

SIMATIC ET 200SP, TM TIMER DIDQ 10X24V TIME BASED  
DIGITAL INPUTS AND OUTPUTS 4DI, 6DQ WITH TIMESTAMP  
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               |
| 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                                             |                                  |
| • 24 V                                                          | Yes; L+ (-0.8 V)                 |
| • Short-circuit protection                                      | Yes                              |
| • Output current, max.                                          | 500 mA; Observe derating         |
| Power loss                                                      |                                  |
| Power loss, typ.                                                | 1.5 W                            |
| Address area                                                    |                                  |
| Occupied address area                                           |                                  |
| • Inputs                                                        | 26 byte                          |
| • Outputs                                                       | 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                        |                                  |
| • Digital input with time stamp                                 | Yes                              |
| — Number, max.                                                  | 4                                |
| • Counter                                                       | Yes                              |
| — Number, max.                                                  | 3                                |
| • Counter for incremental encoder                               | Yes                              |
| — Number, max.                                                  | 1                                |
| • Digital input with oversampling                               | Yes                              |
| — Number, max.                                                  | 4                                |
| • HW enable for digital input                                   | Yes                              |
| — Number, max.                                                  | 1                                |
| • HW enable for digital output                                  | Yes                              |
| — Number, max.                                                  | 3                                |
| Input voltage                                                   |                                  |
| • Type of input voltage                                         | DC                               |
| • Rated value (DC)                                              | 24 V                             |
| • for signal "0"                                                | -30 to +5V                       |
| • for signal "1"                                                | +11 to +30V                      |
| • permissible voltage at input, min.                            | -30 V                            |
| • permissible voltage at input, max.                            | 30 V                             |
| Input current                                                   |                                  |
| • for signal "1", typ.                                          | 2.5 mA                           |
| Input delay (for rated value of input voltage)                  |                                  |
| • Minimum pulse width for program reactions                     | 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                                                         |
| <b>Cable length</b>                              |                                                                   |
| • 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      |
| <b>Digital outputs</b>                           |                                                                   |
| 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                                                            |
| <b>Digital output functions, parameterizable</b> |                                                                   |
| • Digital output with time stamp                 | Yes                                                               |
| — Number, max.                                   | 6                                                                 |
| • PWM output                                     | Yes                                                               |
| — Number, max.                                   | 6                                                                 |
| • Digital output with oversampling               | Yes                                                               |
| — Number, max.                                   | 6                                                                 |
| <b>Switching capacity of the outputs</b>         |                                                                   |
| • 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                                   |
| <b>Load resistance range</b>                     |                                                                   |
| • lower limit                                    | 48 $\Omega$ ; 240 ohm with High Speed output                      |
| • upper limit                                    | 12 k $\Omega$                                                     |
| <b>Output voltage</b>                            |                                                                   |
| • 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)                                               |
| <b>Output current</b>                            |                                                                   |
| • 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                                                            |
| <b>Output delay with resistive load</b>          |                                                                   |
| • "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>                                           |                                                                                      |
| Isochronous operation (application synchronized up to terminal)   | Yes                                                                                  |
| 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                                                                                  |

|                                              |                                    |
|----------------------------------------------|------------------------------------|
| <b>Diagnostics indication LED</b>            |                                    |
| • Monitoring of the supply voltage (PWR-LED) | Yes; green PWR LED                 |
| • Channel status display                     | Yes                                |
| • for module diagnostics                     | Yes; green/red DIAG LED            |
| <b>Integrated Functions</b>                  |                                    |
| Number of counters                           | 3                                  |
| Counting frequency (counter) max.            | 200 kHz; with quadruple evaluation |
| <b>Counting functions</b>                    |                                    |
| • Continuous counting                        | Yes                                |
| <b>Potential separation</b>                  |                                    |
| <b>Potential separation channels</b>         |                                    |
| • between the channels and backplane bus     | Yes                                |
| <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; Observe derating            |
| • vertical installation, min.                | 0 °C                               |
| • vertical installation, max.                | 50 °C; Observe derating            |
| <b>Decentralized operation</b>               |                                    |
| to SIMATIC S7-1500                           | Yes                                |
| <b>Dimensions</b>                            |                                    |
| Width                                        | 15 mm                              |
| Height                                       | 73 mm                              |
| Depth                                        | 58 mm                              |
| <b>Weights</b>                               |                                    |
| Weight, approx.                              | 45 g                               |
| <b>last modified:</b>                        | 10/28/2016                         |