HIMatrix

Safety-Related Controller

F3 DIO 16/8 01 Manual

HIMA Paul Hildebrandt GmbH + Co KG

Industrial Automation

Rev. 2.00

HI 800 177 E

3.5 Product Data

General	
Response time	≥ 10 ms
Ethernet interfaces	2 x RJ-45, 10BASE-T/100BASE-Tx with integrated switch
Operating voltage	24 VDC, -15...+20 %, r_{PP} ≤ 15 %, from a power supply unit with safe insulation in accordance with IEC 61131-2
Current input	max. 11 A (with maximum load) for UL, only 10 A allowed Idle current: 0.45 A
Fuse (external)	12 A time-lag (T)
Operating temperature	0...+60 °C
Storage temperature	-40...+85 °C
Type of protection	IP20
Max. dimensions (without plug)	Width: 205 mm (with housing screws) Height: 114 mm (with fixing bolt) Depth: 88 mm (with earth)
Weight	approx. 1.3 kg

Table 12: Product Data of F3 DIO 16/8 01

Digital inputs	
Number of inputs	16 (non-galvanically separated)
Low level: voltage current input	15...30 VDC ≥ 2 mA at 15 V
Low level: voltage current input	max. 5 VDC max. 1.5 mA (1 mA at 5 V)
Switching point	typ. 7.5 V
Switching time	250 µs
Supply	4 x LS+ minus 4 V / 40 mA, short-circuit-proof Buffered for 20 ms 2x LS+ minus 2 V / 1 A total, short-circuit-proof, unbuffered Current input: max. 1 A at 60 °C

Table 13: Specifications for the Digital Inputs

Digital outputs		
Number of outputs	8 (non-galvanically separated) 2-pole switching DO+ 2 A (inrush current typ. 10 A at 2 ms) DO- 2 A (inrush current typ. 10 A at 2 ms)	
Output voltage	≥ L+ minus voltage drop (L+ and L- leg)	
Voltage drop 2-pole outputs	max. 3 V at 2 A	
Voltage drop Outputs DO+	max. 1.5 V at 2 A	
Voltage drop Outputs DO-	max. 1.5 V at 2 A	
Output current, see also Table 11	max. 2 A at < 40 °C max. 1 A at 40…60 °C min. 10 mA	
Total permissible current	max. 8 A	
Leakage current (with low level)	max. 1 mA at 2 V	
Lamp load	max. 25 W	
Inductive load	max. 500 mH	
Line Diagnosis	Open-circuit	> 4 kΩ
	Short-circuit	< 10 Ω
Behavior upon overload	The affected output is switched off and cyclically switched on again	

Table 14: Specifications for the Digital Outputs

Pulsed outputs	
Number of outputs	2 (non-galvanically separated)
Output voltage	≥ L+ minus 4 V
Output current	approx. 60 mA
Minimum load	None
Switching time	≤ 100 µs
Behavior upon overload	2 x ≥ 19.2 V, short-circuit current 60 mA at 24 V

Table 15: Specifications for the Pulsed Outputs

3.5.1 Product Data F3 DIO 16/8 014

The F3 DIO 16/8 014 model variant is intended for use in railway applications. The electronic components are coated with a protective lacquer.

F3 DIO 16/8 014	
Operating temperature	-25…+70 °C (temperature class T1)
Output current	The output current of the digital outputs depends on the ambient temperature.

Ambient temperature	Output current
< 40 °C	2 A
40…60 °C	1 A
> 60 °C	0.5 A

Weight	approx. 1.3 kg

Table 16: Product Data of F3 DIO 16/8 014

3.6 Certified HIMatrix F3 DIO 16/8 01

Test institute	Standard, Scope
CE	EMC, ATEX Zone 2
TÜV	IEC 61508 1-7:2000 up to SIL 3 IEC 61511:2004 EN ISO 13849-1:2008 up to Cat. 4 und PL e
UL Underwriters Laboratories Inc.	ANSI/UL 508, NFPA 70 – Industrial Control Equipment CSA C22.2 No.142 UL 1998 Software Programmable Components NFPA 79 Electrical Standard for Industrial Machinery IEC 61508
FM Approvals	Class I, DIV 2, Groups A, B, C and D Class 3600, 1998 Class 3611, 1999 Class 3810, 1989 Including Supplement #1, 1995 CSA C22.2 No. 142 CSA C22.2 No. 213
TÜV CENELEC	Railway applications EN 50126: 1999 up to SIL 4 EN 50128: 2001 up to SIL 4 EN 50129: 2003 up to SIL 4

Table 17: Certificates