

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6DL1131-6BH00-0PH1

HIGH AVAILABILITY DIGITAL INPUT MODULE

Used with the applicable SIMATIC ET 200SP HA DI 16 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens technical documentation for 6DL1131-6BH00-0PH1

Product overview

2.1 Properties of the I/O module DI 16x24VDC HA

View of the module

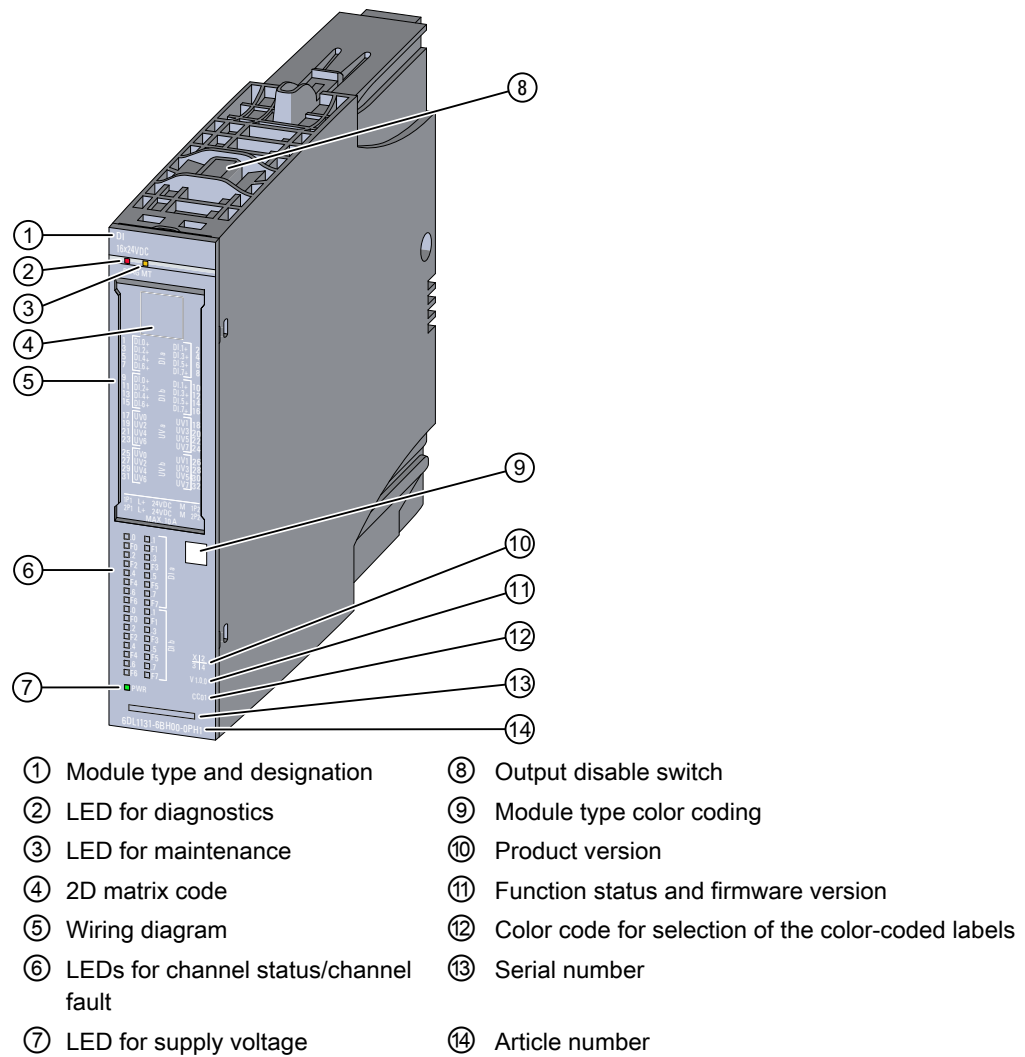


Figure 2-1 View of the DI 16x24VDC HA

Properties

The I/O module has the following technical properties:

- 16 digital inputs with the following properties that can be individually configured for each channel
 - Pulse stretching
 - Diagnostics
 - Input delay
 - Hardware interrupts for positive and negative edges
- Sink input (PNP, active high)
- Module-specific configurable diagnostics for missing supply voltage L+
- Suitable for connecting switches and 2-wire sensors according to IEC 61131-2, types 1 and 3

The I/O module supports the following functions:

- Firmware update
- I&M identification data
- Parameter reassignment in RUN
- Value status QI
- IO redundancy
- Time stamping with 1 ms accuracy
- Output disable switch

You can configure the I/O module with HW Config and integrate it into your system.

Output disable switch

If you want to pull the I/O module in runtime, you have to press the output disable switch for 3 seconds for the I/O module to be deenergized.

When the output disable switch has been pressed for 3 seconds, the LED DIAG flashes red, the LED MT lights up yellow and the I/O module generates a diagnostics message. See section Status and error displays of the I/O module DI 16x24VDC HA (Page 21).

Note

Pressing the output disable switch interrupts any ongoing firmware update. A firmware update cannot be performed when the device is deenergized.

Accessories

The following accessories must be ordered separately:

- Labeling strips
- Color-coded labels

Technical specifications

Technical specifications of the DI 16X24VDC HA

Article number	6DL1131-6BH00-0PH1
General information	
Product type designation	DI 16x24VDC HA
HW functional status	FS01
Firmware version	V1.0
• FW update possible	Yes
Usable terminal block	TB type H1 and M1
Color code for module-specific color identification plate	CC01
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• PCS 7 configurable/integrated as of version	V9.0
Operating mode	
• DI	Yes
• Counter	No
• Oversampling	No
• MSI	No
Redundancy	
• Redundancy capability	Yes; With TB type M1
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption (rated value)	60 mA; without sensor supply
Current consumption, max.	120 mA; without sensor supply
Encoder supply	
Number of outputs	16
Output voltage encoder supply, min.	18.2 V; L+ (-1 V)
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.3 A; for IO redundancy up to 2.6 A) Ensure sufficient low-resistance cable routing to the sensor/actuator in order to attain the response threshold. Depending on the cable cross-section used, there may be constraints regarding the usable length of cable.
Output current	

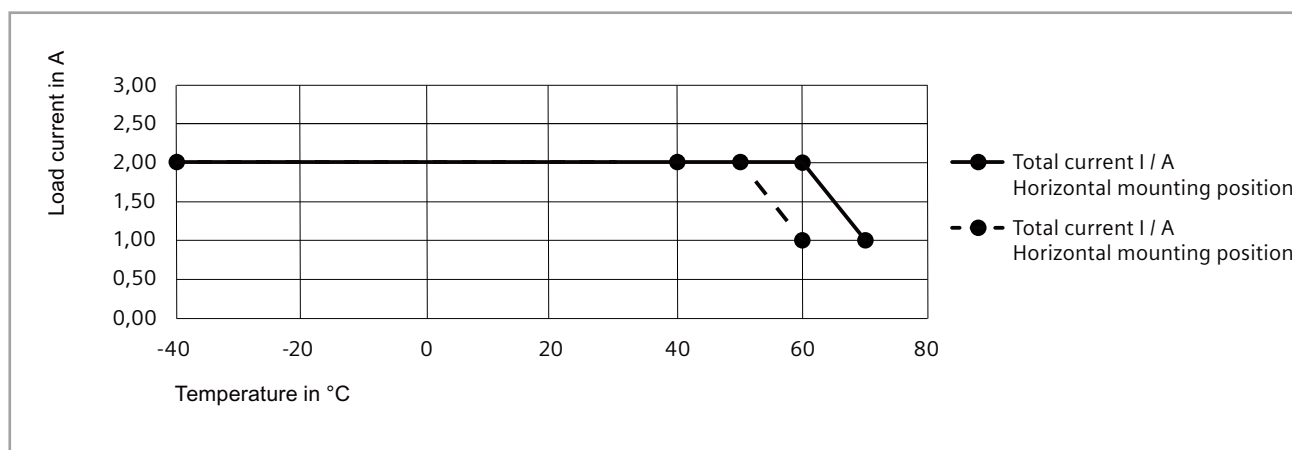
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up to 60 °C, max.	2 A; 1 A when mounted vertically; see derating information in Equipment Manual
up to 70 °C, max.	1 A; See derating information in Equipment Manual
24 V encoder supply	
24 V - Short-circuit protection	Yes Yes; Electronic (response threshold 0.7 A to 1.3 A; for IO redundancy up to 2.6 A) Ensure sufficient low-resistance cable routing to the sensor/actuator in order to attain the response threshold. Depending on the cable cross-section used, there may be constraints regarding the usable length of cable.
Power	
Power available from the backplane bus	80 mW
Power loss	
Power loss, typ.	3.6 W; Maximum value (taking the max. encoder current and the max. operating voltage into account)
Address area	
Address space per module	
Address space per module, max.	2 byte; + 2 bytes for QI information (additional 18 bytes when using high-precision time stamping)
Hardware configuration	
Automatic encoding	
Mechanical coding element	Yes
Digital inputs	
Number of digital inputs	16
Digital inputs, parameterizable	Yes
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Pulse extension	Yes
Length	Off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Time stamping	Yes; Resolution 10 ms
Time stamp (with precision of 1 ms)	Yes; Resolution 1ms
Edge evaluation	Yes; rising edge, falling edge, edge change
Input voltage	
- Type of input voltage - Rated value (DC) - for signal "0" - for signal "1"	DC 24 V -30 to +5V +11 to +30V
Input current	
for signal "1", typ.	2.5 mA

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Input delay (for rated value of input voltage) for standard inputs	
– parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
– permissible quiescent current (2-wire sensor), max.	1.5 mA
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes; channel by channel
• Hardware interrupt	Yes; channel by channel
Diagnostic messages	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; Module-wise
– parameterizable	Yes
• Monitoring of encoder power supply	Yes
• Wire-break	Yes; Channel-by-channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 15 kOhm to 18 kOhm
• Short-circuit to M	Yes; Encoder supply to M, channel by channel
Diagnostics indication LED	
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; Green/red LED
Potential separation	
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
Isolation	
Isolation tested with	1 500 V DC/1 min, type test
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C

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- horizontal installation, max. - vertical installation, min. - vertical installation, max.	70 °C -40 °C 60 °C
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	135 g

Derating curve

The following figure shows the load current derating with horizontal and vertical mounting positions.



Cycle time

The cycle time describes the time slice in which signals from the inputs are acquired and processed. The cycle time of the I/O module is 1 ms (250 µs for time stamping).

Minimum pulse length

In order for a pulse or an edge transition to be reliably detected by the I/O module, the signal status must be active for at least the duration of the minimum pulse length.

In non-redundant mode, the minimum pulse length is greater than the input delay and greater than the cycle time.

In IO redundancy mode, the minimum pulse length is greater than the input delay and greater than the cycle time + 50 ms.