



Figure similar

\*\*\* spare part \*\*\* 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                                         | V1.3                                                         |
| • FW update possible                                     | Yes                                                          |
| Product function                                         |                                                              |
| • I&M data                                               | Yes; I&M0 to I&M3                                            |
| • Isochronous mode                                       | Yes                                                          |
| Engineering with                                         |                                                              |
| • STEP 7 TIA Portal configurable/integrated from version | V12 (FW V1.0) ... V15 (FW V1.3)/V12 (FW V1.0), V13 (FW V1.1) |
| • PROFIBUS from GSD version/GSD revision                 | GSD Revision 5                                               |
| • PROFINET from GSD version/GSD revision                 | V2.3 / -                                                     |
| Installation type/mounting                               |                                                              |
| Rail mounting                                            | Yes; S7-1500 mounting rail                                   |
| Supply voltage                                           |                                                              |
| Load voltage L+                                          |                                                              |
| • Rated value (DC)                                       | 24 V                                                         |
| • permissible range, lower limit (DC)                    | 19.2 V                                                       |
| • permissible range, upper limit (DC)                    | 28.8 V                                                       |
| • 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                                       |                                                              |
| • 5 V                                                    | Yes; 5.2 V $\pm$ 2 %                                         |
| • Short-circuit protection                               | Yes                                                          |
| • Output current, max.                                   | 300 mA; Per channel                                          |
| 24 V encoder supply                                      |                                                              |
| • 24 V                                                   | Yes; L+ (-0.8 V)                                             |
| • Short-circuit protection                               | Yes                                                          |
| • 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                                 |                                                              |
| • Inputs                                                 | 16 byte; Per channel                                         |
| • Outputs                                                | 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   |
| 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   |

## Encoder

|                                                                        |                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Encoder signals, incremental encoder (symmetrical)                     |                                                                                                                                                                                                                                                                                                      |
| • 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                                                                                                                                                                                                                                                                                                  |
| 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                                                        |                                                                                                                                                                                                                                                                                                      |
| • TTL 5 V                                                              | Yes; push-pull encoders only                                                                                                                                                                                                                                                                         |
| • RS 422                                                               | Yes                                                                                                                                                                                                                                                                                                  |
| Isochronous mode                                                       |                                                                                                                                                                                                                                                                                                      |
| Filtering and processing time (TCI), min.                              | 130 µs; only for pulse and incremental encoders                                                                                                                                                                                                                                                      |
| Bus cycle time (TDP), min.                                             | 250 µs                                                                                                                                                                                                                                                                                               |
| Interrupts/diagnostics/status information                              |                                                                                                                                                                                                                                                                                                      |
| Alarms                                                                 |                                                                                                                                                                                                                                                                                                      |
| • Diagnostic alarm                                                     | Yes                                                                                                                                                                                                                                                                                                  |
| • Hardware interrupt                                                   | Yes                                                                                                                                                                                                                                                                                                  |
| Diagnoses                                                              |                                                                                                                                                                                                                                                                                                      |
| • 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                                                                                                                                                                                                                                                                                                  |
| Diagnostics indication LED                                             |                                                                                                                                                                                                                                                                                                      |
| • RUN LED                                                              | Yes; green LED                                                                                                                                                                                                                                                                                       |
| • ERROR LED                                                            | Yes; red LED                                                                                                                                                                                                                                                                                         |
| • MAINT LED                                                            | Yes; Yellow LED                                                                                                                                                                                                                                                                                      |
| • Monitoring of the supply voltage (PWR-LED)                           | Yes; green LED                                                                                                                                                                                                                                                                                       |
| • Channel status display                                               | Yes; green LED                                                                                                                                                                                                                                                                                       |

|                                                        |                                                                                        |
|--------------------------------------------------------|----------------------------------------------------------------------------------------|
| • for channel diagnostics                              | Yes; red LED                                                                           |
| <b>Integrated Functions</b>                            |                                                                                        |
| Counter                                                | Yes                                                                                    |
| • Number of counters                                   | 2                                                                                      |
| • Counting frequency, max.                             | 4 MHz; with quadruple evaluation                                                       |
| <b>Counting functions</b>                              |                                                                                        |
| • 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                                                                                    |
| <b>Comparator</b>                                      |                                                                                        |
| — Number of comparators                                | 2; Per channel                                                                         |
| — Direction dependency                                 | Yes                                                                                    |
| — Can be changed from user program                     | Yes                                                                                    |
| <b>Position detection</b>                              |                                                                                        |
| • 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                                 | No                                                                                     |
| • between the channels and backplane bus               | Yes                                                                                    |
| • Between the channels and load voltage L+             | No                                                                                     |
| <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; Please note derating for inductive loads                                        |
| • vertical installation, min.                          | 0 °C                                                                                   |
| • vertical installation, max.                          | 40 °C; Please note derating for inductive loads                                        |
| <b>Altitude during operation relating to sea level</b> |                                                                                        |
| • Installation altitude above sea level, max.          | 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  |         |                |
| 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   | 9       | EC001422       |
|                 | ETIM   | 8       | EC001422       |
|                 | ETIM   | 7       | EC001422       |
|                 | IDEA   | 4       | 3567           |
|                 | UNSPSC | 15      | 32-15-17-05    |

Approvals / Certificates

General Product Approval




[Miscellaneous](#)
[Manufacturer Declaration](#)




For use in hazardous locations

[FM](#)


[FM](#)
[CCC-Ex](#)




For use in hazardous locationsMaritime application

[Miscellaneous](#)
[Type Examination Certificate](#)







Maritime application

[NK / Nippon Kaiji Kyokai](#)



[CCS \(China Classification Society\)](#)



last modified: 12/8/2024 