



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
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> • Gate start/stop 	Yes; only for pulse and incremental encoders
<ul style="list-style-type: none"> • Capture 	Yes
<ul style="list-style-type: none"> • Synchronization 	Yes; only for pulse and incremental encoders
<ul style="list-style-type: none"> • Freely usable digital input 	Yes
Input voltage	
<ul style="list-style-type: none"> • Type of input voltage 	DC
<ul style="list-style-type: none"> • Rated value (DC) 	24 V
<ul style="list-style-type: none"> • for signal "0" 	-5 ... +5 V
<ul style="list-style-type: none"> • for signal "1" 	+11 to +30V
<ul style="list-style-type: none"> • permissible voltage at input, min. 	-30 V; -5 V continuous, -30 V brief reverse polarity protection
<ul style="list-style-type: none"> • permissible voltage at input, max. 	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	
— 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	
<ul style="list-style-type: none"> • shielded, max. 	1 000 m
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Response threshold, typ. 	1 A
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
<ul style="list-style-type: none"> • Switching tripped by comparison values 	Yes
<ul style="list-style-type: none"> • Freely usable digital output 	Yes
Switching capacity of the outputs	
<ul style="list-style-type: none"> • with resistive load, max. 	0.5 A; Per digital output
<ul style="list-style-type: none"> • on lamp load, max. 	5 W
Load resistance range	
<ul style="list-style-type: none"> • lower limit 	48 Ω
<ul style="list-style-type: none"> • upper limit 	12 kΩ
Output voltage	
<ul style="list-style-type: none"> • Type of output voltage 	DC
<ul style="list-style-type: none"> • for signal "1", min. 	23.2 V; L+ (-0.8 V)
Output current	
<ul style="list-style-type: none"> • for signal "1" rated value 	0.5 A; Per digital output
<ul style="list-style-type: none"> • for signal "1" permissible range, max. 	0.6 A; Per digital output
<ul style="list-style-type: none"> • for signal "1" minimum load current 	2 mA
<ul style="list-style-type: none"> • for signal "0" residual current, max. 	0.5 mA
Output delay with resistive load	
<ul style="list-style-type: none"> • "0" to "1", max. 	50 μs
<ul style="list-style-type: none"> • "1" to "0", max. 	50 μs
Switching frequency	
<ul style="list-style-type: none"> • with resistive load, max. 	10 kHz
<ul style="list-style-type: none"> • with inductive load, max. 	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
<ul style="list-style-type: none"> • on lamp load, max. 	10 Hz
Total current of the outputs	
<ul style="list-style-type: none"> • Current per module, max. 	2 A
Cable length	

<ul style="list-style-type: none"> • shielded, max. 	1 000 m
<ul style="list-style-type: none"> • unshielded, max. 	600 m
Encoder	
Encoder signals, incremental encoder (symmetrical)	
<ul style="list-style-type: none"> • Input voltage 	RS 422
<ul style="list-style-type: none"> • Input frequency, max. 	1 MHz
<ul style="list-style-type: none"> • Counting frequency, max. 	4 MHz; with quadruple evaluation
<ul style="list-style-type: none"> • Cable length, shielded, max. 	32 m; at 1 MHz
<ul style="list-style-type: none"> • Signal filter, parameterizable 	Yes
<ul style="list-style-type: none"> • Incremental encoder with A/B tracks, 90° phase offset 	Yes
<ul style="list-style-type: none"> • Incremental encoder with A/B tracks, 90° phase offset and zero track 	Yes
<ul style="list-style-type: none"> • pulse encoder 	Yes
<ul style="list-style-type: none"> • Pulse encoder with direction 	Yes
<ul style="list-style-type: none"> • pulse encoder with one impulse signal per count direction 	Yes
Encoder signals, incremental encoder (asymmetrical)	
<ul style="list-style-type: none"> • Input voltage 	5 V TTL (push-pull encoders only)
<ul style="list-style-type: none"> • Input frequency, max. 	1 MHz
<ul style="list-style-type: none"> • Counting frequency, max. 	4 MHz; with quadruple evaluation
<ul style="list-style-type: none"> • Signal filter, parameterizable 	Yes
<ul style="list-style-type: none"> • Incremental encoder with A/B tracks, 90° phase offset 	Yes
<ul style="list-style-type: none"> • Incremental encoder with A/B tracks, 90° phase offset and zero track 	Yes
<ul style="list-style-type: none"> • pulse encoder 	Yes
<ul style="list-style-type: none"> • pulse encoder with direction 	Yes
<ul style="list-style-type: none"> • pulse encoder with one impulse signal per count direction 	Yes
Encoder signals, absolute encoder (SSI)	
<ul style="list-style-type: none"> • Input signal 	to RS-422
<ul style="list-style-type: none"> • Telegram length, parameterizable 	10 ... 40 bit
<ul style="list-style-type: none"> • Clock frequency, max. 	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
<ul style="list-style-type: none"> • Binary code 	Yes
<ul style="list-style-type: none"> • 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 µs & 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
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	
Counter	Yes

• Number of counters	2
• Counting frequency, max.	4 MHz; with quadruple evaluation
Fast mode	Yes
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.	-30 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
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
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	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](#)



EMV **For use in hazardous locations**

[KC](#)

[FM](#)

[CCC-Ex](#)



[Type Examination Certificate](#)



For use in hazardous locations **Maritime application**

[Miscellaneous](#)



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