SIEMENS

Data sheet

SIMATIC S7-1500, TM POSINPUT 2 Counter and position detection module for RS422 incremental encoder or SSI absolute value encoder, 2 channels, 2 DI, 2 DQ per channel

Figure similar

General information	
Product type designation	TM PosInput 2
Firmware version	V1.3
• FW update possible	Yes
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V12 (FW V1.0) ... V15 (FW V1.3)/V12 (FW V1.0), V13 (FW V1.1)
• PROFIBUS from GSD version/GSD revision	GSD Revision 5
• PROFINET from GSD version/GSD revision	V2.3 / -
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	

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• 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.	75 mA; without load

Encoder supply

Number of outputs	4; One 5V and 24V encoder supply per channel

5 V encoder supply

• 5 V	Yes; 5.2 V ±2 %
• Short-circuit protection	Yes
• Output current, max.	300 mA; Per channel

24 V encoder supply

• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	300 mA; Per channel

Power

Power available from the backplane bus	1.3 W

Power loss

Power loss, typ.	5.5 W

Address area

Address space per module

• Inputs	16 byte; Per channel
• Outputs	12 byte; per channel; 4 bytes for Motion Control

Digital inputs

Number of digital inputs	4; 2 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes

Digital input functions, parameterizable

• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes

Input voltage

• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection

• 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
— at "0" to "1", min.	6 µs; for parameterization "none"
— at "1" to "0", min.	6 µs; for parameterization "none"
for technological functions	
— parameterizable	Yes
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
• Response threshold, typ.	1 A
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "1" permissible range, max.	0.6 A; Per digital output
• 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", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	

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● with resistive load, max.	10 kHz
● with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
● on lamp load, max.	10 Hz
Total current of the outputs	
● Current per module, max.	2 A
Cable length	
● shielded, max.	1 000 m
● unshielded, max.	600 m

Encoder

Encoder signals, incremental encoder (symmetrical)	
● Input voltage	RS 422
● Input frequency, max.	1 MHz
● Counting frequency, max.	4 MHz; with quadruple evaluation
● Cable length, shielded, max.	32 m; at 1 MHz
● Signal filter, parameterizable	Yes
● Incremental encoder with A/B tracks, 90° phase offset	Yes
● Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
● Pulse encoder	Yes
● Pulse encoder with direction	Yes
● Pulse encoder with one impulse signal per count direction	Yes
Encoder signals, incremental encoder (asymmetrical)	
● Input voltage	5 V TTL (push-pull encoders only)
● Input frequency, max.	1 MHz
● Counting frequency, max.	4 MHz; with quadruple evaluation
● Signal filter, parameterizable	Yes
● Incremental encoder with A/B tracks, 90° phase offset	Yes
● Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
● Pulse encoder	Yes
● Pulse encoder with direction	Yes
● Pulse encoder with one impulse signal per count direction	Yes
Encoder signals, absolute encoder (SSI)	
● Input signal	to RS-422
● Telegram length, parameterizable	10 ... 40 bit
● Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
● Binary code	Yes
● Gray code	Yes

• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interface types	
• TTL 5 V	Yes; push-pull encoders only
• RS 422	Yes

Isochronous mode	
Filtering and processing time (TCI), min.	130 µs; only for pulse and incremental encoders
Bus cycle time (TDP), min.	250 µs

Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Telegram error at SSI encoder	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

Integrated Functions	
Number of counters	2
Counting frequency (counter) max.	4 MHz; with quadruple evaluation
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes

● Event-controlled stop	Yes
● Synchronization via digital input	Yes
● Counting range, parameterizable	Yes
Comparator	
— Number of comparators	2; Per channel
— Direction dependency	Yes
— Can be changed from user program	Yes
Position detection	
● Incremental acquisition	Yes
● Absolute acquisition	Yes
● Suitable for S7-1500 Motion Control	Yes
Measuring functions	
● Measuring time, parameterizable	Yes
● Dynamic measurement period adjustment	Yes
● Number of thresholds, parameterizable	2
Measuring range	
— Frequency measurement, min.	0.04 Hz
— Frequency measurement, max.	4 MHz
— Cycle duration measurement, min.	0.25 µs
— Cycle duration measurement, max.	25 s
Accuracy	
— Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
— Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
— Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
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)
Ambient conditions	
Ambient temperature during operation	
● horizontal installation, min.	0 °C
● horizontal installation, max.	60 °C; Please note derating for inductive loads
● vertical installation, min.	0 °C
● vertical installation, max.	40 °C; Please note derating for inductive loads
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes

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to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes; FW V1.1 and higher
to standard PROFINET controller	Yes

Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm

Weights	
Weight, approx.	325 g

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