

SIPLUS ET 200SP TM TIMER DIDQ 10x24V -40 ... +60°C with conformal coating based on 6ES7138-6CG00-0BA0 . 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               |
| 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              |
| <b>Power loss</b>                                               |                                       |
| Power loss, typ.                                                | 1.5 W                                 |
| <b>Address area</b>                                             |                                       |
| Address space per module                                        |                                       |
| • Inputs                                                        | 26 byte                               |
| • Outputs                                                       | 32 byte                               |
| <b>Digital inputs</b>                                           |                                       |
| 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                                     |
| <b>Input voltage</b>                                            |                                       |
| • Type of input voltage                                         | DC                                    |
| • Rated value (DC)                                              | 24 V                                  |
| • for signal "0"                                                | -30 to +5 V                           |
| • for signal "1"                                                | +11 to +30V                           |
| • permissible voltage at input, min.                            | -30 V                                 |
| • permissible voltage at input, max.                            | 30 V                                  |
| <b>Input current</b>                                            |                                       |
| • for signal "1", typ.                                          | 2.5 mA                                |
| <b>Input delay (for rated value of input voltage)</b>           |                                       |
| • 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 µs                                  |
| — at "1" to "0", min.                                           | 4 µs                                  |

|                                                  |                                                                |
|--------------------------------------------------|----------------------------------------------------------------|
| <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 Ω; 240 ohm with High Speed output                           |
| • upper limit                                    | 12 kΩ                                                          |
| <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 μs; With High Speed output, 5 μs with Standard output        |
| • "1" to "0", max.                               | 1 μs; With High Speed output, 6 μs 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                                        |

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| Cable length                                                      |                                                                                      |
| • shielded, max.                                                  | 1 000 m; Depending on load and cable quality                                         |
| • unshielded, max.                                                | 600 m; Depending on load and cable quality                                           |
| Encoder                                                           |                                                                                      |
| Connectable encoders                                              |                                                                                      |
| • Incremental encoder (asymmetrical)                              | Yes                                                                                  |
| • 24 V initiator                                                  | Yes                                                                                  |
| • 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.                                           | 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                                                                                  |
| Encoder signal 24 V                                               |                                                                                      |
| — permissible voltage at input, min.                              | -30 V                                                                                |
| — permissible voltage at input, max.                              | 30 V                                                                                 |
| Interface types                                                   |                                                                                      |
| • Input characteristic curve in accordance with IEC 61131, type 3 | Yes                                                                                  |
| Isochronous mode                                                  |                                                                                      |
| Bus cycle time (TDP), min.                                        | 375 µs                                                                               |
| Jitter, max.                                                      | 1 µs                                                                                 |
| Interrupts/diagnostics/status information                         |                                                                                      |
| Diagnostics function                                              | Yes                                                                                  |
| Substitute values connectable                                     | Yes                                                                                  |
| Alarms                                                            |                                                                                      |
| • Diagnostic alarm                                                | Yes                                                                                  |
| Diagnostic messages                                               |                                                                                      |
| • 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                                              |                                                                                      |

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| 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                                                                                                                                                                                                             |
| Ambient conditions                                                  |                                                                                                                                                                                                                 |
| Ambient temperature during operation                                |                                                                                                                                                                                                                 |
| • horizontal installation, min.                                     | -40 °C; = Tmin (incl. condensation/frost)                                                                                                                                                                       |
| • horizontal installation, max.                                     | 60 °C; = Tmax; see Derating BasedOn (e.g. manual)                                                                                                                                                               |
| • vertical installation, min.                                       | -40 °C; = Tmin                                                                                                                                                                                                  |
| • vertical installation, max.                                       | 50 °C; = Tmax; see Derating BasedOn (e.g. manual)                                                                                                                                                               |
| Altitude during operation relating to sea level                     |                                                                                                                                                                                                                 |
| • Installation altitude above sea level, max.                       | 5 000 m                                                                                                                                                                                                         |
| • Ambient air temperature-barometric pressure-altitude              | Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m) |
| Relative humidity                                                   |                                                                                                                                                                                                                 |
| • With condensation, tested in accordance with IEC 60068-2-38, max. | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation                                                                                                               |
| Resistance                                                          |                                                                                                                                                                                                                 |
| Coolants and lubricants                                             |                                                                                                                                                                                                                 |
| — Resistant to commercially available coolants and lubricants       | Yes; Incl. diesel and oil droplets in the air                                                                                                                                                                   |
| Use in stationary industrial systems                                |                                                                                                                                                                                                                 |
| — to biologically active substances according to EN 60721-3-3       | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request                                                                                                              |
| — to chemically active substances according to EN 60721-3-3         | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *                                                                                                                        |
| — to mechanically active substances according to EN 60721-3-3       | Yes; Class 3S4 incl. sand, dust, *                                                                                                                                                                              |
| — Against mechanical environmental conditions acc. to EN 60721-3-3  | Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)                                                                                                                                      |
| Use on ships/at sea                                                 |                                                                                                                                                                                                                 |
| — to biologically active substances according to EN 60721-3-6       | Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request                                                                                                                                   |
| — to chemically active substances according to EN 60721-3-6         | Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *                                                                                                                        |
| — to mechanically active substances according to EN 60721-3-6       | Yes; Class 6S3 incl. sand, dust; *                                                                                                                                                                              |

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| — Against mechanical environmental conditions acc. to EN 60721-3-6                                                                                                                                                                                                                                                                                                              | Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)                                                                                                          |
| <b>Usage in industrial process technology</b>                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                     |
| — Against chemically active substances acc. to EN 60654-4                                                                                                                                                                                                                                                                                                                       | Yes; Class 3 (excluding trichlorethylene)                                                                                                                                           |
| — Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04                                                                                                                                                                                                                                                                                    | Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil) |
| <b>Remark</b>                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                     |
| — Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04                                                                                                                                                                                                                                                                     | * The supplied plug covers must remain in place over the unused interfaces during operation!                                                                                        |
| <b>Conformal coating</b>                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>• Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>• Protection against fouling acc. to EN 60664-3</li> <li>• Military testing according to MIL-I-46058C, Amendment 7</li> <li>• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul> | <p>Yes; Class 2 for high availability</p> <p>Yes; Type 1 protection</p> <p>Yes; Discoloration of coating possible during service life</p> <p>Yes; Conformal coating, Class A</p>    |
| <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>                                                                                                                                                                                                                                                                                                                                                           | 05/06/2020                                                                                                                                                                          |