SIGMATEK

DI 169

S-DIAS Digital Input Module

Date of creation: 23.06.2015 | Version date: 23.06.2015 | Article number: 21-006-169-E

Publisher: SIGMATEK GmbH & Co KG
A-5112 Lamprechtshausen
Tel.: 06274/4321
Fax: 06274/4321-18
Email: office@sigmatek.at
WWW.SIGMATEK-AUTOMATION.COM

Translation from German

S-DIAS DIGITAL INPUT MODULE DI 169

with 16 counter inputs

The S-DIAS digital input module DI 169 is equipped with 16 counter inputs for Open-Collector outputs. The actual input signal can be read (use as digital input - earthing switching).

To suppress noise in the signal lines, input filters are provided.

Contents

1 Technical Data

1.1 Digital Input Specifications

Number	16	
Input signal	GND switching	
Pull-up voltage	typically +24 V	maximum +30 V
Collector current	typically 2.5 mA	maximum 3.5 mA
Saturation voltage	maximum 1 V at 3 mA	
Residual current	maximum 200 µA	
Input delay	50 µs low pass 1. order	
Input frequency	maximum 1 kHz	
Counter frequency	1 kHz in normal counter mode resp. 4 kHz in incremental counter mode with 4-edge analysis	
Status display	LED (green) lights when the input signal < 1 V	

1.2 Counter Functionality

Channel	16	8
Operating modes	counter mode	1-/4-edge analysis
Resolution	8-bit	

1.3 Electrical Requirements

Voltage supply from S-DIAS bus	+5 V		+24 V	
Current consumption on the S-DIAS bus	typically 38 mA	maximum 43 mA	typically 40 mA (at +24 V)	maximum 56 mA (at +30 V)

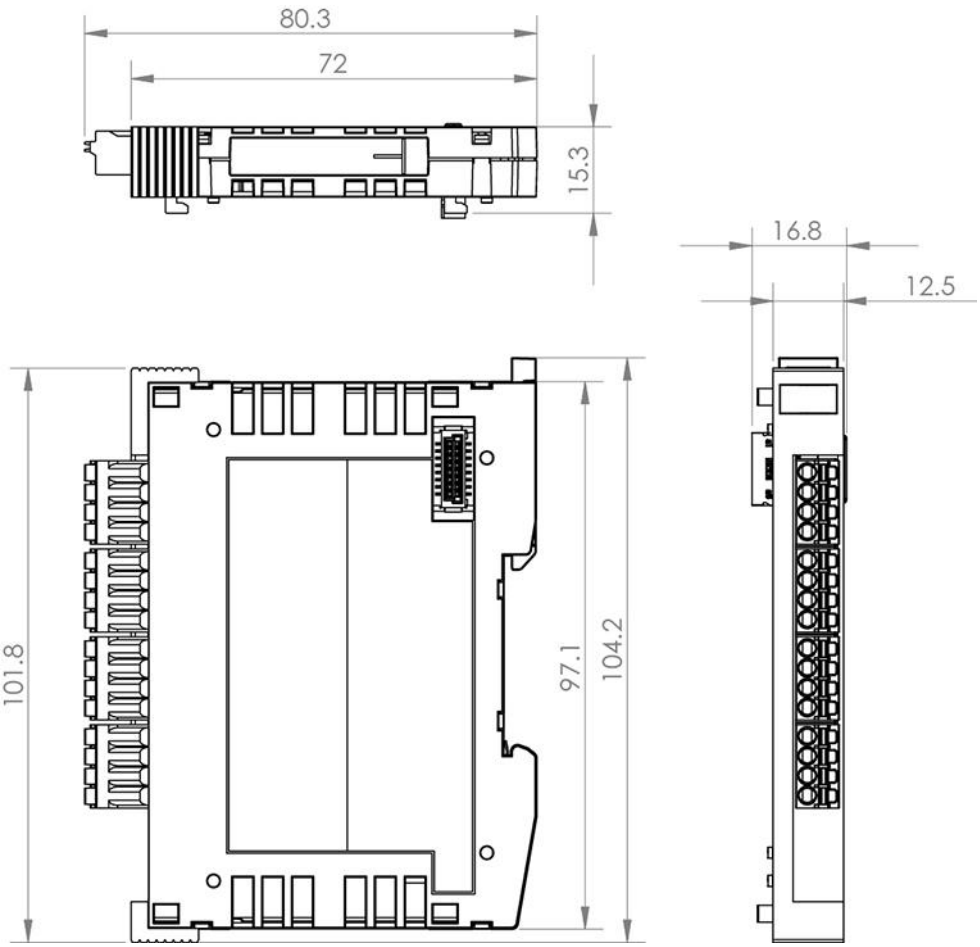
1.4 Miscellaneous

Article number	20-006-169
Hardware version	1.x
Standard	UL in preparation

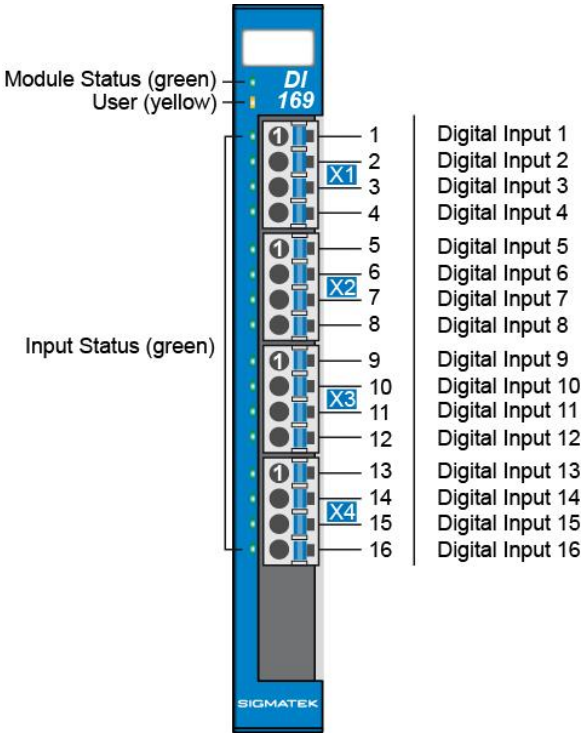
1.5 Environmental Conditions

Storage temperature	-20 ... +85 °C	
Operating temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMV resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC - noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5 Hz-8.4 Hz 1 g from 8.4 Hz-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

2 Mechanical Dimensions



3 Connector Layout



3.1 Status LEDs

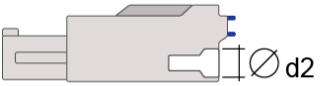
Module Status	green	ON	module active
		OFF	no supply available
		BLINKING (5 Hz)	no communication
User	yellow	ON	can be set from the application (e.g. the module LED can be set to blinking through the visualization so that the module is easily found in the control cabinet)
		OFF	
		BLINKING (2 Hz)	
		BLINKING (4 Hz)	
Input Status	green	ON	input connected to ground (1)
		OFF	input open (0)

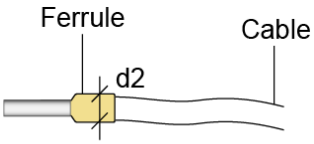
3.2 Applicable Connectors

Connectors:
X1-X4: Connectors with spring terminals (included in delivery)

Connections:

Stripping length:	10 mm
Mating direction:	parallel to the connector axis resp. parallel to the connector board
Conductor cross section rigid:	0.2-1.5 mm^2
Conductor cross section flexible:	0.2-1.5 mm^2
Conductor cross section AWG/kcmil:	24-16
Conductor cross section flexible with ferrule without with plastic sleeve:	0.25-1.5 mm^2
Conductor cross section flexible with ferrule with plastic sleeve:	0.25-0.75 mm^2 (reason for reduction d2 of the ferrule)

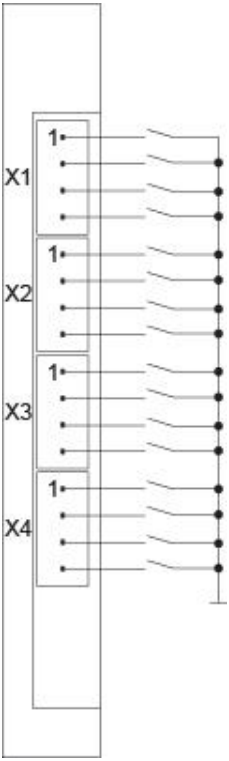




d2 = max. 2.8 mm

4 Wiring

4.1 Wiring Example



4.2 Note

The input filters, which suppress noise signals, allow operation in harsh environmental conditions. A careful wiring method is also recommended to ensure error-free function.

The following guidelines should be observed:

- Avoid parallel connections between input lines and load-bearing circuits.
- Protective circuits for all relays (RC networks or free-wheeling diodes)
- Correct wiring to ground

The ground bus should be connected to the control cabinet when possible!

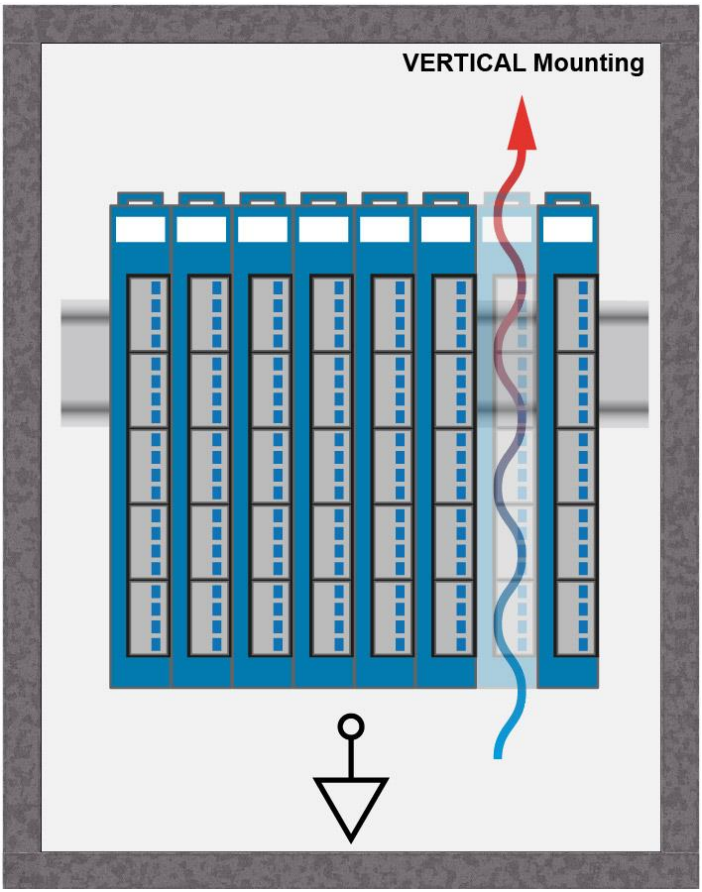
Si possible la terre doit être connectée à l'armoire de commande!

IMPORTANT:
The S-DIAS module cannot be connected/disconnected while voltage is applied!

IMPORTANT:
Le module S-Dias NE PEUT PAS être inséré ou retiré sous tension.

5 Mounting

The S-DIAS modules are designed for installation into the control cabinet. To mount the modules a DIN-rail is required. The DIN rail must establish a conductive connection with the back wall of the control cabinet. The individual S-DIAS modules are mounted on the DIN rail as a block and secured with latches. The modules must be mounted vertically with sufficient clearance between the ventilation slots of the S-DIAS module blocks and nearby components and/or the control cabinet wall. This is necessary for optimal cooling and air circulation, so that proper function up to the maximum operating temperature is ensured.



6 Addressing

Address (hex)	Size (bytes)	Access Type	Description	Reset value
Read PDO				
0000	2	r	Digital input status register	0000
0002	2	r	Latched input signal register Latched input signal (reading deletes latched edge)	0000
0004	1	r/w	Counter 1 status register (Counter status register channel 1 for mode 2 and 3)	00
0005	1	r/w	Counter 2 status register	00
0006	1	r/w	Counter 3 status register (Counter status register channel 2 for mode 2 and 3)	00
0007	1	r/w	Counter 4 status register	00
0008	1	r/w	Counter 5 status register (Counter status register channel 3 for mode 2 and 3)	00
0009	1	r/w	Counter 6 status register	00
3 m	1	r/w	Counter 7 status register (Counter status register channel 4 for mode 2 and 3)	00
3 m	1	r/w	Counter 8 status register	00
3 m	1	r/w	Counter 9 status register (Counter status register channel 5 for mode 2 and 3)	00
3 m	1	r/w	Counter 10 status register	00
3 m	1	r/w	Counter 11 status register (Counter status register channel 6 for mode 2 and 3)	00
3 m	1	r/w	Counter 12 status register	00
0010	1	r/w	Counter 13 status register (Counter status register channel 7 for mode 2 and 3)	00
0011	1	r/w	Counter 14 status register	00
0012	1	r/w	Counter 15 status register (Counter status register channel 8 for mode 2 and 3)	00
0013	1	r/w	Counter 16 status register	00

SDO				
0014	2	r/w	Latchtes input signal control register 1 Enable register rising edge Bit 0: Input 0 ‘1‘ is latched Bit 1: Input 1-	g_rising _edge_intr
0016	2	r/w	Latchtes input signal control register 2 Enable register falling edge Bit 0: Input 0 ‘1‘ is latched Bit 1: Input 1-	g_falling _edge_intr
0018	2	r/w	Counter control register 1 Enable register rising edge Bit 0: Input 0 '1' = rising edge triggers a counting impulse Bit 1: Input 1-	g_rising _edge_cnt
3 m	2	r/w	Counter control register 2 Enable register falling edge Bit 0: Input 0 '1' = fallinge dge triggers a counting impulse Bit 1: Input 1-	g_falling _edge_cnt
3 m	2	r/w	Counter control register 3 Counting direction (only mode 1) Bit0: '0' = increment counter 1 '1' = decrement counter 1, Bit1: '0' = increment counter 2 '1' = decrement counter 2, Bit2:…	g_cnt_dir

3 m	2	r/w	Counter mode: Bit 1…0: Channel 1 mode (input 1 + 2) Bit 3…2: Channel 2 mode (input 3 + 4) Bit 5…4: Channel 3 mode (input 5 + 6) Bit 7…6: Channel 4 mode (input 7 + 8) Bit 9…8: Channel 5 mode (input 9 + 10) Bit 11…10: Channel 6 mode (input 11 + 12) Bit 13…12: Channel 7 mode (input 13 + 14) Bit 15…14: Channel 8 mode (input 15 + 16) With a mode change the according channel is deleted Mode: “00” counter for each input will be increased or decreased depending on the configured control register 1 -3 (mode 1, counter mode). “10” counter will be increased or decreased with each rising edge of the first input of the channel. With the second input of the channel the counting direction is defined (mode 2, single edge analysis). “11” counter will be increased or decreased (depending on the direction) for each rising and falling edge of the two inputs (mode 3, 4 edge analysis).	g_mode_set

Documentation Changes

Change Date	Affected page(s)	Chapter	Note