

SIMATIC S7-1500 digital input/output module, DI16x 24 V DC BA, 16 channels in groups of 16, input delay typ. 3.2ms Input type 3 (IEC 61131), DQ16X24 V DC/0.5A BA; 16 channels in groups of 8; 4 A per group incl. push-in front connector



| General information                                       |                                  |
|-----------------------------------------------------------|----------------------------------|
| Product type designation                                  | DI 16x24VDC / DQ16x24VDC/0.5A BA |
| HW functional status                                      | FS01                             |
| Firmware version                                          | V1.0.0                           |
| • FW update possible                                      | Yes                              |
| Product function                                          |                                  |
| • I&M data                                                | Yes; I&M0 to I&M3                |
| Engineering with                                          |                                  |
| • STEP 7 TIA Portal configurable/integrated as of version | V13 / V13                        |
| • STEP 7 configurable/integrated as of version            | V5.5 SP3 / -                     |
| • PROFIBUS as of GSD version/GSD revision                 | V1.0 / V5.1                      |
| • PROFINET as of GSD version/GSD revision                 | V2.3 / -                         |
| Operating mode                                            |                                  |
| • DI                                                      | Yes                              |
| • Counter                                                 | No                               |
| • DQ                                                      | Yes                              |
| • DQ with energy-saving function                          | No                               |
| • PWM                                                     | No                               |

|                                                                                                                                                           |                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Oversampling</li> <li>• MSI</li> <li>• MSO</li> </ul>                                                            | No<br>Yes<br>Yes                                    |
| <b>Supply voltage</b>                                                                                                                                     |                                                     |
| Rated value (DC)                                                                                                                                          | 24 V                                                |
| permissible range, lower limit (DC)                                                                                                                       | 20.4 V                                              |
| permissible range, upper limit (DC)                                                                                                                       | 28.8 V                                              |
| Reverse polarity protection                                                                                                                               | Yes; through internal protection with 7 A per group |
| <b>Input current</b>                                                                                                                                      |                                                     |
| Current consumption, max.                                                                                                                                 | 30 mA                                               |
| <b>Output voltage</b>                                                                                                                                     |                                                     |
| Rated value (DC)                                                                                                                                          | 24 V                                                |
| <b>Power</b>                                                                                                                                              |                                                     |
| Power available from the backplane bus                                                                                                                    | 1.1 W                                               |
| <b>Power loss</b>                                                                                                                                         |                                                     |
| Power loss, typ.                                                                                                                                          | 3.45 W                                              |
| <b>Digital inputs</b>                                                                                                                                     |                                                     |
| Number of digital inputs                                                                                                                                  | 16                                                  |
| Digital inputs, parameterizable                                                                                                                           | No                                                  |
| Source/sink input                                                                                                                                         | P-reading                                           |
| Input characteristic curve in accordance with IEC 61131, type 3                                                                                           | Yes                                                 |
| <b>Input voltage</b>                                                                                                                                      |                                                     |
| <ul style="list-style-type: none"> <li>• Type of input voltage</li> <li>• Rated value (DC)</li> <li>• for signal "0"</li> <li>• for signal "1"</li> </ul> | DC<br>24 V<br>-30 to +5V<br>+11 to +30V             |
| <b>Input current</b>                                                                                                                                      |                                                     |
| <ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>                                                                                  | 2.7 mA                                              |
| <b>Input delay (for rated value of input voltage)</b>                                                                                                     |                                                     |
| for standard inputs                                                                                                                                       |                                                     |
| — parameterizable                                                                                                                                         | No                                                  |
| — at "0" to "1", min.                                                                                                                                     | 3 ms                                                |
| — at "0" to "1", max.                                                                                                                                     | 4 ms                                                |
| — at "1" to "0", min.                                                                                                                                     | 3 ms                                                |
| — at "1" to "0", max.                                                                                                                                     | 4 ms                                                |
| for interrupt inputs                                                                                                                                      |                                                     |
| — parameterizable                                                                                                                                         | No                                                  |
| <b>Cable length</b>                                                                                                                                       |                                                     |
| <ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>                                                                                        | 1 000 m                                             |

- unshielded, max.

600 m

## Digital outputs

|                                                                                            |                                                 |
|--------------------------------------------------------------------------------------------|-------------------------------------------------|
| Type of digital output                                                                     | Transistor                                      |
| Number of digital outputs                                                                  | 16                                              |
| Current-sourcing                                                                           | Yes                                             |
| Short-circuit protection                                                                   | Yes                                             |
| <ul style="list-style-type: none"> <li>• Response threshold, typ.</li> </ul>               | 1 A                                             |
| Limitation of inductive shutdown voltage to                                                | L+ (-53 V)                                      |
| Controlling a digital input                                                                | Yes                                             |
| Switching capacity of the outputs                                                          |                                                 |
| <ul style="list-style-type: none"> <li>• with resistive load, max.</li> </ul>              | 0.5 A                                           |
| <ul style="list-style-type: none"> <li>• on lamp load, max.</li> </ul>                     | 5 W                                             |
| Load resistance range                                                                      |                                                 |
| <ul style="list-style-type: none"> <li>• lower limit</li> </ul>                            | 48 $\Omega$                                     |
| <ul style="list-style-type: none"> <li>• upper limit</li> </ul>                            | 12 k $\Omega$                                   |
| Output voltage                                                                             |                                                 |
| <ul style="list-style-type: none"> <li>• for signal "1", min.</li> </ul>                   | L+ (-0.8 V)                                     |
| Output current                                                                             |                                                 |
| <ul style="list-style-type: none"> <li>• for signal "1" rated value</li> </ul>             | 0.5 A                                           |
| <ul style="list-style-type: none"> <li>• for signal "1" permissible range, max.</li> </ul> | 0.5 A                                           |
| <ul style="list-style-type: none"> <li>• for signal "0" residual current, max.</li> </ul>  | 0.5 mA                                          |
| Output delay with resistive load                                                           |                                                 |
| <ul style="list-style-type: none"> <li>• "0" to "1", max.</li> </ul>                       | 100 $\mu$ s                                     |
| <ul style="list-style-type: none"> <li>• "1" to "0", max.</li> </ul>                       | 500 $\mu$ s                                     |
| Parallel switching of two outputs                                                          |                                                 |
| <ul style="list-style-type: none"> <li>• for logic links</li> </ul>                        | Yes                                             |
| <ul style="list-style-type: none"> <li>• for uprating</li> </ul>                           | No                                              |
| <ul style="list-style-type: none"> <li>• for redundant control of a load</li> </ul>        | Yes                                             |
| Switching frequency                                                                        |                                                 |
| <ul style="list-style-type: none"> <li>• with resistive load, max.</li> </ul>              | 100 Hz                                          |
| <ul style="list-style-type: none"> <li>• with inductive load, max.</li> </ul>              | 0.5 Hz                                          |
| <ul style="list-style-type: none"> <li>• on lamp load, max.</li> </ul>                     | 10 Hz                                           |
| Total current of the outputs                                                               |                                                 |
| <ul style="list-style-type: none"> <li>• Current per channel, max.</li> </ul>              | 0.5 A; see additional description in the manual |
| <ul style="list-style-type: none"> <li>• Current per group, max.</li> </ul>                | 4 A; see additional description in the manual   |
| <ul style="list-style-type: none"> <li>• Current per module, max.</li> </ul>               | 8 A; see additional description in the manual   |
| Cable length                                                                               |                                                 |
| <ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>                         | 1 000 m                                         |
| <ul style="list-style-type: none"> <li>• unshielded, max.</li> </ul>                       | 600 m                                           |

## Encoder

|                      |
|----------------------|
| Connectable encoders |
|----------------------|

|                                                       |        |
|-------------------------------------------------------|--------|
| • 2-wire sensor                                       | Yes    |
| — permissible quiescent current (2-wire sensor), max. | 1.5 mA |

#### Isochronous mode

|                                                                 |    |
|-----------------------------------------------------------------|----|
| Isochronous operation (application synchronized up to terminal) | No |
|-----------------------------------------------------------------|----|

#### Interrupts/diagnostics/status information

|                               |    |
|-------------------------------|----|
| Diagnostics function          | No |
| Substitute values connectable | No |

#### Alarms

|                         |    |
|-------------------------|----|
| • Diagnostic alarm      | No |
| • Maintenance interrupt | No |
| • Hardware interrupt    | No |

#### Diagnostic messages

|                                 |    |
|---------------------------------|----|
| • Monitoring the supply voltage | No |
| • Wire-break                    | No |
| • Short-circuit                 | No |
| • Group error                   | No |

#### Diagnostics indication LED

|                                              |                |
|----------------------------------------------|----------------|
| • RUN LED                                    | Yes; Green LED |
| • ERROR LED                                  | Yes; Red LED   |
| • Monitoring of the supply voltage (PWR-LED) | Yes; Green LED |
| • Channel status display                     | Yes; Green LED |
| • for channel diagnostics                    | No             |
| • for module diagnostics                     | No             |

#### Potential separation

##### Potential separation channels

|                                          |     |
|------------------------------------------|-----|
| • between the channels                   | No  |
| • between the channels, in groups of     | 8   |
| • between the channels and backplane bus | Yes |

#### Isolation

|                       |                      |
|-----------------------|----------------------|
| Isolation tested with | 707 V DC (type test) |
|-----------------------|----------------------|

#### Ambient conditions

##### Ambient temperature during operation

|                                 |       |
|---------------------------------|-------|
| • horizontal installation, min. | 0 °C  |
| • horizontal installation, max. | 60 °C |
| • vertical installation, min.   | 0 °C  |
| • vertical installation, max.   | 40 °C |

##### Altitude during operation relating to sea level

- Installation altitude above sea level, max.

5 000 m; Restrictions for installation altitudes > 2 000 m, see manual

#### Decentralized operation

Prioritized startup Yes

#### Dimensions

Width 25 mm

Height 147 mm

Depth 129 mm

#### Weights

Weight, approx. 280 g

#### Other

Note: Supplied incl. 40-pole push-in front connectors

**last modified:** 08/16/2019