

SIMATIC ET 200SP, TM POSINPUT 1 COUNT AND POSITON INPUT MODULE FOR RS422 INCREMENTAL ENCODER OR SSI ABSOLUTE ENCODER, 2 DI, 3 DQ



Product type designation	
General information	
Usable BaseUnits	BU type A0
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / V5.5 SP4
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3
Installation type/mounting	
Rack mounting possible	Yes
Type of fitting, rail mounting	Yes
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V

• permissible range, lower limit (DC) • permissible range, upper limit (DC) • Reverse polarity protection	19.2 V 28.8 V Yes
Input current	
Current consumption, max.	75 mA; without load
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V • short-circuit protection • Output current, max.	Yes; L+ (-0.8 V) Yes 300 mA
Power losses	
Power loss, typ.	1.9 W
Address area	
Occupied address area	
• Inputs • Outputs	16 byte 12 byte; 4 bytes for Motion Control
Digital inputs	
Number of digital inputs	2
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop • Capture • Synchronization • Freely usable digital input	Yes; only for pulse and incremental encoders Yes Yes; only for pulse and incremental encoders Yes
Input voltage	
• Rated value (DC) • for signal "0" • for signal "1" • Permissible voltage at input, min. • Permissible voltage at input, max.	24 V -30 to +5 V +11 to +30 V -30 V 30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— Parameterizable — at "0" to "1", min. — at "1" to "0", min.	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms 6 µs; for parameterization "none" 6 µs; for parameterization "none"
for counter/technological functions	
— Parameterizable	Yes

Cable length	
• Cable length, shielded, max.	1 000 m
• Cable length unshielded, max.	600 m
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, configurable	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 k Ω
Output voltage	
• 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 μ s
• "1" to "0", max.	50 μ s
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Aggregate current of the outputs	
• Max. current per module	1 A
Cable length	
• Cable length, shielded, max.	1 000 m
• Cable length unshielded, max.	600 m
Encoder	
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz

• Counting frequency, max. • Signal filter, can be parameterized • Cable length, shielded, max. • Incremental encoder with A/B tracks, 90° out of phase • Incremental encoder with A/B tracks, 90° out of phase and zero track • Pulse encoder • Pulse encoder with direction • Pulse encoder with one impulse signal per count direction	4 MHz; with quadruple evaluation Yes 32 m; at 1 MHz Yes Yes Yes Yes Yes
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage • Input frequency, max. • Counting frequency, max. • Signal filter, can be parameterized • Incremental encoder with A/B tracks, 90° out of phase • Incremental encoder with A/B tracks, 90° out of phase and zero track • Pulse encoder • Pulse encoder with direction • Pulse encoder with one impulse signal per count direction	5 V TTL (push-pull encoders only) 1 MHz 4 MHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes
Encoder signals, absolute encoder (SSI)	
• Input signal • Message frame length, parameterizable • Clock frequency, max. • Binary code • Gray code • Cable length, shielded, max. • Parity bit, parameterizable • Monoflop time • Multiturn • Singleturn	to RS-422 10 ... 40 bit 2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz Yes Yes 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. Yes 16, 32, 48, 64 µs & automatic Yes Yes
Interface types	
• RS422 • TTL 5 V	Yes Yes
Isochronous mode	

Isochronous operation (application synchronized up to terminal)	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; Parameterizable
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
• Frame error at SSI encoder	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
Integrated Functions	
Number of counters	1
Counter 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 can be parameterized	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
— 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
• Dyn. measuring time adjustment	Yes
• Number of thresholds, parameterizable	2

Measuring range	
— Frequency measurement, min.	0.04 Hz
— Frequency measurement, max.	4 MHz
— Period measurement, min.	0.25 µs
— Period 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
— Speed measurement	100 ppm; depending on measuring interval and signal evaluation
Galvanic isolation	
Electrical isolation channels	
• between the channels and the backplane bus	Yes
Permissible potential difference	
between different circuits	75 V DC/60 V AC (base isolation)
Isolation	
Isolation checked with	707 V DC (type test)
Ambient conditions	
Operating temperature	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C; Observe derating
Dimensions	
Width	15 mm
Weights	
Weight, approx.	45 g
last modified:	11.11.2014