

# X67DO1332

## 1 General information

The module is a digital output module for 24 VDC. It has 8 outputs for the source output circuit.

- 8 A summation current per module
- All outputs with single-channel diagnostics for short circuit or overload
- Extremely short cycle times
- Outputs with short circuit protection
- Integrated protection for switching inductances

## 2 Order data

Model number	Short description	Figure
X67DO1332	<b>Digital output modules</b> X67 digital output module, 8 outputs, 24 VDC, 2 A, readable output status	

Table 1: X67DO1332 - Order data

Required accessories
For a general overview, see section "Accessories - General overview" of the X67 system user's manual.

### 3 Technical data

<b>Model number</b>	<b>X67DO1332</b>
<b>Short description</b>	
I/O module	8 digital outputs 24 VDC
<b>General information</b>	
B&R ID code	0x1467
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
Outputs	Yes, using status LED and software
I/O power supply	Yes, using status LED
Connection type	
X2X Link	M12, B-keyed
Outputs	8x M8, 3-pin
I/O power supply	M8, 4-pin
Power consumption	
Internal I/O	2 W
X2X Link power supply	0.75 W
Certifications	
CE	Yes
KC	Yes
EAC	Yes
UL	cULus E115267 Industrial control equipment
HazLoc	cCSAus 244665 Process control equipment for hazardous locations Class I, Division 2, Groups ABCD, T5
ATEX	Zone 2, II 3G Ex nA IIA T5 Gc IP67, Ta = 0 - Max. 60°C TÜV 05 ATEX 7201X
<b>I/O power supply</b>	
Nominal voltage	24 VDC
Voltage range	18 to 30 VDC
Integrated protection	Reverse polarity protection
Power consumption	
Actuator power supply	Max. 12 W <sup>1)</sup>
<b>Digital outputs</b>	
Quantity	8 <sup>2)</sup>
Variant	FET positive switching
Nominal voltage	24 VDC
Switching voltage	I/O power supply minus residual voltage
Nominal output current	2 A
Total nominal current	8 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply
Actuator power supply	0.5 A summation current
Diagnostic status	Output monitoring with 10 ms delay
Leakage current when switched off	5 µA
Switching on after overload shutdown	Approx. 10 ms (depends on the module temperature)
Group 1	Channels 1 to 4
Group 2	Channels 5 to 8
Residual voltage	<0.5 V at 2 A nominal current
Peak short-circuit current	<21 A
Switching delay	
0 → 1	<250 µs
1 → 0	<270 µs
Switching frequency	
Resistive load	Max. 100 Hz
Braking voltage when switching off inductive loads	50 VDC
Continuous current per	
Output	Max. 2 A
Group	Max. 4 A (simultaneity factor = 50%) <sup>3)</sup>
Module	Max. 8 A
<b>Actuator power supply</b>	
Voltage	I/O power supply minus voltage drop for short circuit protection
Voltage drop for short-circuit protection at 500 mA	Max. 2 VDC
Summation current	Max. 0.5 A
Short-circuit proof	Yes
<b>Electrical properties</b>	
Electrical isolation	Channel isolated from bus Channel not isolated from channel

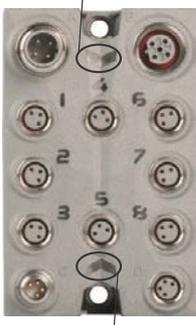
Table 2: X67DO1332 - Technical data

<b>Model number</b>	<b>X67DO1332</b>
<b>Operating conditions</b>	
Mounting orientation	
Any	Yes
Installation elevation above sea level	
0 to 2000 m	No limitations
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Degree of protection per EN 60529	IP67
<b>Ambient conditions</b>	
Temperature	
Operation	-25 to 60°C
Derating	See section "Derating"
Storage	-40 to 85°C
Transport	-40 to 85°C
<b>Mechanical properties</b>	
Dimensions	
Width	53 mm
Height	85 mm
Depth	42 mm
Weight	180 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Table 2: X67DO1332 - Technical data

- 1) The power consumption of the actuators connected to the module is not permitted to exceed 12 W.
- 2) In 2 groups of 4 channels each
- 3) Simultaneous factor = 50%: A maximum 2 of 4 outputs in a group are allowed to be fully loaded at the same time.

## 4 LED status indicators

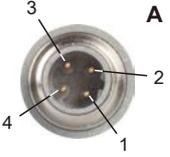
Figure	LED	Color/Status	Description	
 <p>Status indicator 1: Left: green; Right: red</p> <p>Status indicator 2: Left: green; Right: red</p>	<b>Status indicator 1: Status indicator for X2X Link</b>			
	<b>LED</b>	<b>Green</b>	<b>Red</b>	<b>Description</b>
		Off	Off	No power supply via X2X Link
		On	Off	X2X Link supplied, communication OK
		Off	On	X2X Link supplied but X2X Link communication not functioning
		On	On	PREOPERATIONAL: X2X Link supplied, module not initialized
	<b>I/O LEDs</b>			
	<b>LED</b>	<b>Color</b>	<b>Status</b>	<b>Description</b>
	1 - 8	Orange	-	Output status of the corresponding digital output
	<b>Status indicator 2: Status indicator for module function</b>			
	<b>LED</b>	<b>Color</b>	<b>Status</b>	<b>Description</b>
	Left	Green	Off	No power to module
			Single flash	RESET mode
			Blinking	PREOPERATIONAL mode
			On	RUN mode
Right	Red	Off	No power to module or everything OK	
		On	Error or reset status	
		Single flash	Warning/Error on an I/O channel. Level monitoring for digital outputs has been triggered.	

## 5 Connection elements

	X2X Link Connection A: Input Connection B: Output
	Digital outputs 1 to 8
	24 VDC I/O power supply Connection C: Supply Connection D: Routing

## 6 X2X Link

This module is connected to X2X Link using pre-assembled cables. The connection is made using M12 circular connectors.

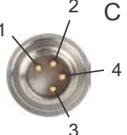
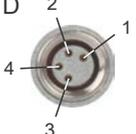
Connection	Pinout	
	Pin	Description
 	1	X2X+
	2	X2X
	3	X2X <sub>L</sub>
	4	X2X <sub>I</sub>
Shield connection made via threaded insert in the module.		
A → B-keyed (male), input B → B-keyed (female), output		

## 7 24 VDC I/O power supply

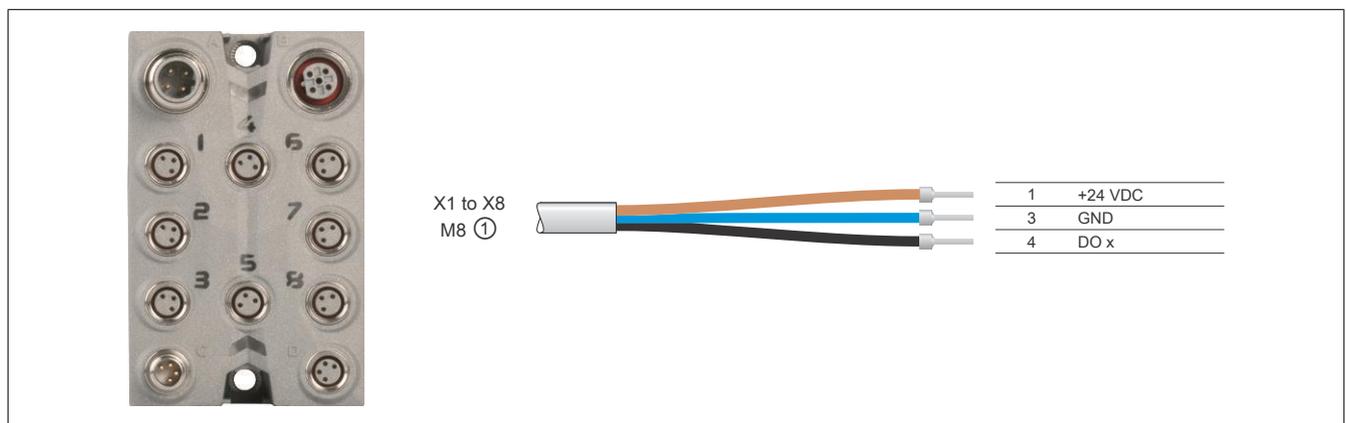
The I/O power supply is connected via M8 connectors C and D. The I/O power supply is connected via connector C (male). Connector D (female) is used to route the I/O power supply to other modules.

### Information:

**The maximum permissible current for the I/O power supply is 8 A (4 A per connection pin)!**

Connection	Pinout	
	Pin	Description
 	1	24 VDC
	2	24 VDC
	3	GND
	4	GND
C → Connector (male) in module, feed for I/O power supply D → Connection (female) in module, routing of I/O power supply		

## 8 Pinout



- ① X67CA0D40.xxxx: M8 sensor cable, straight  
X67CA0D50.xxxx: M8 sensor cable, angled

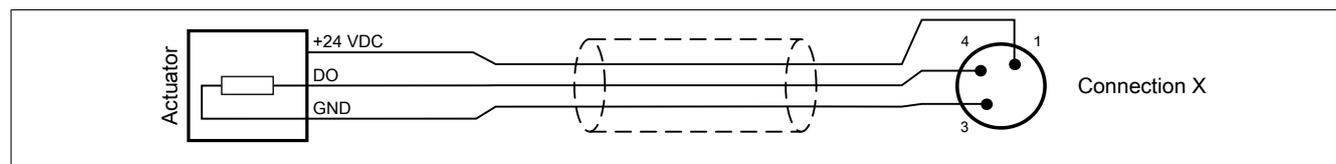
## 8.1 Connections X1 to X8

M8, 3-pin	Pinout	
	Pin	Name
	1	24 VDC actuator supply <sup>1)</sup>
	3	GND
	4	Output

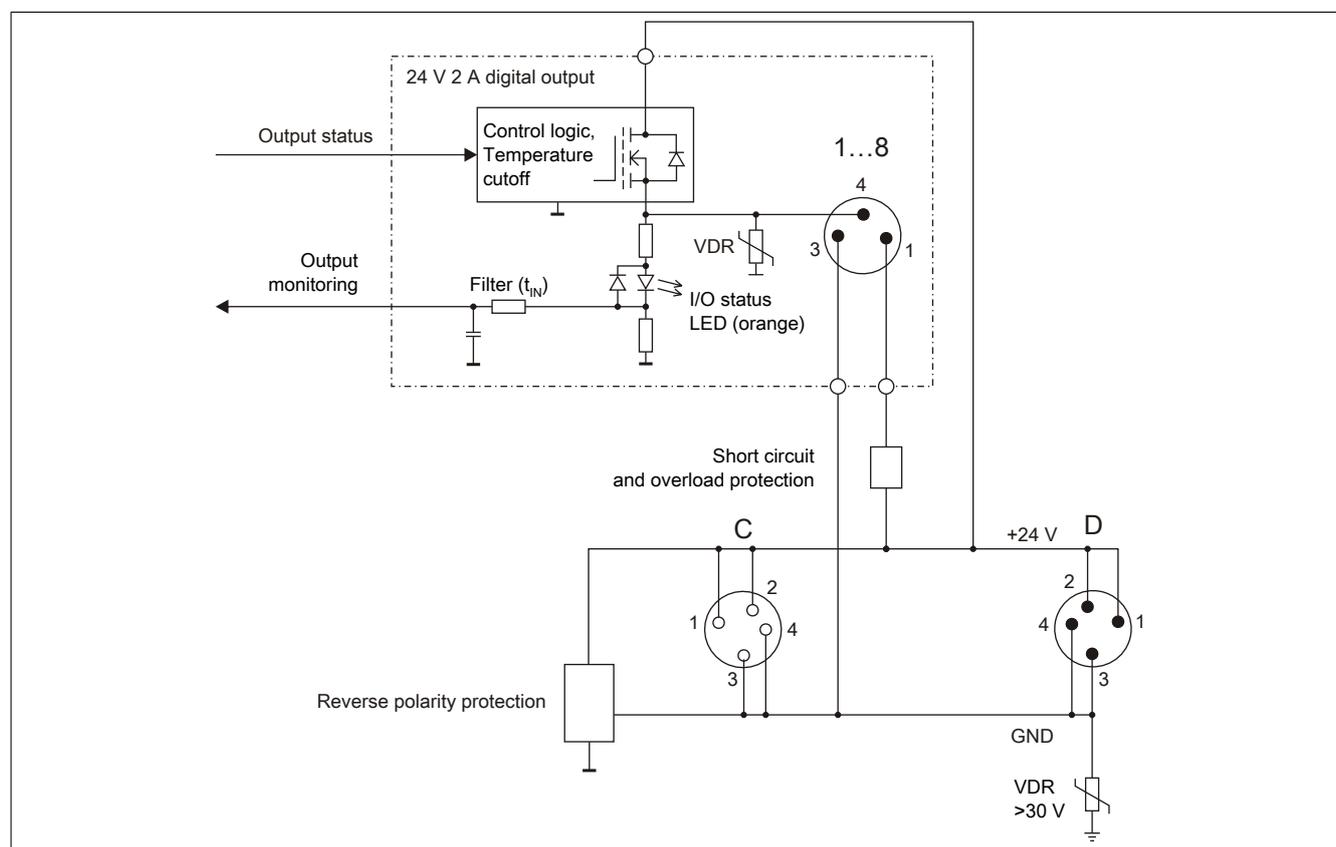
1) Actuators are not permitted to be supplied externally.

Connections (female), output

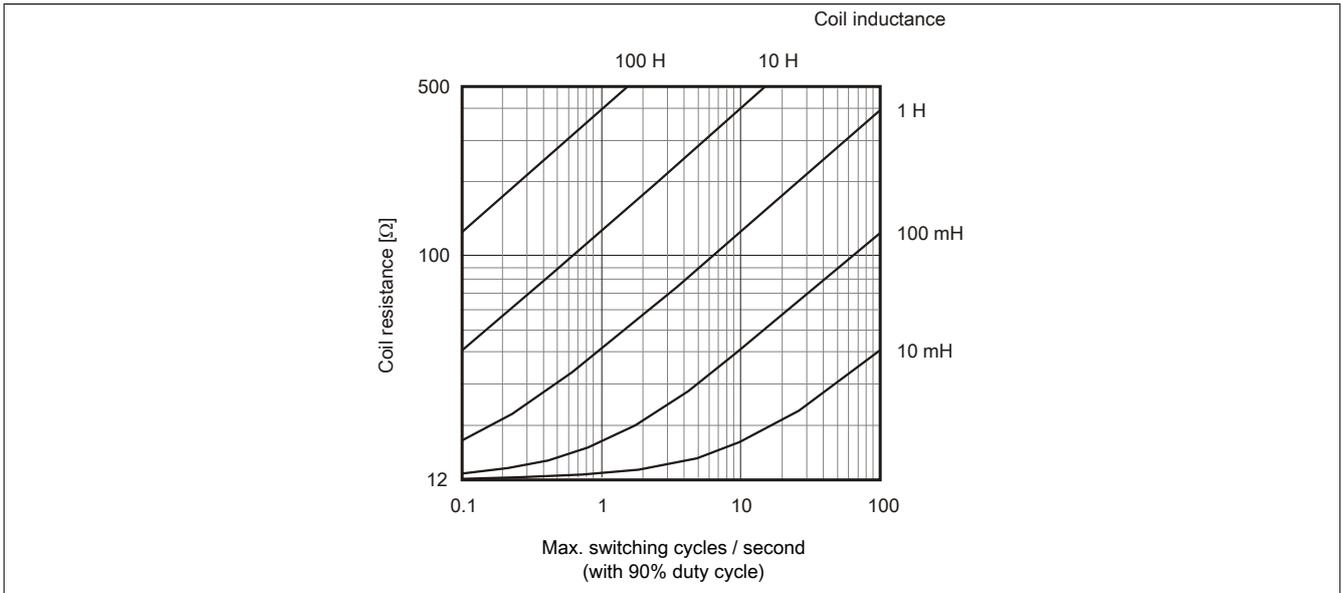
## 9 Connection example



## 10 Output circuit diagram



## 11 Switching inductive loads



## 12 Derating / Operation with 2 A

The outputs of the module can handle up to 2 A. With a summation current of 8 A, no more than 4 channels are operable at full load. To ensure optimal use of the module, it is important to assign the channels properly, and to keep in mind a potential derating.

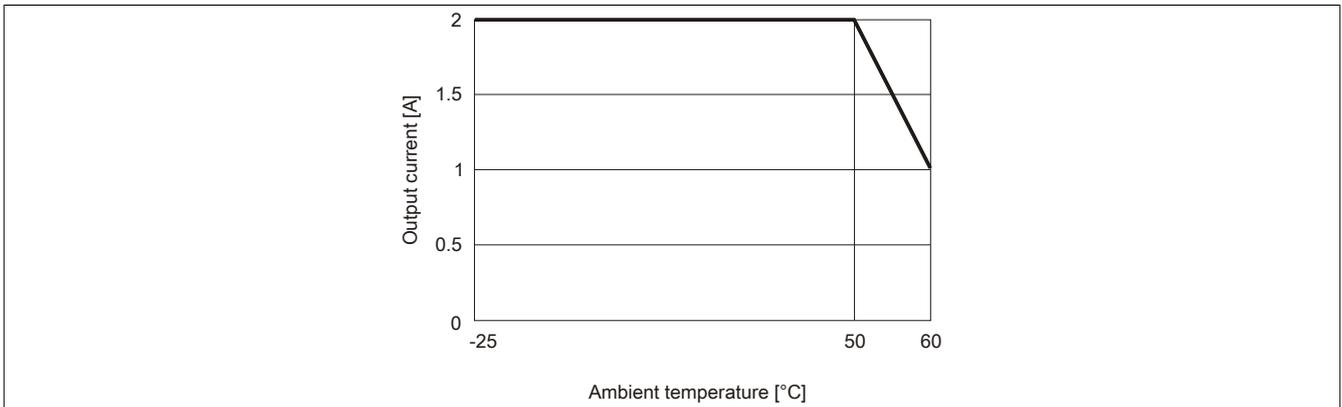
Correct channel assignment is important, since the 8 outputs are divided between 2 output drivers. The channels operated with 2 A must therefore be evenly divided between both output drivers.

- Output driver 1: Channels 1 to 4
- Output driver 2: Channels 5 to 8

The following table provides an overview of the number of fully used channels, the resulting best distribution, and a potential derating.

Number of channels using 2 A	Division	Derating
1	Any	No
2	1st channel with 2 A ... channel no. 1 to 4 2nd channel with 2 A ... channel no. 5 to 8	No
3	Assign all even or all odd channel numbers. Examples: 1, 3, 5 2, 4, 6 3, 5, 7 4, 6, 8	Channels 1 and 3 Channels 2 and 4 Channels 5 and 7 Channels 6 and 8
4	Assign all even or all odd channel numbers. Possible divisions: 1, 3, 5, 7 2, 4, 6, 8	On each channel On each channel

Derating when 3 or 4 channels are operated with 2 A:



## 13 Register description

### 13.1 General data points

In addition to the registers listed in the register description, the module also has other more general data points. These registers are not specific to the module but contain general information such as serial number and hardware version.

These general data points are listed in section "Additional information - General data points" of the X67 system user's manual.

### 13.2 Function model 0 - Standard

Register	Name	Data type	Read		Write	
			Cyclic	Acyclic	Cyclic	Acyclic
<b>Digital signal - Communication</b>						
2	Switching state of digital outputs 1 to 8	USINT			•	
	DigitalOutput01	Bit 0				
	...	...				
30	Status of digital outputs 1 to 8	USINT	•			
	StatusDigitalOutput01	Bit 0				
	...	...				
8192	asy_ModulID	UINT		•		

### 13.3 Function model 254 - Bus controller

Register	Offset <sup>1)</sup>	Name	Data type	Read		Write	
				Cyclic	Acyclic	Cyclic	Acyclic
<b>Digital signal - Communication</b>							
0	2	Switching state of digital outputs 1 to 8	USINT			•	
		DigitalOutput01	Bit 0				
		...	...				
30	-	Status of digital outputs 1 to 8	USINT		•		
		StatusDigitalOutput01	Bit 0				
		...	...				
8192	-	asy_ModulID	UINT		•		

1) The offset specifies the position of the register within the CAN object.

#### 13.3.1 Using the module on the bus controller

Function model 254 "Bus controller" is used by default only by non-configurable bus controllers. All other bus controllers can use additional registers and functions depending on the fieldbus used.

For detailed information, see section "Additional information - Using I/O modules on the bus controller" of the X67 user's manual (version 3.30 or later).

#### 13.3.2 CAN I/O bus controller

The module occupies 1 digital logical slot on CAN I/O.

## 13.4 Digital signal - Communication

### 13.4.1 Digital outputs

The output status is transferred to the output channels with a fixed offset in relation to the network cycle (SyncOut).

#### 13.4.1.1 Switching state of digital outputs 1 to 8

Name:

DigitalOutput01 to DigitalOutput08

This register is used to store the switching state of digital outputs 1 to 8.

Data type	Values
USINT	See the bit structure.

Bit structure:

Bit	Name	Value	Information
0	DigitalOutput01	0	Digital output 01 reset
		1	Digital output 01 set
...		...	
7	DigitalOutput08	0	Digital output 08 reset
		1	Digital output 08 set

#### 13.4.2 Monitoring status of the digital outputs

On the module, the output states of the outputs are compared to the target states. The control of the output driver is used for the target state.

A change in the output state resets monitoring for that output. The status of each individual channel can be read. A change in the monitoring status generates an error message.

##### 13.4.2.1 Status of digital outputs 1 to 8

Name:

StatusDigitalOutput01 to StatusDigitalOutput08

This register is used to indicate the status of digital outputs 1 to 8.

Data type	Values
USINT	See the bit structure.

Bit structure:

Bit	Name	Value	Information
0	StatusDigitalOutput01	0	Channel 01: No error
		1	Channel 01: Short circuit or overload
...		...	
7	StatusDigitalOutput08	0	Channel 08: No error
		1	Channel 08: Short circuit or overload

#### 13.4.3 Reading the module ID

Name:

asy\_ModulID

This register offers the possibility to read the module ID.

Data type	Values
UINT	Module ID

### 13.5 Minimum cycle time

The minimum cycle time specifies the time up to which the bus cycle can be reduced without communication errors occurring. It is important to note that very fast cycles reduce the idle time available for handling monitoring, diagnostics and acyclic commands.

Minimum cycle time
150 $\mu$ s

### 13.6 Minimum I/O update time

The minimum I/O update time defines how far the bus cycle can be reduced while still allowing an I/O update to take place in each cycle.

Minimum I/O update time
150 $\mu$ s