



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             |

|                                                                 |                                                                 |
|-----------------------------------------------------------------|-----------------------------------------------------------------|
| <b>Digital inputs</b>                                           |                                                                 |
| Number of digital inputs                                        | 4; 2 per channel                                                |
| Digital inputs, parameterizable                                 | Yes                                                             |
| Input characteristic curve in accordance with IEC 61131, type 3 | Yes                                                             |
| <b>Digital input functions, parameterizable</b>                 |                                                                 |
| • 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                                                             |
| <b>Input voltage</b>                                            |                                                                 |
| • 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                                                            |
| <b>Input current</b>                                            |                                                                 |
| • for signal "1", typ.                                          | 2.5 mA                                                          |
| <b>Input delay (for rated value of input voltage)</b>           |                                                                 |
| 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                                                             |
| <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                                       | 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                                                             |
| <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>                                           |                                                                 |
| • Type of output voltage                                        | DC                                                              |
| • 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.                                             | 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> <li>• Channel status display</li> <li>• for channel diagnostics</li> </ul>                                                                                                                                                                                                | Yes; green LED<br>Yes; green LED<br>Yes; red LED                                                                                                                                                   |
| <b>Integrated Functions</b>                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                    |
| Counter                                                                                                                                                                                                                                                                                                                                                            | Yes                                                                                                                                                                                                |
| <ul style="list-style-type: none"> <li>• Number of counters</li> <li>• Counting frequency, max.</li> </ul>                                                                                                                                                                                                                                                         | 2<br>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> <li>• Continuous counting</li> <li>• Counter response parameterizable</li> <li>• Hardware gate via digital input</li> <li>• Software gate</li> <li>• Event-controlled stop</li> <li>• Synchronization via digital input</li> <li>• Counting range, parameterizable</li> </ul> | Yes; only for pulse and incremental encoders<br>Yes<br>Yes<br>Yes<br>Yes<br>Yes<br>Yes<br>Yes                                                                                                      |
| <b>Comparator</b>                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>— Number of comparators</li> <li>— Direction dependency</li> <li>— Can be changed from user program</li> </ul>                                                                                                                                                                                                              | 2; Per channel<br>Yes<br>Yes                                                                                                                                                                       |
| <b>Position detection</b>                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>• Incremental acquisition</li> <li>• Absolute acquisition</li> <li>• Suitable for S7-1500 Motion Control</li> </ul>                                                                                                                                                                                                         | Yes<br>Yes<br>Yes                                                                                                                                                                                  |
| <b>Measuring functions</b>                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>• Measuring time, parameterizable</li> <li>• Dynamic measurement period adjustment</li> <li>• Number of thresholds, parameterizable</li> </ul>                                                                                                                                                                              | Yes<br>Yes<br>2                                                                                                                                                                                    |
| <b>Measuring range</b>                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>— Frequency measurement, min.</li> <li>— Frequency measurement, max.</li> <li>— Cycle duration measurement, min.</li> <li>— Cycle duration measurement, max.</li> </ul>                                                                                                                                                     | 0.04 Hz<br>4 MHz<br>0.25 $\mu$ s<br>25 s                                                                                                                                                           |
| <b>Accuracy</b>                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>— Frequency measurement</li> <li>— Cycle duration measurement</li> <li>— Velocity measurement</li> </ul>                                                                                                                                                                                                                    | 100 ppm; depending on measuring interval and signal evaluation<br>100 ppm; depending on measuring interval and signal evaluation<br>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> <li>• between the channels and backplane bus</li> <li>• Between the channels and load voltage L+</li> </ul>                                                                                                                                                                                     | No<br>Yes<br>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> <li>• horizontal installation, max.</li> <li>• vertical installation, min.</li> <li>• vertical installation, max.</li> </ul>                                                                                                                                                           | 0 °C<br>60 °C; Please note derating for inductive loads<br>0 °C<br>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 |
| Weights         |        |
| Weight, approx. | 325 g  |

last modified: 3/12/2024 