



# ibaMS16xD0-2A

Output module for digital signals

Manual

Issue 2.0

Measurement Systems for Industry and Energy  
[www.iba-ag.com](http://www.iba-ag.com)

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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.



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

Issue	Date	Revision	Chapter	Author	Version HW / FW
2.0	08-2023	Scope of delivery, ibaPDA GUI			

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# 1 About this manual

In this manual, you learn a lot about the design of the ibaMS16xDO-2A module and how to use and operate it. You can find a general description of the systems of the iba-modular system and further information about the design of the central units and how to use and operate them in separate manuals.



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## Note

The documentation for the iba-modular system is part of the data medium “iba Software & Manuals”. The documentation is also available at [www.iba-ag.com](http://www.iba-ag.com) in the download area.

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

### ❑ Central units

The manuals of the central units (e.g. ibaPADU-S-IT-2x16 or ibaPADU-S-CM) contain the following information:

- Scope of delivery
- System requirements
- Description of the device
- Mounting/Demounting
- Start-up
- Configuration
- Technical data
- Accessories

### ❑ Modules

The manuals for the single modules contain specific information about the module. There are the following information classes:

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

## 1.1 Target group

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

The ibaMS16xDO-2A module is part of the iba-modular system. The modular concept is based on a backplane with a backplane bus. On this backplane bus, you can plug a central unit and up to 4 input/output modules. The power supply of the module is provided by the backplane bus.

The ibaMS16xDO-2A module offers 16 digital outputs that are electrically isolated. By means of an external power supply, the outputs can be switched on continuous operation.

### In brief

- ☐ Additional module for the iba-modular system
- ☐ Voltage supply 24 V DC over backplane bus
- ☐ Switching voltages 0 V up to 55 V
- ☐ Switching currents up to 2 A
- ☐ Short-switch proof
- ☐ Automatic disconnection at 2.3 A continuous current
- ☐ Rugged design, easy mounting

The device driver and the firmware are stored on the module. When switching on and booting the central unit, the module is identified automatically and the drivers are loaded.

### Monitoring functions

The device offers several self-protection and monitoring functions. The device identifies and indicates 4 errors:

- ☐ Shorted switch
- ☐ Broken line
- ☐ Over temperature
- ☐ Overcurrent and shorted load

## 3 Scope of delivery

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

The scope of delivery comprises:

- ☐ ibaMS16xDO-2A device
- ☐ 2 x 16-pin multi-pin connector
- ☐ Data medium "iba Software & Manuals" (only for single delivery)



## 4 Safety instructions

### 4.1 Proper use

This device is used for the output of digital signals. It is only allowed to use the device in combination with a central unit (e.g. ibaPADU-S-IT-2x16 or ibaPADU-S-CM).

The device is only to be used as shown in the „Technical Data“.

### 4.2 Special safety instructions

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#### **DANGER**

Do not connect the device to branch circuits! The device is not made for this type of operation.

Do only operate the output channels with SELV (Safety Extra Low Voltage)!

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#### **DANGER**

##### **Electric shock!**

The device is only designed for electrical measuring voltages as shown in the „Technical Data“!

Do not use any damaged measuring cables!

You must not attach or detach measuring cables to the device that is under voltage!

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#### **WARNING**

Modules must NOT be attached or detached to/from the rack under voltage!

Switch off the central unit or disconnect power supply before attaching/detaching the modules.

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#### **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.

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#### **Important note**

Do not open the device! When opening the device, you will lose the warranty!

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#### **Note**

Please only clean the device on the outside with a dry or a lightly wet and statically discharged cloth.

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## 5 System requirements

### 5.1 Hardware

- ☐ Central unit: ibaPADU-S-IT-2x16 or ibaPADU-S-CM (version 02.10.001 or later)
- ☐ Backplane unit, e.g. ibaPADU-B4S

### 5.2 Software

- ☐ ibaPDA version 6.34.0 or later
- ☐ ibaLogic-V5 version 5.0.2 or later



#### Note

The use of ibaLogic-V5 requires the central unit ibaPADU-S-IT-2x16. If the module is used with the predecessor ibaPADU-S-IT-16, only ibaLogic-V4 can be used.

## 6 Mounting, Connecting, Dismounting

### CAUTION

Works on the device must NOT be done when it is under voltage! Always disconnect the central unit from the power supply!



#### Note

Mount one or more modules on the right next to the central unit (slots X2 to X5 can be freely selected).

### 6.1 Mounting

1. Disconnect the central unit from the power supply.
2. Remove the cover from the backplane bus to which the module is to be attached.
3. Attach the module to the backplane bus and press it firmly against the backplane.
4. Secure the device with the fixing screws.
5. Connect the grounding screw with the protective ground/ grounding shield.

### CAUTION

Connect the grounding screw on the bottom of the housing with the protective ground/ grounding shield!



#### Important note

Always screw tight the device and the modules. Otherwise, plugging or unplugging the connectors for the inputs/outputs can cause damage.

## 6.2 Connecting



### Note

The backplane unit and the device must be connected to a protective conductor.

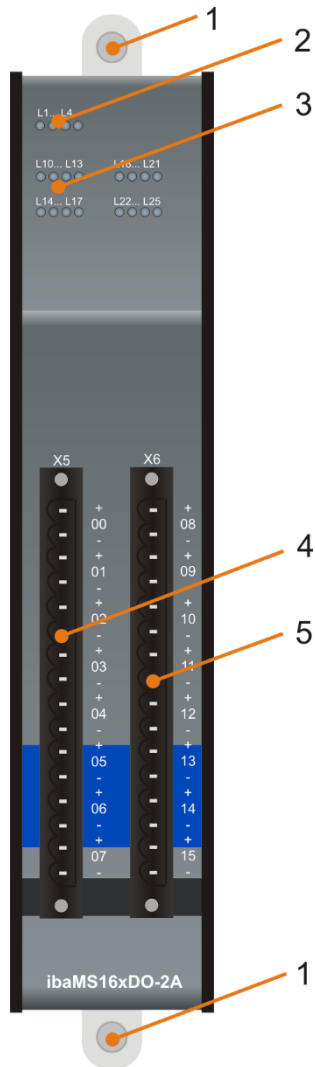
1. Connect all cables.
2. If all required cables are connected, connect the central unit to the power supply.
3. Switch on the voltage supply of the central unit.

## 6.3 Dismounting

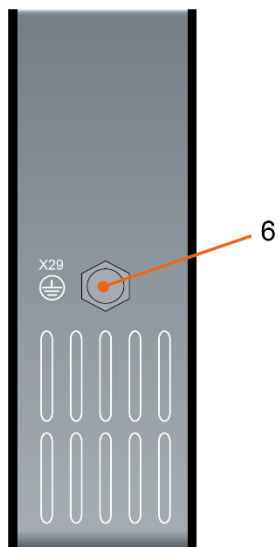
1. Disconnect the central unit from the power supply.
2. Remove all cables.
3. Remove the both fixing screws on the upper and the lower side of the device.
4. Pull the device straight from the backplane.
5. Put a cover on the backplane bus.

## 7 Device description

### 7.1 Device views



- 1 Fixing screws
- 2 Operating status indicators L1 ... L4
- 3 Status LEDs L10 ... L25 for the digital outputs 00 ... 15
- 4 Connector X5 for digital outputs 00 ... 07
- 5 Connector X6 for digital outputs 08 ... 15



- 6 Grounding screw X29

## 7.2 Indicating elements

On the device, colored LEDs show the status of the device and the digital outputs.

### 7.2.1 Operating status

LED	Status	Description
L1: green	Flashing / On Off	Device is working Device is not working (switched off)
L2: yellow	On	Access to the backplane bus
L3: white	-	-
L4: red	Off On	Normal status, no faults Disorder/Fault



#### Important note

When LED L4 indicates a failure, please contact the iba support.

### 7.2.2 Status of digital outputs

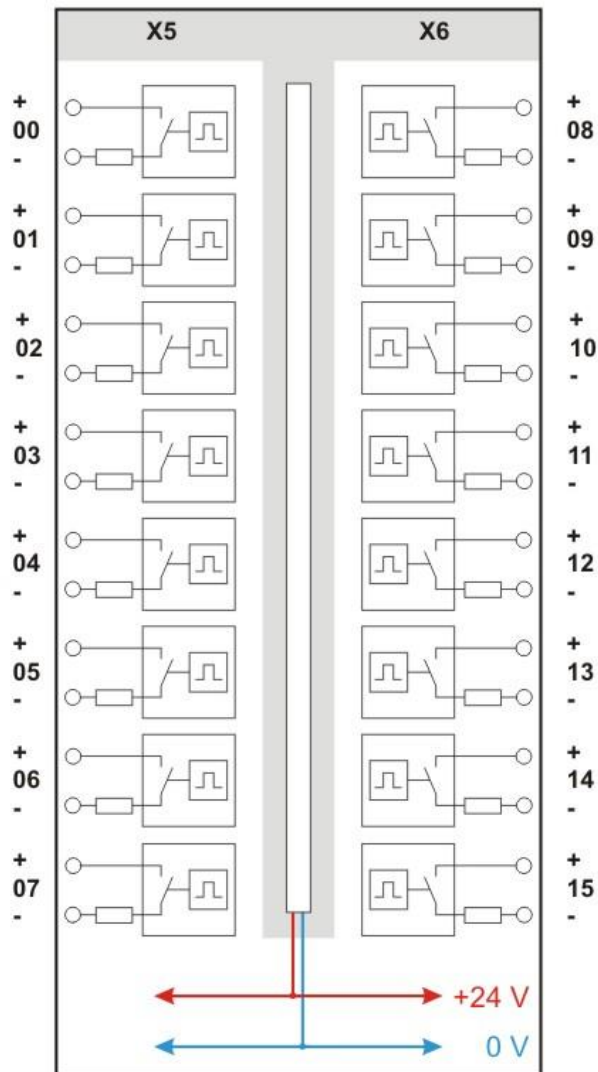
LED*	Status	Description
L10...L25	Off	Channel is open
	Green	Channel is closed
	Red	Failure (Channel is switched off automatically)

\* If an output is deactivated in ibaPDA, the corresponding LED remains off.

## 7.3 Digital outputs

### 7.3.1 Connection diagram / Pin assignment

16 output signals (0...15), each bipolar and electrically isolated, can be connected. Each channel is connected by means of two-wire-connection.



**Pin assignment**

X5 Pin	Connection	LED	X6 Pin	Connection	LED
1	Digital output 00 +	L10	1	Digital output 08 +	L18
2	Digital output 00 –		2	Digital output 08 –	
3	Digital output 01 +	L11	3	Digital output 09 +	L19
4	Digital output 01 –		4	Digital output 09 –	
5	Digital output 02 +	L12	5	Digital output 10 +	L20
6	Digital output 02 –		6	Digital output 10 –	
7	Digital output 03 +	L13	7	Digital output 11 +	L21
8	Digital output 03 –		8	Digital output 11 –	
9	Digital output 04 +	L14	9	Digital output 12 +	L22
10	Digital output 04 –		10	Digital output 12 –	
11	Digital output 05 +	L15	11	Digital output 13 +	L23
12	Digital output 05 –		12	Digital output 13 –	
13	Digital output 06 +	L16	13	Digital output 14 +	L24
14	Digital output 06 –		14	Digital output 14 –	
15	Digital output 07 +	L17	15	Digital output 15 +	L25
16	Digital output 07 –		16	Digital output 15 –	

**7.3.2 Circuit design****Important note**

Please consider for all applications, that the load switch can only work with the correct polarity. If polarity is wrong, the load switch is permanent conductive and all the self-protective functions that can only be effective when the load switch is switched off, become ineffective.

**Note**

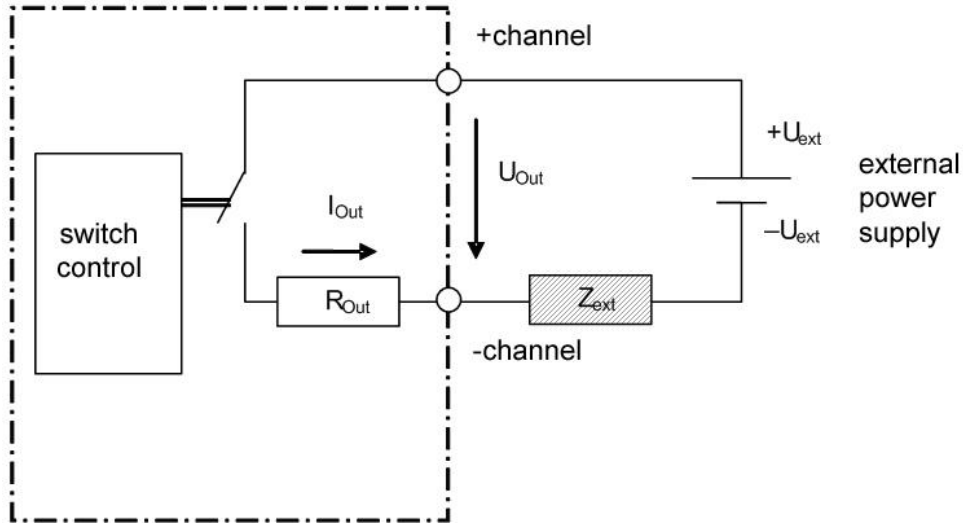
Please do not connect 2 channels in series in contrary direction for having a non-polarized (AC-) switch.

Each individual channel can be used as kind of a relay. For each channel there are only the output channels +channel and –channel (2-conductor technology), they can have any potential difference to each other channel, to the grounding or to the current supply. The channels can be operated as equivalent of an N-switch or between 2 load resistances (in any combination). You can also connect several channels in series or in parallel, e.g. for switching high load currents or realizing logical circuits.

### 7.3.3 Output channel as P switch

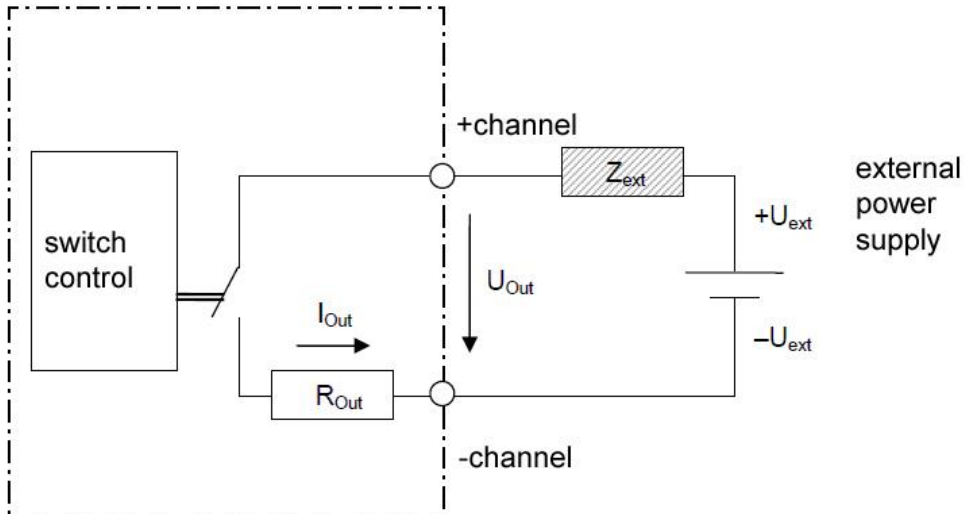
The circuit is designed as P switch (positive voltage).

The connected load  $Z_{\text{ext}}$  is connected to  $-U_{\text{ext}}$  and switched on  $+U_{\text{ext}}$  by means of the controllable switch (load switch) in the output channel. In the figure below, you can see this typical circuit.



### 7.3.4 Output channel as N switch

The circuit can also be realized as N switch (negative voltage).

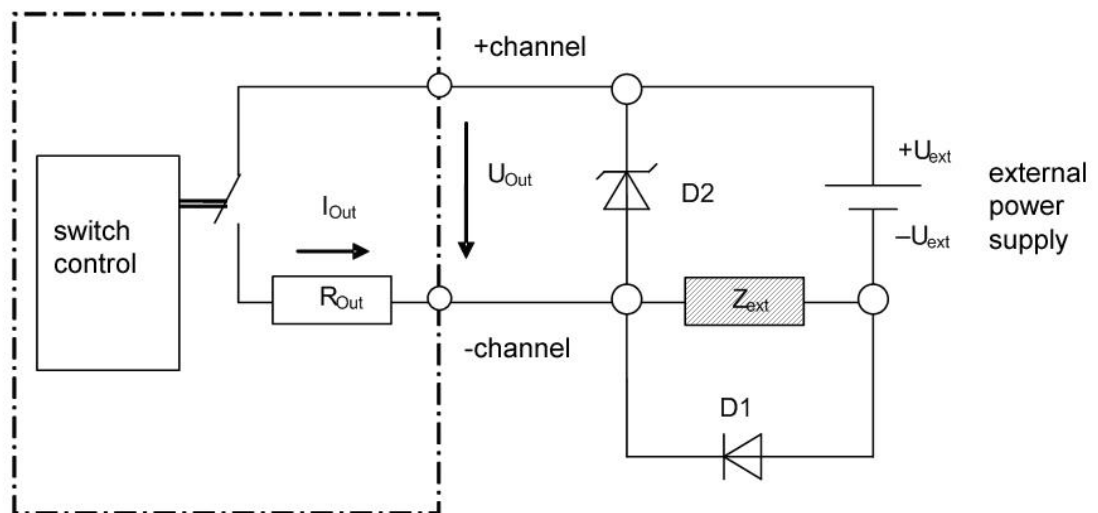


Compared to the use as positive switch, no particularities have to be observed in operation.

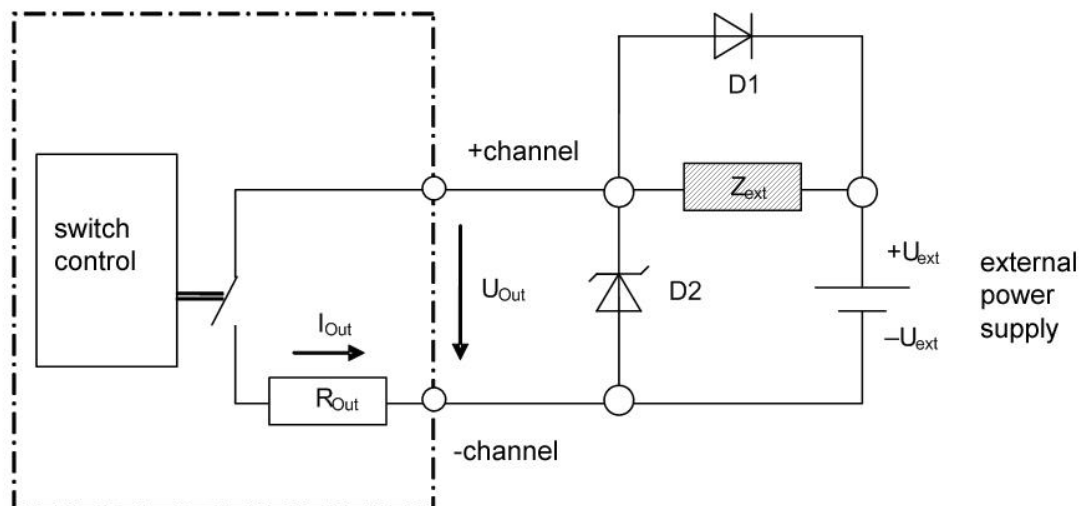


### 7.3.5 Output channel with external diodes

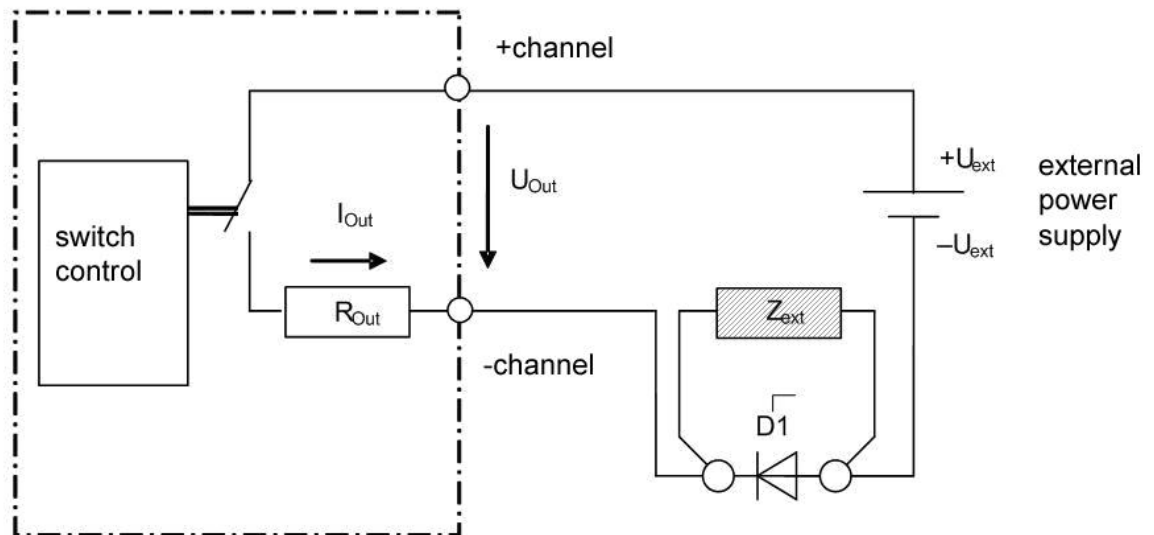
For load circuits with P switch:



For load circuits with N switch:



**When connecting a freewheeling diode:**



## 7.4 Connectors

### 7.4.1 Grounding screw X29

Proper connection of cable shielding to the device should be ensured. The shield connector (M6 screw) found on the bottom of the device should be connected with any total shield that serves for all sensor cables. Use a M6 cable lug for the connection.



#### **Important note!**

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

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

## 8 Protective and monitoring functions

### 8.1 Physical protective functions of the hardware



#### Important note

The protective functions are only guaranteed when the polarity is correct.

The output channels have several self-protective functions for preventing damages to the device even when there are faults in the load circuit.

#### 8.1.1 Shorted load protection

The load switch limits the current and switches off when the load impedance breaks down to up to  $0\ \Omega$  in the switched on status and when the device is switched on at such a low-resistant load. This way, the load switch is not damaged. The shorted load protection is only guaranteed when polarity is correct.



#### Note

The scenario described above is named „shorted load“ in this manual, for a better differentiation from the internal short-switching of the load switch (shorted switch).

#### 8.1.2 Over temperature protection

Each channel switches off individually in case the load-switch IC exceeds a certain maximum junction temperature ( $T_{IS}$ ). This can be caused by:

- ☐ Continuous currents that are too high
- ☐ Periodical switch loads that are too high (load voltages and/or switching frequencies)
- ☐ Ambient temperature that is too high
- ☐ Shorted load

#### 8.1.3 Overcurrent protection

Each channel switches off individually if the current in the load circuit exceeds a value that is too high for guaranteeing the service life of the fuse. This can be triggered by:

- ☐ Continuous currents that are too high
- ☐ Inrush currents that are too intensive
- ☐ Shorted load

#### 8.1.4 Toleration of capacitive and PTC loads

The channels can process short inrush currents that are clearly above the permissible continuous current. This is why a complete self-protection is guaranteed for these loads.

### 8.1.5 Toleration of inductive loads



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**Note**

For inductive loads, the self-protection is only for preventing the direct destruction of the load switch by rebound voltages that are too high. The rebound energy heats up the load switch. There is no over temperature protection for this problem. This is why circuiting with inductive loads needs to be planned carefully, considering all failure scenarios. Otherwise, it can result in a spontaneous destruction of the load switch.

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When switching off the inductances, the rebound voltage is limited by the device itself. Hence, a damage of the load switch is prevented up to a certain load.

### 8.1.6 Overvoltage protection

Temporary (transient) overvoltages of the channel compared to all other potentials are buffered up to 2.5 kV by isolation.

### 8.1.7 Reverse current and polarity reversal protection

If a load generates itself a positive voltage above  $U_{\text{ext}}$ , or is connected to a higher potential than is applied to the +channel, the load switch will be operated inverse (current flow in reverse direction compared to normal operation). In inverse operation, the switch cannot be switched off and its internal resistance is higher than in normal operation.

### 8.1.8 Fire protection

A fuse guarantees the safety of the product, in case the channels are overloaded by exceeding the limit values that are tolerable for the self protective functions, by inadmissible operating conditions or by a defect on the output channel.



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**Note**

The fuse is not designed to protect the load switch from damages.

The fuse cannot be replaced by the user.

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## 8.2 Monitoring functions / Error states

Monitoring functions are used to identify error states of the channels and the device. The following error types are monitored on each channel and indicated by a status signal in ibaLogic.

- ☐ Shorted switch
- ☐ Broken line
- ☐ Over temperature
- ☐ Overcurrent and shorted load



### Important note

The errors "Overcurrent" and "Over temperature" always lead to a disconnection of the respective channel triggered by the hardware. The error must be reset it by („ResetError\_Ch[00..15]).

The errors "Broken line" and "Shorted switch" do not automatically disconnect the channel. A disconnection in case of an error can be configured in ibaPDA.

### 8.2.1 Shorted switch

In case a current flows although the channel is not connected logically, this error is indicated.

Status signals	Possible cause
DO_Err_CurrentWhileOff_Ch[00...15]	In this case, you can suppose a hardware problem of the channel.

### 8.2.2 Broken line

As soon as a current is higher than 100 mA, it is identified. If the channel is connected on the software side, but no current is flowing or a current lower than 100 mA, the error "Broken line" is indicated.

Status signals	Possible cause
DO_Err_NoCurrentWhileOn_Ch[00...15]	Broken cable, Load current < 100 mA

### 8.2.3 Over temperature

The IC load switch has reached a maximum junction temperature ( $T_{JS}$ ) of 150 °C. If the temperature declines, the error is deleted at 135 °C.

Status signals
DO_Err_OverTemp_Ch[00...15]

### 8.2.4 Overcurrent

The current of the channel load circuit has exceeded half of the current that is admissible for the protective function of the fuse. If a current is flowing that is too high, the IC switch switches off internally. The magnitude of the current depends on the number of impulses and the energy over time.

Protection type	Description
Continuous over-current protection	Channel inactive at $I_{out}$ min. >2.0 / typ. 2.3 / max. <2.7A
Impulse overcurrent protection	Channel inactive at $I_{out} \cdot t_{OC}$ : z.B: $I_{out} \cdot t_{OC} \rightarrow 3A \times 80ms / 5A \times 33ms / 10A \times 15ms / 20A \times 7ms / 35A \times 4ms$ (tolerance $\pm 20\%$ ) $t_{OC}$ =response time of the overcurrent protection

#### Status signals

DO\_Err\_OverCurrent\_Ch[00...15]

## 9 Start-up / Update



### Important note

Installing an update can take some minutes. Do not switch off the device when an update is running. This might damage the device.

### 9.1 Auto-Update

After having mounted the module and applied the voltage to the central unit, the central unit detects the module and checks the software version.

The central unit has a so-called „Overall Release Version“. This version contains the current software version of the central unit as well as the software versions of the modules. You can find the “overall release version” on the website of the central unit on the „firmware“ tab.

When the software version of a module does not match the „Overall Release Version“ of the central unit, the central unit does an automatic up- or downgrade of the module. Thereafter, the module is ready to be used.



### Important note

The “overall release version” contains all modules developed up to the date of release of this firmware and the corresponding software versions. If a module cannot be detected, yet (i.e. it is more recent than the firmware version of the CPU), this module is ignored and outlined in red on the web interface.

In this case, a new update file has to be installed for the “overall release version“. If you want to get the current update file, please contact the iba support.

### 9.2 Overall Release Version

The „Overall Release Version“ provides information about the software version of the entire iba-modular system. You can find it on the website of the central unit or in the I/O Manager of ibaPDA.



### Important note

If you require support, please specify the „Overall Release Version“.

## 9.3 Update

An update can be installed in two different ways.

- ☐ Web interface (only with ibaPADU-S-IT-2x16)
- ☐ ibaPDA

No matter which of the both ways you choose to install an update: the progress of the update is shown by the LEDs L5 ... L8. Beginning with L5, the LEDs are flashing one after another, at first in orange and then in green and at a slower rate. When the update is finished, the device will be rebooted.



### Important note

When updating the iba-modular system, a possible autostart of the ibaLogic PMAC is deactivated and the existing ibaLogic-V5 application deleted. Furthermore, an update of the ibaLogic-V5 software (ibaLogic Clients) might be necessary.

### 9.3.1 Update via web interface



### Important note

The web interface is available only with the central unit ibaPADU-S-IT-2x16.

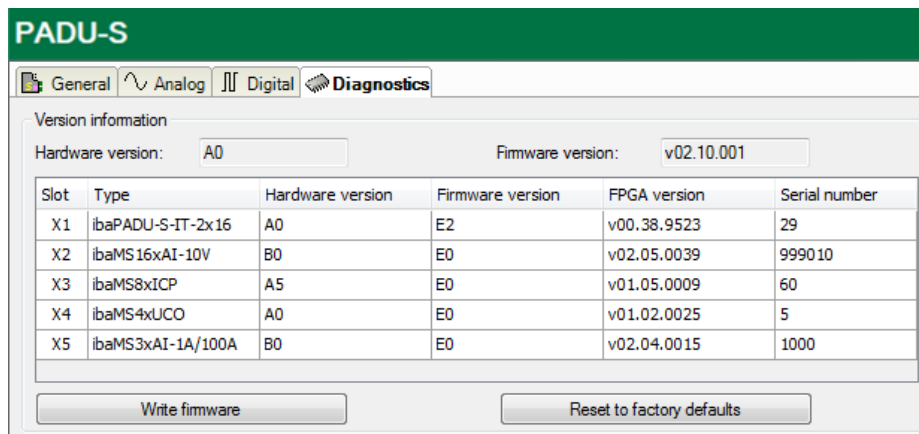
- ☐ Start the website of the iba-modular system in your browser and select the central unit.
- ☐ On the “update“ tab, click on the <Browse...> button and choose the <padusit2x16\_v[xx.yy.zzz].iba> update file.
- ☐ By clicking on <Start Update>, you start the update.

#### Module 0 : ibaPADU-S-IT-2x16

### 9.3.2 Update via ibaPDA

- ☐ Open the ibaPDA I/O Manager and choose your iba-modular system in the tree structure.
- ☐ On the “Diagnostics“ tab, click on the <Write firmware> button and choose the „padusit2x16\_v[xx.yy.zzz].iba“ or „paduscm\_v[xx.yy.zzz].iba“ update file.
- ☐ You start the update by clicking on <OK>.





## 9.4 Module Information / Diagnostics

### 9.4.1 Diagnostics in ibaPDA

Important information about the iba-modular system, like hardware version, firmware version, FPGA version and serial number is displayed in the “Diagnostics” tab. Open the ibaPDA I/O Manager and choose your iba-modular system in the tree structure (see also the figure above)

### 9.4.2 Web interface

On the module website, general information about the module is only displayed. You cannot change the values.

### 9.4.2.1 „info“ tab

The „info“ tab displays general information and technical specifications of the I/O module.

info		notes
Serial number	000019	
Hardware version	A1	
Firmware version	E1	
Process-IO		
digital output channels	16	
maximum load	2	A
switching voltage	0...55	V DC

### 9.4.2.2 „notes“ tab

On the „notes“ tab, you can enter notes, e.g. for notes on wiring or the recording of changes.

By clicking on <save notes>, the notes are permanently stored on the device.

info

notes

This buffer is for your personal notes.

You can use it for linkage data, for example:

"Connector xyz must be connected to jack X5"

Its contents are stored in permanent storage on the cpu unit.

save notes

## 10 iba applications

### 10.1 Configuration in ibaPDA

You can configure the signals with the I/O Manager of ibaPDA. If the iba-modular system is already installed and you want to add a new module, click on „Read configuration from device“. The module will be detected automatically.

[Read configuration from device](#)



#### Note

The automatic detection requires a bidirectional FO connection from the ibaPDA computer to the central unit.

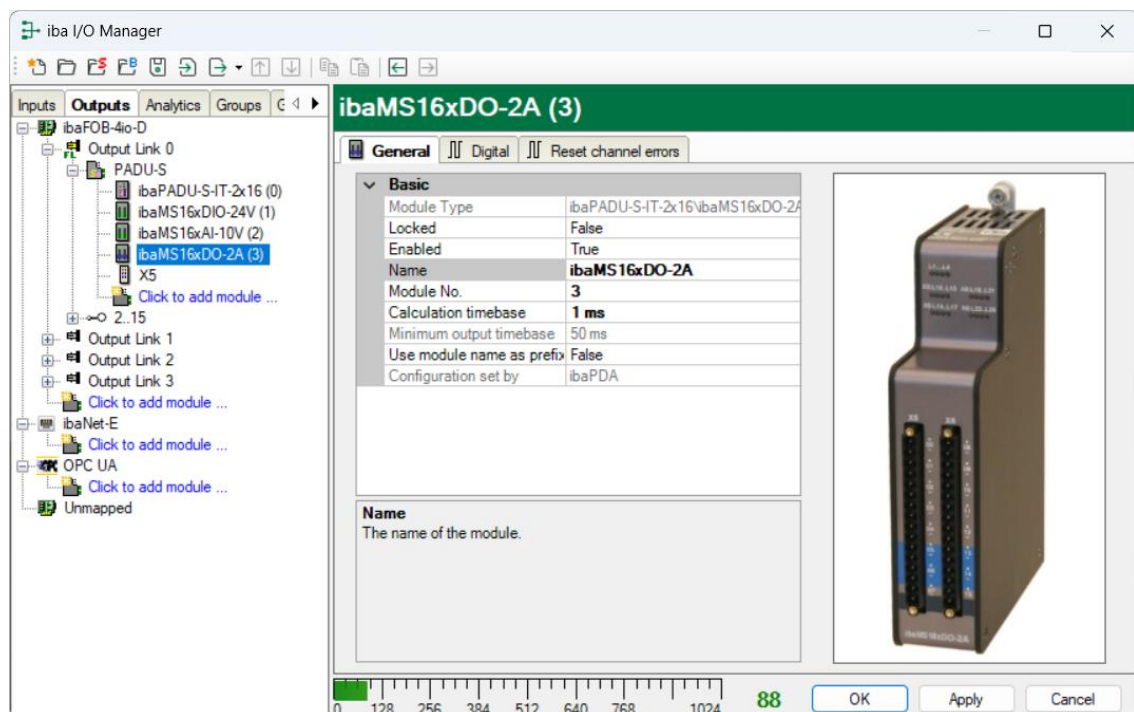


#### Other documentation

If you want to install the iba-modular system at first, refer to the manual of the central unit, chapter “Configuration with ibaPDA”.

#### 10.1.1 General settings

If the module is detected, click on the module in the signal tree and the “General” tab appears.



#### Basic settings

☐ Modul Type

Display of module type (read only)

☐ Locked

True: the module can only be changed by an authorized user.

False: the module can be changed by any user.

☐ Enabled

Data capturing for this module is enabled.

☐ Name

You can enter a name for the module.

☐ Module No.

Consecutive module number assigned by ibaPDA for clearly referencing the signals, e.g. in expressions and for ibaAnalyzer. The number can be changed by the user.

☐ Timebase

Timebase, specified in the PADU-S module.

☐ Use name as prefix

Prefix the signal names of this module with the module name.

☐ Configuration set by

This item is only visible when ibaPADU-S-IT-2x16 is used as central unit. When an embedded application has been started on ibaPADU-S-IT-2x16 (e. g. ibaLogic), then ibaPDA cannot modify the configuration of the modules and signals. In this case the configuration is set by the embedded application. The following entries can be displayed:

- ibaPDA

Configuration set by	ibaPDA
----------------------	--------

When ibaPDA is displayed, an embedded application has not been started and the configuration can be set by ibaPDA.

- Embedded application

Configuration set by	Embedded application
Import signal names	False

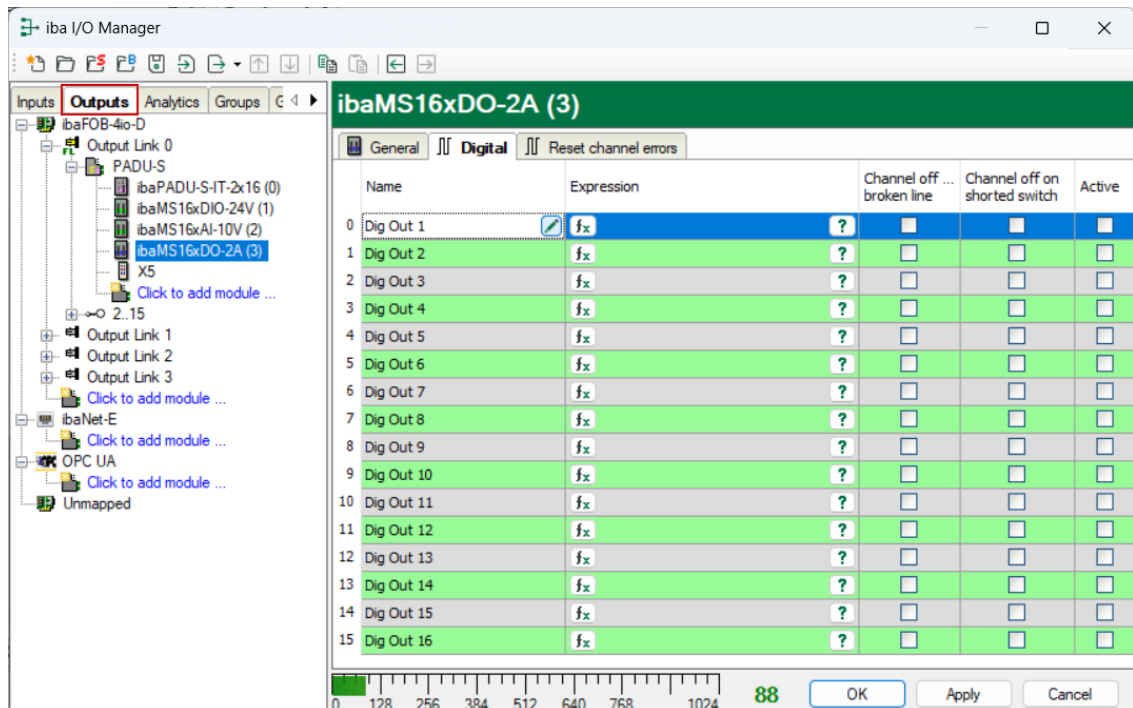
When embedded application is displayed, the configuration of the modules and signals is set by the embedded application on the device. In this case it is possible to import user-defined signal names, which are configured in the embedded application, provided that the embedded application supports this function (Import signal names: True).

The modules and signals configured by the embedded application cannot be configured in ibaPDA, they are displayed in gray in the respective fields.


The configuration is read by ibaPDA and used for the acquisition. Modules and signals which are not displayed in gray can be used in ibaPDA.

### 10.1.2 Output configuration


Select the „Outputs“ tab in order to configure settings and signals at the output side. The following settings apply to the “Digital” tab:



#### ☐ Name

You can enter a name for the signal and two additional comments (click on the  icon in the Name field).

#### ☐ Expression

For each output you can specify a signal using the expression builder . Signals can be linked mathematically or logically.

#### ☐ Channel off on broken line

If this option is active, the channel will be switched off in case of a broken line error.

#### ☐ Channel off on shorted switch

If this option is active, the channel will be switched off in case of a shorted switch error.

#### ☐ Active

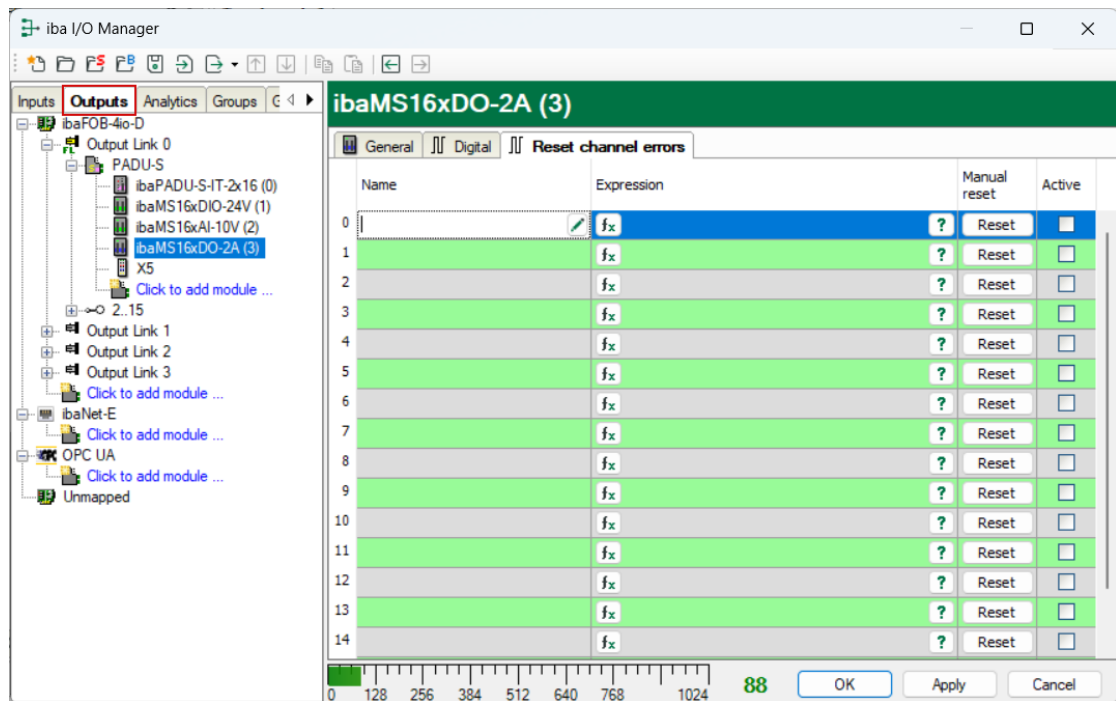
Enabling/disabling the signal.

### 10.1.3 Reset channel errors


Hardware errors of the channels can be reset in two ways:

- Manually using the <Reset> button
- Automatically by an output signal


The following settings apply to the “Reset channel errors” tab:



#### ☐ Name

You can enter a name for the signal and two additional comments (click on the  icon in the Name field).

#### ☐ Expression

Using the expression builder  you can specify an output signal in order to reset a hardware error.

#### ☐ Manual reset

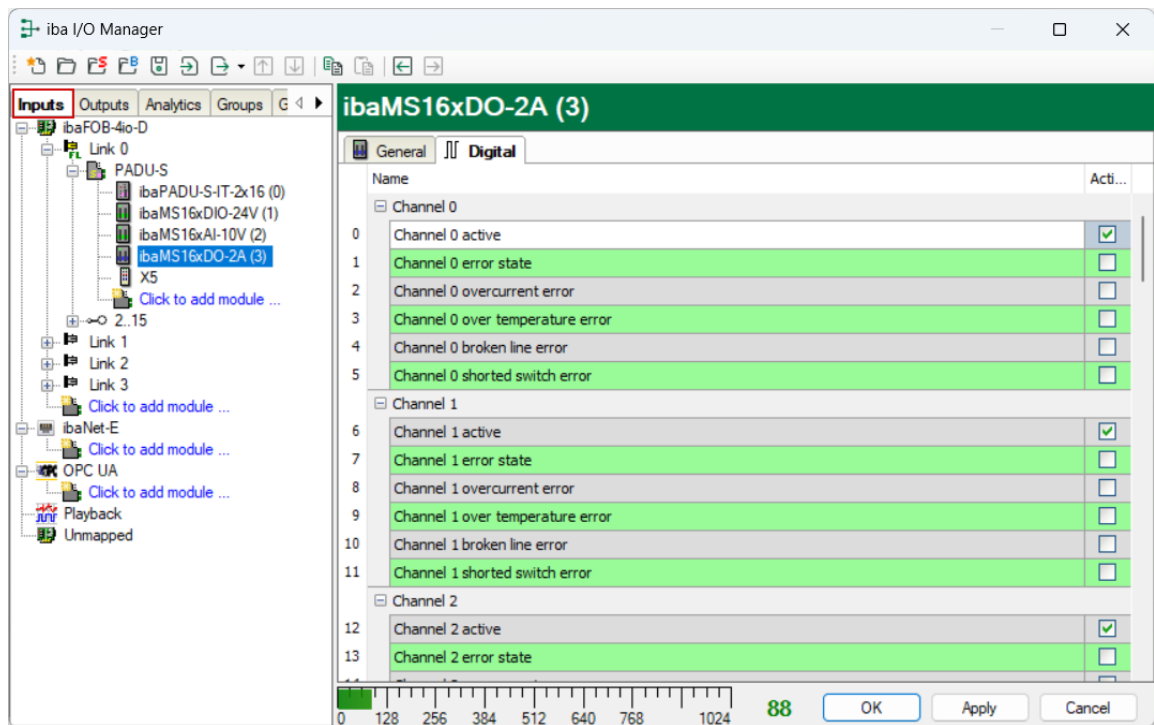
Button to manually reset the hardware error.

#### ☐ Active


Enabling/disabling the signal.

### 10.1.4 Diagnostics channels

In the „Inputs“ tab, status and error signals can be activated in the “Digital” tab:



#### ☐ Name

Status signals can be activated here. They have default names, but you can enter two additional comments (click on the  icon in the Name field).

- Channel [0...15] active  
Output signal is ready
- Channel [0...15] error state  
Group error of the channel.
- Channel [0...15] overcurrent error  
Channel is in error status due to overcurrent
- Channel [0...15] over temperature error  
Channel is in error status due to over temperature
- Channel [0...15] broken line error  
Channel is in error status due to broken line
- Channel [0...15] shorted switch error  
Channel is in error status due to shorted switch

#### ☐ Active

Enabling/disabling the signal.

## 10.2 Configuration in ibaLogic-V5



### Other documentation

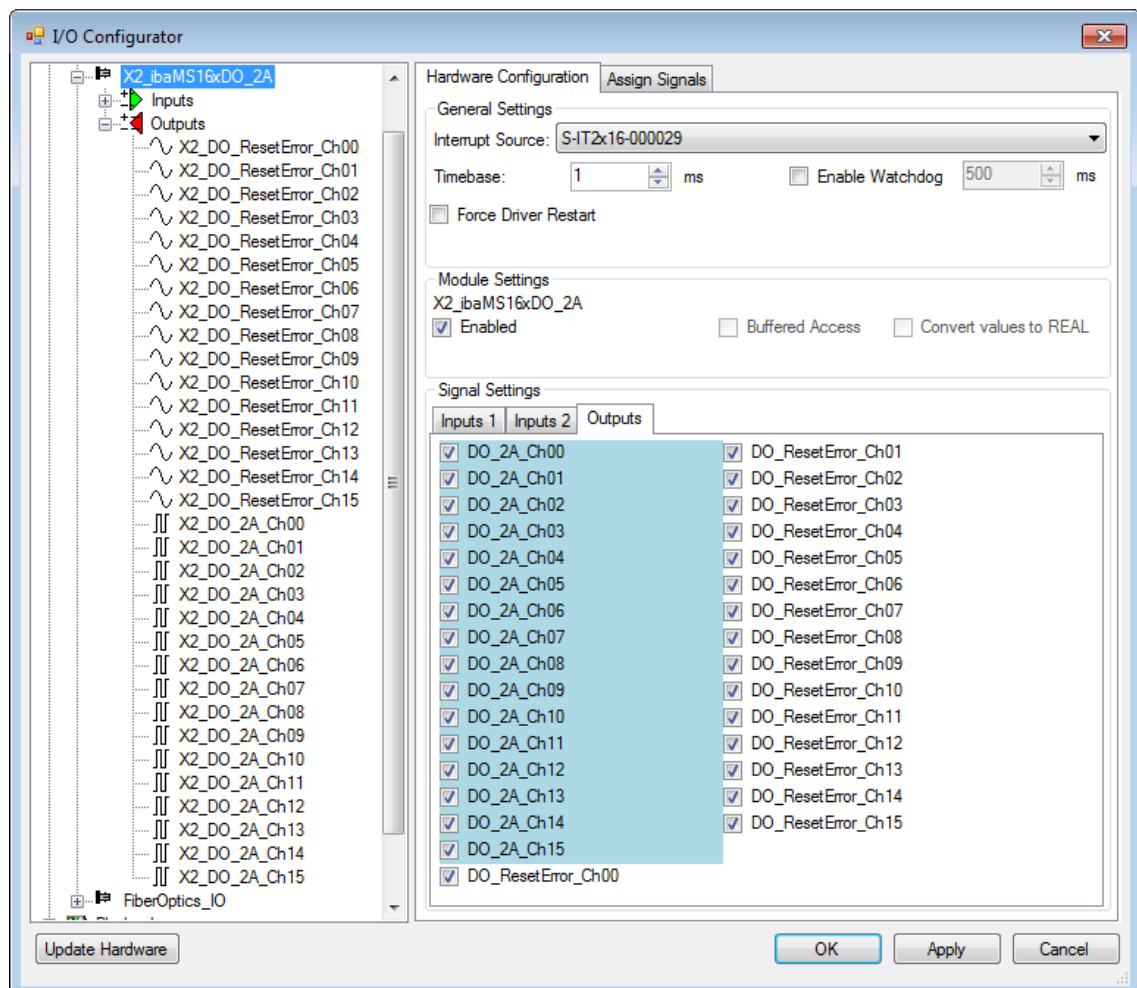
Combined with ibaLogic-V5, an ibaPADU-S-IT-2x16 device can be used to realize individual signal pre-processing or stand-alone applications. You find the basic way of proceeding description in the separate ibaPADU-S-IT-2x16 manual. This manual describes only the signals belonging to this module.

The signals can be configured in the I/O Configurator of ibaLogic-V5. Open the I/O Configurator in the “Configuraton – I/O Configurator” menu. When you click on the <Update Hardware> button, then ibaLogic detects the module.

ibaMS16xDO-2A offers the following signal groups:

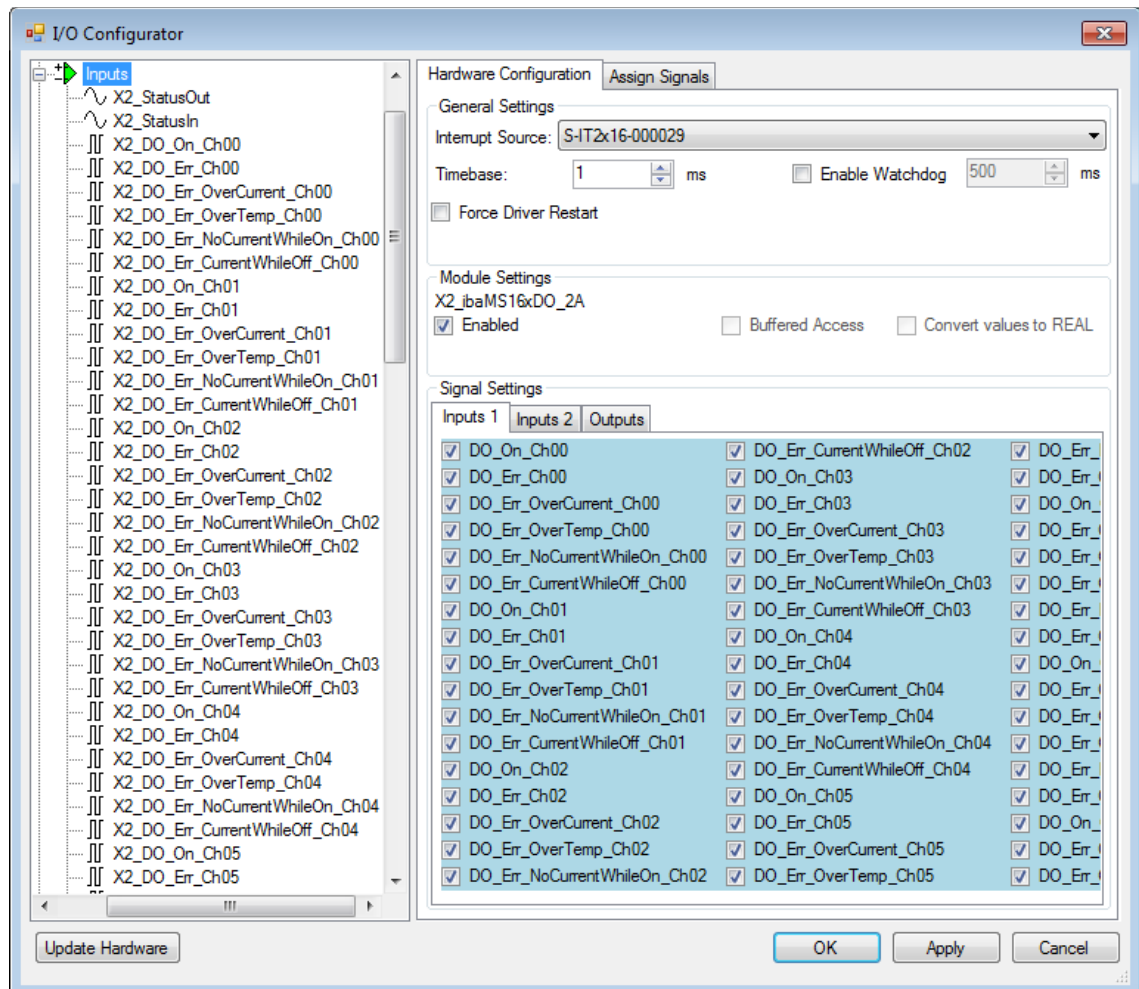
1. Outputs
2. Inputs

The digital output channels as well as the ResetErrors are shown under „Outputs“.





All available status or failure information is listed under „Inputs“.



Signal	Description
<b>Inputs</b>	
DO_On_Ch[00...15]	Channel status: 0 = channel not ready for operation 1 = channel ready for operation
DO_Err_Ch[00...15]	Group error per channel of „DO_Err_OverCurrent_Ch[00...15]“ and „DO_Err_OverTemp_Ch[00...15]“. Failure remains active until it is set back by means of „ResetError_Ch[00...15]“.
DO_Err_OverCurrent_Ch[00...15]	Error signal: single error „Overcurrent“, Statusbit, see chapter 8.2
DO_Err_OverTemp_Ch[00...15]	Error signal: single error „Over temperature“, Statusbit, see chapter 8.2
DO_Err_NoCurrentWhileOn_Ch[00...15]	Error signal: single error „Broken line“, Statusbit, see chapter 8.2
DO_Err_CurrentWhileOff_Ch[00...15]	Error signal: single error „Shorted switch“, Statusbit, see chapter 8.2
StatusIn	Status information about the plugged input module (for output module without function): 0 = module not initialized 1 = module is running >1 = error (e.g. module cannot be initialized)
StatusOut	Status information about the plugged output module (for input module without function): 0 = module not initialized 1 = module is running >1 = error (e.g. module cannot be initialized)
<b>Outputs</b>	
DO_2A_Ch[00...15]	Digital output channels: 0 = channel is not connected 1 = channel is connected
DO_ResetError_Ch[00...15]	Sets back the group error „DO_Err_Ch[00...15]“: 0 = not reset the error 1 = resets the error (The length of an ibaLogic-V5 task cycle is sufficient as reset signal)

## 11 Technical Data

### 11.1 Main Data

<b>Short description</b>	
Name	ibaMS16xDO-2A
Description	Output module with 16 digital outputs
Order number	10.124250
<b>Power supply, interfaces,</b>	
Voltage supply	24 V DC, internal via backplane bus
Power consumption	Max. 8 W
<b>Operating and indicating elements</b>	
Indicators	4 LEDs for device status 16 LEDs for the status of the digital outputs
Fault indication	Broken line, shorted circuit, over temperature, overcurrent
<b>Operating and environmental conditions</b>	
Temperature ranges	<div>Operation</div> <div>Storage/transport</div> <div>32 °F ... 122 °F (0 °C ... 50 °C)</div> <div>-13 °F ... 158 °F (-25 °C ... 70 °C)</div>
Installation position	Vertical, plugged on backplane bus
Cooling	Passive
Humidity class acc. to DIN 40040	F, no condensation
Protection class	IP20
Certification/Standards	EMC : IEC 61326-1 Safety : IEC 61010-1 FCC part 15 class A
Dimensions (Width x height x depth)	1.69 in x 8.43 in x 5.83 in (43 mm x 214 mm x 148 mm)
Weight (incl. packaging and documentation)	approx. 2.43 lbs (1.1 kg)

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

**Unique Identifier:** 10.124250 ibaMS16xDO-2A

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

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

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

**FCC Compliance Statement**

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

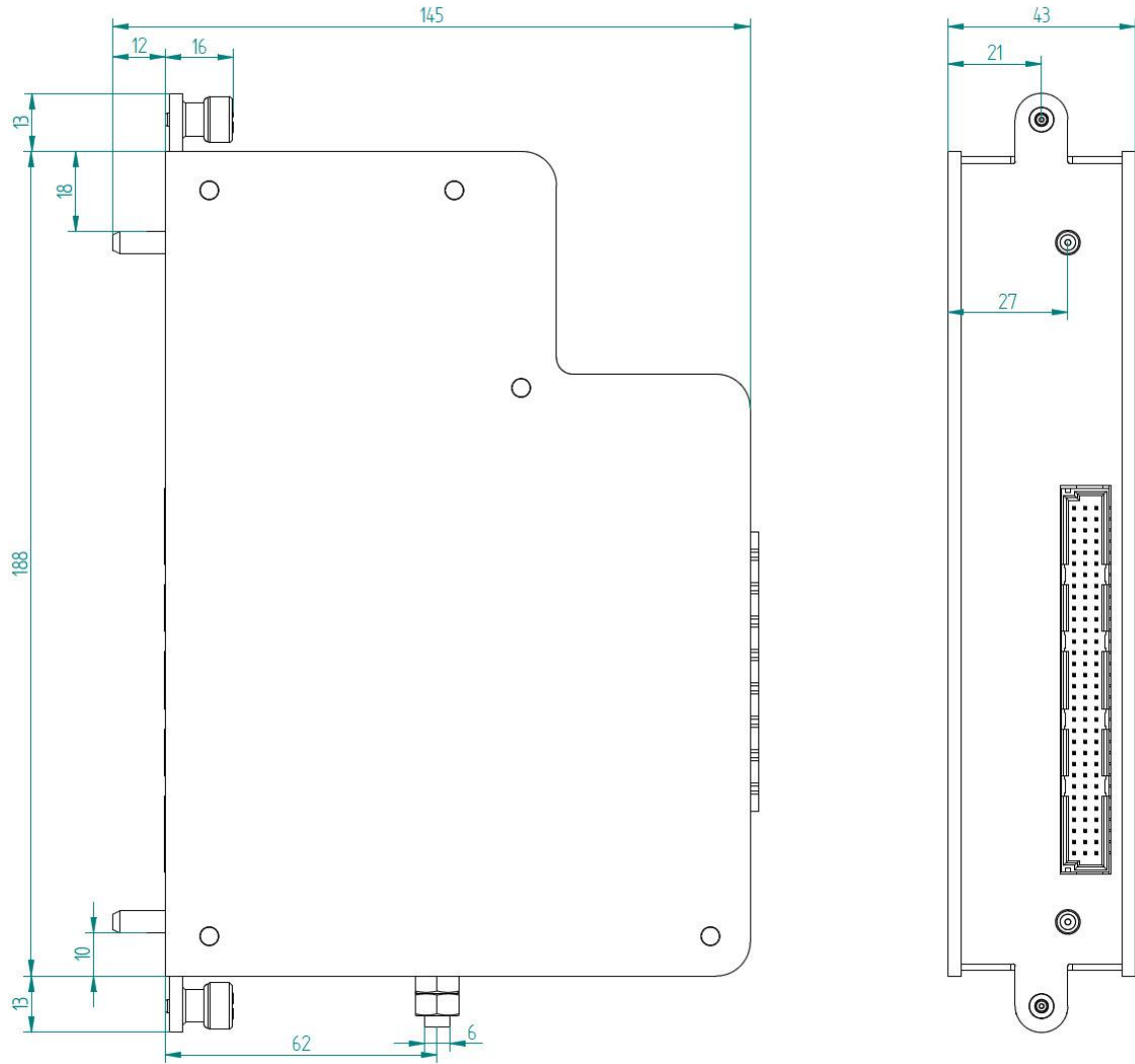
## 11.2 Digital outputs

Digital outputs	
Number	16
Design	Galvanically isolated, 2-wire system, switch
Load voltage	0 V ... +55 V
Switching current per channel	10 mA ... 2 A
Switching frequency	0 Hz ... 5 kHz <sup>1</sup>
Switching delay	<10 µs
Output impedance	Typ. 0.1 Ohm
Electrical isolation	
Channel-channel	2.5 kV AC
Channel-housing/power supply	2.5 kV AC
Connection technology	2 x 16-pin multipin-connector, clamp-type terminal (0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> ) , screw connection, included in delivery
Protection functions	
Safe state	Open switch
Current limitation	25 A (peak)
Reverse voltage limitation	appr. -1 V
Overvoltage limitation	+60 V
Overtemperature protection	from 150 °C

<sup>1</sup> deviating switching frequency with ibaLogic (up to 1 kHz) and ibaPDA (up to 20 Hz)

Permanent overcurrent protection	min. >2.0 / typ. 2.3 / max. <2.7A
Surge current protection	Channel inactive at an impulse of appr. 3 A x 80 ms/ 5 A x 33 ms/ 10 A x 15 ms/20 A x 7 ms
Fire protection	4 A lead fuse

### 11.3 Dimensions



(Dimensions in mm)

## 12 Support and contact

### 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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### Contact

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