



SIMATIC S7-1500, TM PosInput 2 counter and position detection module for RS-422 incremental encoder or SSI absolute encoder, 2 channels, 2 DI, 2 DQ per channel

General information	
Product type designation	TM PosInput 2
Firmware version	V2.0
<ul style="list-style-type: none"> FW update possible 	Yes
Number of channels	2
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 	V17
<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+	
<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.	75 mA; without load
Encoder supply	
Number of outputs	4; One 5V and 24V encoder supply per channel
5 V encoder supply	
<ul style="list-style-type: none"> 5 V 	Yes; 5.2 V \pm 2 %
<ul style="list-style-type: none"> Short-circuit protection 	Yes
<ul style="list-style-type: none"> Output current, max. 	300 mA; Per channel
24 V encoder supply	
<ul style="list-style-type: none"> 24 V 	Yes; L+ (-0.8 V)
<ul style="list-style-type: none"> Short-circuit protection 	Yes
<ul style="list-style-type: none"> Output current, max. 	300 mA; Per channel
Power	
Power consumption from the backplane bus	1.3 W
Power loss	
Power loss, typ.	5.5 W
Address area	
Address space per module	
<ul style="list-style-type: none"> Inputs 	32 byte; 16 bytes per channel; 4 bytes for fast mode

• Outputs	24 byte; 12 bytes per channel; 4 bytes for Motion Control, 0 bytes for fast mode
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
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
• 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
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• 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

<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	
Counter	Yes
<ul style="list-style-type: none"> • Number of counters 	2
<ul style="list-style-type: none"> • Counting frequency, max. 	4 MHz; with quadruple evaluation
Fast mode	Yes
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
<ul style="list-style-type: none"> • Event-controlled stop 	Yes
<ul style="list-style-type: none"> • Synchronization via digital input 	Yes
<ul style="list-style-type: none"> • Counting range, parameterizable 	Yes
Comparator	
<ul style="list-style-type: none"> — Number of comparators 	2; Per channel
<ul style="list-style-type: none"> — Direction dependency 	Yes
<ul style="list-style-type: none"> — Can be changed from user program 	Yes
Position detection	
<ul style="list-style-type: none"> • Incremental acquisition 	Yes
<ul style="list-style-type: none"> • Absolute acquisition 	Yes
<ul style="list-style-type: none"> • Suitable for S7-1500 Motion Control 	Yes
Measuring functions	
<ul style="list-style-type: none"> • Measuring time, parameterizable 	Yes
<ul style="list-style-type: none"> • Dynamic measurement period adjustment 	Yes
<ul style="list-style-type: none"> • Number of thresholds, parameterizable 	2
Measuring range	
<ul style="list-style-type: none"> — Frequency measurement, min. 	0.04 Hz
<ul style="list-style-type: none"> — Frequency measurement, max. 	4 MHz
<ul style="list-style-type: none"> — Cycle duration measurement, min. 	0.25 μ s
<ul style="list-style-type: none"> — Cycle duration measurement, max. 	25 s
Accuracy	
<ul style="list-style-type: none"> — Frequency measurement 	100 ppm; depending on measuring interval and signal evaluation
<ul style="list-style-type: none"> — Cycle duration measurement 	100 ppm; depending on measuring interval and signal evaluation
<ul style="list-style-type: none"> — Velocity measurement 	100 ppm; depending on measuring interval and signal evaluation
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. 	-30 °C
<ul style="list-style-type: none"> • horizontal installation, max. 	60 °C; Please note derating for inductive loads
<ul style="list-style-type: none"> • vertical installation, min. 	-30 °C
<ul style="list-style-type: none"> • vertical installation, max. 	40 °C; Please note derating for inductive loads
Ambient temperature during storage/transportation	
<ul style="list-style-type: none"> • min. 	-40 °C
<ul style="list-style-type: none"> • max. 	70 °C
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
Absolute humidity	
<ul style="list-style-type: none"> • dew point, min. 	-60 °C; suitable for dry room applications

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
to standard PROFINET controller	Yes

Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm

Weights	
Weight, approx.	325 g

Classifications			
		Version	Classification
	eClass	16	27-24-22-05
	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
	ETIM	7	EC001422

Approvals / Certificates

General Product Approval



[Miscellaneous](#)

[Manufacturer Declaration](#)



General Product Approval EMV For use in hazardous locations



[China RoHS](#)



[FM](#)

[CCC-Ex](#)



For use in hazardous locations Maritime application

[Type Examination Certificate](#)



[Miscellaneous](#)

[CCC-Ex](#)



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