

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
<ul style="list-style-type: none"> FW update possible 	Yes
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 	V12 (FW V1.0) ... V15 (FW V1.3)/V12 (FW V1.0), V13 (FW V1.1)
<ul style="list-style-type: none"> PROFIBUS from GSD version/GSD revision 	GSD Revision 5
<ul style="list-style-type: none"> PROFINET from GSD version/GSD revision 	V2.3 / -
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. 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 \pm 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	

• 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

<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> • Parity bit, parameterizable 	Yes
<ul style="list-style-type: none"> • Monoflop time 	16, 32, 48, 64 μ s & automatic
<ul style="list-style-type: none"> • Multiturn 	Yes
<ul style="list-style-type: none"> • Singleturn 	Yes
Interface types	
<ul style="list-style-type: none"> • TTL 5 V 	Yes; push-pull encoders only
<ul style="list-style-type: none"> • RS 422 	Yes
Isochronous mode	
Filtering and processing time (TCI), min.	130 μ s; only for pulse and incremental encoders
Bus cycle time (TDP), min.	250 μ s
Interrupts/diagnostics/status information	
Alarms	
<ul style="list-style-type: none"> • Diagnostic alarm 	Yes
<ul style="list-style-type: none"> • Hardware interrupt 	Yes
Diagnoses	
<ul style="list-style-type: none"> • Monitoring the supply voltage 	Yes
<ul style="list-style-type: none"> • Wire-break 	Yes
<ul style="list-style-type: none"> • Short-circuit 	Yes
<ul style="list-style-type: none"> • A/B transition error at incremental encoder 	Yes
<ul style="list-style-type: none"> • Telegram error at SSI encoder 	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
Integrated Functions	
Number of counters	2
Counting frequency (counter) max.	4 MHz; with quadruple evaluation
Counting functions	
<ul style="list-style-type: none"> • Can be used with TO High_Speed_Counter 	Yes; only for pulse and incremental encoders
<ul style="list-style-type: none"> • Continuous counting 	Yes
<ul style="list-style-type: none"> • Counter response parameterizable 	Yes
<ul style="list-style-type: none"> • Hardware gate via digital input 	Yes
<ul style="list-style-type: none"> • 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 μ s
— 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

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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last modified: 10/13/2020