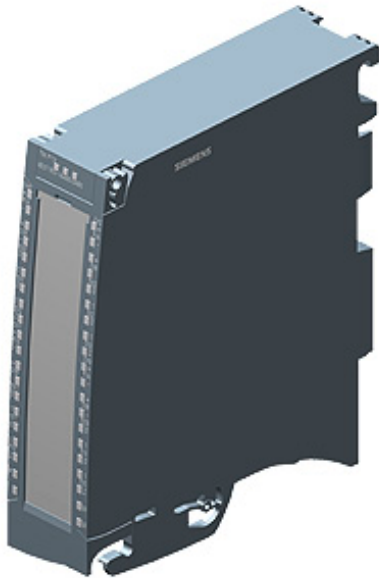


SIMATIC S7-1500, TM PTO 4 Interface board for stepper drives 4 Channels Pulse Train output PTO: 24 V, 2 DI, 1 DQ 24VDC per channel



| 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 as of version</li> </ul> | STEP 7 V14 or higher       |
| <ul style="list-style-type: none"> <li>• STEP 7 configurable/integrated as of version</li> </ul>            | V5.5 SP3 with GSD file / - |
| <ul style="list-style-type: none"> <li>• PROFINET as of 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   |
| <b>Input current</b>  |   |
| Current consumption, max.   | 70 mA; without load   |
| <b>Power</b>  |   |
| Power available from the backplane bus  | 1.3 W   |
| <b>Power loss</b>   |   |
| Power loss, typ.  | 4 W   |
| <b>Address area</b>   |   |
| 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  |
| <b>Digital inputs</b>   |   |
| 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> </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>  | -5 V  |
| <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>                                   |   |
| for standard inputs   |   |
| — parameterizable   | Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms |
| — at "0" to "1", min.   | 4 µs; for parameterization "none"                             |
| — at "1" to "0", min.   | 4 µs; for parameterization "none"                             |
| for technological functions   |   |
| — parameterizable   | Yes   |
| <b>Cable length</b>   |   |
| <ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>                      | 1 000 m   |
| <ul style="list-style-type: none"> <li>• unshielded, max.</li> </ul>                    | 600 m   |

| Digital outputs  |   |
|--|---|
| 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   |
| Digital output functions, parameterizable  |   |
| <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> | <br>Yes<br>Yes<br>Yes<br><br>Yes<br>Yes<br>Yes<br>Yes   |
| Switching capacity of the outputs  |   |
| <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<br>1 W; 5 W for DIQn.2  |
| Load resistance range  |   |
| <ul style="list-style-type: none"> <li>• lower limit</li> <li>• upper limit</li> </ul>   | 240 Ω; 48 ohms for DIQn.2<br>12 kΩ  |
| Output voltage   |   |
| <ul style="list-style-type: none"> <li>• Type of output voltage</li> <li>• for signal "1", min.</li> </ul>   | DC<br>23.2 V; L+ (-0.8 V), L+ (-1.3 V) for DIQn.2   |
| Output current   |   |
| <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<br>0.12 A; 0.6 A for DIQn.2<br>2 mA<br>0.5 mA   |
| Output delay with resistive load   |   |
| <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<br>1 μs; 25 μs for DIQn.2  |
| Switching frequency  |   |
| <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> <li>• For signal interface RS 422 symmetrical</li> </ul>  | 1 kHz; For DIQn.2<br>0.5 Hz; According to IEC 60947-5-1, DC-13, for DIQn.2<br>10 Hz; For DIQn.2<br>200 kHz; With DQn.0 and DQn.1<br>1 MHz |

|   |  |
|---|--|
| <ul style="list-style-type: none"> <li>For signal interface TTL (5 V) asymmetrical</li> </ul> | 200 kHz  |
| <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>Diagnostic messages</b>  |  |
| <ul style="list-style-type: none"> <li>Monitoring the supply voltage</li> </ul>               | Yes  |
| <ul style="list-style-type: none"> <li>Short-circuit</li> </ul>                               | Yes; Thermal overload protection   |
| <ul style="list-style-type: none"> <li>Group error</li> </ul>                                 | Yes  |
| <b>Diagnostics indication LED</b>   |  |
| <ul style="list-style-type: none"> <li>RUN LED</li> </ul>                                     | Yes; green LED   |
| <ul style="list-style-type: none"> <li>ERROR LED</li> </ul>                                   | Yes; red LED   |
| <ul style="list-style-type: none"> <li>MAINT LED</li> </ul>                                   | Yes; Yellow LED  |
| <ul style="list-style-type: none"> <li>Monitoring of the supply voltage (PWR-LED)</li> </ul>  | Yes; green LED   |
| <ul style="list-style-type: none"> <li>Channel status display</li> </ul>                      | Yes; green LED   |
| <ul style="list-style-type: none"> <li>for channel diagnostics</li> </ul>                     | Yes; red LED   |
| <b>Potential separation</b>   |  |
| <b>Potential separation channels</b>  |  |
| <ul style="list-style-type: none"> <li>between the channels</li> </ul>                        | No   |
| <ul style="list-style-type: none"> <li>between the channels and backplane bus</li> </ul>      | Yes  |
| <ul style="list-style-type: none"> <li>Between the channels and load voltage L+</li> </ul>    | No   |
| <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> </ul>               | 0 °C   |
| <ul style="list-style-type: none"> <li>horizontal installation, max.</li> </ul>               | 60 °C; Observe derating  |
| <ul style="list-style-type: none"> <li>vertical installation, min.</li> </ul>                 | 0 °C   |
| <ul style="list-style-type: none"> <li>vertical installation, max.</li> </ul>                 | 40 °C; Observe derating  |
| <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 |

#### Dimensions

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

#### Weights

|                 |       |
|-----------------|-------|
| Weight, approx. | 300 g |
|-----------------|-------|

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