



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"> I&M data 	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> Isochronous mode 	Yes
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	STEP 7 V14 or higher
<ul style="list-style-type: none"> STEP 7 configurable/integrated from version 	V5.5 SP3 with GSD file / -
<ul style="list-style-type: none"> PROFINET from GSD version/GSD revision 	GSDML V2.32
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
<ul style="list-style-type: none"> Rated value (DC) 	24 V
<ul style="list-style-type: none"> permissible range, lower limit (DC) 	19.2 V
<ul style="list-style-type: none"> permissible range, upper limit (DC) 	28.8 V
<ul style="list-style-type: none"> Reverse polarity protection 	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"> Inputs 	18 byte; Per channel
<ul style="list-style-type: none"> Outputs 	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"> Synchronization 	Yes
<ul style="list-style-type: none"> Probe 	Yes
<ul style="list-style-type: none"> Drive ready 	Yes
Input voltage	

<ul style="list-style-type: none"> • Type of input voltage • Rated value (DC) • for signal "0" • for signal "1" • permissible voltage at input, min. • permissible voltage at input, max. 	DC 24 V -5 ... +5 V +11 to +30V -5 V 30 V
Input current	
<ul style="list-style-type: none"> • for signal "1", typ. 	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
<ul style="list-style-type: none"> — parameterizable — at "0" to "1", min. — at "1" to "0", min. 	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"> — parameterizable 	Yes
Cable length	
<ul style="list-style-type: none"> • shielded, max. • unshielded, max. 	1 000 m 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"> • Response threshold, typ. 	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"> • PTO (pulse train output) signal interface <ul style="list-style-type: none"> — 24 V asymmetrical — RS 422 symmetrical — TTL (5 V) asymmetrical • PTO (pulse train output) signal type <ul style="list-style-type: none"> — Pulse and direction — Count up, count down — Incremental encoder (A, B phase shift) — Incremental encoder (A, B phase shift, quadruple) 	Yes Yes Yes Yes Yes Yes Yes Yes
Switching capacity of the outputs	
<ul style="list-style-type: none"> • with resistive load, max. • on lamp load, max. 	0.1 A; 0.5 A for DIQn.2 1 W; 5 W for DIQn.2
Load resistance range	
<ul style="list-style-type: none"> • lower limit • upper limit 	240 Ω; 48 ohms for DIQn.2 12 kΩ
Output voltage	
<ul style="list-style-type: none"> • Type of output voltage • for signal "1", min. 	DC 23.2 V; L+ (-0.8 V), L+ (-1.3 V) for DIQn.2
Output current	
<ul style="list-style-type: none"> • for signal "1" rated value • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "0" residual current, max. 	0.1 A; 0.5 A for DIQn.2 0.12 A; 0.6 A for DIQn.2 2 mA 0.5 mA
Output delay with resistive load	
<ul style="list-style-type: none"> • "0" to "1", typ. • "1" to "0", typ. 	1 µs; 28 µs for DIQn.2 1 µs; 25 µs for DIQn.2
Switching frequency	
<ul style="list-style-type: none"> • with resistive load, max. • with inductive load, max. • on lamp load, max. • For signal interface 24 V asymmetrical • For signal interface RS 422 symmetrical • For signal interface TTL (5 V) asymmetrical 	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 1 MHz 200 kHz
Cable length	
<ul style="list-style-type: none"> • shielded, max. 	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.

Isochronous mode

Bus cycle time (TDP), min.	250 µs; 375 µs if all 4 channels are used
Jitter, max.	1 µs

Interrupts/diagnostics/status information

Diagnostics function	Yes
----------------------	-----

Alarms

<ul style="list-style-type: none"> Diagnostic alarm 	Yes
--	-----

Diagnoses

<ul style="list-style-type: none"> Monitoring the supply voltage 	Yes
<ul style="list-style-type: none"> Short-circuit 	Yes; Thermal overload protection
<ul style="list-style-type: none"> Group error 	Yes

Diagnostics indication LED

<ul style="list-style-type: none"> RUN LED 	Yes; green LED
<ul style="list-style-type: none"> ERROR LED 	Yes; red LED
<ul style="list-style-type: none"> MAINT LED 	Yes; Yellow LED
<ul style="list-style-type: none"> Monitoring of the supply voltage (PWR-LED) 	Yes; green LED
<ul style="list-style-type: none"> Channel status display 	Yes; green LED
<ul style="list-style-type: none"> for channel diagnostics 	Yes; red LED

Potential separation

Potential separation channels

<ul style="list-style-type: none"> between the channels 	No
<ul style="list-style-type: none"> between the channels and backplane bus 	Yes
<ul style="list-style-type: none"> Between the channels and load voltage L+ 	No

Isolation

Isolation tested with	707 V DC (type test)
-----------------------	----------------------

Ambient conditions

Ambient temperature during operation

<ul style="list-style-type: none"> horizontal installation, min. 	0 °C
<ul style="list-style-type: none"> horizontal installation, max. 	60 °C; Observe derating
<ul style="list-style-type: none"> vertical installation, min. 	0 °C
<ul style="list-style-type: none"> vertical installation, max. 	40 °C; Observe derating

Altitude during operation relating to sea level

<ul style="list-style-type: none"> Installation altitude above sea level, max. 	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
---	--

Decentralized operation

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: 3/2/2021 