

SIMATIC ET 200SP, TM count 1x 24 V Counter module, 1 channel for 24 V incremental encoder or pulse encoder, 3 DI, 2 DQ Suitable for BU type A0, packing quantity: 1 unit,



| General information                                       |                                                |
|-----------------------------------------------------------|------------------------------------------------|
| Product type designation                                  | TM Count 1x24V                                 |
| Firmware version                                          | V2.0                                           |
| • FW update possible                                      | Yes                                            |
| usable BaseUnits                                          | BU type A0                                     |
| Color code for module-specific color identification plate | CC00                                           |
| Product function                                          |                                                |
| • I&M data                                                | Yes; I&M0 to I&M3                              |
| • Isochronous mode                                        | Yes                                            |
| Engineering with                                          |                                                |
| • STEP 7 TIA Portal configurable/integrated from version  | STEP 7 V15 SP1 or higher                       |
| • STEP 7 configurable/integrated from version             | V5.6 and higher                                |
| • PROFIBUS from GSD version/GSD revision                  | One GSD file each, Revision 3 and 5 and higher |
| • PROFINET from GSD version/GSD revision                  | GSDML V2.34                                    |
| Supply voltage                                            |                                                |
| Load voltage L+                                           |                                                |

|                                                                                                                                                                                                                      |                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Rated value (DC)</li> <li>• permissible range, lower limit (DC)</li> <li>• permissible range, upper limit (DC)</li> <li>• Reverse polarity protection</li> </ul>            | 24 V<br>19.2 V<br>28.8 V<br>Yes                                                                               |
| <b>Input current</b>                                                                                                                                                                                                 |                                                                                                               |
| Current consumption, max.                                                                                                                                                                                            | 60 mA; without load                                                                                           |
| <b>Encoder supply</b>                                                                                                                                                                                                |                                                                                                               |
| Number of outputs                                                                                                                                                                                                    | 1                                                                                                             |
| <b>24 V encoder supply</b>                                                                                                                                                                                           |                                                                                                               |
| <ul style="list-style-type: none"> <li>• 24 V</li> <li>• Short-circuit protection</li> <li>• Output current, max.</li> </ul>                                                                                         | Yes; L+ (-0.8 V)<br>Yes; electronic/thermal<br>300 mA                                                         |
| <b>Power loss</b>                                                                                                                                                                                                    |                                                                                                               |
| Power loss, typ.                                                                                                                                                                                                     | 1 W                                                                                                           |
| <b>Address area</b>                                                                                                                                                                                                  |                                                                                                               |
| <b>Address space per module</b>                                                                                                                                                                                      |                                                                                                               |
| <ul style="list-style-type: none"> <li>• Inputs</li> <li>• Outputs</li> </ul>                                                                                                                                        | 16 byte; 4 bytes in Fast mode<br>12 byte; 4 bytes for Motion Control, 0 bytes for Fast mode                   |
| <b>Hardware configuration</b>                                                                                                                                                                                        |                                                                                                               |
| Automatic encoding                                                                                                                                                                                                   |                                                                                                               |
| <ul style="list-style-type: none"> <li>• Type of mechanical coding element</li> </ul>                                                                                                                                | type B                                                                                                        |
| <b>Digital inputs</b>                                                                                                                                                                                                |                                                                                                               |
| Number of digital inputs                                                                                                                                                                                             | 3                                                                                                             |
| Digital inputs, parameterizable                                                                                                                                                                                      | Yes                                                                                                           |
| Input characteristic curve in accordance with IEC 61131, type 3                                                                                                                                                      | Yes                                                                                                           |
| <b>Digital input functions, parameterizable</b>                                                                                                                                                                      |                                                                                                               |
| <ul style="list-style-type: none"> <li>• Gate start/stop</li> <li>• Capture</li> <li>• Synchronization</li> <li>• Freely usable digital input</li> <li>• Probe</li> </ul>                                            | Yes<br>Yes<br>Yes<br>Yes<br>Yes                                                                               |
| <b>Input voltage</b>                                                                                                                                                                                                 |                                                                                                               |
| <ul style="list-style-type: none"> <li>• Rated value (DC)</li> <li>• for signal "0"</li> <li>• for signal "1"</li> <li>• permissible voltage at input, min.</li> <li>• permissible voltage at input, max.</li> </ul> | 24 V<br>-5 ... +5 V<br>+11 to +30V<br>-30 V; -5 V continuous, -30 V brief reverse polarity protection<br>30 V |
| <b>Input current</b>                                                                                                                                                                                                 |                                                                                                               |
| <ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>                                                                                                                                             | 2.5 mA                                                                                                        |

|                                                |                                                               |
|------------------------------------------------|---------------------------------------------------------------|
| Input delay (for rated value of input voltage) |                                                               |
| for standard inputs                            |                                                               |
| — parameterizable                              | Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms |
| — at "0" to "1", min.                          | 6 µs; for parameterization "none"                             |
| — at "1" to "0", min.                          | 6 µs; for parameterization "none"                             |
| for technological functions                    |                                                               |
| — parameterizable                              | Yes                                                           |
| Cable length                                   |                                                               |
| • shielded, max.                               | 1 000 m                                                       |
| • unshielded, max.                             | 600 m                                                         |
| Digital outputs                                |                                                               |
| Type of digital output                         | Transistor                                                    |
| Number of digital outputs                      | 2                                                             |
| Digital outputs, parameterizable               | Yes                                                           |
| Short-circuit protection                       | Yes; electronic/thermal                                       |
| • Response threshold, typ.                     | 1 A                                                           |
| Limitation of inductive shutdown voltage to    | L+ (-53 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                                 |                                                               |
| • 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.                                             | 1 A                                                                                  |
| <b>Cable length</b>                                                    |                                                                                      |
| • shielded, max.                                                       | 1 000 m                                                                              |
| • unshielded, max.                                                     | 600 m                                                                                |
| <b>Encoder</b>                                                         |                                                                                      |
| <b>Connectable encoders</b>                                            |                                                                                      |
| • 2-wire sensor                                                        | Yes                                                                                  |
| — permissible quiescent current (2-wire sensor), max.                  | 1.5 mA                                                                               |
| <b>Encoder signals, incremental encoder (asymmetrical)</b>             |                                                                                      |
| • 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                                                                                  |
| <b>Encoder signal 24 V</b>                                             |                                                                                      |
| — permissible voltage at input, min.                                   | -30 V; -5 V continuous, -30 V brief reverse polarity protection                      |
| — permissible voltage at input, max.                                   | 30 V                                                                                 |
| <b>Interface types</b>                                                 |                                                                                      |
| • Source/sink input                                                    | Yes                                                                                  |
| • Input characteristic curve in accordance with IEC 61131, type 3      | Yes                                                                                  |
| <b>Interrupts/diagnostics/status information</b>                       |                                                                                      |
| Substitute values connectable                                          | Yes; Parameterizable                                                                 |
| <b>Alarms</b>                                                          |                                                                                      |
| • Diagnostic alarm                                                     | Yes                                                                                  |
| • Hardware interrupt                                                   | Yes                                                                                  |
| <b>Diagnostic messages</b>                                             |                                                                                      |
| • Monitoring the supply voltage                                        | Yes                                                                                  |
| • Wire-break                                                           | Yes                                                                                  |
| • Short-circuit                                                        | Yes                                                                                  |
| • A/B transition error at incremental encoder                          | Yes                                                                                  |
| • Group error                                                          | Yes                                                                                  |

|                                              |                                                                |
|----------------------------------------------|----------------------------------------------------------------|
| <b>Diagnostics indication LED</b>            |                                                                |
| • Monitoring of the supply voltage (PWR-LED) | Yes; green PWR LED                                             |
| • Channel status display                     | Yes; green LED                                                 |
| • for module diagnostics                     | Yes; green/red DIAG LED                                        |
| • Status indicator forward counting (green)  | Yes                                                            |
| • Status indicator backward counting (green) | Yes                                                            |
| <b>Integrated Functions</b>                  |                                                                |
| Number of counters                           | 1                                                              |
| Counting frequency (counter) max.            | 800 kHz; with quadruple evaluation                             |
| Fast mode                                    | Yes                                                            |
| <b>Counting functions</b>                    |                                                                |
| • 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                                                            |
| <b>Comparator</b>                            |                                                                |
| — Number of comparators                      | 2                                                              |
| — Direction dependency                       | Yes                                                            |
| — Can be changed from user program           | Yes                                                            |
| <b>Position detection</b>                    |                                                                |
| • Incremental 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.                | 800 kHz                                                        |
| — Cycle duration measurement, min.           | 1.25 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 and backplane bus

Yes

## Isolation

Isolation tested with 707 V DC (type test)

## Ambient conditions

### Ambient temperature during operation

- horizontal installation, min. -30 °C
- horizontal installation, max. 60 °C
- vertical installation, min. -30 °C
- vertical installation, max. 50 °C
- ceiling installation, min. -30 °C
- ceiling installation, max. 50 °C
- floor installation, min. -30 °C
- floor installation, max. 50 °C

### Altitude during operation relating to sea level

- Installation altitude above sea level, max. 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual

## 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 |
| to standard PROFINET controller | Yes |

## Dimensions

|        |       |
|--------|-------|
| Width  | 15 mm |
| Height | 73 mm |
| Depth  | 58 mm |

## Weights

Weight, approx. 45 g

**last modified:** 06/22/2020