



SIMATIC S7-1500, TM POSINPUT 2 COUNT AND POSITON INPUT MODULE. 2 CHANNELS FOR RS422 INCREMENTAL ENCODER OR SSI ABSOLUTE ENCODER, 2 DI, 3 DQ PER CHANNEL

Figure similar

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| Product type designation | |
| General information | |
| Product function | |
| • I&M data | Yes; I&M 0 |
| Engineering with | |
| • STEP 7 TIA Portal can be configured/integrated as of version | V12 SP1 / V12 SP1 |
| • STEP 7 can be configured/integrated as of version | V5.5 SP3 / - |
| • PROFINET as of GSD version/GSD revision | V2.3 / - |
| Installation type/mounting | |
| Type of fitting, 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 5 V and 24 V encoder supply per channel |
| 5 V encoder supply | |

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| <ul style="list-style-type: none"> • 5 V • short-circuit protection • Output current, max. | Yes; 5.2 V +/-2% Yes 300 mA; Per channel |
| 24 V encoder supply | |
| <ul style="list-style-type: none"> • 24 V • short-circuit protection • Output current, max. | Yes; L+ (-0.8 V) Yes 300 mA; Per channel |
| Power | |
| Power available from the backplane bus | 1.3 W |
| Power losses | |
| Power loss, typ. | 5.5 W |
| Address area | |
| Occupied address area | |
| <ul style="list-style-type: none"> • Inputs • Outputs | 16 byte; Per channel 12 byte; per channel; 4 bytes for Motion Control |
| Digital inputs | |
| Number of digital inputs | 4; 2 per channel |
| Digital inputs, configurable | Yes |
| Input characteristic curve in accordance with IEC 61131, type 3 | Yes |
| Digital input functions, parameterizable | |
| <ul style="list-style-type: none"> • Gate start/stop • Capture • Synchronization • Freely usable digital input | Yes; only for pulse and incremental encoders Yes Yes; only for pulse and incremental encoders Yes |
| Input voltage | |
| <ul style="list-style-type: none"> • Type of input voltage • Rated value (DC) • for signal "0" • for signal "1" • permissible voltage at input, min. • permissible voltage at input, max. | DC 24 V -30 to +5V +11 to +30V -30 V 30 V |
| Input current | |
| <ul style="list-style-type: none"> • for signal "1", typ. | 2.5 mA |
| Input delay (for rated value of input voltage) | |
| for standard inputs | |
| <ul style="list-style-type: none"> — Parameterizable — at "0" to "1", min. — at "1" to "0", min. | Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms 6 µs; for parameterization "none" 6 µs; for parameterization "none" |
| for counter/technological functions | |

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| — Parameterizable | Yes |
| Cable length | |
| • shielded, max. | 1 000 m |
| • Unshielded, max. | 600 m |
| Digital outputs | |
| Type of digital output | Transistor |
| Number of digital outputs | 4; 2 per channel |
| Digital outputs, configurable | Yes |
| short-circuit protection | Yes; electronic/thermal |
| • Response threshold, typ. | 1 A |
| Limitation of inductive shutdown voltage to | L+ (-33 V) |
| Controlling a digital input | Yes |
| Digital output functions, parameterizable | |
| • Switching tripped by comparison values | Yes |
| • Freely usable digital output | Yes |
| Switching capacity of the outputs | |
| • with resistive load, max. | 0.5 A; Per digital output |
| • on lamp load, max. | 5 W |
| Load resistance range | |
| • lower limit | 48 Ω |
| • upper limit | 12 kΩ |
| Output voltage | |
| • Type of output voltage | DC |
| • for signal "1", min. | 23.2 V; L+ (-0.8 V) |
| Output current | |
| • for signal "1" rated value | 0.5 A; Per digital output |
| • for signal "1" permissible range, max. | 0.6 A; Per digital output |
| • for signal "1" minimum load current | 2 mA |
| • for signal "0" residual current, max. | 0.5 mA |
| Output delay with resistive load | |
| • "0" to "1", max. | 50 μs |
| • "1" to "0", max. | 50 μs |
| Switching frequency | |
| • with resistive load, max. | 10 kHz |
| • with inductive load, max. | 0.5 Hz; Acc. to IEC 947-5-1, DC-13; observe derating curve |
| • on lamp load, max. | 10 Hz |
| Aggregate current of the outputs | |
| • Current per module, max. | 2 A |
| Cable length | |
| • shielded, max. | 1 000 m |
| • Unshielded, max. | 600 m |
| Encoder signals, incremental encoder (symmetrical) | |

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| <ul style="list-style-type: none"> • Input voltage • Input frequency, max. • Counting frequency, max. • Signal filter, can be parameterized • Cable length, shielded, max. • Incremental encoder with A/B tracks, 90° out of phase • Incremental encoder with A/B tracks, 90° out of phase and zero track • Pulse encoder • Pulse encoder with direction • Pulse encoder with one impulse signal per count direction | RS 422 1 MHz 4 MHz; with quadruple evaluation Yes 32 m; at 1 MHz Yes Yes Yes Yes Yes |
| Encoder signals, incremental encoder (asymmetrical) | |
| <ul style="list-style-type: none"> • Input voltage • Input frequency, max. • Counting frequency, max. • Signal filter, can be parameterized • Incremental encoder with A/B tracks, 90° out of phase • Incremental encoder with A/B tracks, 90° out of phase and zero track • Pulse encoder • Pulse encoder with direction • Pulse encoder with one impulse signal per count direction | 5 V TTL (push-pull encoders only) 1 MHz 4 MHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes |
| Encoder signals, absolute encoder (SSI) | |
| <ul style="list-style-type: none"> • Input signal • Message frame length, parameterizable • Clock frequency, max. • Binary code • Gray code • Cable length, shielded, max. • Parity bit, parameterizable • Monoflop time • Multiturn • Singleturn | to RS-422 10 ... 40 bit 2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz Yes Yes 320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max. Yes 16, 32, 48, 64 µs & automatic Yes Yes |
| Interface types | |
| <ul style="list-style-type: none"> • RS422 | Yes |

- TTL 5 V

Yes; push-pull encoders only

Isochronous mode

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| Isochronous operation (application synchronized up to terminal) | Yes |
| 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

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| Alarms | |
| • Diagnostic alarm | Yes |
| • Hardware interrupt | Yes |
| Diagnostic messages | |
| • Monitoring the supply voltage | Yes |
| • Wire break | Yes |
| • Short circuit | Yes |
| • A/B transition error at incremental encoder | Yes |
| • Frame error at SSI encoder | Yes |
| 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 |

Integrated Functions

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| Number of counters | 2 |
| Counter frequency (counter) max. | 4 MHz; with quadruple evaluation |
| Counting functions | |
| • Can be used with TO High_Speed_Counter | Yes; only for pulse and incremental encoders |
| • Continuous counting | Yes |
| • Counter response can be parameterized | Yes |
| • Hardware gate via digital input | Yes |
| • Software gate | Yes |
| • Event-controlled stop | Yes |
| • Synchronization via digital input | Yes |
| • Counting range, parameterizable | Yes |
| Comparator | |
| — Number of comparators | 2; Per channel |
| — Direction dependency | Yes |
| — Can be changed from user program | Yes |
| Position detection | |
| • Incremental acquisition | Yes |

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| • Absolute acquisition | Yes |
| • Suitable for S7-1500 Motion Control | Yes |
| Measuring functions | |
| • Measuring time, parameterizable | Yes |
| • Dynamic measurement period adjustment | Yes |
| • Number of thresholds, parameterizable | 2 |
| Measuring range | |
| — Frequency measurement, min. | 0.04 Hz |
| — Frequency measurement, max. | 4 MHz |
| — Period measurement, min. | 0.25 μ s |
| — Period measurement, max. | 25 s |
| Accuracy | |
| — Frequency measurement | 100 ppm; depending on measuring interval and signal evaluation |
| — Cycle duration measurement | 100 ppm; depending on measuring interval and signal evaluation |
| — Speed measurement | 100 ppm; depending on measuring interval and signal evaluation |
| Electrical isolation channels | |
| • between the channels | No |
| • between the channels and the backplane bus | Yes |
| • between the channels and the load voltage L+ | No |
| Permissible potential difference | |
| between different circuits | 75 V DC/60 V AC (base isolation) |
| Isolation | |
| Isolation checked with | 707 V DC (type test) |
| Ambient conditions | |
| Ambient temperature in operation | |
| • 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 |
| Decentralized operation | |
| To SIMATIC S7-1500 | Yes |
| To standard PROFINET controller | Yes |
| Dimensions | |
| Width | 35 mm |
| Height | 147 mm |
| Depth | 129 mm |
| Weights | |
| Weight, approx. | 325 g |
| last modified: | 12.03.2015 |