 50$ k Ω (-16/-16-F1) $R_{on} = 1$ M Ω $R_{off} = 500$ k Ω (-16-HI)	$R_{on} = 100$ k Ω $R_{off} = 50$ k Ω (-32/-32-R) $R_{on} = 1$ M Ω $R_{off} = 500$ k Ω (-32-HI/-32-HI-60 /- 32-R-HI-60)
Sampling rate	1 kHz			1 kHz	
Galvanic isolation	Channel-Channel 1.5 kV Channel-Digital ground 1.5 kV				

Type	ibaPADU-8/ -8-F1 /-8-1	ibaPADU-8-HI/ -HI-F1/-HI-15/ -HI-24/-HI-25/ -HI-60	ibaPADU-8-I/ -8-I-50	ibaPADU-16/ -16-HI/-16-F1	ibaPADU-32/ -32-HI/-32-HI-60/ -32-R / -32-R-HI-60
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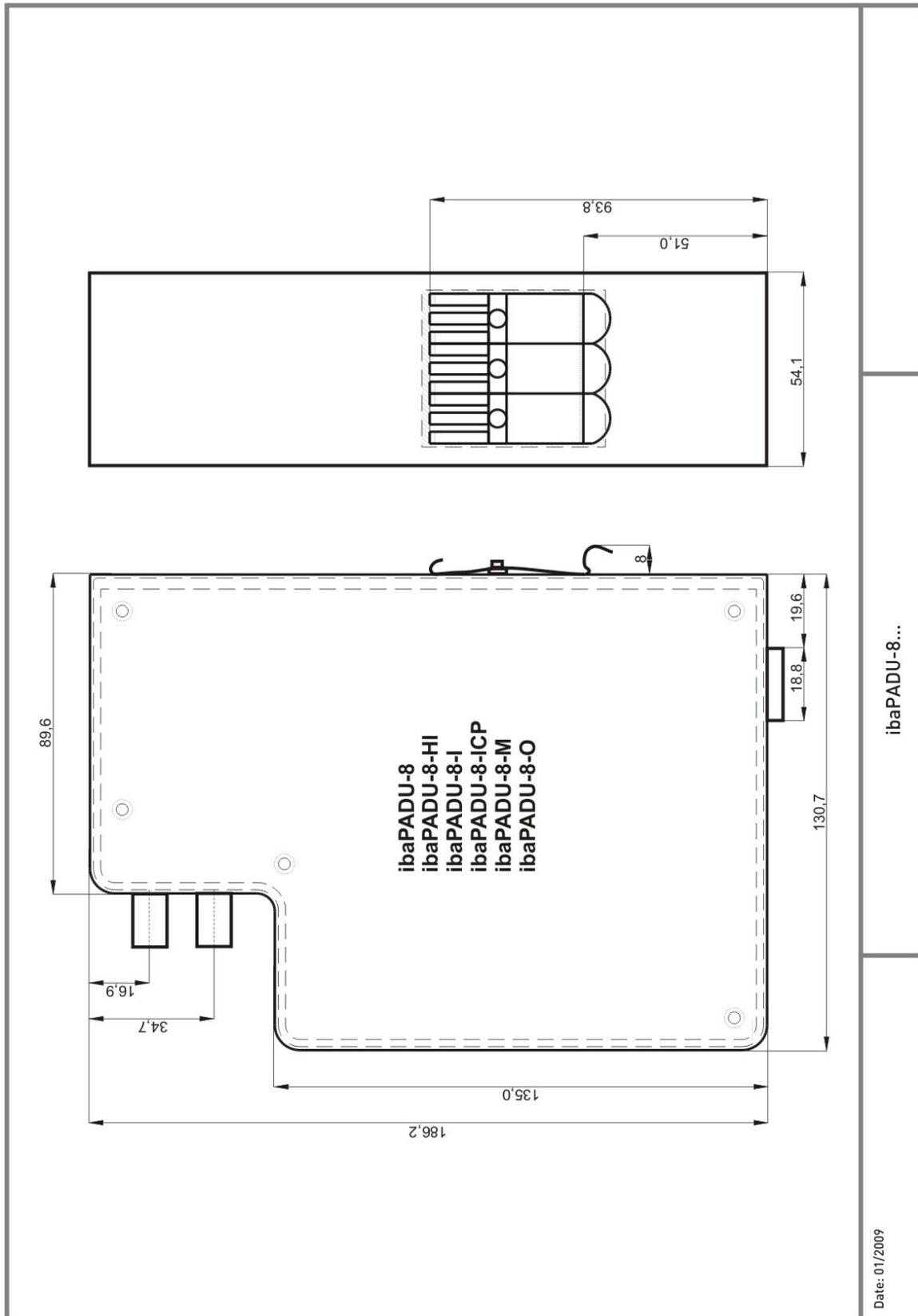
10.3 Binary inputs

Number	8	8	8	16	32
Input level	$U_N \pm 24 \text{ V}$; $U_{\max} \pm 60 \text{ V}$; $I_{\max} 1 \text{ mA}$ Switching level: log 0; < $\pm 9 \text{ V}$; log 1; > $\pm 10 \text{ V}$;				
Sampling	Simultaneously sampled with analog inputs				
Galvanic isolation	Channel-Channel 1.5 kV Channel-Digital ground 1.5 kV				

10.4 Device data

Montage	DIN rail snap in mount		Table device	19" rack mount	
Power supply	DC 24 V $\pm 20 \%$ not stabilized		AC 115 V/250 V, 50/60 Hz		
Power/Current consumption (no load)	Typ. 300 mA, max. 400 mA $I_{\text{OFF} \rightarrow \text{ON}}$ approx. 1A		Approx. 16 W	Approx. 20 W	
FO-cable	62.5/125 μm				
Coupling	ST Lean				
Dimension (w x h x d)	2.1 in x 7.6 in x 6.1 in 54 mm x 194 mm x 155 mm		15.2 x 2.2 x 10.2 385 x 55 x 260	15.2 x 3.7 x 10.2 385 x 95 x 260 (-32/-32-HI-60) 19.0 x 3.5 x 10.1 484 x 89 x 256 (-32-R...)	
Weight (incl. box and documentation)	2.31 lb 1050 g	2.31 lb 1050 g	2.31 lb 1050 g	7.39 lb 3350 g	10.36 lb 4700 g (-32) 15.21 lb 6900 g (-32-R)

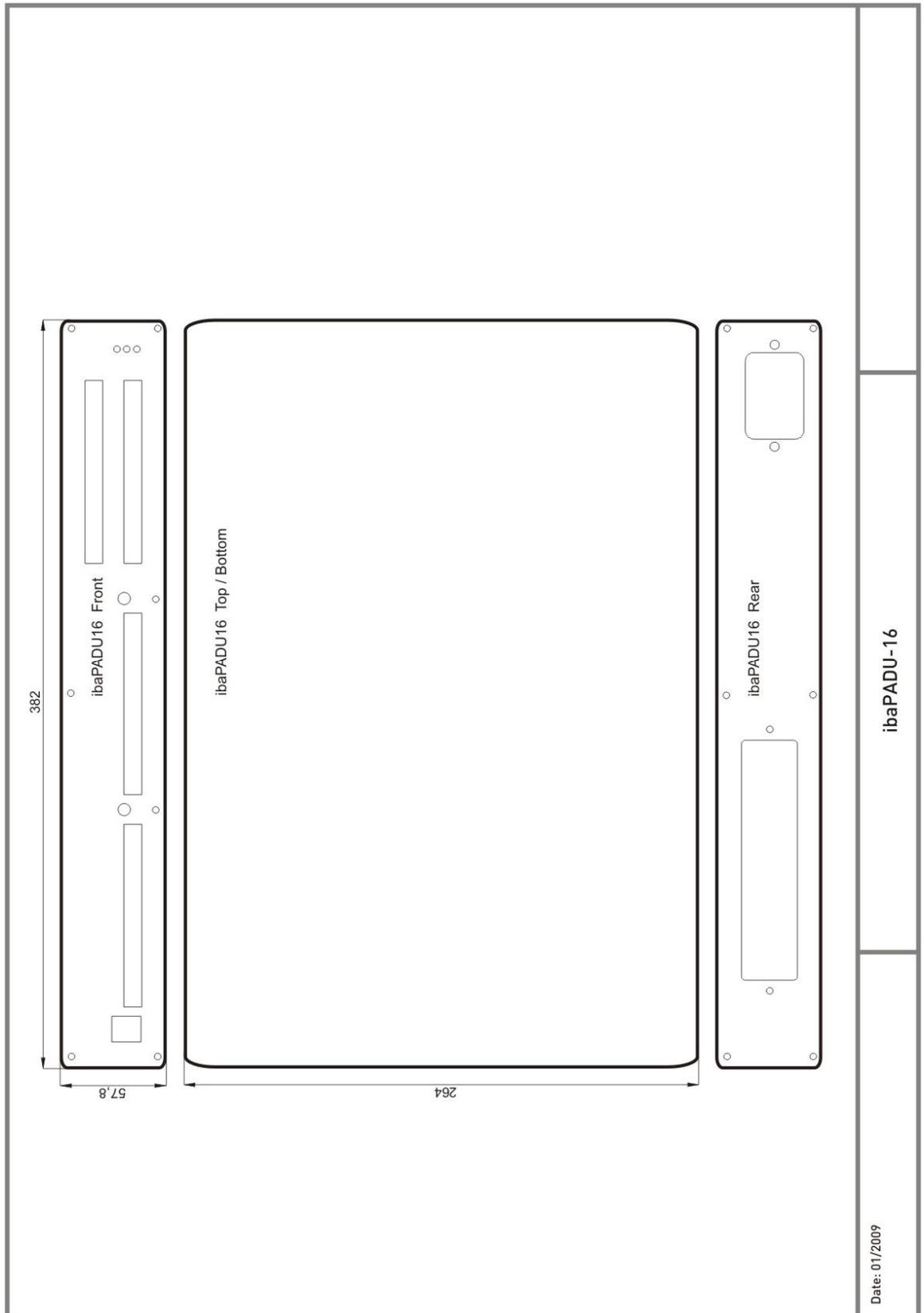
10.5 Dimensions drawing ibaPADU-8



(Dimensions given in mm)

Figure 15: Dimensions drawing ibaPADU-8

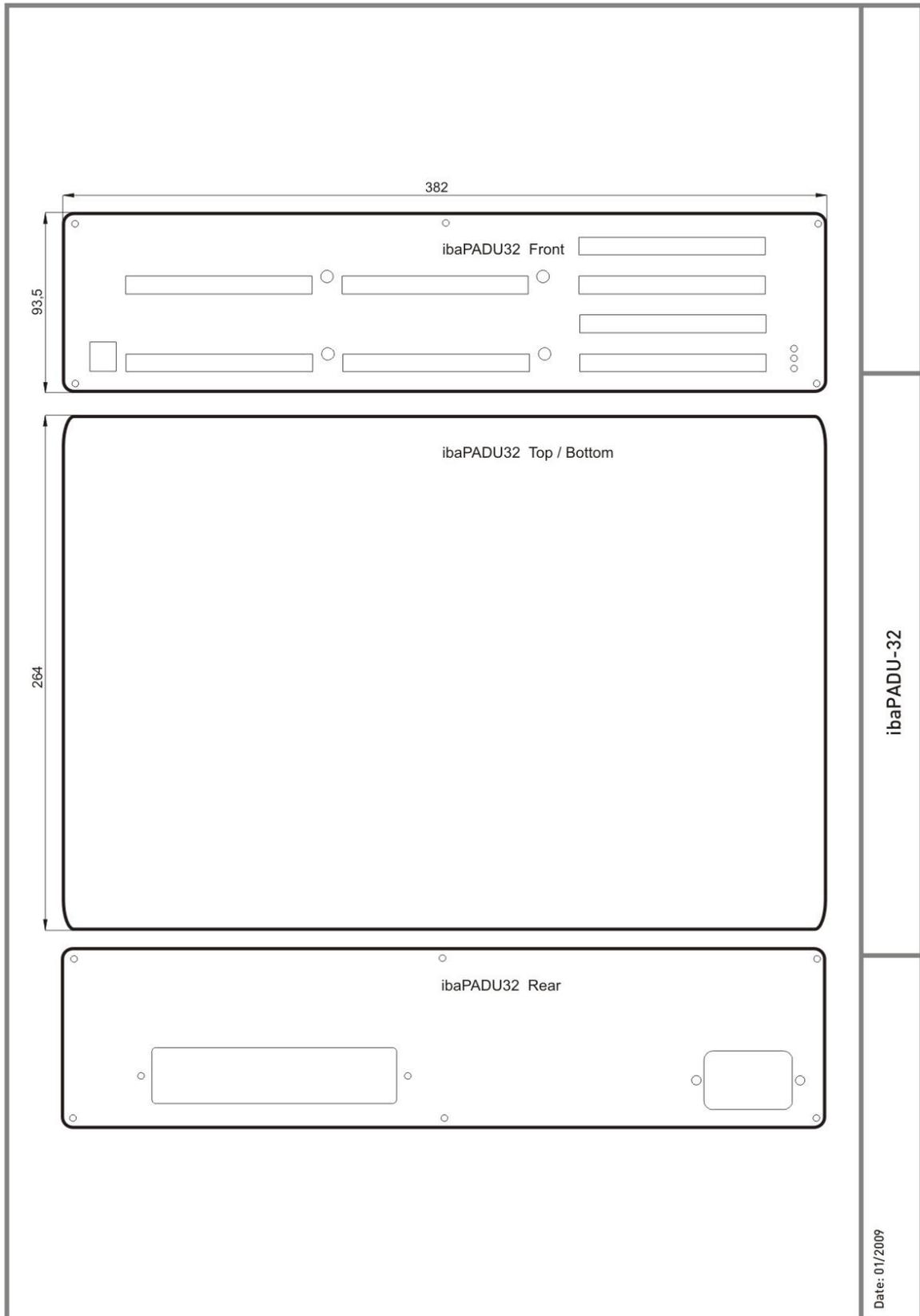
10.6 Dimensions drawing ibaPADU-16



(Dimensions given in mm)

Figure 16: Dimensions drawing ibaPADU-16

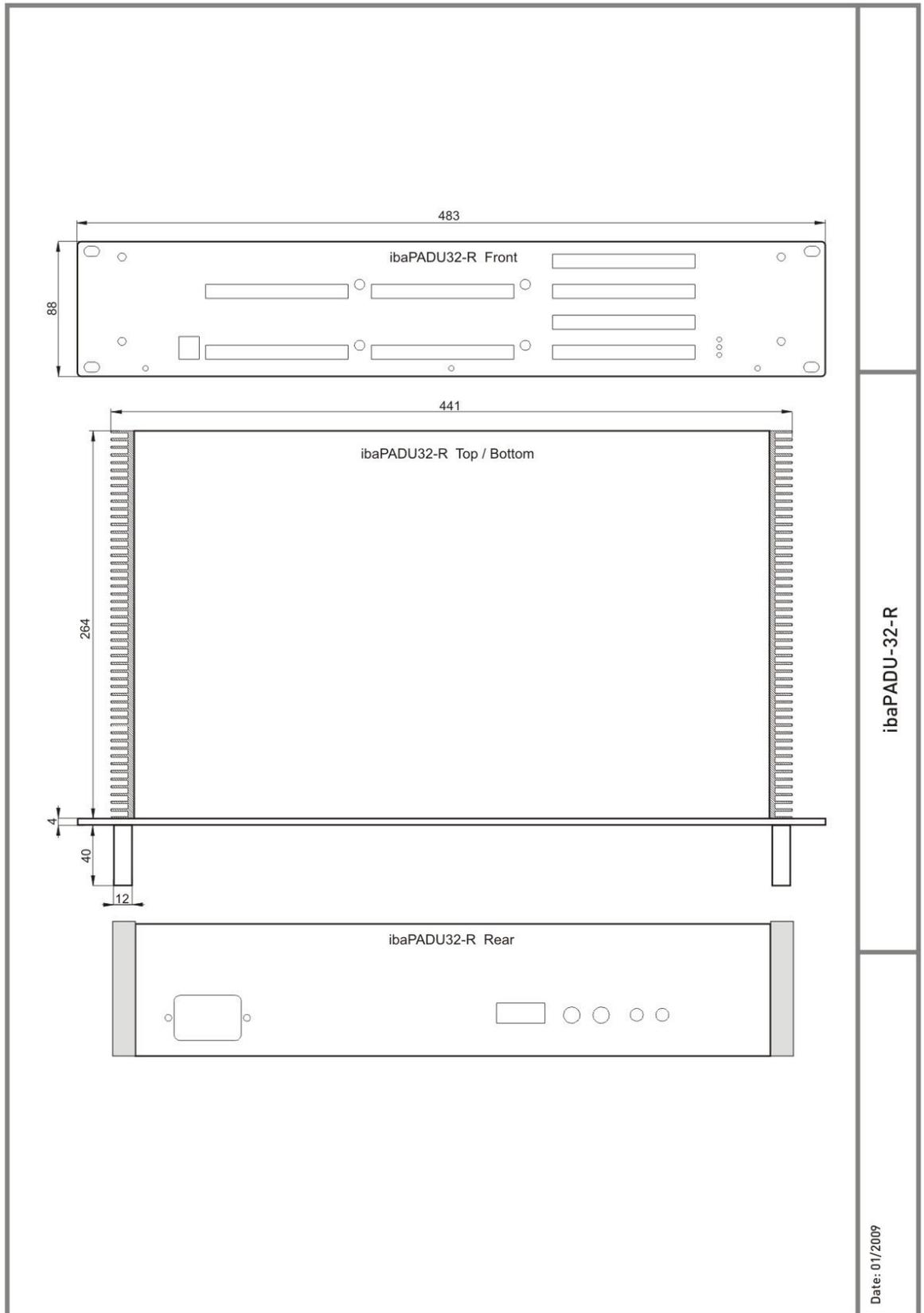
10.7 Dimensions drawing ibaPADU-32



(Dimensions given in mm)

Figure 17: Dimensions drawing ibaPADU-32

10.8 Dimensions drawing ibaPADU-32-R



(Dimensions given in mm)

Figure 18: Dimensions drawing ibaPADU-32-R

11 Support and Contact

Support

Phone: +49 911 97282-14

Fax: +49 911 97282-33

E-Mail: support@iba-ag.com



Note

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

Contact

Headquarters

iba AG

Koenigswarterstr. 44

90762 Fuerth

Germany

Phone: +49 911 97282-0

Fax: +49 911 97282-33

E-Mail: iba@iba-ag.com

Contact: Mr. Harald Opel

Regional and Worldwide

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

www.iba-ag.com.