



SIMATIC S7-1500, TM PTO 4 interface module for stepper drives 4 channels pulse train output PTO: 24 V, RS-422, 5 V, 2 DI, 1 DQ 24VDC per channel

General information	
Product type designation	TM PTO 4
HW functional status	FS02
Number of channels	4; Axes
Product function	
<ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>	Yes; I&M0 to I&M3
<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>	STEP 7 V14 or higher
<ul style="list-style-type: none"> <li>STEP 7 configurable/integrated from version</li> </ul>	V5.5 SP3 with GSD file / -
<ul style="list-style-type: none"> <li>PROFINET from GSD version/GSD revision</li> </ul>	GSDML V2.32
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
<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
Input current	
Current consumption, max.	70 mA; without load
Power	
Power available from the backplane bus	1.3 W
Power loss	
Power loss, typ.	4 W
Address area	
Address space per module	
<ul style="list-style-type: none"> <li>Inputs</li> </ul>	18 byte; Per channel
<ul style="list-style-type: none"> <li>Outputs</li> </ul>	10 byte; Per channel
Digital inputs	
Number of digital inputs	12; 3 per channel, of which 1 DIQ
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
<ul style="list-style-type: none"> <li>Synchronization</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Probe</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Drive ready</li> </ul>	Yes

<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 24 V -5 ... +5 V +11 to +30V -5 V 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>	
for standard inputs	
<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 / 1.6 / 3.2 / 12.8 / 20 ms 4 µs; for parameterization "none" 4 µs; for parameterization "none"
for technological functions	
<ul style="list-style-type: none"> <li>parameterizable</li> </ul>	Yes
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>shielded, max.</li> <li>unshielded, max.</li> </ul>	1 000 m 600 m
<b>Digital outputs</b>	
Number of digital outputs	12; 3 per channel, of which 1 DIQ
Current-sinking	Yes; For DQn.0 and DQn.1 push-pull outputs
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>	0.2 A for DQn.0 and DQn.1, 0.9 A for DIQn.2
Controlling a digital input	Yes
<b>Digital output functions, parameterizable</b>	
<ul style="list-style-type: none"> <li>PTO (pulse train output) signal interface               <ul style="list-style-type: none"> <li>24 V asymmetrical</li> <li>RS 422 symmetrical</li> <li>TTL (5 V) asymmetrical</li> </ul> </li> <li>PTO (pulse train output) signal type               <ul style="list-style-type: none"> <li>Pulse and direction</li> <li>Count up, count down</li> <li>Incremental encoder (A, B phase shift)</li> <li>Incremental encoder (A, B phase shift, quadruple)</li> </ul> </li> </ul>	Yes Yes Yes Yes Yes Yes Yes
<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>	0.1 A; 0.5 A for DIQn.2 1 W; 5 W for DIQn.2
<b>Load resistance range</b>	
<ul style="list-style-type: none"> <li>lower limit</li> <li>upper limit</li> </ul>	240 Ω; 48 ohms for DIQn.2 12 kΩ
<b>Output voltage</b>	
<ul style="list-style-type: none"> <li>Type of output voltage</li> <li>for signal "1", min.</li> </ul>	DC 23.2 V; L+ (-0.8 V), L+ (-1.3 V) for DIQn.2
<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>	0.1 A; 0.5 A for DIQn.2 0.12 A; 0.6 A for DIQn.2 2 mA 0.5 mA
<b>Output delay with resistive load</b>	
<ul style="list-style-type: none"> <li>"0" to "1", typ.</li> <li>"1" to "0", typ.</li> </ul>	1 µs; 28 µs for DIQn.2 1 µs; 25 µs for DIQn.2
<b>Switching frequency</b>	
<ul style="list-style-type: none"> <li>with resistive load, max.</li> <li>with inductive load, max.</li> <li>on lamp load, max.</li> <li>For signal interface 24 V asymmetrical</li> </ul>	1 kHz; For DIQn.2 0.5 Hz; According to IEC 60947-5-1, DC-13, for DIQn.2 10 Hz; For DIQn.2 200 kHz; With DQn.0 and DQn.1

<ul style="list-style-type: none"> <li>For signal interface RS 422 symmetrical</li> <li>For signal interface TTL (5 V) asymmetrical</li> </ul>	<p>1 MHz</p> <p>200 kHz</p>
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>shielded, max.</li> </ul>	600 m; Cable length, RS 422 / TTL Siemens Type 6FX2001-5: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 32 meters shielded, max. 24 V (DQn.x / DIQn.2): 10 kHz, 600 meters, shielded, max. 200 kHz, 50 meters shielded, max.
<b>Isochronous mode</b>	
Bus cycle time (TDP), min.	250 µs; 375 µs if all 4 channels are used
Jitter, max.	1 µs
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	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> <li>Group error</li> </ul>	<p>Yes</p> <p>Yes; Thermal overload protection</p> <p>Yes</p>
<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>	<p>Yes; green LED</p> <p>Yes; red LED</p> <p>Yes; Yellow LED</p> <p>Yes; green LED</p> <p>Yes; green LED</p> <p>Yes; red LED</p>
<b>Potential separation</b>	
<b>Potential separation channels</b>	
<ul style="list-style-type: none"> <li>between the channels</li> <li>between the channels and backplane bus</li> <li>Between the channels and load voltage L+</li> </ul>	<p>No</p> <p>Yes</p> <p>No</p>
<b>Isolation</b>	
Isolation tested with	707 V DC (type test)
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
<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>	<p>0 °C</p> <p>60 °C; Observe derating</p> <p>0 °C</p> <p>40 °C; Observe derating</p>
<b>Altitude during operation relating to sea level</b>	
<ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
<b>Decentralized operation</b>	
to SIMATIC S7-300	Yes; Via control and feedback interface
to SIMATIC S7-400	Yes; Via control and feedback interface
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFINET controller	Yes; Via control and feedback interface
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	300 g
<b>last modified:</b>	3/2/2021 