

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 16x24 V DC/DQ 16x24 V DC/0.5 A BA |
| HW functional status  | FS01                                 |
| Firmware version  | V1.0.0                               |
| <ul style="list-style-type: none"> <li>FW update possible</li> </ul>                                      | Yes                                  |
| Product function  |                                      |
| <ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>  | Yes; I&M0 to I&M3                    |
| Engineering with  |                                      |
| <ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated as of version</li> </ul> | V13 / V13                            |
| <ul style="list-style-type: none"> <li>STEP 7 configurable/integrated as of version</li> </ul>            | V5.5 SP3 / -                         |
| <ul style="list-style-type: none"> <li>PROFIBUS as of GSD version/GSD revision</li> </ul>                 | V1.0 / V5.1                          |
| <ul style="list-style-type: none"> <li>PROFINET as of GSD version/GSD revision</li> </ul>                 | V2.3 / -                             |
| Operating mode  |                                      |
| <ul style="list-style-type: none"> <li>DI</li> </ul>  | Yes                                  |
| <ul style="list-style-type: none"> <li>Counter</li> </ul>   | No                                   |
| <ul style="list-style-type: none"> <li>DQ</li> </ul>  | Yes                                  |
| <ul style="list-style-type: none"> <li>DQ with energy-saving function</li> </ul>                          | No                                   |
| <ul style="list-style-type: none"> <li>PWM</li> </ul>   | No                                   |

|                |     |
|----------------|-----|
| • Oversampling | No  |
| • MSI          | Yes |
| • MSO          | Yes |

#### Supply voltage

|                                     |   |
|-------------------------------------|---|
| 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 |

#### Input current

|                           |       |
|---------------------------|-------|
| Current consumption, max. | 30 mA |
|---------------------------|-------|

#### Output voltage

|                  |      |
|------------------|------|
| Rated value (DC) | 24 V |
|------------------|------|

#### Power

|  |       |
|--|-------|
| Power available from the backplane bus | 1.1 W |
|--|-------|

#### Power loss

|                  |        |
|------------------|--------|
| Power loss, typ. | 3.45 W |
|------------------|--------|

#### Digital inputs

|   |           |
|---|-----------|
| 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       |

#### Input voltage

|                         |             |
|-------------------------|-------------|
| • Type of input voltage | DC          |
| • Rated value (DC)      | 24 V        |
| • for signal "0"        | -30 to +5V  |
| • for signal "1"        | +11 to +30V |

#### Input current

|                        |        |
|------------------------|--------|
| • for signal "1", typ. | 2.7 mA |
|------------------------|--------|

#### Input delay (for rated value of input voltage)

|                       |      |
|-----------------------|------|
| 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   |

#### Cable length

|                  |         |
|------------------|---------|
| • shielded, max. | 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   |
| <b>Switching capacity of the outputs</b>   |   |
| <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   |
| <b>Load resistance range</b>   |   |
| <ul style="list-style-type: none"> <li>• lower limit</li> </ul>                            | 48 Ω  |
| <ul style="list-style-type: none"> <li>• upper limit</li> </ul>                            | 12 kΩ   |
| <b>Output voltage</b>  |   |
| <ul style="list-style-type: none"> <li>• for signal "1", min.</li> </ul>                   | L+ (-0.8 V)                                     |
| <b>Output current</b>  |   |
| <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  |
| <b>Output delay with resistive load</b>  |   |
| <ul style="list-style-type: none"> <li>• "0" to "1", max.</li> </ul>                       | 100 μs  |
| <ul style="list-style-type: none"> <li>• "1" to "0", max.</li> </ul>                       | 500 μs  |
| <b>Parallel switching of two outputs</b>   |   |
| <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   |
| <b>Switching frequency</b>   |   |
| <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   |
| <b>Total current of the outputs</b>  |   |
| <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   |
| <b>Cable length</b>  |   |
| <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

|  |               |
|--|---------------|
| <ul style="list-style-type: none"> <li>• 2-wire sensor</li> <li>— permissible quiescent current (2-wire sensor), max.</li> </ul> | Yes<br>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

|  |          |
|--|----------|
| <ul style="list-style-type: none"> <li>• Diagnostic alarm</li> <li>• Hardware interrupt</li> </ul> | No<br>No |
|--|----------|

### Diagnostic messages

|   |                      |
|---|----------------------|
| <ul style="list-style-type: none"> <li>• Monitoring the supply voltage</li> <li>• Wire-break</li> <li>• Short-circuit</li> <li>• Group error</li> </ul> | No<br>No<br>No<br>No |
|---|----------------------|

### Diagnostics indication LED

|   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• RUN LED</li> <li>• ERROR LED</li> <li>• Monitoring of the supply voltage (PWR-LED)</li> <li>• Channel status display</li> <li>• for channel diagnostics</li> <li>• for module diagnostics</li> </ul> | Yes; Green LED<br>Yes; Red LED<br>Yes; Green LED<br>Yes; Green LED<br>No<br>No |
|---|--|

### Potential separation

#### Potential separation channels

|  |                |
|--|----------------|
| <ul style="list-style-type: none"> <li>• between the channels</li> <li>• between the channels, in groups of</li> <li>• between the channels and backplane bus</li> </ul> | No<br>8<br>Yes |
|--|----------------|

### Isolation

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

### Ambient conditions

#### Ambient temperature during operation

|  |                                |
|--|--------------------------------|
| <ul style="list-style-type: none"> <li>• horizontal installation, min.</li> <li>• horizontal installation, max.</li> <li>• vertical installation, min.</li> <li>• vertical installation, max.</li> </ul> | 0 °C<br>60 °C<br>0 °C<br>40 °C |
|--|--------------------------------|

### 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:** 01/29/2018