



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 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 19.2 V 28.8 V 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 19.2 V 28.8 V 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) Yes 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 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
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> </ul>	Yes 8
<ul style="list-style-type: none"> <li>• Counter <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> </ul>	Yes 4
<ul style="list-style-type: none"> <li>• Counter for incremental encoder <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> </ul>	Yes 4
<ul style="list-style-type: none"> <li>• Digital input with oversampling <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> </ul>	Yes 8
<ul style="list-style-type: none"> <li>• HW enable for digital input <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> </ul>	Yes 4
<ul style="list-style-type: none"> <li>• HW enable for digital output <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> </ul>	Yes 4
<b>Input voltage</b>	
<ul style="list-style-type: none"> <li>• Type of input voltage</li> </ul>	DC
<ul style="list-style-type: none"> <li>• Rated value (DC)</li> </ul>	24 V
<ul style="list-style-type: none"> <li>• for signal "0"</li> </ul>	-5 ... +5 V
<ul style="list-style-type: none"> <li>• for signal "1"</li> </ul>	+11 to +30V
<ul style="list-style-type: none"> <li>• permissible voltage at input, min.</li> </ul>	-30 V; -5 V continuous, -30 V brief reverse polarity protection
<ul style="list-style-type: none"> <li>• permissible voltage at input, max.</li> </ul>	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> </ul>	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
<ul style="list-style-type: none"> <li>— at "0" to "1", min.</li> </ul>	4 µs; for parameterization "none"
<ul style="list-style-type: none"> <li>— at "1" to "0", min.</li> </ul>	4 µs; for parameterization "none"
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	1 000 m; Depending on sensor, cable quality and rate of change
<ul style="list-style-type: none"> <li>• unshielded, max.</li> </ul>	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> </ul>	Yes 16
<ul style="list-style-type: none"> <li>• PWM output <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> </ul>	Yes 16
<ul style="list-style-type: none"> <li>• Digital output with oversampling <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> </ul>	Yes 16
<b>Switching capacity of the outputs</b>	
<ul style="list-style-type: none"> <li>• with resistive load, max.</li> </ul>	0.5 A; 0.1 A with High Speed output
<ul style="list-style-type: none"> <li>• on lamp load, max.</li> </ul>	5 W; 1 W with High Speed output
<b>Load resistance range</b>	
<ul style="list-style-type: none"> <li>• lower limit</li> </ul>	48 Ω; 240 ohm with High Speed output
<ul style="list-style-type: none"> <li>• upper limit</li> </ul>	12 kΩ
<b>Output voltage</b>	
<ul style="list-style-type: none"> <li>• Type of output voltage</li> </ul>	DC
<ul style="list-style-type: none"> <li>• for signal "0", max.</li> </ul>	1 V; With High Speed output
<ul style="list-style-type: none"> <li>• for signal "1", min.</li> </ul>	23.2 V; L+ (-0.8 V)
<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 0.6 A; 0.12 A with High Speed output, observe derating 2 mA 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 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 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 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 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               <ul style="list-style-type: none"> <li>— permissible quiescent current (2-wire sensor), max.</li> </ul> </li> </ul>	Yes Yes Yes 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 50 kHz 200 kHz; with quadruple evaluation 600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz Yes 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. Jitter, max.	250 µs 1 µs
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function Substitute values connectable	Yes 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 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 Yes; red LED Yes; Yellow LED Yes; green LED Yes; green LED Yes; red LED
<b>Integrated Functions</b>	
Counter <ul style="list-style-type: none"> <li>• Number of counters</li> <li>• Counting frequency, max.</li> </ul>	Yes 4 200 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>	
Potential separation channels	

• between the channels and backplane bus	Yes
<b>Isolation</b>	
Isolation tested with	707 V DC (type test)
<b>Ambient conditions</b>	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Observe derating
Altitude during operation relating to sea level	
• 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
<b>last modified:</b>	9/20/2021 