

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
<ul style="list-style-type: none"> <li>Isochronous mode</li> </ul>	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
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## 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

- permissible range, lower limit (DC) 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
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#### 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
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### Power loss

Power loss, typ.	5 W
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### Address area

#### Address space per module

- Inputs 44 byte
- Outputs 74 byte

### Digital inputs

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

Digital inputs, parameterizable	Yes
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Input characteristic curve in accordance with IEC 61131, type 3	Yes
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#### 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	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	3 µs for parameterization "none"
for standard inputs	
— 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"
Cable length	
• shielded, max.	1 000 m; Depending on sensor, cable quality and rate of change
• unshielded, max.	600 m; Depending on sensor, cable quality and rate of change
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	16; max. depending on parameterization
• in groups of	8
Current-sinking	Yes; With High Speed output
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
• Response threshold, typ.	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
Digital output functions, parameterizable	
• Digital output with time stamp	Yes
— Number, max.	16
• PWM output	Yes
— Number, max.	16
• Digital output with oversampling	Yes
— Number, max.	16
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
• on lamp load, max.	5 W; 1 W with High Speed output
Load resistance range	
• lower limit	48 Ω; 240 ohm with High Speed output

• upper limit	12 kΩ
<b>Output voltage</b>	
• 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)
<b>Output current</b>	
• 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
<b>Output delay with resistive load</b>	
• "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
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per group, max.	4 A
• Current per module, max.	8 A; Observe derating
<b>Cable length</b>	
• shielded, max.	1 000 m; Depending on load and cable quality
• unshielded, max.	600 m; Depending on load and cable quality
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• 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
<b>Encoder signal 24 V</b>	
— permissible voltage at input, min.	-30 V
— permissible voltage at input, max.	30 V
<b>Interface types</b>	

• 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>Diagnoses</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
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**last modified:** 10/13/2020