

SIMATIC ET 200SP, TM POSINPUT 1 COUNTING AND POSITION DETECTION MODULE, FOR RS422 INCREMENTAL ENCODER OR SSI ABSOLUTE ENCODER, 2 DI, 2 DQ



General information	
Product type designation	TM PosInput 1
usable BaseUnits	BU type A0
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V13 / V13
• STEP 7 configurable/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
Rail mounting possible	Yes
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V

<ul style="list-style-type: none"> <li>• permissible range, upper limit (DC)</li> <li>• Reverse polarity protection</li> </ul>	28.8 V Yes
<b>Input current</b>	
Current consumption, max.	75 mA; without load
<b>Encoder supply</b>	
Number of outputs	1
<b>24 V encoder supply</b>	
<ul style="list-style-type: none"> <li>• 24 V</li> <li>• Short-circuit protection</li> <li>• Output current, max.</li> </ul>	Yes; L+ (-0.8 V) Yes 300 mA
<b>Power loss</b>	
Power loss, typ.	1.9 W
<b>Address area</b>	
<b>Occupied address area</b>	
<ul style="list-style-type: none"> <li>• Inputs</li> <li>• Outputs</li> </ul>	16 byte 12 byte; 4 bytes for Motion Control
<b>Digital inputs</b>	
Number of digital inputs	2
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Digital input functions, parameterizable</b>	
<ul style="list-style-type: none"> <li>• Gate start/stop</li> <li>• Capture</li> <li>• Synchronization</li> <li>• Freely usable digital input</li> </ul>	Yes; only for pulse and incremental encoders Yes Yes; only for pulse and incremental encoders Yes
<b>Input voltage</b>	
<ul style="list-style-type: none"> <li>• Rated value (DC)</li> <li>• for signal "0"</li> <li>• for signal "1"</li> <li>• permissible voltage at input, min.</li> <li>• permissible voltage at input, max.</li> </ul>	24 V -30 to +5V +11 to +30V -30 V 30 V
<b>Input current</b>	
<ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>	2.5 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
<ul style="list-style-type: none"> <li>— parameterizable</li> <li>— at "0" to "1", min.</li> <li>— at "1" to "0", min.</li> </ul>	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"
<b>for counter/technological functions</b>	

— parameterizable	Yes
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	2
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
<b>Digital output functions, parameterizable</b>	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	12 kΩ
<b>Output voltage</b>	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• 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
<b>Output delay with resistive load</b>	
• "0" to "1", max.	50 μs
• "1" to "0", max.	50 μs
<b>Switching frequency</b>	
• 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
<b>Total current of the outputs</b>	
• Current per module, max.	1 A
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Encoder</b>	

Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, parameterizable	Yes
• Cable length, shielded, max.	32 m; at 1 MHz
• 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	

- RS 422 Yes
- TTL 5 V Yes; push-pull encoders only

### 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
- Telegram 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

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
- 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
<b>Measuring functions</b>	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
<b>Measuring range</b>	
— Frequency measurement, min.	0.04 Hz
— Frequency measurement, max.	4 MHz
— Cycle duration measurement, min.	0.25 µs
— Cycle duration measurement, max.	25 s
<b>Accuracy</b>	
— 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
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels and backplane bus	Yes
<b>Permissible potential difference</b>	
between different circuits	75 V DC/60 V AC (base isolation)
<b>Isolation</b>	
Isolation tested with	707 V DC (type test)
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C; Observe derating
<b>Dimensions</b>	
Width	15 mm
<b>Weights</b>	
Weight, approx.	45 g
<b>last modified:</b>	22.02.2016