



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> <li>Isochronous mode</li> </ul>  | Yes; I&M 0<br>Yes   |
| Engineering with  |   |
| <ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from 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> <li>permissible range, lower limit (DC)</li> <li>permissible range, upper limit (DC)</li> <li>Reverse polarity protection</li> </ul> | 24 V<br>19.2 V<br>28.8 V<br>Yes; against destruction  |
| Load voltage 2L+  |   |
| <ul style="list-style-type: none"> <li>Rated value (DC)</li> <li>permissible range, lower limit (DC)</li> <li>permissible range, upper limit (DC)</li> <li>Reverse polarity protection</li> </ul> | 24 V<br>19.2 V<br>28.8 V<br>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   |   |
| <ul style="list-style-type: none"> <li>24 V</li> <li>Short-circuit protection</li> <li>Output current, max.</li> </ul>  | Yes; L+ (-0.8 V)<br>Yes<br>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  |   |
| <ul style="list-style-type: none"> <li>Inputs</li> <li>Outputs</li> </ul>   | 44 byte<br>74 byte  |
| Digital inputs  |   |
| Number of digital inputs  | 8; max. depending on parameterization   |
| <ul style="list-style-type: none"> <li>in groups of</li> </ul>  | 8   |

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|---|--|
| Digital inputs, parameterizable   | Yes  |
| Input characteristic curve in accordance with IEC 61131, type 3   | Yes  |
| <b>Digital input functions, parameterizable</b>   |  |
| <ul style="list-style-type: none"> <li>• Digital input with time stamp <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> <li>• Counter <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> <li>• Counter for incremental encoder <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> <li>• Digital input with oversampling <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> <li>• HW enable for digital input <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> <li>• HW enable for digital output <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> </ul> | Yes<br>8<br>Yes<br>4<br>Yes<br>4<br>Yes<br>8<br>Yes<br>4<br>Yes<br>4   |
| <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> <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>  |  |
| <ul style="list-style-type: none"> <li>— parameterizable</li> <li>— at "0" to "1", min.</li> <li>— at "1" to "0", min.</li> </ul>   | Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms<br>4 µs; for parameterization "none"<br>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 <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> <li>• PWM output <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> <li>• Digital output with oversampling <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </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  |
| <b>Output voltage</b>   |  |
| <ul style="list-style-type: none"> <li>• Type of output voltage</li> <li>• for signal "0", max.</li> <li>• for signal "1", min.</li> </ul>  | DC<br>1 V; With High Speed output<br>23.2 V; L+ (-0.8 V)   |

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| <b>Output current</b>  |  |
| <ul style="list-style-type: none"> <li>• for signal "1" rated value</li> <li>• for signal "1" permissible range, max.</li> <li>• for signal "1" minimum load current</li> <li>• for signal "0" residual current, max.</li> </ul>   | 0.5 A; 0.1 A with High Speed output, observe derating<br>0.6 A; 0.12 A with High Speed output, observe derating<br>2 mA<br>0.5 mA                          |
| <b>Output delay with resistive load</b>  |  |
| <ul style="list-style-type: none"> <li>• "0" to "1", max.</li> <li>• "1" to "0", max.</li> </ul>   | 1 µs; With High Speed output, 5 µs with Standard output<br>1 µs; With High Speed output, 6 µs with Standard output   |
| <b>Switching frequency</b>   |  |
| <ul style="list-style-type: none"> <li>• with resistive load, max.</li> <li>• on lamp load, max.</li> </ul>  | 10 kHz<br>10 Hz  |
| <b>Total current of the outputs</b>  |  |
| <ul style="list-style-type: none"> <li>• Current per group, max.</li> <li>• Current per module, max.</li> </ul>  | 4 A<br>8 A; Observe derating   |
| <b>Cable length</b>  |  |
| <ul style="list-style-type: none"> <li>• shielded, max.</li> <li>• unshielded, max.</li> </ul>   | 1 000 m; depending on load and cable quality<br>600 m; depending on load and cable quality   |
| <b>Encoder</b>   |  |
| <b>Connectable encoders</b>  |  |
| <ul style="list-style-type: none"> <li>• Incremental encoder (asymmetrical)</li> <li>• 24 V initiator</li> <li>• 2-wire sensor</li> <li>— permissible quiescent current (2-wire sensor), max.</li> </ul>   | Yes<br>Yes<br>Yes<br>1.5 mA  |
| <b>Encoder signals, incremental encoder (asymmetrical)</b>   |  |
| <ul style="list-style-type: none"> <li>• Input voltage</li> <li>• Input frequency, max.</li> <li>• Counting frequency, max.</li> <li>• Cable length, shielded, max.</li> <li>• Incremental encoder with A/B tracks, 90° phase offset</li> <li>• pulse encoder</li> </ul> | 24 V<br>50 kHz<br>200 kHz; with quadruple evaluation<br>600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz<br>Yes<br>Yes |
| <b>Interface types</b>   |  |
| <ul style="list-style-type: none"> <li>• Input characteristic curve in accordance with IEC 61131, type 3</li> </ul>  | 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>  |  |
| <ul style="list-style-type: none"> <li>• Diagnostic alarm</li> </ul>   | Yes  |
| <b>Diagnoses</b>   |  |
| <ul style="list-style-type: none"> <li>• Monitoring the supply voltage</li> <li>• Short-circuit</li> </ul>   | Yes<br>Yes   |
| <b>Diagnostics indication LED</b>  |  |
| <ul style="list-style-type: none"> <li>• RUN LED</li> <li>• ERROR LED</li> <li>• MAINT LED</li> <li>• Monitoring of the supply voltage (PWR-LED)</li> <li>• Channel status display</li> <li>• for channel diagnostics</li> </ul>   | Yes; green LED<br>Yes; red LED<br>Yes; Yellow LED<br>Yes; green LED<br>Yes; green LED<br>Yes; red LED  |
| <b>Integrated Functions</b>  |  |
| Counter  | Yes  |
| <ul style="list-style-type: none"> <li>• Number of counters</li> <li>• Counting frequency, max.</li> </ul>   | 4<br>200 kHz; with quadruple evaluation  |
| <b>Counting functions</b>  |  |
| <ul style="list-style-type: none"> <li>• Continuous counting</li> </ul>  | Yes  |
| <b>Position detection</b>  |  |
| <ul style="list-style-type: none"> <li>• Incremental acquisition</li> </ul>  | Yes  |
| <b>Potential separation</b>  |  |

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| <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>Altitude during operation relating to sea level</b> |  |
| • Installation altitude above sea level, max.          | 5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual |
| <b>Decentralized operation</b>                         |  |
| to SIMATIC S7-1500                                     | Yes  |
| <b>Dimensions</b>                                      |  |
| Width  | 35 mm  |
| Height   | 147 mm   |
| Depth  | 129 mm   |
| <b>Weights</b>   |  |
| Weight, approx.  | 320 g  |

last modified:

