

X20DI2371

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Version history

B&R makes every effort to keep documents as current as possible. The most current versions are available for download on the B&R website (www.br-automation.com).

1 General information

1.1 Other applicable documents

For additional and supplementary information, see the following documents.

Other applicable documents

Document name	Title	
MAX20	X20 System user's manual	
MAEMV Installations / EMV guide		

1.2 Order data

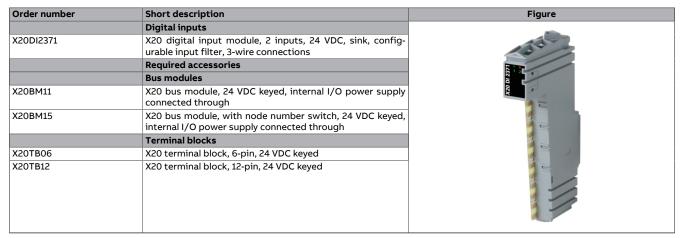


Table 1: X20DI2371 - Order data

1.3 Module description

The module is equipped with 2 inputs for 3-wire connections.

This module is designed for X20 6-pin terminal blocks. If needed (e.g. for logistical reasons), the 12-pin terminal block can also be used.

· 24 VDC and GND for the sensor power supply

Functions:

· Digital inputs

Digital inputs

The digital inputs are equipped with an input filter with a configurable input delay.

2 Technical description

2.1 Technical data

Short description 2 digital inputs 24 VDC for 3-wire connections	Order number	X20DI2371
Sentral Information	Short description	
BRITLO code Status indicators I/O function per channel, operating state, module status	I/O module	2 digital inputs 24 VDC for 3-wire connections
Status indicators Module run/error Wes, using LED status indicator and software	General information	
Diagnostics Module run/error Power consumption Bus Internal I/O Additional power dissipation caused by actua- tors (resistive) [W] Certifications CE UKCA ATEX ATEX ATEX ATEX ATEX ATEX ATEX ATE	B&R ID code	0x1B8D
Diagnostics Module run/error Power consumption Bus Internal I/O Additional power dissipation caused by actua- tors (resistive) [W] Certifications CE UKCA ATEX ATEX ATEX ATEX ATEX ATEX ATEX ATE	Status indicators	I/O function per channel, operating state, module status
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Rower consumption Bus 0.12 W Internal I/O 0.29 W Additional power dissipation caused by actual tors (resistive) [W] Certifications Yes Ves	3	Yes, using LED status indicator and software
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Certifications		
MCA		
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Table 2: X20DI2371 - Technical data

Order number	X20DI2371
Operating conditions	
Mounting orientation	
Horizontal	Yes
Vertical	Yes
Installation elevation above sea level	
0 to 2000 m	No limitation
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Degree of protection per EN 60529	IP20
Ambient conditions	
Temperature	
Operation	
Horizontal mounting orientation	-25 to 60°C
Vertical mounting orientation	-25 to 50°C
Derating	
Storage	-40 to 85°C
Transport	-40 to 85°C
Relative humidity	
Operation	5 to 95%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
Mechanical properties	
Note	Order 1x terminal block X20TB06 or X20TB12 separately. Order 1x bus module X20BM11 separately.
Pitch	12.5 ^{+0.2} mm

Table 2: X20DI2371 - Technical data

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

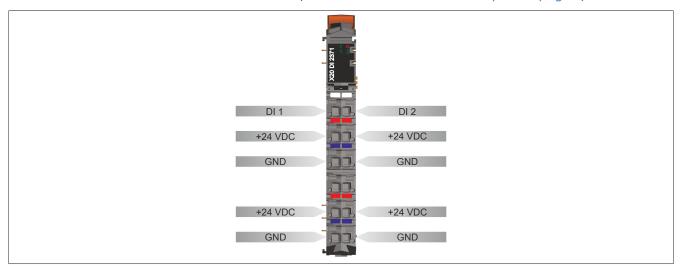
2.2 Status LEDs

For a description of the various operating modes, see section "Additional information - Diagnostic LEDs" in the X20 System user's manual.

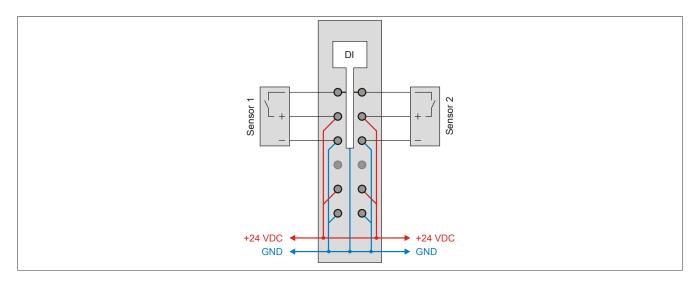
Image	LED	Color	Status	Description
	r	Green	Off	No power to module
			Single flash	RESET mode
			Blinking	PREOPERATIONAL mode
			On	RUN mode
LES 1 2 5	е	Red	Off	Module supply not connected or everything OK
	e + r	Red on / Greer	n single flash	Invalid firmware
X20 E	1-2	Green		Input status of the corresponding digital input
THE RESIDENCE OF THE PARTY OF T				

2.3 Pinout

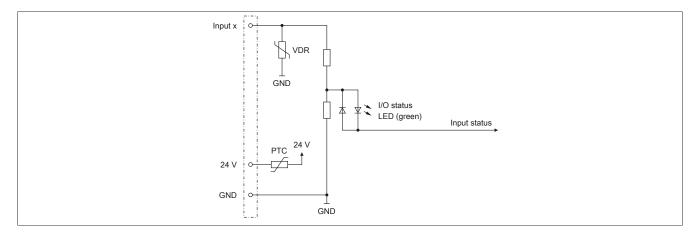
Auxiliary contacts are provided on the module for easy wiring. VDC and GND contacts are internally connected and can be loaded with a total of 0.5 A (see section "Connection example" on page 6).



2.4 Connection example



2.5 Input circuit diagram



3 Function description

3.1 Digital inputs

The module is equipped with 2 digital input channels.

3.1.1 Recording the input state

Unfiltered

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

Filtered

The filtered state is collected with a fixed offset to the network cycle and transferred in the same cycle. Filtering takes place asynchronously to the network in multiples of 200 μ s with a network-related jitter of up to 50 μ s.

Packed outputs (only function model 0 - Standard)

Setting "Packed inputs" in the Automation Studio I/O configuration can be used to determine whether all bits of the register should be applied as individual data points in the Automation Studio I/O mapping ("DigitalInput01 to DigitalInputxx") or whether the register should be displayed as a single USINT data point ("DigitalInput").

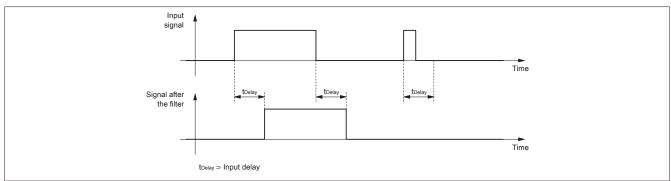


Information:

The register is described in "Input status of digital inputs 1 to 2" on page 10.

3.1.2 Input filter

An input filter is available for each input. Disturbance pulses that are shorter than the input delay are suppressed by the input filter.



The input delay can be set in steps of 100 μ s. It makes sense, however, to enter values in steps of 2 since the input signals are sampled in an interval of 200 μ s.

Values	Filter
0	No software filter
2	0.2 ms
250	25 ms - Higher values are limited to this value.



Information:

The register is described in "Digital input filter" on page 10.

4 Commissioning

4.1 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 other registers and functions depending on the fieldbus used.

For detailed information, see section "Additional information - Using I/O modules on the bus controller" in the X20 user's manual (version 3.50 or later).

4.1.1 CAN I/O bus controller

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

5 Register description

5.1 General data points

In addition to the registers described in the register description, the module has additional general data points. These are not module-specific but contain general information such as serial number and hardware variant.

General data points are described in section "Additional information - General data points" in the X20 System user's manual.

5.2 Function model 0 - Standard

Register	Fixed offset	Name	Data type	Read		Wr	Write	
				Cyclic	Acyclic	Cyclic	Acyclic	
Configuration	ì							
18	-	ConfigOutput01 (input filter)	USINT				•	
Communicati	on							
0	1	DigitalInput	USINT	•				
		DigitalInput01	Bit 0					
		DigitalInput02	Bit 1					

Fixed modules require their data points to be in a specific order in the X2X frame. Cyclic access occurs according to a predefined offset, not based on the register address.

Acyclic access continues to be based on the register numbers.

5.3 Function model 254 - Bus Controller

Register	Offset1)	Name	Data type	Read		Write	
				Cyclic	Acyclic	Cyclic	Acyclic
Configuration							
18	-	ConfigOutput01 (input filter)	USINT				•
Communication	on						
0	1	Input status of digital inputs 1 to 2	USINT	•			
		DigitalInput01	Bit 0				
		DigitalInput02	Bit 1				

1) The offset specifies where the register is within the CAN object.

5.4 Digital inputs

5.4.1 Digital input filter

Name:

ConfigOutput01

The filter value for all digital inputs can be configured in this register.

Data type	Values	Filter	
USINT	0	oftware filter (bus controller default setting)	
	2 0.2 ms		
	250	25 ms - Higher values are limited to this value.	

5.4.2 Input status of digital inputs 1 to 2

Name:

DigitalInput or

DigitalInput01 to DigitalInput02

This register contains the input state of digital inputs 1 to 2.

Data type	Value	Information ¹⁾	
USINT	0 to 3	0 to 3 Packed inputs = On	
		Data point: "DigitalInput"	
	See the bit structure.	Packed inputs = Off or function model ≠ 0 - Standard	
		Data points: "DigitalInput01" to "DigitalInput02"	

¹⁾ See "Digital inputs - Record input status" on page 7.

Bit structure:

Bit	Name	Value	Information
0	DigitalInput01	0 or 1	Input status - Digital input 1
1	DigitalInput02	0 or 1	Input state - Digital input 2

5.5 Minimum cycle time

The minimum cycle time specifies how far 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	
Without filtering	100 μs
With filtering	150 μs

5.6 Minimum I/O update time

The minimum I/O update time specifies how far the bus cycle can be reduced so that an I/O update is performed in each cycle.

Minimum I/O update time		Minimum I/O update time
	Without filtering	100 μs
	With filtering	200 μs