

SIMATIC S7-1500, TM Timer DIDQ 16x 24 V time-controlled digital inputs and outputs max. 8 DI, 16 DQ of which max. 16 with time stamp, Count, PWM, oversampling



| General information   |                            |
|---|----------------------------|
| Product type designation  | TM Timer DIDQ 16x24V       |
| Product function  |                            |
| <ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>  | Yes; I&M 0                 |
| Engineering with  |                            |
| <ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated as of version</li> </ul> | V13 Update 3               |
| Installation type/mounting  |                            |
| Rail mounting   | Yes; S7-1500 mounting rail |
| Supply voltage  |                            |
| Load voltage 1L+  |                            |
| <ul style="list-style-type: none"> <li>Rated value (DC)</li> </ul>  | 24 V                       |
| <ul style="list-style-type: none"> <li>permissible range, lower limit (DC)</li> </ul>                     | 19.2 V                     |
| <ul style="list-style-type: none"> <li>permissible range, upper limit (DC)</li> </ul>                     | 28.8 V                     |
| <ul style="list-style-type: none"> <li>Reverse polarity protection</li> </ul>                             | Yes; against destruction   |
| Load voltage 2L+  |                            |
| <ul style="list-style-type: none"> <li>Rated value (DC)</li> </ul>  | 24 V                       |
| <ul style="list-style-type: none"> <li>permissible range, lower limit (DC)</li> </ul>                     | 19.2 V                     |

- permissible range, upper limit (DC) 28.8 V
- Reverse polarity protection Yes; against destruction

### Input current

|  |                     |
|--|---------------------|
| from load voltage 1L+ (without load), max. | 40 mA; without load |
| from load voltage 2L+ (without load), max. | 30 mA; without load |

### Encoder supply

|                   |                                       |
|-------------------|---------------------------------------|
| Number of outputs | 8; max. depending on parameterization |
|-------------------|---------------------------------------|

#### 24 V encoder supply

- 24 V Yes; L+ (-0.8 V)
- Short-circuit protection Yes
- Output current, max. 1.2 A; Total current of all encoders / channels, max. 0.5 A per output

### Power

|  |       |
|--|-------|
| Power available from the backplane bus | 1.3 W |
|--|-------|

### Power loss

|                  |     |
|------------------|-----|
| Power loss, typ. | 5 W |
|------------------|-----|

### Address area

#### Address space per module

- Inputs 44 byte
- Outputs 74 byte

### Digital inputs

|                          |                                       |
|--------------------------|---------------------------------------|
| Number of digital inputs | 8; max. depending on parameterization |
| • in groups of           | 8                                     |

|                                 |     |
|---------------------------------|-----|
| Digital inputs, parameterizable | Yes |
|---------------------------------|-----|

|   |     |
|---|-----|
| Input characteristic curve in accordance with IEC 61131, type 3 | Yes |
|---|-----|

#### Digital input functions, parameterizable

- Digital input with time stamp Yes
  - Number, max. 8
- Counter Yes
  - Number, max. 4
- Counter for incremental encoder Yes
  - Number, max. 4
- Digital input with oversampling Yes
  - Number, max. 8
- HW enable for digital input Yes
  - Number, max. 4
- HW enable for digital output Yes
  - Number, max. 4

### Input voltage

|   |  |
|---|--|
| <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> <li>• permissible voltage at input, min.</li> <li>• permissible voltage at input, max.</li> </ul> | DC<br>24 V<br>-5 ... +5 V<br>+11 to +30V<br>-30 V; -5 V continuous, -30 V brief reverse polarity protection<br>30 V            |
| <b>Input current</b>  |  |
| <ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>  | 2.5 mA   |
| <b>Input delay (for rated value of input voltage)</b>   |  |
| <ul style="list-style-type: none"> <li>• Minimum pulse width for program reactions</li> </ul>   | 3 µs for parameterization "none"   |
| <b>for standard inputs</b>  |  |
| — parameterizable   | Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms  |
| — at "0" to "1", min.   | 4 µs; for parameterization "none"  |
| — at "1" to "0", min.   | 4 µs; for parameterization "none"  |
| <b>Cable length</b>   |  |
| <ul style="list-style-type: none"> <li>• shielded, max.</li> <li>• unshielded, max.</li> </ul>  | 1 000 m; Depending on sensor, cable quality and rate of change<br>600 m; Depending on sensor, cable quality and rate of change |
| <b>Digital outputs</b>  |  |
| Type of digital output  | Transistor   |
| Number of digital outputs   | 16; max. depending on parameterization   |
| <ul style="list-style-type: none"> <li>• in groups of</li> </ul>  | 8  |
| Current-sinking   | Yes; With High Speed output  |
| Current-sourcing  | Yes  |
| Digital outputs, parameterizable  | Yes  |
| Short-circuit protection  | Yes; electronic/thermal  |
| <ul style="list-style-type: none"> <li>• Response threshold, typ.</li> </ul>  | 1.7 A with Standard output, 0.5 A with High Speed output   |
| Limitation of inductive shutdown voltage to   | -0.8 V   |
| Controlling a digital input   | Yes  |
| <b>Digital output functions, parameterizable</b>  |  |
| <ul style="list-style-type: none"> <li>• Digital output with time stamp</li> <li>— Number, max.</li> <li>• PWM output</li> <li>— Number, max.</li> <li>• Digital output with oversampling</li> <li>— Number, max.</li> </ul>                          | Yes<br>16<br>Yes<br>16<br>Yes<br>16  |
| <b>Switching capacity of the outputs</b>  |  |
| <ul style="list-style-type: none"> <li>• with resistive load, max.</li> <li>• on lamp load, max.</li> </ul>   | 0.5 A; 0.1 A with High Speed output<br>5 W; 1 W with High Speed output   |
| <b>Load resistance range</b>  |  |
| <ul style="list-style-type: none"> <li>• lower limit</li> <li>• upper limit</li> </ul>  | 48 Ω; 240 ohm with High Speed output<br>12 kΩ  |

| Output voltage  |  |
|---|--|
| • Type of output voltage                                | DC   |
| • for signal "0", max.                                  | 1 V; With High Speed output  |
| • for signal "1", min.                                  | 23.2 V; L+ (-0.8 V)  |
| Output current  |  |
| • for signal "1" rated value                            | 0.5 A; 0.1 A with High Speed output, observe derating                                |
| • for signal "1" permissible range, max.                | 0.6 A; 0.12 A with High Speed output, observe derating                               |
| • for signal "1" minimum load current                   | 2 mA   |
| • for signal "0" residual current, max.                 | 0.5 mA   |
| Output delay with resistive load                        |  |
| • "0" to "1", max.                                      | 1 µs; With High Speed output, 5 µs with Standard output                              |
| • "1" to "0", max.                                      | 1 µs; With High Speed output, 6 µs with Standard output                              |
| Switching frequency                                     |  |
| • with resistive load, max.                             | 10 kHz   |
| • on lamp load, max.                                    | 10 Hz  |
| Total current of the outputs                            |  |
| • Current per group, max.                               | 4 A  |
| • Current per module, max.                              | 8 A; Observe derating  |
| Cable length  |  |
| • shielded, max.  | 1 000 m; Depending on load and cable quality   |
| • unshielded, max.                                      | 600 m; Depending on load and cable quality   |
| Encoder   |  |
| Connectable encoders                                    |  |
| • Incremental encoder (asymmetrical)                    | Yes  |
| • 24 V initiator  | Yes  |
| • 2-wire sensor   | Yes  |
| — permissible quiescent current (2-wire sensor), max.   | 1.5 mA   |
| Encoder signals, incremental encoder (asymmetrical)     |  |
| • Input voltage   | 24 V   |
| • Input frequency, max.                                 | 50 kHz   |
| • Counting frequency, max.                              | 200 kHz; with quadruple evaluation   |
| • Cable length, shielded, max.                          | 600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz |
| • Incremental encoder with A/B tracks, 90° phase offset | Yes  |
| • Pulse encoder   | Yes  |
| Encoder signal 24 V                                     |  |
| — permissible voltage at input, min.                    | -30 V  |
| — permissible voltage at input, max.                    | 30 V   |
| Interface types   |  |

|   |                                    |
|---|------------------------------------|
| • Input characteristic curve in accordance with IEC 61131, type 3 | Yes                                |
| <b>Isochronous mode</b>   |                                    |
| Bus cycle time (TDP), min.  | 250 µs                             |
| Jitter, max.  | 1 µs                               |
| <b>Interrupts/diagnostics/status information</b>                  |                                    |
| Diagnostics function  | Yes                                |
| Substitute values connectable                                     | Yes                                |
| <b>Alarms</b>   |                                    |
| • Diagnostic alarm  | Yes                                |
| <b>Diagnostic messages</b>  |                                    |
| • Monitoring the supply voltage                                   | Yes                                |
| • Short-circuit   | Yes                                |
| <b>Diagnostics indication LED</b>                                 |                                    |
| • RUN LED   | Yes; green LED                     |
| • ERROR LED   | Yes; red LED                       |
| • MAINT LED   | Yes; Yellow LED                    |
| • Monitoring of the supply voltage (PWR-LED)                      | Yes; green LED                     |
| • Channel status display  | Yes; green LED                     |
| • for channel diagnostics   | Yes; red LED                       |
| <b>Integrated Functions</b>                                       |                                    |
| Number of counters  | 4                                  |
| Counting frequency (counter) max.                                 | 200 kHz; with quadruple evaluation |
| <b>Counting functions</b>   |                                    |
| • Continuous counting   | Yes                                |
| <b>Potential separation</b>                                       |                                    |
| <b>Potential separation channels</b>                              |                                    |
| • between the channels and backplane bus                          | Yes                                |
| <b>Isolation</b>  |                                    |
| Isolation tested with   | 707 V DC (type test)               |
| <b>Ambient conditions</b>   |                                    |
| <b>Ambient temperature during operation</b>                       |                                    |
| • horizontal installation, min.                                   | 0 °C                               |
| • horizontal installation, max.                                   | 60 °C                              |
| • vertical installation, min.                                     | 0 °C                               |
| • vertical installation, max.                                     | 40 °C; Observe derating            |
| <b>Decentralized operation</b>                                    |                                    |
| to SIMATIC S7-1500  | Yes                                |
| <b>Dimensions</b>   |                                    |

|        |        |
|--------|--------|
| Width  | 35 mm  |
| Height | 147 mm |
| Depth  | 129 mm |

#### Weights

|                 |       |
|-----------------|-------|
| Weight, approx. | 320 g |
|-----------------|-------|

**last modified:** 04/10/2020