

SIMATIC S7-1500, TM count 2x24V Counter module, 2 channels for 24 V incremental or encoder 3 DI, 2 DQ per channel



| General information | |
|---|--|
| Product type designation | TM Count 2x24V |
| Firmware version | V1.3 |
| <ul style="list-style-type: none"> FW update possible | Yes |
| Product function | |
| <ul style="list-style-type: none"> I&M data | Yes; I&M0 to I&M3 |
| <ul style="list-style-type: none"> Isochronous mode | Yes |
| Engineering with | |
| <ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated as of version | V12 (FW V1.0) ... V15 (FW V1.3)/V12 (FW V1.0), V13 (FW V1.1) |
| <ul style="list-style-type: none"> PROFIBUS as of GSD version/GSD revision | GSD Revision 5 |
| <ul style="list-style-type: none"> PROFINET as of GSD version/GSD revision | V2.3 / - |
| Installation type/mounting | |
| Rail mounting | Yes; S7-1500 mounting rail |
| Supply voltage | |
| Load voltage L+ | |
| <ul style="list-style-type: none"> Rated value (DC) | 24 V |
| <ul style="list-style-type: none"> permissible range, lower limit (DC) | 19.2 V |

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|---|---|
| <ul style="list-style-type: none"> • permissible range, upper limit (DC) • Reverse polarity protection | 28.8 V Yes |
| Input current | |
| Current consumption, max. | 75 mA; without load |
| Encoder supply | |
| Number of outputs | 1; A common 24V encoder supply for both channels |
| 24 V encoder supply | |
| <ul style="list-style-type: none"> • 24 V • Short-circuit protection • Output current, max. | Yes; L+ (-0.8 V) Yes 1 A; total current of all encoders/channels |
| Power | |
| Power available from the backplane bus | 1.3 W |
| Power loss | |
| Power loss, typ. | 4 W |
| Address area | |
| Address space per module | |
| <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 | 6; 3 per channel |
| Digital inputs, parameterizable | Yes |
| Input characteristic curve in accordance with IEC 61131, type 3 | Yes |
| Digital input functions, parameterizable | |
| <ul style="list-style-type: none"> • Gate start/stop • Capture • Synchronization • Freely usable digital input | Yes Yes Yes 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 -5 ... +5 V +11 to +30V -30 V; -5 V continuous, -30 V brief reverse polarity protection 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 | |
| — parameterizable | Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms |

| | |
|---|--|
| — at "0" to "1", min. | 6 µs; for parameterization "none" |
| — at "1" to "0", min. | 6 µs; for parameterization "none" |
| for technological functions | |
| — parameterizable | Yes |
| Cable length | |
| • 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, 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 |
| 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 60947-5-1, DC-13; observe derating curve |
| • on lamp load, max. | 10 Hz |
| Total current of the outputs | |
| • Current per module, max. | 2 A |
| Cable length | |

- shielded, max. 1 000 m
- unshielded, max. 600 m

Encoder

Connectable encoders

- 2-wire sensor Yes
- permissible quiescent current (2-wire sensor), max. 1.5 mA

Encoder signals, incremental encoder (asymmetrical)

- Input voltage 24 V
- Input frequency, max. 200 kHz
- Counting frequency, max. 800 kHz; with quadruple evaluation
- Cable length, shielded, max. 600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
- 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 signal 24 V

- permissible voltage at input, min. -30 V
- permissible voltage at input, max. 30 V

Interface types

- Source/sink input Yes
- Input characteristic curve in accordance with IEC 61131, type 3 Yes

Isochronous mode

- Filtering and processing time (TCI), min. 130 µs
- Bus cycle time (TDP), min. 250 µs

Interrupts/diagnostics/status information

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

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 |
| • Status indicator forward counting (green) | Yes |
| • Status indicator backward counting (green) | Yes |

Integrated Functions

| | |
|--|--|
| Number of counters | 2 |
| Counting frequency (counter) max. | 800 kHz; with quadruple evaluation |
| Counting functions | |
| • Can be used with TO High_Speed_Counter | Yes |
| • Continuous counting | Yes |
| • Counter response parameterizable | Yes |
| • Hardware gate via digital input | Yes |
| • Software gate | Yes |
| • Event-controlled stop | Yes |
| • Synchronization via digital input | Yes |
| • Counting range, parameterizable | Yes |
| Comparator | |
| — Number of comparators | 2; Per channel |
| — Direction dependency | Yes |
| — Can be changed from user program | Yes |
| Position detection | |
| • Incremental 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. | 800 kHz |
| — Cycle duration measurement, min. | 1.25 μ s |
| — Cycle duration 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 |
| — Velocity measurement | 100 ppm; depending on measuring interval and signal evaluation |

Potential separation

| Potential separation channels | |
|--|-----|
| • between the channels | No |
| • between the channels and backplane bus | Yes |
| • Between the channels and load voltage L+ | No |

| Isolation | |
|-----------------------|----------------------|
| Isolation tested with | 707 V DC (type test) |

| Ambient conditions | |
|--------------------------------------|---|
| Ambient temperature during 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 S7-300 | 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 |

| Dimensions | |
|------------|--------|
| Width | 35 mm |
| Height | 147 mm |
| Depth | 129 mm |

| Weights | |
|-----------------------|------------|
| Weight, approx. | 250 g |
| last modified: | 04/29/2020 |