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Data sheet 6ES7553-1AA01-0AB0



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 24 V DC per channel

General information	
Product type designation	TM PTO 4
Number of channels	4; Axes
Product function	
● I&M data	Yes; I&M0 to I&M3
● Isochronous mode	Yes
Engineering with	
● STEP 7 TIA Portal configurable/integrated from version	STEP 7 V19 or higher
● STEP 7 configurable/integrated from version	V5.5 SP3 with GSD file / -
● PROFINET from GSD version/GSD revision	GSDML V2.43
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
● Rated value (DC)	24 V
● permissible range, lower limit (DC)	19.2 V
● permissible range, upper limit (DC)	28.8 V
● Reverse polarity protection	Yes
Input current	
Current consumption, max.	70 mA; without load
Power	
Power consumption from the backplane bus	1.3 W
Power loss	
Power loss, typ.	4 W
Address area	
Address space per module	
● Inputs	72 byte; 18 per channel
● Outputs	40 byte; 10 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	
● Synchronization	Yes
● Probe	Yes
● Drive ready	Yes
Input voltage	
● Type of input voltage	DC
● Rated value (DC)	24 V

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● for signal "0"	-5 ... +5 V
● for signal "1"	+11 to +30V
● permissible voltage at input, min.	-5 V
● permissible voltage at input, max.	30 V
Input current	
● for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
for technological functions	
— parameterizable	Yes
Cable length	
● shielded, max.	1 000 m
● unshielded, max.	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
● 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	
● PTO (pulse train output) signal interface	
— 24 V asymmetrical	Yes
— RS 422 symmetrical	Yes
— TTL (5 V) asymmetrical	Yes
● PTO (pulse train output) signal type	
— Pulse and direction	Yes
— Count up, count down	Yes
— Incremental encoder (A, B phase shift)	Yes
— Incremental encoder (A, B phase shift, quadruple)	Yes
Switching capacity of the outputs	
● with resistive load, max.	0.1 A; 0.5 A for DIQn.2
Load resistance range	
● lower limit	240 Ω; 48 ohms for DIQn.2
● upper limit	12 kΩ
Output voltage	
● Type of output voltage	DC
● for signal "1", min.	23.2 V; L+ (-0.8 V), L+ (-1.3 V) for DIQn.2
Output current	
● for signal "1" rated value	0.1 A; 0.5 A for DIQn.2
● for signal "1" permissible range, max.	0.12 A; 0.6 A for DIQn.2
● for signal "1" minimum load current	2 mA
● for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
● "0" to "1", typ.	1 µs; 28 µs for DIQn.2
● "1" to "0", typ.	1 µs; 25 µs for DIQn.2
Switching frequency	
● with resistive load, max.	1 kHz; For DIQn.2
● with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13, for DIQn.2
● For signal interface 24 V asymmetrical	200 kHz; With DQn.0 and DQn.1
● For signal interface RS 422 symmetrical	1 MHz
● For signal interface TTL (5 V) asymmetrical	200 kHz
Cable length	
● shielded, max.	600 m; 600 m for technological functions; depending on output frequency, load, and cable quality
Isochronous mode	
Bus cycle time (TDP), min.	250 µs; 375 µs if all 4 channels are used

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Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
● Diagnostic alarm	Yes
Diagnoses	
● Monitoring the supply voltage	Yes
● Short-circuit	Yes; Thermal overload protection
● Group error	Yes
Diagnostics indication LED	
● 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
Potential separation	
Potential separation channels	
● between the channels	No
● between the channels and backplane bus	Yes
● Between the channels and load voltage L+	No
Isolation	
Isolation tested with	707 V DC (type test)
Security	
signed firmware update	Yes
Ambient conditions	
Ambient temperature during operation	
● horizontal installation, min.	-30 °C
● horizontal installation, max.	60 °C; Observe derating
● vertical installation, min.	-30 °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
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
Classifications	

	Version	Classification
eClass	14	27-24-22-05
eClass	12	27-24-22-05
eClass	9.1	27-24-22-05
eClass	9	27-24-22-05
eClass	8	27-24-22-05
eClass	7.1	27-24-22-05
eClass	6	27-24-22-05
ETIM	10	EC001422
ETIM	9	EC001422
ETIM	8	EC001422

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	ETIM	7	EC001422

Approvals / Certificates

General Product Approval

KC | CE EG-Konf. | UKCA | Manufacturer Declaration | Miscellaneous | UL

General Product Approval	EMV	For use in hazardous locations

RCM | KC | UL | CCC-Ex | FM | IECEx

For use in hazardous locations		Maritime application

ATEX | Type Examination Certificate | Miscellaneous | ABS | BUREAU VERITAS | DNV

Maritime application

LRS | NK / Nippon Kaiji Kyokai | RINA | CCS (China Classification Society) | KR

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