



Figure similar

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

General information	
Product type designation	TM PosInput 2
Firmware version	V1.3
<ul style="list-style-type: none"> <li>FW update possible</li> </ul>	Yes
Product function	
<ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> <li>Isochronous mode</li> </ul>	Yes
Engineering with	
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V12 (FW V1.0) ... V15 (FW V1.3)/V12 (FW V1.0), V13 (FW V1.1)
<ul style="list-style-type: none"> <li>PROFIBUS from GSD version/GSD revision</li> </ul>	GSD Revision 5
<ul style="list-style-type: none"> <li>PROFINET from GSD version/GSD revision</li> </ul>	V2.3 / -
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
<ul style="list-style-type: none"> <li>Rated value (DC)</li> </ul>	24 V
<ul style="list-style-type: none"> <li>permissible range, lower limit (DC)</li> </ul>	19.2 V
<ul style="list-style-type: none"> <li>permissible range, upper limit (DC)</li> </ul>	28.8 V
<ul style="list-style-type: none"> <li>Reverse polarity protection</li> </ul>	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"> <li>5 V</li> </ul>	Yes; 5.2 V $\pm$ 2 %
<ul style="list-style-type: none"> <li>Short-circuit protection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Output current, max.</li> </ul>	300 mA; Per channel
24 V encoder supply	
<ul style="list-style-type: none"> <li>24 V</li> </ul>	Yes; L+ (-0.8 V)
<ul style="list-style-type: none"> <li>Short-circuit protection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Output current, max.</li> </ul>	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	
<ul style="list-style-type: none"> <li>Inputs</li> </ul>	16 byte; Per channel
<ul style="list-style-type: none"> <li>Outputs</li> </ul>	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	
<ul style="list-style-type: none"> <li>• Gate start/stop</li> </ul>	Yes; only for pulse and incremental encoders
<ul style="list-style-type: none"> <li>• Capture</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Synchronization</li> </ul>	Yes; only for pulse and incremental encoders
<ul style="list-style-type: none"> <li>• Freely usable digital input</li> </ul>	Yes
Input voltage	
<ul style="list-style-type: none"> <li>• Type of input voltage</li> </ul>	DC
<ul style="list-style-type: none"> <li>• Rated value (DC)</li> </ul>	24 V
<ul style="list-style-type: none"> <li>• for signal "0"</li> </ul>	-5 ... +5 V
<ul style="list-style-type: none"> <li>• for signal "1"</li> </ul>	+11 to +30V
<ul style="list-style-type: none"> <li>• permissible voltage at input, min.</li> </ul>	-30 V; -5 V continuous, -30 V brief reverse polarity protection
<ul style="list-style-type: none"> <li>• permissible voltage at input, max.</li> </ul>	30 V
Input current	
<ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>	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	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	1 000 m
<ul style="list-style-type: none"> <li>• unshielded, max.</li> </ul>	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"> <li>• Response threshold, typ.</li> </ul>	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"> <li>• Switching tripped by comparison values</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Freely usable digital output</li> </ul>	Yes
Switching capacity of the outputs	
<ul style="list-style-type: none"> <li>• with resistive load, max.</li> </ul>	0.5 A; Per digital output
<ul style="list-style-type: none"> <li>• on lamp load, max.</li> </ul>	5 W
Load resistance range	
<ul style="list-style-type: none"> <li>• lower limit</li> </ul>	48 Ω
<ul style="list-style-type: none"> <li>• upper limit</li> </ul>	12 kΩ
Output voltage	
<ul style="list-style-type: none"> <li>• Type of output voltage</li> </ul>	DC
<ul style="list-style-type: none"> <li>• for signal "1", min.</li> </ul>	23.2 V; L+ (-0.8 V)
Output current	
<ul style="list-style-type: none"> <li>• for signal "1" rated value</li> </ul>	0.5 A; Per digital output
<ul style="list-style-type: none"> <li>• for signal "1" permissible range, max.</li> </ul>	0.6 A; Per digital output
<ul style="list-style-type: none"> <li>• for signal "1" minimum load current</li> </ul>	2 mA
<ul style="list-style-type: none"> <li>• for signal "0" residual current, max.</li> </ul>	0.5 mA
Output delay with resistive load	
<ul style="list-style-type: none"> <li>• "0" to "1", max.</li> </ul>	50 µs
<ul style="list-style-type: none"> <li>• "1" to "0", max.</li> </ul>	50 µs
Switching frequency	
<ul style="list-style-type: none"> <li>• with resistive load, max.</li> </ul>	10 kHz
<ul style="list-style-type: none"> <li>• with inductive load, max.</li> </ul>	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
<ul style="list-style-type: none"> <li>• on lamp load, max.</li> </ul>	10 Hz
Total current of the outputs	

• Current per module, max.	2 A
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Encoder</b>	
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• 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
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• 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
<b>Encoder signals, absolute encoder (SSI)</b>	
• 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
<b>Interface types</b>	
• TTL 5 V	Yes; push-pull encoders only
• RS 422	Yes
<b>Isochronous mode</b>	
Filtering and processing time (TCI), min.	130 µs; only for pulse and incremental encoders
Bus cycle time (TDP), min.	250 µs
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
<b>Diagnoses</b>	
• 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
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED

<ul style="list-style-type: none"> <li>• Monitoring of the supply voltage (PWR-LED)</li> </ul>	Yes; green LED
<ul style="list-style-type: none"> <li>• Channel status display</li> </ul>	Yes; green LED
<ul style="list-style-type: none"> <li>• for channel diagnostics</li> </ul>	Yes; red LED
<b>Integrated Functions</b>	
Counter	Yes
<ul style="list-style-type: none"> <li>• Number of counters</li> </ul>	2
<ul style="list-style-type: none"> <li>• Counting frequency, max.</li> </ul>	4 MHz; with quadruple evaluation
<b>Counting functions</b>	
<ul style="list-style-type: none"> <li>• Can be used with TO High_Speed_Counter</li> </ul>	Yes; only for pulse and incremental encoders
<ul style="list-style-type: none"> <li>• Continuous counting</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Counter response parameterizable</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Hardware gate via digital input</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Software gate</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Event-controlled stop</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Synchronization via digital input</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Counting range, parameterizable</li> </ul>	Yes
<b>Comparator</b>	
<ul style="list-style-type: none"> <li>— Number of comparators</li> </ul>	2; Per channel
<ul style="list-style-type: none"> <li>— Direction dependency</li> </ul>	Yes
<ul style="list-style-type: none"> <li>— Can be changed from user program</li> </ul>	Yes
<b>Position detection</b>	
<ul style="list-style-type: none"> <li>• Incremental acquisition</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Absolute acquisition</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Suitable for S7-1500 Motion Control</li> </ul>	Yes
<b>Measuring functions</b>	
<ul style="list-style-type: none"> <li>• Measuring time, parameterizable</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Dynamic measurement period adjustment</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Number of thresholds, parameterizable</li> </ul>	2
<b>Measuring range</b>	
<ul style="list-style-type: none"> <li>— Frequency measurement, min.</li> </ul>	0.04 Hz
<ul style="list-style-type: none"> <li>— Frequency measurement, max.</li> </ul>	4 MHz
<ul style="list-style-type: none"> <li>— Cycle duration measurement, min.</li> </ul>	0.25 $\mu$ s
<ul style="list-style-type: none"> <li>— Cycle duration measurement, max.</li> </ul>	25 s
<b>Accuracy</b>	
<ul style="list-style-type: none"> <li>— Frequency measurement</li> </ul>	100 ppm; depending on measuring interval and signal evaluation
<ul style="list-style-type: none"> <li>— Cycle duration measurement</li> </ul>	100 ppm; depending on measuring interval and signal evaluation
<ul style="list-style-type: none"> <li>— Velocity measurement</li> </ul>	100 ppm; depending on measuring interval and signal evaluation
<b>Potential separation</b>	
<b>Potential separation channels</b>	
<ul style="list-style-type: none"> <li>• between the channels</li> </ul>	No
<ul style="list-style-type: none"> <li>• between the channels and backplane bus</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Between the channels and load voltage L+</li> </ul>	No
<b>Isolation</b>	
Isolation tested with	707 V DC (type test)
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
<ul style="list-style-type: none"> <li>• horizontal installation, min.</li> </ul>	0 °C
<ul style="list-style-type: none"> <li>• horizontal installation, max.</li> </ul>	60 °C; Please note derating for inductive loads
<ul style="list-style-type: none"> <li>• vertical installation, min.</li> </ul>	0 °C
<ul style="list-style-type: none"> <li>• vertical installation, max.</li> </ul>	40 °C; Please note derating for inductive loads
<b>Altitude during operation relating to sea level</b>	
<ul style="list-style-type: none"> <li>• Installation altitude above sea level, max.</li> </ul>	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
<b>Decentralized operation</b>	
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
<b>Dimensions</b>	

Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	325 g

**last modified:** 8/8/2023 