ibaMS16xDO-2A

Output module for digital signals

Manual

Issue2.1

Measurement Systems for Industry and Energy

www.iba-ag.com

Manufacturer

iba AG

Koenigswarterstraße 44

90762 Fuerth

Germany

Contacts

Headquarters	+49 911 97282-0
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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2.1	10-2025	ibaPDA updated, MTBF value	st	2.10.001

Certification

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

Other international and national standards were observed.

Contents

1 About this documentation

This documentation describes the construction, the use and the operation of the device *ibaMS16xDO-2A*. You can find a general description 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.

Other documentation

For a general description of the iba modular system and additional information about layout, application and operation of the modules, please refer to the dedicated documentations.

The documentation of the iba modular system is part of the data medium "iba Software & Manuals".

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

- **Central units**

  The manuals of the central units contain information about:

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

- **Modules**

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

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

1.1 Target group and previous knowledge

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 About ibaMS16xDO-2A

The *ibaMS16xDO-2A* module is part of the iba-modular system. The modular concept of the iba-modular system is designed on the basis of a backplane. You can plug on this backplane not only the CPU, but also up to 4 input/output modules. The power supply of the I/O modules is provided by the backplane bus.

The *ibaMS16xDO-2A* module provides 16 digital outputs that are electrically isolated. The outputs can be switched in continuous operation with an external power supply.

At a glance

- I/O 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-circuit 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 that the delivery is complete and undamaged.

The scope of delivery includes:

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

4 Safety instructions

Observe the following safety instructions for *ibaMS16xDO-2A*.

4.1 Intended 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 must only be used as specified in chapter *Technical data*.

4.2 Special safety instructions

Danger!

Do not connect the device to mains circuits! The device is not intended for this use.

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

Caution!

Supply and measuring cables

- Do not use damaged supply and measuring cables.
- Do not connect or disconnect supply and measuring cables when the device is connected to the power.
- Supply and measuring cables must be suitable for the corresponding voltages.

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!

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

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

Note

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

Note

To clean the device, use a dry or slightly moistened cloth.

5 System requirements

Hardware

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

Software

- *ibaPDA* version 6.34.0 or higher
- *ibaLogic-V5* version 5.0.2 or higher

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 and dismounting

In the following, you will learn how to install, connect and dismount the modules *ibaMS16xDO-2A* . Also refer to the notes in chapter ↗ *Safety instructions*, page 10.

Caution!

Before working on or dismounting the device, disconnect it from the power supply.

Note

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

6.1 Mounting

To mount the module *ibaMS16xDO-2A* , proceed as follows.

1. Disconnect the central unit from the power supply.
2. Remove the cover from the backplane bus onto which you want to attach the module.
3. Attach the module to the backplane bus and press it firmly against the module rack.
4. Screw the module to the top and bottom of the module rack using the fastening screws.

   Caution!

   Always screw the device and the modules tightly. Plugging or unplugging the connectors for the inputs/outputs can otherwise cause damage.

5. Connect the grounding screw on the bottom of the housing to the protective ground / grounding shield.

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 central unit.

6.3 Dismounting

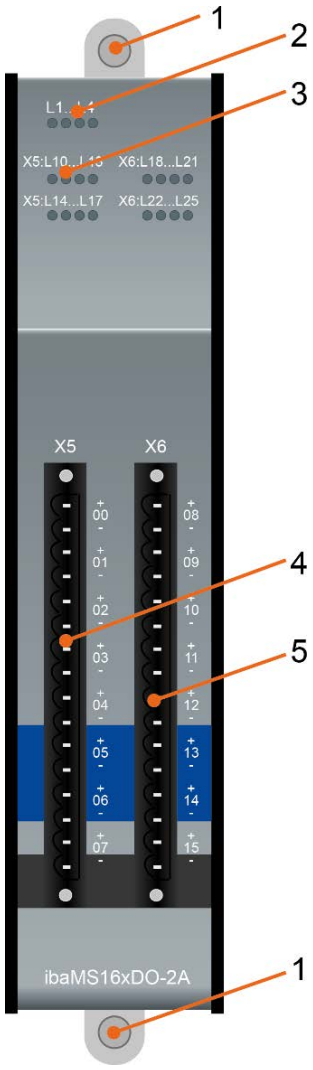
To dismount the module, proceed as follows.

1. Disconnect the central unit from the power supply.
2. Remove all cables.
3. Loosen the upper and lower fixing screws that secure the module to the module rack.
4. Pull the device straight from the backplane.
5. Put the cover on the backplane bus.

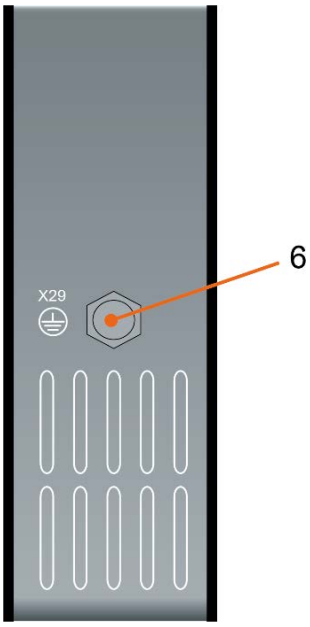
7 Device description

Here you will find views and descriptions of the device *ibaMS16xDO-2A*.

7.1 Views



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



6	Grounding screw

7.2 Indicating elements

Colored LEDs on the device indicate the status of the device and the digital outputs.

7.2.1 Operating state

The following overview shows the possible operating states of the module *ibaMS16xDO-2A*.

LED	Color	State	Description
L1	green	flashing	device ready for operation
		off	device not ready for operation (switched off)
L2	yellow	on	access to the backplane bus
L3	white	-	-
L4	red	off	normal status, no errors
		flashing	failure/error

Note

If an error is displayed on LED L4, contact iba support.

7.2.2 Status of digital outputs

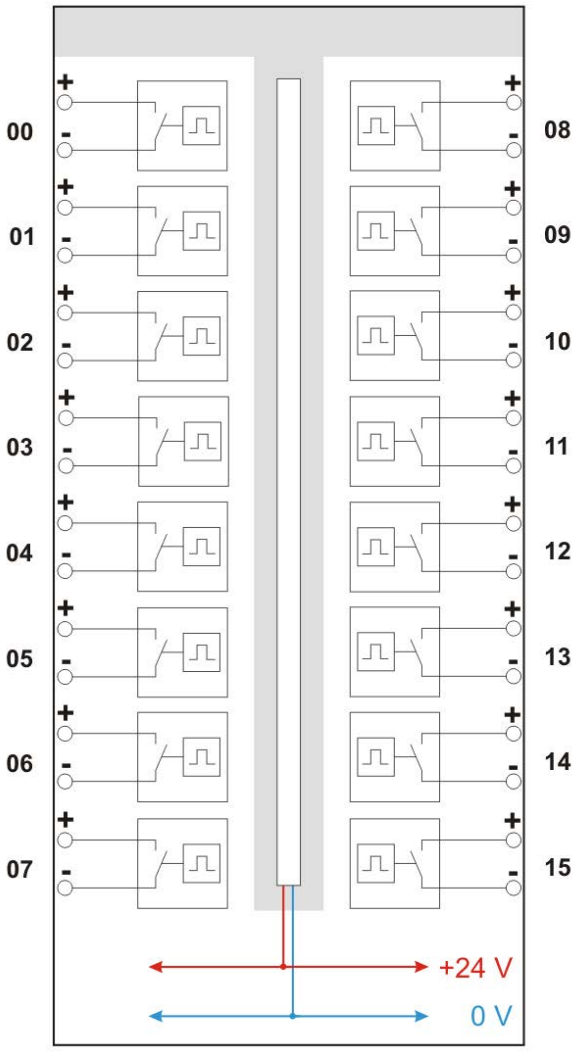
LED	status	Description
L10...L25	off	channel is open
	green	channel is closed
	red	error (channel is switched off automatically)

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. 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

Note

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

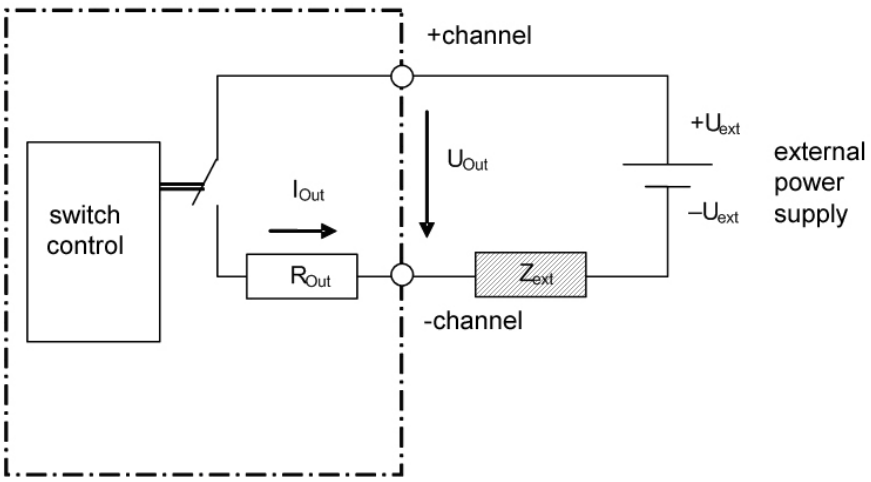
Do not connect 2 channels in series in contrary direction for having a non-polarized (AC-) switch.

Each individual channel can be used as kind of a relay. There are only output connections +channel and –channel (2-wire technology) for each channel. 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 resistanc-es (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

7.3.2.1 Output channel as P switch

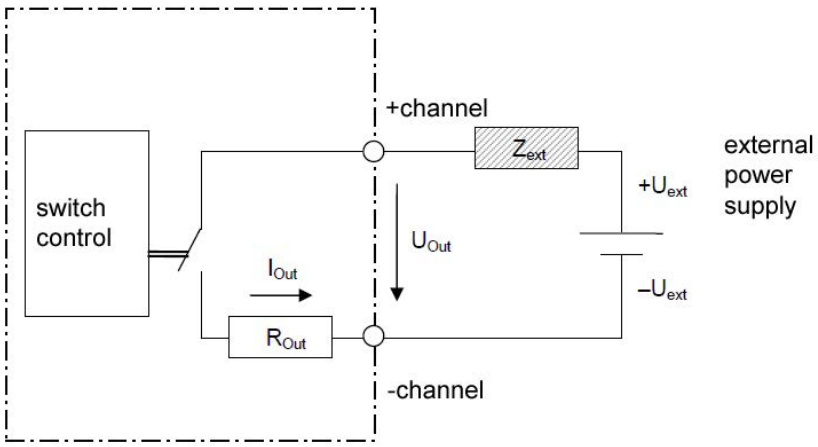
The circuit is designed as P switch (positive voltage).

The connected load Zext is connected to –Uext and switched on +Uext by means of the controllable switch (load switch) in the output channel. This typical circuit is shown schematically in the following figure.



7.3.2.2 Output channel as N switch

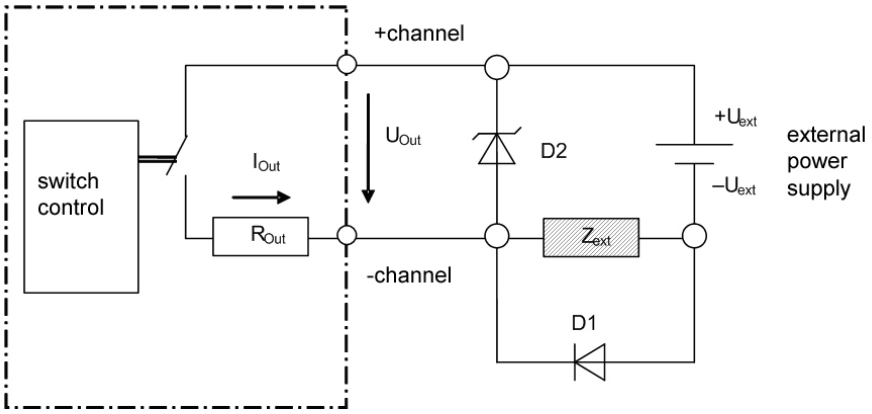
The circuit can also be realized as N switch (negative voltage).



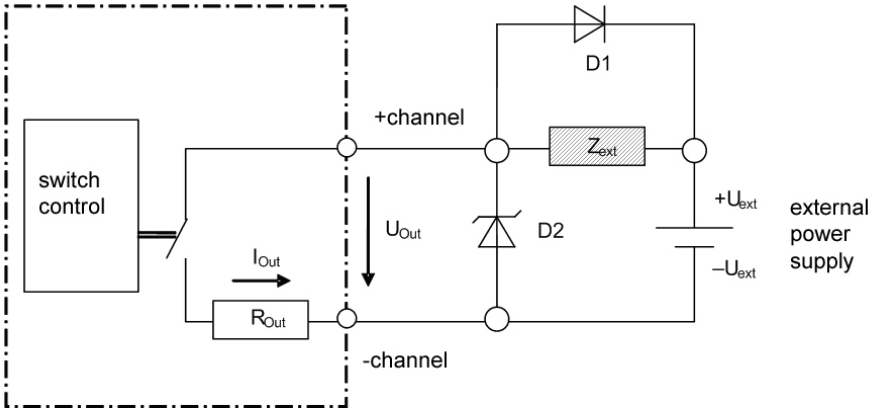
Compared to the use as positive switch, no particularities have to be observed in operation.

7.3.2.3 Output channel with external diodes

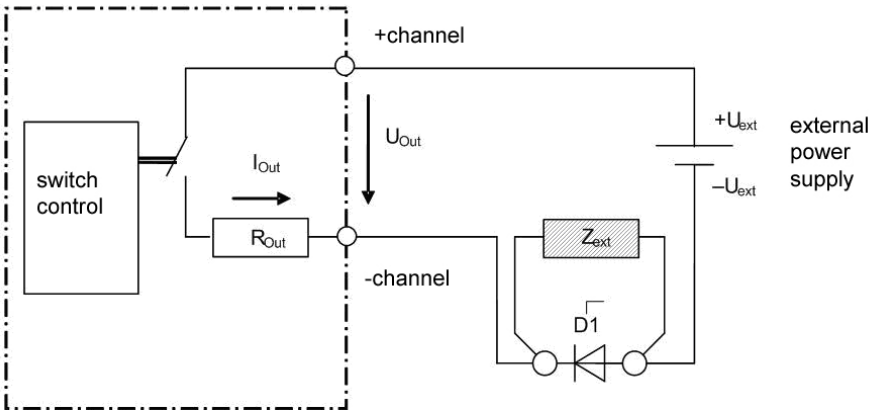
For load circuits with P switch:



For load circuits with N switch:



When connecting a freewheeling diode:



Optimal wiring with a freewheeling diode

7.4 Connections

7.4.1 Grounding screw X29

For interference reasons, it may be necessary to connect the overall shield of the input cables to the grounding screw (M6) on the bottom of the device. Use an M6 cable lug for the connection.

Caution!

Only connect the shields to the device on one side, e.g. to avoid earth loops via the sensor housing.

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

8 Protective and monitoring functions

Here you will find information about the protective and monitoring functions.

8.1 Physical protective functions of the hardware

Note

The shorted load protection is only guaranteed when polarity is correct.

The output channels provide a self-protection function in order to avoid damages to the device under fault conditions in the load circuit as far as possible.

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 Ω 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 Overtemperature protection

Each channel switches off individually in case the load-switch IC exceeds a certain maximum junction temperature (T_{LS}). 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

Note

With inductive loads, self-protection only extends to preventing direct destruction of the load switch due to reverse voltages that are too high. However, the rebound energy heats up the load switch without any over-temperature protection. 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.

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_{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

If the channels are overloaded due to operating conditions exceeding the limits compatible with the self-protection functions, or due to a defect in the output channel, a fuse ensures product safety.

Note

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

The fuse cannot be replaced by the user.

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

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 (TLS) of 150 °C. If the temperature decreases, 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 class	Description
Permanent overcurrent protection	Channel inactive at I_{out} min. >2,0 / typ. 2,3 / max. <2,7A
Surge current protection	Channel inactive at I_{out} * t_{oc}: e. g. I_{out} * t_{oc} -> 3Ax80ms / 5Ax33ms / 10Ax15ms / 20Ax7ms / 35Ax4ms (tolerance ±20%) t_{oc} = response time of the overcurrent protection

Status signals
DO_Err_OverCurrent_Ch[00…15]

9 Start-up and Update

Note

Do not switch off the device during an update as you may damage the device. Installing an update can take some minutes.

9.1 Auto-Update

After having mounted the module and applied the voltage to the central unit, the central unit detects the modules 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. After that the module is ready for use.

Note

The “overall release version” contains all modules developed up to the date of release of this firmware and the corresponding software versions. If the module is not yet known (i.e. newer than the firmware version of the central unit), it is ignored and framed in red in the web interface.

In this case, a new update file has to be installed for the "overall release version", see ↗ *Update*, page 27. Therefore, 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*.

Note

Specify the "overall release version" for support cases.

9.3 Update

An update can be installed in two different ways:

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

  see ↗ *Perform update via web interface*, page 27

- *ibaPDA*

  see ↗ *Perform update via ibaPDA*, page 28

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.

Note

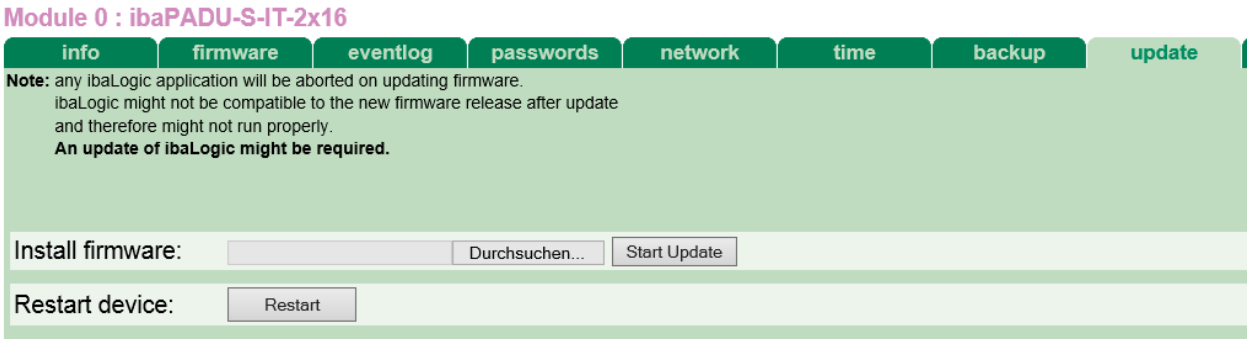
When updating the iba-modular system, a possible autostart of the *ibaLogic* PMAC is deactivated and the existing *ibaLogic-V5* application deleted. Furthermore, an update of the *ibaLogic-V5* software (*ibaLogic* Clients) might be necessary.

9.3.1 Perform update via web interface

Note

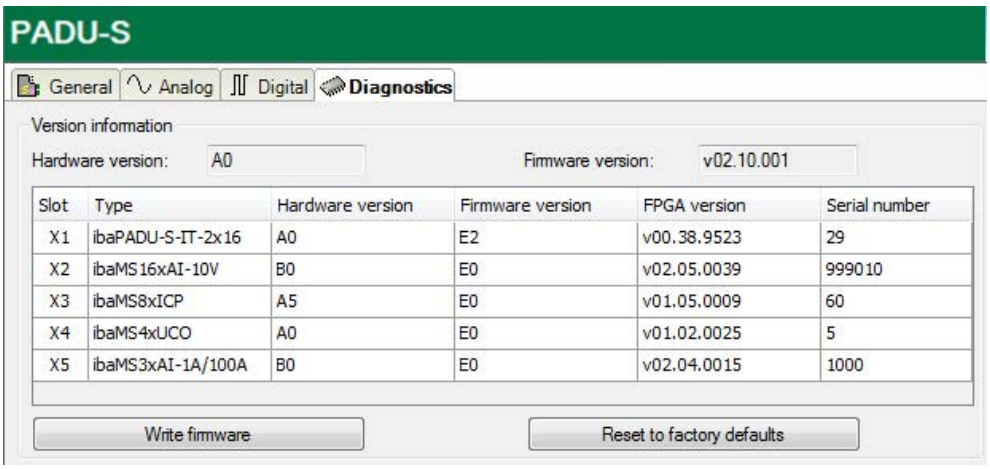
The web interface is available only with the central unit *ibaPADU-S-IT-2x16*.

1. Open the website of the iba modular system in your browser and select the central unit.
2. On the *update* tab, click on the <Browse…> button and choose the `padusit2x16_ v[xx.yy.zzz].iba` update file.
3. By clicking on <Start Update>, you start the update.



9.3.2 Perform update via ibaPDA

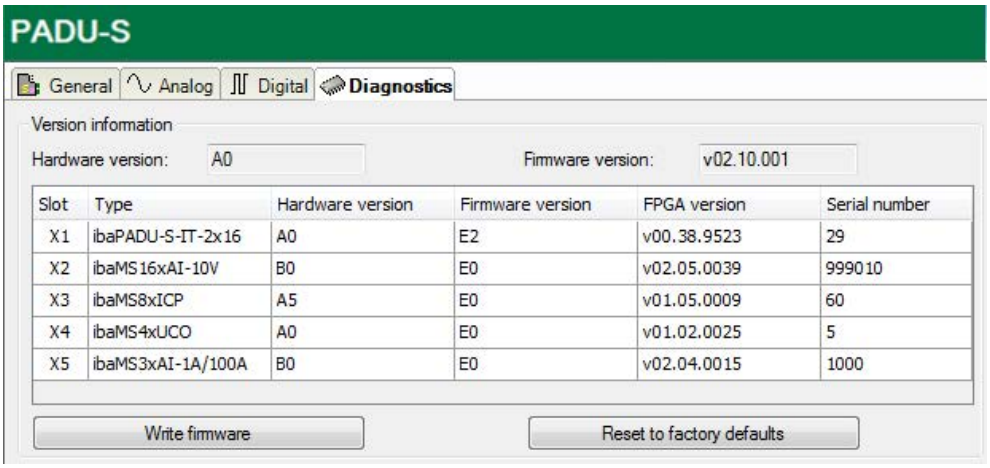
1. Open the *ibaPDA* I/O Manager and navigate to your iba modular system in the tree structure.
2. On the *Diagnostics* tab, click on the <Write firmware> button and select the `padusit2x16_v[xx.yy.zzz].iba` or `paduscm_v[xx.yy.zzz].iba` update file.
3. You start the update by clicking on <OK>.



9.4 Module information/diagnostics

9.4.1 Diagnostics

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.



9.4.2 Web interface

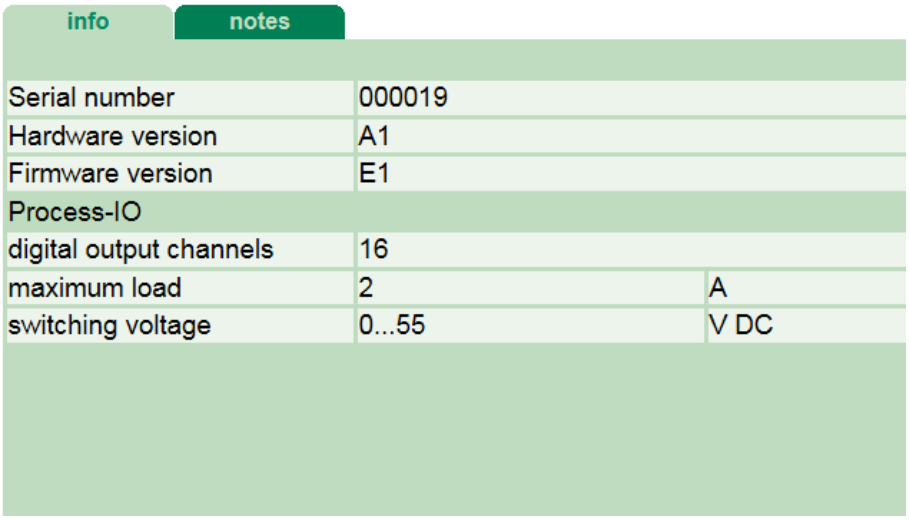
Only information on status and parameters is displayed on the module website. You cannot change the values.

Note

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

9.4.2.1 Info tab

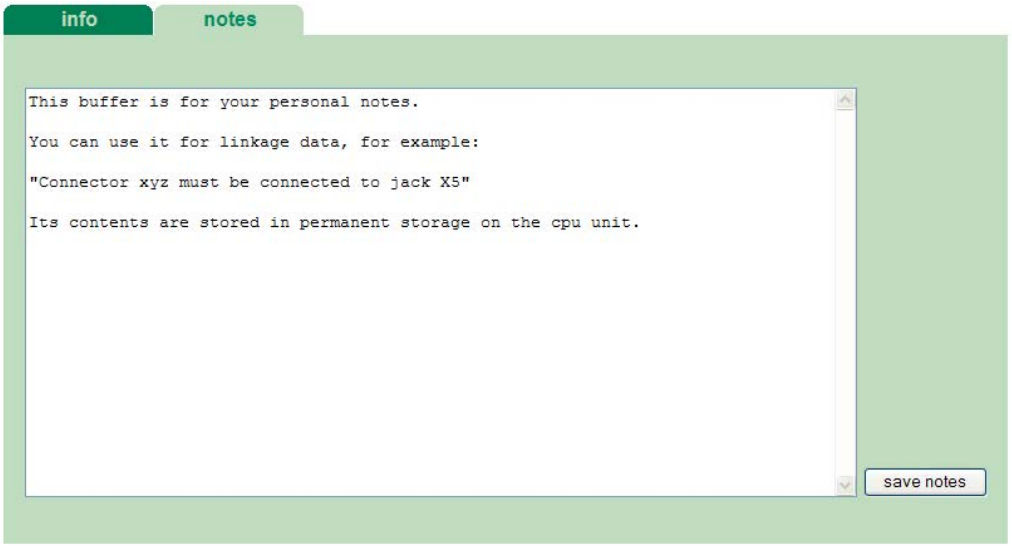
The *info* tab displays general information and technical specifications of the I/O module.



9.4.2.2 notes tab

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

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



10 iba Applications

10.1 Configuration with 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.

Note

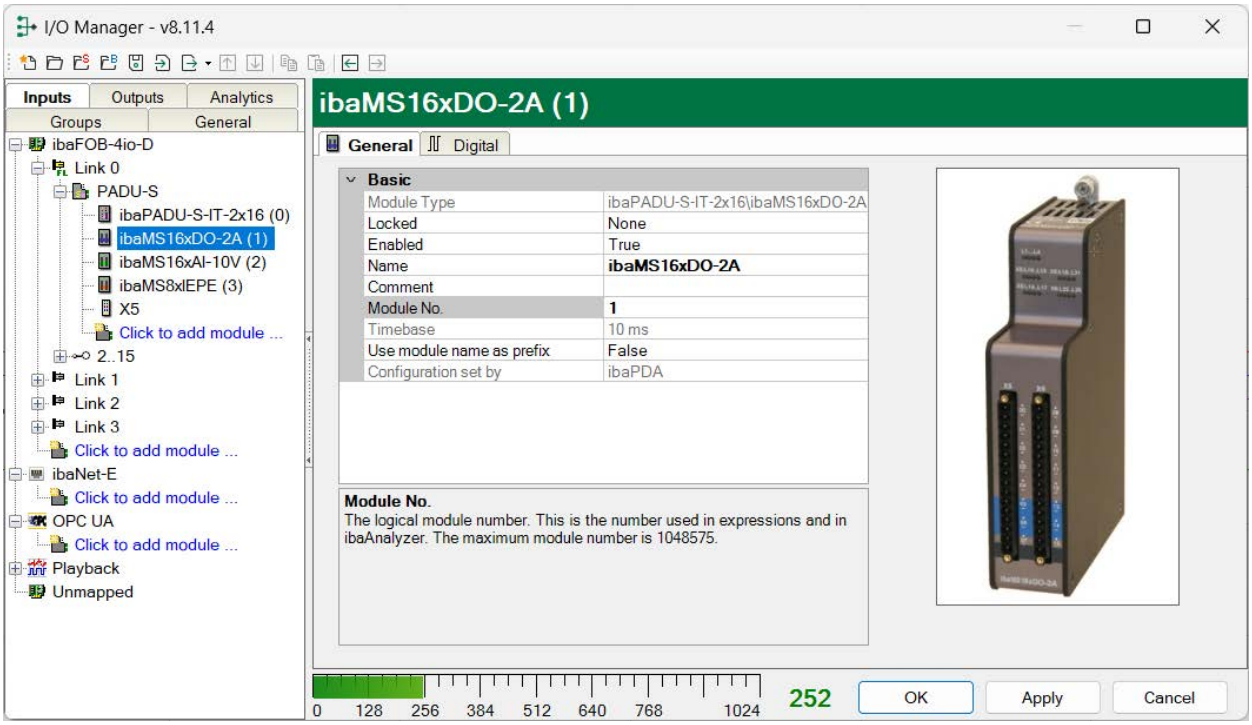
The automatic detection requires a bidirectional FO connection from the *ibaPDA* computer to the central unit.

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

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

Locked
You can lock a module to avoid unintentional or unauthorized changing of the module settings.

Enabled
Enable the module to record signals.

Name
You can enter a name for the module here.

Comment
You can enter a comment or description of the module here. This will be displayed as a tooltip in the signal tree.

Module No.
This internal reference number of the module 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 timebase.

Acquisition timebase specified in the PADU-S module

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

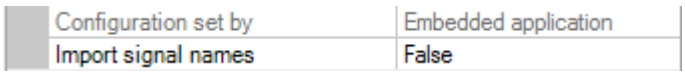
Configuration set by
This item is only visible when *ibaPADU-S-IT-2x16* is used as central unit. When an embedded application has been started on *ibaPADU-S-IT-2x16* (e. g. ibaLogic), then *ibaPDA* cannot modify the configuration of the modules and signals. In this case the configuration is set by the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

- *ibaPDA*

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

- Embedded application

  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.

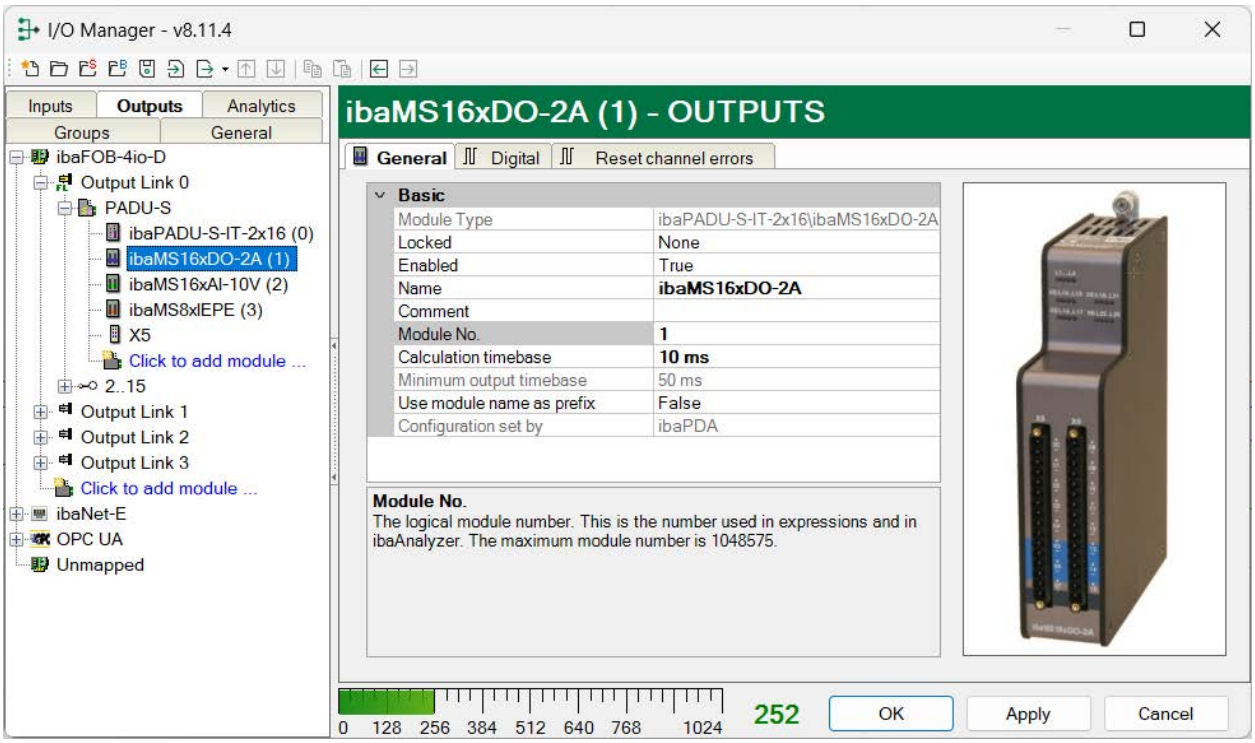
  The configuration is read by *ibaPDA* and used for the acquisition. Modules and signals which are not displayed in gray can be used in *ibaPDA*.

10.1.2 Configuring outputs

Select the *Outputs* tab to configure the settings and signals at the output side.

General tab

Most of the basic settings apply to the input and output module. The *Calculation timebase* and *Minimum output timebase* settings are only available for the output module.



Calculation timebase

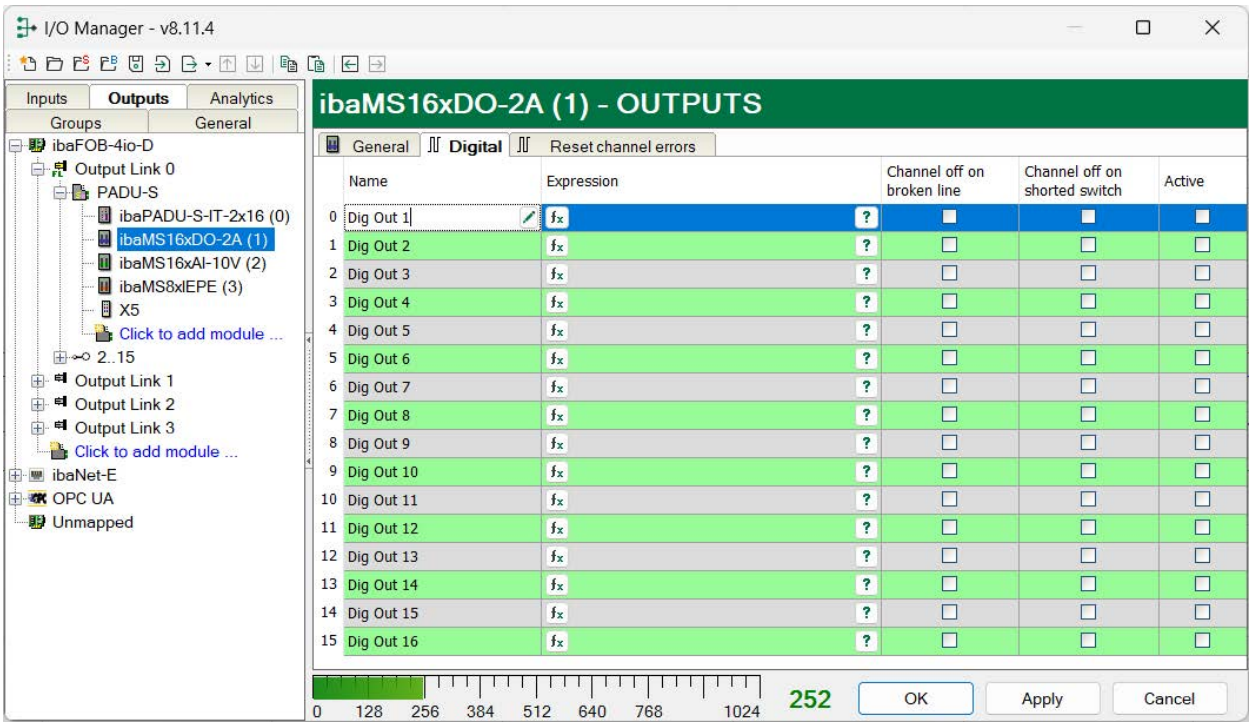
Timebase (in ms) used for the calculation of the output values. The calculation timebase is not the same as the output timebase, with which the values are output. The calculation timebase is identical to the timebase of the input module.

Minimum output timebase (information only)

Timebase with which the outputs can be updated as quickly as possible. The output timebase results from the smallest common multiple of all module timebases or is at least 50 ms.

Digital tab

The following settings apply to the *Digital* tab:



Name

Here you can enter a signal name and additionally two comments when clicking the icon in the *Name* field.

Expression

For each output you can specify a signal using the expression builder *f(x)*. Signals can be linked mathematically or logically.

Channel off on broken line

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

Channel off on shorted switch

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

Active

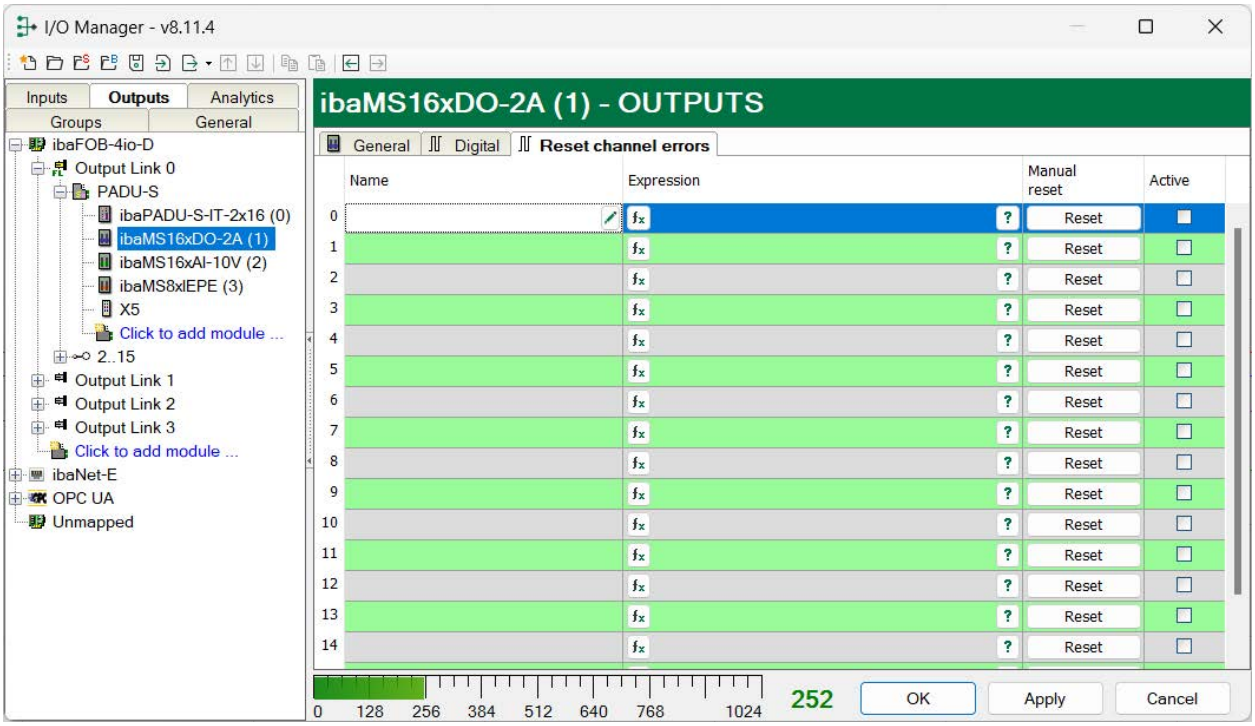
Enabling/disabling the signal.

10.1.3 Reset channel errors

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

- Manual reset using the <Reset> button
- Automatic reset with an output signal

Make the following settings in the *Reset channel errors* tab, in the *Outputs* tab:



Name

Here you can enter a signal name and additionally two comments when clicking the icon in the *Name* field.

Expression

Using the expression builder *f(x)* you can define an output signal for resetting a hardware error.

Manual reset

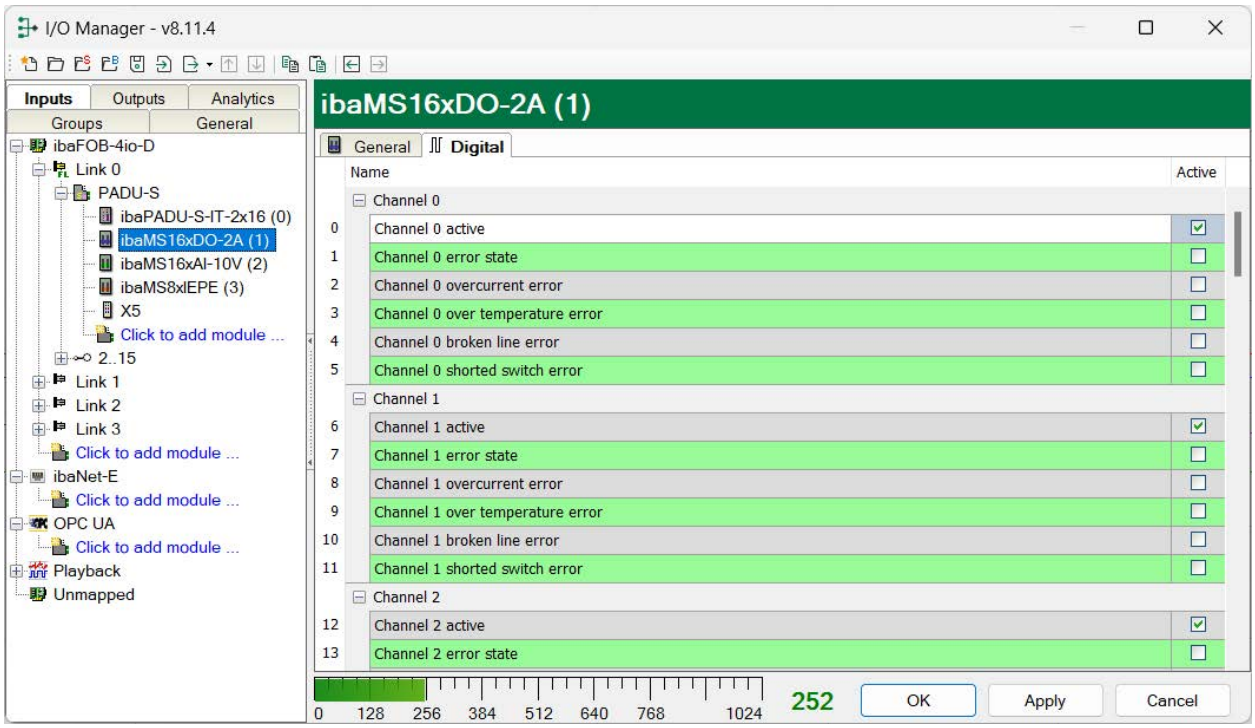
Button to manually reset the hardware error

Active

Enabling/disabling the signal

10.1.4 Diagnostics channels

Status signals can be enabled in the *Inputs* tab, in the *Digital* tab:



Name

The signals have default names. You can edit the names and enter two additional comments when clicking 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

The signals can be configured in the I/O Configurator of *ibaLogic-V5*.

Other documentation

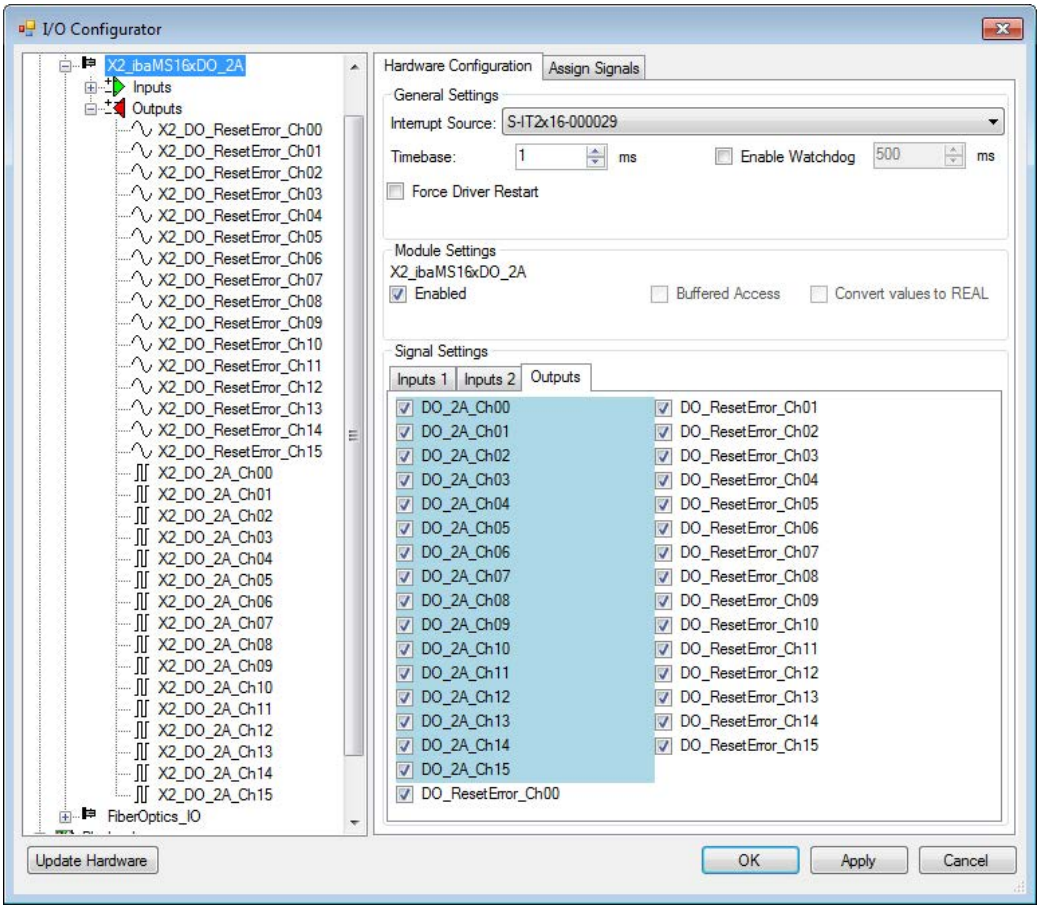
Combined with *ibaLogic-V5*, an *ibaPADU-S-IT-2x16* device can be used to realize individual signal pre-processing or stand-alone applications. The basic procedure for using *ibaLogic-V5* is described in the manual for the *ibaPADU-S-IT-2x16* central unit. This manual describes only the signals belonging to this module.

Open the I/O Configurator in the *Tools – I/O Configurator* menu. When you click on the <Update hardware> button, then *ibaLogic-V5* detects the module.

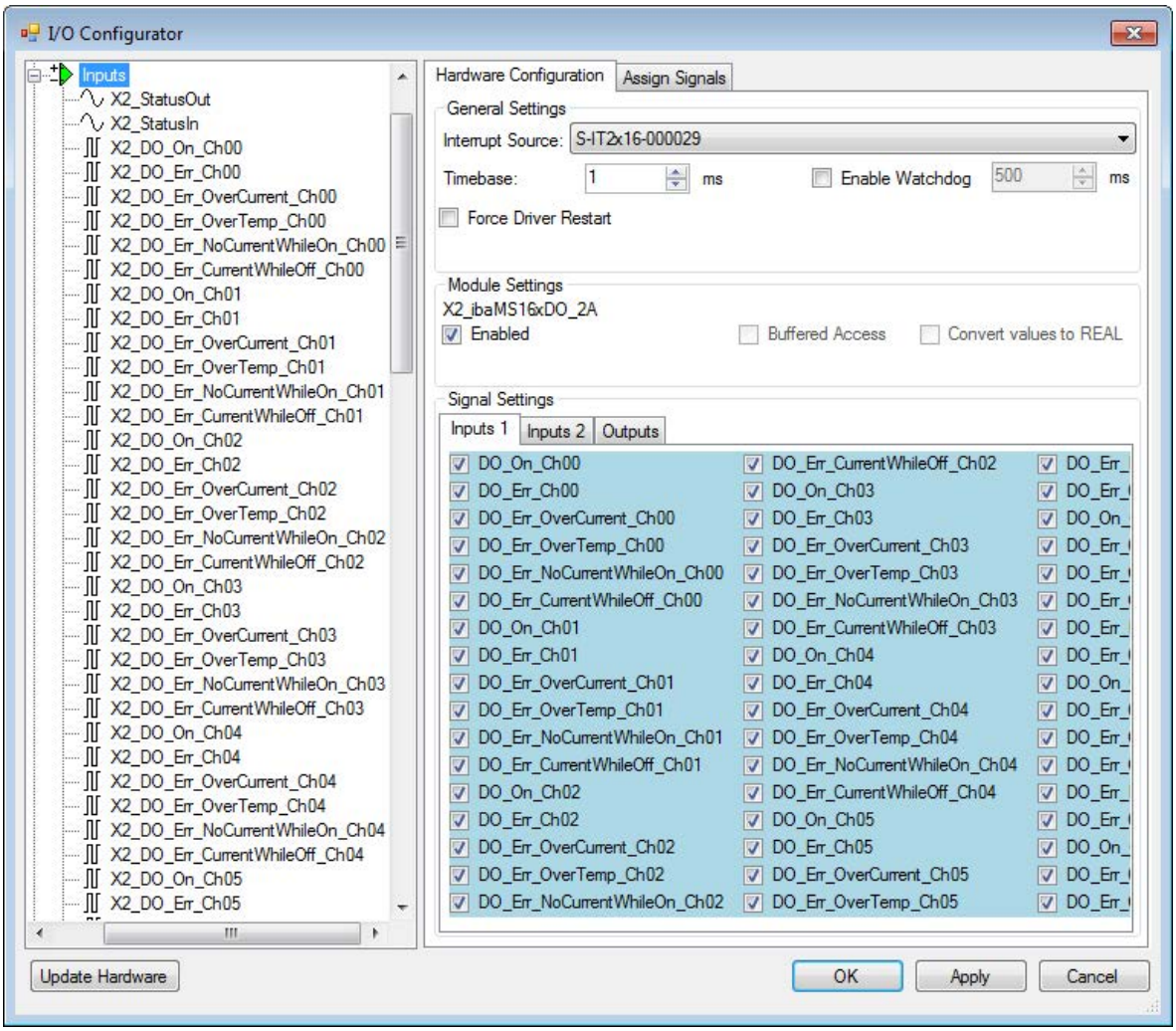
ibaMS16xDO-2A offers the following signal groups:

1. Outputs
2. Inputs

The digital output channels as well as the ResetError signals are shown under *Outputs*.



All available status or error information is listed under *Inputs*.



Signal	Meaning
Inputs	
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_Over-Current_Ch[00…15] and DO_Err_OverTemp_Ch[00…15]. The error remains active until it is reset using ResetError_Ch[00…15].
DO_Err_OverCurrent_Ch[00…15]	Error signal: single error „Overcurrent“, Statusbit, see ↗ *Monitoring functions / Error states*, page 24
DO_Err_OverTemp_Ch[00...15]	Error signal: single error „Over temperature“, Statusbit, see ↗ *Monitoring functions / Error states*, page 24
DO_Err_NoCurrentWhileOn_Ch[00...15]	Error signal: single error „Broken line“, Statusbit, see ↗ *Monitoring functions / Error states*, page 24

Signal	Meaning
DO_Err_CurrentWhileOff_Ch[00...15]	Error signal: single error „Shorted switch“, Statusbit, see ↗ *Monitoring functions / Error states*, page 24
StatusIn	Status information about the plugged input module (for output module without function): 0 = Module not initialized 1 = Module running >1 = Error (e.g. module cannot be initialized)
StatusOut	Status information about the plugged module (for input module without function): 0 = Module not initialized 1 = Module running >1 = Error (e.g. module cannot be initialized)
Outputs	
DO_2A_Ch[00...15]	Digital output channels: 0 = channel is not connected 1 = channel is connected
DO_ResetError_Ch[00...15]	Resets the group error „DO_Err_Ch[00…15]“ zurück: 0 = error not reset 1 = reset errors (The length of an *ibaLogic-V5* task cycle is sufficient as reset signal)

11 Technical data

In the following you will find the technical data and dimensions for *ibaMS16xDO-2A*.

11.1 Main data

Short description	
Description	ibaMS16xDO-2A
Description	Output module with 16 digital power outputs
Order number	10.124250
Supply	
Voltage supply	24 V DC, internal via backplane bus
Power consumption	max. 8 W
Operating and indicating elements	
Indicators	4 LEDs for operating status of the device 16 LEDs for status of the digital outputs
Fault indication	broken line, shorted circuit, over temperature, overcurrent
Operating and environmental conditions	
Temperature ranges	
Operation	32 °F … 122 °F (0 °C … 50 °C)
Storage/transport	-13 °F … 158 °F (-25 °C … 70 °C)
Installation position	vertical, plugged into backplane
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
MTBF[1)]	1,417,369 hours / 161 years
Dimensions (width x height x depth)	43 mm x 214 mm x 148 mm
Weight (incl. packaging)	1.1 kg

[1)] according to Telcordia Issue 3 (SR232) Reliability Prediction Procedure of Electronic Equipment (Issue 3 Jan. 2011)

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[2)]
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 type	2 x 16-pin multi-pin connector; clamp-type terminal (0.2 mm^2 to 2.5 mm^2), screw connection, included in delivery
Protective 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
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

[2)] deviating switching frequency with ibaLogic (up to 1 kHz) and ibaPDA (up to 20 Hz)

11.3 Decalaration of conformity

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

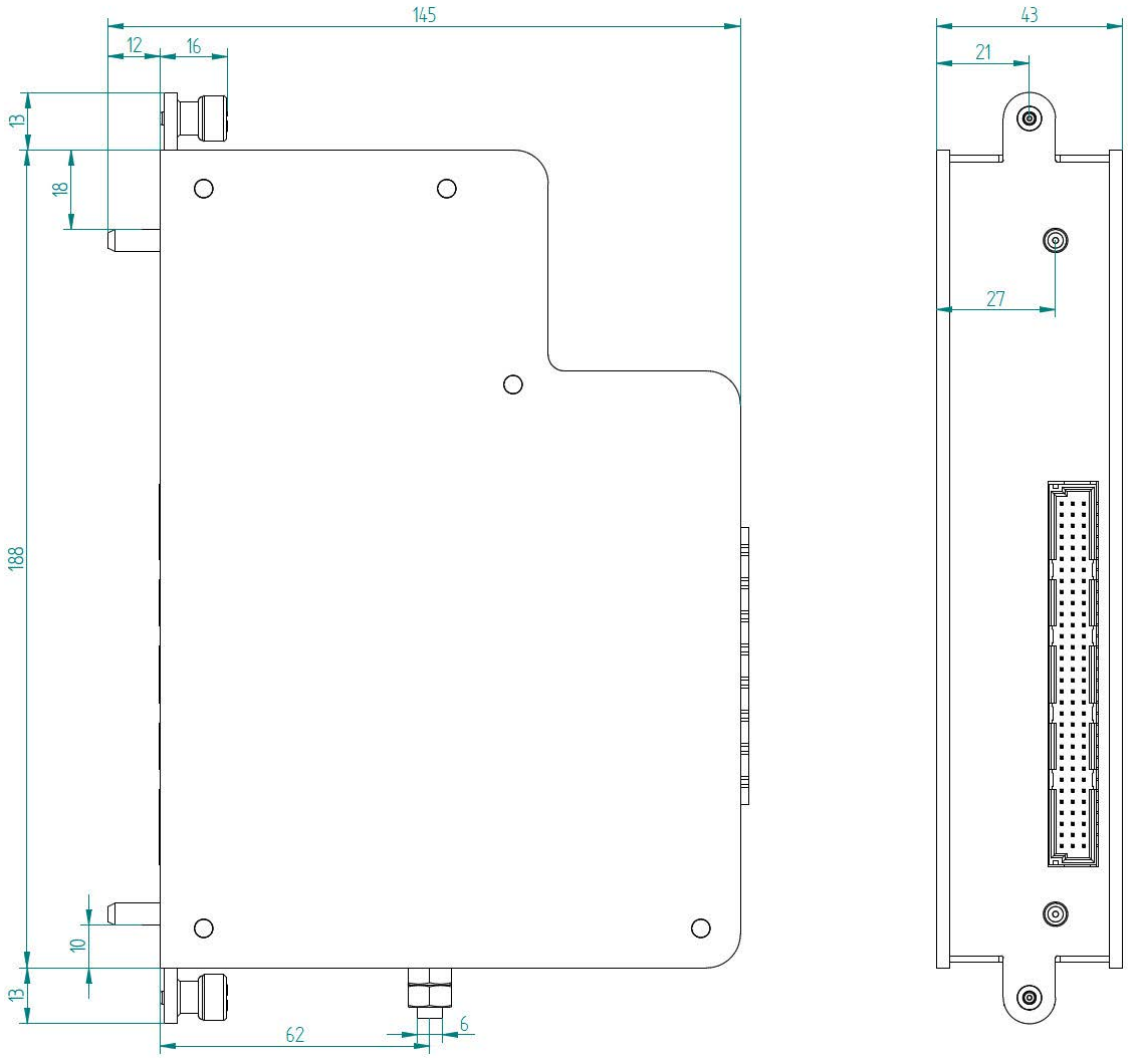
(770) 886-2318-102

www.iba-america.com

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.

11.4 Dimensions



Module dimensions (in mm)

12 Support and contact

Support

Phone: +49 911 97282-14

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

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