

3.5.1 Product Data F3 DIO 8/8 014

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

F3 DIO 8/8 014									
Operating temperature	-25...+70 °C (temperature class T1)								
Output current DO+	Channels 1...3 and 5...7: 0.5 A at ≤ 70 °C The output current of the channels 4 and 8 depends on the ambient temperature. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Ambient temperature</th> <th>Output current</th> </tr> </thead> <tbody> <tr> <td>< 40 °C</td> <td>2 A</td> </tr> <tr> <td>40...60 °C</td> <td>1 A</td> </tr> <tr> <td>> 60 °C</td> <td>0.5 A</td> </tr> </tbody> </table>	Ambient temperature	Output current	< 40 °C	2 A	40...60 °C	1 A	> 60 °C	0.5 A
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< 40 °C	2 A								
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> 60 °C	0.5 A								
Weight	approx. 1 kg								

Table 15: Product Data of F3 DIO 8/8 014

The remote I/O F3 DIO 8/8 014 meets the conditions for vibrations and shock test according to IEC 61373, category 1, class B.

3.6 Certified HIMatrix F3 DIO 8/8 01

HIMatrix F3 DIO 8/8 01	
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 application EN 50126: 1999 up to SIL 4 EN 50128: 2001 up to SIL 4 EN 50129: 2003 up to SIL 4

Table 16: Certificates

4 Start-up

To start up the remote I/O, it must be mounted, connected and configured in the programming tool.

4.1 Installation and Mounting

The remote I/O is mounted on a 35 mm DIN rail such as described in the HIMatrix system manual for compact systems.

When laying cables (long cables, in particular), take appropriate measures to avoid interference, e.g., by separating the signal lines from the power lines.

When dimensioning the cables, ensure that their electrical properties have no negative impact on the measuring circuit.

4.1.1 Connecting the Digital Inputs

Use the following terminals to connect the digital inputs:

Terminal	Designation	Function (inputs)
19	LS+	Sensor supply of the inputs 1...4
20	1	Digital input 1
21	2	Digital input 2
22	3	Digital input 3
23	4	Digital input 4
24	L-	Ground
Terminal	Designation	Function (inputs)
25	LS+	Sensor supply of the inputs 5...8
26	5	Digital input 5
27	6	Digital input 6
28	7	Digital input 7
29	8	Digital input 8
30	L-	Ground

Table 17: Terminal Assignment for the Digital Inputs

4.1.1.1 Surges on Digital Inputs

Due to the short cycle time of the HIMatrix systems, a surge pulse as described in EN 61000-4-5 can be read in to the digital inputs as a short-term high level.

The following measures ensure proper operation in environments where surges may occur:

1. Install shielded input wires
2. Program noise blanking in the user program. A signal must be present for at least two cycles before it is evaluated. The fault reaction is triggered with a corresponding delay.

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The measures specified above are not necessary if the plant design precludes surges from occurring within the system.

In particular, the design must include protective measures with respect to overvoltage, lightning, earth grounding and plant wiring in accordance with the relevant standards and the instructions specified in the system manual (HI 800 141 E or HI 800 191 E).

4.1.2 Connecting the Digital Outputs

Use the following terminals to connect the digital outputs:

Terminal	Designation	Function (outputs, DO)
4	4-	Digital output 4- (for increased load)
5	8-	Digital output 8- (for increased load)
6	S+	Ground channel group
Terminal	Designation	Function (outputs, DO+)
7	L-	Ground channel group
8	1	Digital output 1
9	2	Digital output 2
10	3	Digital output 3
11	4+	Digital output 4+ (for increased load)
12	L-	Ground channel group
Terminal	Designation	Function (outputs, DO+)
13	L-	Ground channel group
14	5	Digital output 5
15	6	Digital output 6
16	7	Digital output 7
17	8+	Digital output 8+ (for increased load)
18	L-	Ground channel group

Table 18: Terminal Assignment for the Digital Outputs

4.1.3 Connecting Pulsed Outputs

Terminal	Designation	Function (non-safe pulsed outputs TO)
1	L-	Ground
2	1	Pulsed output 1
3	2	Pulsed output 2

Table 19: Terminal Assignment for the Pulsed Outputs

4.1.4 Cable Plugs

Cable plugs attached to the pin headers of the devices are used to connect to the power supply and to the field zone. The cable plugs are included within the scope of delivery of the HIMatrix devices and modules.

The devices power supply connections feature the following properties:

Connection to the power supply	
Cable plugs	four poles, screw terminals
Wire cross-section	0.2...2.5 mm ² (single-wire) 0.2...2.5 mm ² (finely stranded) 0.2...2.5 mm ² (with wire end ferrule)
Stripping length	10 mm
Screwdriver	Slotted 0.6 x 3.5 mm
Tightening torque	0.4...0.5 Nm

Table 20: Power Supply Cable Plug Properties

Connection to the field zone	
Number of cable plugs	5 pieces, six poles, screw terminals
Wire cross-section	0.2...1.5 mm ² (single-wire) 0.2...1.5 mm ² (finely stranded) 0.2...1.5 mm ² (with wire end ferrule)
Stripping length	6 mm
Screwdriver	Slotted 0.4 x 2.5 mm
Tightening torque	0.2...0.25 Nm

Table 21: Input and Output Cable Plug Properties

4.1.5 Mounting the F3 DIO 8/8 01 in Zone 2

(EC Directive 94/9/EC, ATEX)

The remote I/O is suitable for mounting in zone 2. Refer to the corresponding declaration of conformity available on the HIMA website.

When mounting the device, observe the special conditions specified in the following section.

Specific Conditions X

1. Mount the remote I/O in an enclosure that meets the EN 60079-15 requirements and achieves a type of protection of at least IP54, in accordance with EN 60529. Provide the enclosure with the following label:

Work is only permitted in the de-energized state

Exception:

If a potentially explosive atmosphere has been precluded, work can also be performed when the controller is under voltage.

2. The enclosure in use must be able to safely dissipate the generated heat. Depending on the output load and supply voltage, the HIMatrix F3 DIO 8/8 01 has a power dissipation ranging between 9 W and 27 W.
3. Protect the HIMatrix F3 DIO 8/8 01 with a 10 A time-lag fuse. The 24 VDC power must come from a power supply unit with safe isolation. Use power supply units of type PELV or SELV only.
4. Applicable standards:

VDE 0170/0171 Part 16,	DIN EN 60079-15: 2004-5
VDE 0165 Part 1,	DIN EN 60079-14: 1998-08

Pay particular attention to the following sections:

DIN EN 60079-15:

Chapter 5	Design
Chapter 6	Terminals and cabling
Chapter 7	Air and creeping distances
Chapter 14	Connectors

DIN EN 60079-14:

Chapter 5.2.3	Equipment for use in zone 2
Chapter 9.3	Cabling for zones 1 and 2
Chapter 12.2	Equipment for zones 1 and 2

The remote I/O is additionally equipped with the label represented below:

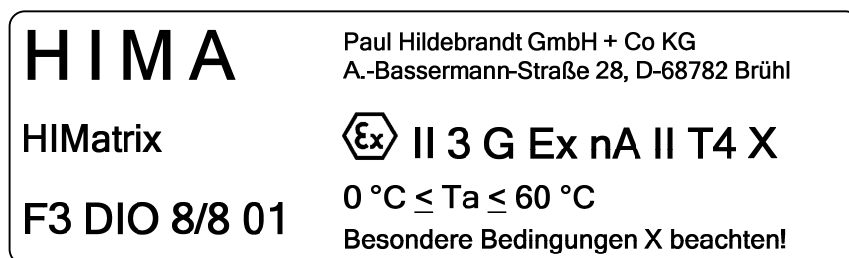


Figure 9: Label for Ex Conditions