

SIMATIC ET 200SP, TM timer DIDQ 10x 24V time-controlled digital inputs and outputs 4 DI, 6DQ with time stamp Count, PWM, oversampling



| General information                                       |                          |
|---|--------------------------|
| Product type designation                                  | TM Timer DIDQ 10x24V     |
| usable BaseUnits  | BU type A0               |
| Product function  |                          |
| • I&M data  | Yes; I&M 0               |
| • Isochronous mode  | Yes                      |
| Engineering with  |                          |
| • STEP 7 TIA Portal configurable/integrated as of version | V13 Update 3             |
| • STEP 7 configurable/integrated as of version            | V5.5 SP3 / -             |
| 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; against destruction |
| Input current   |                          |
| Current consumption, max.                                 | 50 mA; without load      |

| Encoder supply  |   |
|---|---|
| Number of outputs   | 1   |
| 24 V encoder supply   |   |
| <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<br>500 mA; Observe derating   |
| Power loss  |   |
| Power loss, typ.  | 1.5 W   |
| Address area  |   |
| Address space per module  |   |
| <ul style="list-style-type: none"> <li>• Inputs</li> <li>• Outputs</li> </ul>   | 26 byte<br>32 byte  |
| Digital inputs  |   |
| Number of digital inputs  | 4   |
| 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"> <li>• Digital input with time stamp               <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> <li>• Counter               <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> <li>• Counter for incremental encoder               <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> <li>• Digital input with oversampling               <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> <li>• HW enable for digital input               <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> <li>• HW enable for digital output               <ul style="list-style-type: none"> <li>— Number, max.</li> </ul> </li> </ul> | Yes<br>4<br>Yes<br>3<br>Yes<br>1<br>Yes<br>4<br>Yes<br>1<br>Yes<br>3  |
| Input voltage   |   |
| <ul style="list-style-type: none"> <li>• Type of input voltage</li> <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>   | DC<br>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 |
| Input current   |   |
| <ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>  | 2.5 mA  |
| Input delay (for rated value of input voltage)  |   |
| <ul style="list-style-type: none"> <li>• Minimum pulse width for program reactions</li> </ul>   | 3 µs for parameterization "none"  |

|   |   |
|---|---|
| for standard inputs                         |   |
| — parameterizable                           | Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms                             |
| — at "0" to "1", min.                       | 4 $\mu$ s   |
| — at "1" to "0", min.                       | 4 $\mu$ s   |
| Cable length                                |   |
| • shielded, max.                            | 1 000 m; Depending on sensor, cable quality and rate of change    |
| • unshielded, max.                          | 600 m; Depending on sensor, cable quality and rate of change      |
| Digital outputs                             |   |
| Type of digital output                      | Transistor  |
| Number of digital outputs                   | 6   |
| Current-sinking                             | Yes; With High Speed output                                       |
| Current-sourcing                            | Yes   |
| Digital outputs, parameterizable            | Yes   |
| Short-circuit protection                    | Yes; electronic/thermal   |
| • Response threshold, typ.                  | 1.7 A with Standard output, 0.5 A with High Speed output          |
| Limitation of inductive shutdown voltage to | -0.8 V  |
| Digital output functions, parameterizable   |   |
| • Digital output with time stamp            | Yes   |
| — Number, max.                              | 6   |
| • PWM output                                | Yes   |
| — Number, max.                              | 6   |
| • Digital output with oversampling          | Yes   |
| — Number, max.                              | 6   |
| Switching capacity of the outputs           |   |
| • with resistive load, max.                 | 0.5 A; 0.1 A with High Speed output                               |
| • on lamp load, max.                        | 5 W; 1 W with High Speed output                                   |
| Load resistance range                       |   |
| • lower limit                               | 48 $\Omega$ ; 240 ohm with High Speed output                      |
| • upper limit                               | 12 k $\Omega$   |
| Output voltage                              |   |
| • Type of output voltage                    | DC  |
| • for signal "0", max.                      | 1 V; With High Speed output                                       |
| • for signal "1", min.                      | 23.2 V; L+ (-0.8 V)   |
| Output current                              |   |
| • for signal "1" rated value                | 0.5 A; 0.1 A with High Speed output, observe derating             |
| • for signal "1" permissible range, max.    | 0.6 A; 0.12 A with High Speed output, observe derating            |
| • 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.                          | 1 $\mu$ s; With High Speed output, 5 $\mu$ s with Standard output |
| • "1" to "0", max.                          | 1 $\mu$ s; With High Speed output, 6 $\mu$ s with Standard output |

|   |  |
|---|--|
| <b>Switching frequency</b>  |  |
| • with resistive load, max.                                       | 10 kHz   |
| • on lamp load, max.  | 10 Hz  |
| <b>Total current of the outputs</b>                               |  |
| • Current per module, max.  | 3.5 A; Observe derating  |
| <b>Cable length</b>   |  |
| • shielded, max.  | 1 000 m; Depending on load and cable quality   |
| • unshielded, max.  | 600 m; Depending on load and cable quality   |
| <b>Encoder</b>  |  |
| <b>Connectable encoders</b>                                       |  |
| • Incremental encoder (asymmetrical)                              | Yes  |
| • 24 V initiator  | Yes  |
| • 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.   | 50 kHz   |
| • Counting frequency, max.  | 200 kHz; with quadruple evaluation   |
| • Cable length, shielded, max.                                    | 600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz |
| • Incremental encoder with A/B tracks, 90° phase offset           | Yes  |
| • Pulse encoder   | Yes  |
| <b>Encoder signal 24 V</b>  |  |
| — permissible voltage at input, min.                              | -30 V  |
| — permissible voltage at input, max.                              | 30 V   |
| <b>Interface types</b>  |  |
| • Input characteristic curve in accordance with IEC 61131, type 3 | Yes  |
| <b>Isochronous mode</b>   |  |
| Bus cycle time (TDP), min.  | 375 µs   |
| Jitter, max.  | 1 µs   |
| <b>Interrupts/diagnostics/status information</b>                  |  |
| Diagnostics function  | Yes  |
| Substitute values connectable                                     | Yes  |
| <b>Alarms</b>   |  |
| • Diagnostic alarm  | Yes  |
| <b>Diagnostic messages</b>  |  |
| • Monitoring the supply voltage                                   | Yes  |
| • Short-circuit   | Yes  |

| Diagnostics indication LED                   |                         |
|--|-------------------------|
| • Monitoring of the supply voltage (PWR-LED) | Yes; green PWR LED      |
| • Channel status display                     | Yes                     |
| • for module diagnostics                     | Yes; green/red DIAG LED |

### Integrated Functions

|                                   |                                    |
|-----------------------------------|------------------------------------|
| Number of counters                | 3                                  |
| Counting frequency (counter) max. | 200 kHz; with quadruple evaluation |

### Counting functions

|                       |     |
|-----------------------|-----|
| • Continuous counting | Yes |
|-----------------------|-----|

### Potential separation

#### Potential separation channels

|  |     |
|--|-----|
| • 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; Observe derating |
| • vertical installation, min.   | -30 °C                  |
| • vertical installation, max.   | 50 °C; Observe derating |

#### Altitude during operation relating to sea level

|   |  |
|---|--|
| • Installation altitude above sea level, max. | 2 000 m; On request: Installation altitudes greater than 2 000 m |
|---|--|

### Decentralized operation

|                    |     |
|--------------------|-----|
| to SIMATIC S7-1500 | Yes |
|--------------------|-----|

### Dimensions

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

### Weights

|                 |      |
|-----------------|------|
| Weight, approx. | 45 g |
|-----------------|------|

**last modified:** 05/13/2020