

X67DI1371.L12

1 General information

This module is a digital input module with high component density. The module is equipped with 16 inputs and M12 connectors.

- 16 digital inputs
- For all standard sensors with M12 connectors
- 1:1 replacement for passive distributors
- Extremely short cycle times
- Integrated sensor supply with short circuit protection

2 Order data

Model number	Short description	Figure
	Digital input modules	
X67DI1371.L12	X67 digital input module, 16 inputs, 24 VDC, sink, input filter 1 ms, M12 connectors, high-density module	

Table 1: X67DI1371.L12 - Order data

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

3 Technical data

Model number	X67DI1371.L12
Short description	
I/O module	16 digital inputs 24 VDC
General information	
B&R ID code	0x1A1B
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O power supply	Yes, using status LED
Connection type	
X2X Link	M12, B-keyed
Inputs	8x M12, A-keyed
I/O power supply	M8, 4-pin
Power consumption	
Internal I/O	0.5 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
I/O power supply	
Nominal voltage	24 VDC
Voltage range	18 to 30 VDC
Integrated protection	Reverse polarity protection
Power consumption	
Sensor power supply	Max. 12 W ¹⁾
Digital inputs	
Nominal voltage	24 VDC
Input voltage	18 to 30 VDC
Input current at 24 VDC	Typ. 7 mA
Input characteristics per EN 61131-2	Type 1
Input filter	
Hardware	≤100 µs
Software	1 ms
Input circuit	Sink
Input resistance	Typ. 3 kΩ
Sensor power supply	0.5 A summation current
Switching threshold	
Low	<5 VDC
High	>15 VDC
Isolation voltage between channel and bus	500 V _{Eff}
Sensor power supply	
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
Electrical properties	
Electrical isolation	Channel isolated from bus Channel not isolated from channel
Operating conditions	
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
Ambient conditions	
Temperature	
Operation	-25 to 60°C
Derating	-
Storage	-40 to 85°C
Transport	-40 to 85°C

Table 2: X67DI1371.L12 - Technical data

Model number	X67DI1371.L12
Mechanical properties	
Dimensions	
Width	53 mm
Height	155 mm
Depth	42 mm
Weight	320 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Table 2: X67DI1371.L12 - Technical data

- 1) The power consumption of the sensors and actuators connected to the module is not permitted to exceed 12 W.

4 LED status indicators

Figure

Status indicator 1:
Left: green, Right: red

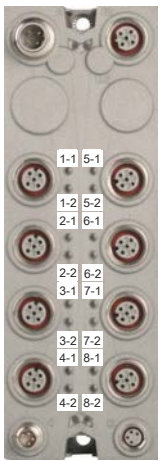


Status indicator 2:
Left: green, Right: red

LED	Color/Status		Description
Status indicator 1: Status indicator for X2X Link			
LED	Green (left)	Red (right)	Description
	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
I/O LEDs			
LED	Color	Status	Description
1/1 - 8/2	Green	-	Input state of the corresponding digital input
Status indicator 2: Status indicator for module function			
LED	Color	Status	Description
Left	Green	Off	No power to module
		Single flash	RESET mode
		Double flash	BOOT mode (during firmware update) ¹⁾
		Blinking	PREOPERATIONAL mode
		On	RUN mode
Right	Red	Off	No power to module or everything OK
		On	Error or reset status

- 1) Depending on the configuration, a firmware update can take up to several minutes.

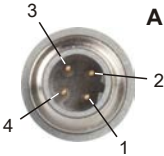
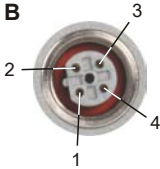
5 Connection elements

		X2X Link Connection A: Input Connection B: Output Digital inputs 1 to 16 24 VDC I/O power supply Connection C: Supply Connection D: Routing
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Left side / Channels 1 to 8 in the first byte		Right side / Channels 9 to 16 in the second byte	
Channel	Connection	Connection	Channel
1	1-1	5-1	9
2	1-2	5-2	10
...	...	...	...
7	4-1	8-1	15
8	4-2	8-2	16

6 X2X Link

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

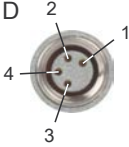
Connection	Pinout	
	Pin	Description
	1	X2X+
	2	X2X
	3	X2X⊥
	4	X2X⊥
	Shield connection made via threaded insert in the module.	
	A → B-keyed (male), input	
	B → B-keyed (female), output	

7 24 VDC I/O power supply

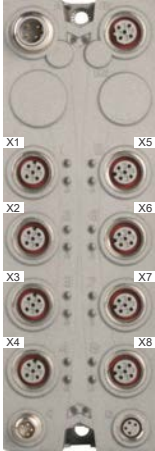
The I/O power supply is connected via M8 connectors C and D. The I/O power supply is connected via connector C (male). Connector D (female) is used to route the I/O power supply to other modules.

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



X1 to X8
M12 ①



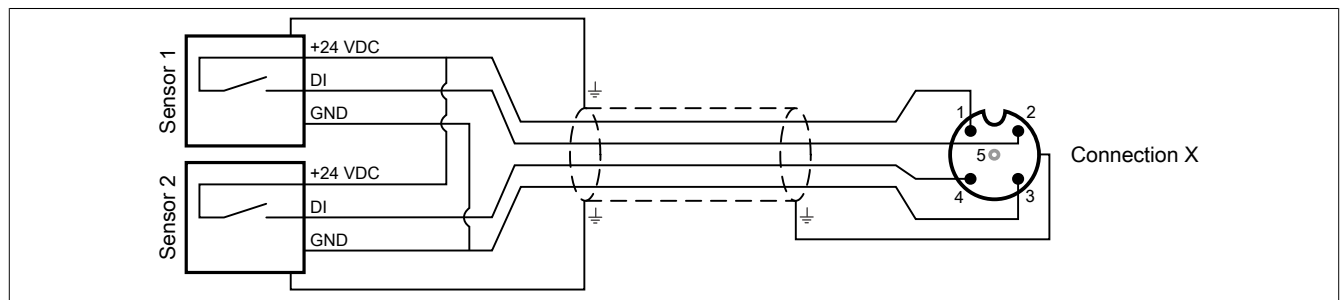
Shield	
1	+24 VDC
2	DI x-1
3	GND
4	DI x-2
5	NC

- ① X67CA0A41.xxxx: M12 sensor cable, straight
- X67CA0A51.xxxx: M12 sensor cable, angled

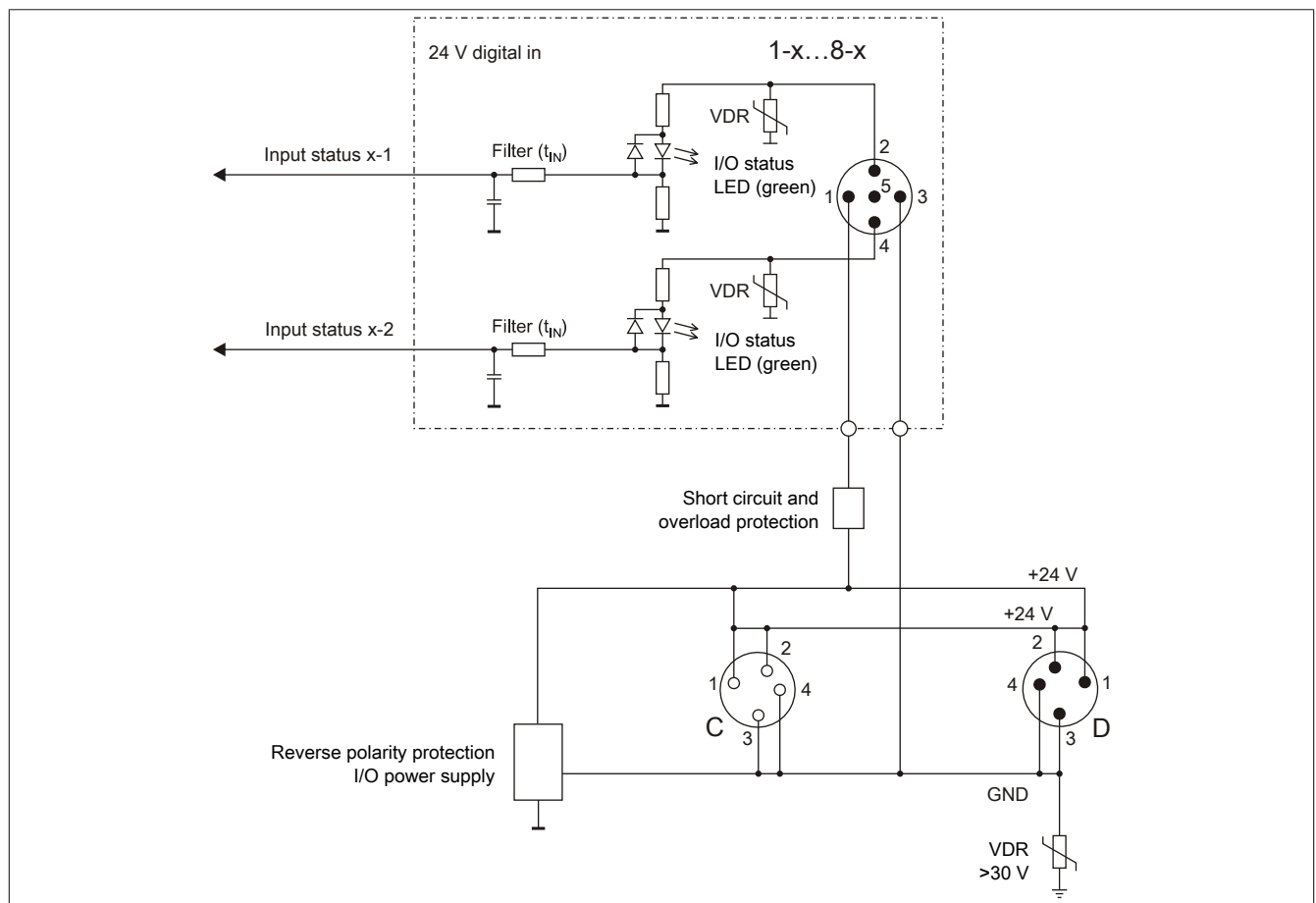
8.1 Connections X1 to X8

M12, 5-pin	Pinout	
	Pin	Name
	1	24 VDC sensor supply ¹⁾
	2	Input 1
	3	GND
	4	Input 2
	5	NC
Shield connection made via threaded insert in the module 1) Sensors are not permitted to be supplied externally. Connections → A-keyed (female), input		

9 Connection example



10 Input circuit diagram



11 Register description

11.1 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.

11.2 Function model 0 - Standard

Register	Name	Data type	Read		Write	
			Cyclic	Acyclic	Cyclic	Acyclic
Digital signal - Communication						
0	Input state of digital inputs 1 to 8	USINT	●			
	DigitalInput01	Bit 0				
	...	...				
	DigitalInput08	Bit 7				
1	Input state of digital inputs 9 to 16	USINT	●			
	DigitalInput09	Bit 0				
	...	...				
	DigitalInput16	Bit 7				
8192	asy_ModulID	UINT		●		

11.3 Function model 254 - Bus controller

Register	Offset ¹⁾	Name	Data type	Read		Write	
				Cyclic	Acyclic	Cyclic	Acyclic
Digital signal - Communication							
0	0	Input state of digital inputs 1 to 8	USINT	●			
		DigitalInput01	Bit 0				
		...	...				
		DigitalInput08	Bit 7				
1	1	Input state of digital inputs 9 to 16	USINT	●			
		DigitalInput09	Bit 0				
		...	...				
		DigitalInput16	Bit 7				
8192	-	asy_ModulID	UINT		●		

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

11.3.1 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).

11.3.2 CAN I/O bus controller

The module occupies 2 digital logical slots on CAN I/O.

11.4 Digital signal - Communication

11.4.1 Digital inputs

Filtered

The filtered status is collected with a fixed offset to the network cycle and transferred in the same cycle.

11.4.1.1 Input state of digital inputs 1 to 8

Name:

DigitalInput01 to DigitalInput08

This register indicates the input state of digital inputs 1 to 8.

Data type	Values
USINT	See the bit structure.

Bit structure:

Bit	Name	Value	Information
0	DigitalInput01	0 or 1	Input state - Digital input 1
...		...	
7	DigitalInput08	0 or 1	Input state - Digital input 8

11.4.1.2 Input state of digital inputs 9 to 16

Name:

DigitalInput09 to DigitalInput16

This register indicates the input state of digital inputs 9 to 16.

Data type	Values
USINT	See the bit structure.

Bit structure:

Bit	Name	Value	Information
0	DigitalInput09	0 or 1	Input state - Digital input 9
...		...	
7	DigitalInput16	0 or 1	Input state - Digital input 16

11.4.2 Reading the module ID

Name:

asy_ModulID

This register offers the possibility to read the module ID.

Data type	Values
UINT	Module ID

11.5 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 µs

11.6 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 µs