



SIMATIC S7-1500, digital input module DI 16x24 V DC AUX; 16 channels in groups of 8; for 24 V encoder; sensor supply 24 V DC; input type 2 (IEC 61131); input delay parameterizable 0.05..20 ms; isochronous mode up to 250 µs; integrated counting function up to 20 kHz; pulse stretching; chatter monitoring; signal inversion diagnostics; hardware interrupts: front connector (screw terminals or push-in) and, if applicable, order shield set separately

| General information  |                            |
|--|----------------------------|
| Product type designation   | DI 16x24 V DC HS           |
| HW functional status   | From FS01                  |
| Firmware version   | V1.0.0                     |
| <ul style="list-style-type: none"> <li>FW update possible</li> </ul>                                     | Yes                        |
| Product function   |                            |
| <ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>   | Yes; I&M0 to I&M3          |
| <ul style="list-style-type: none"> <li>Isochronous mode</li> </ul>                                       | Yes                        |
| <ul style="list-style-type: none"> <li>Prioritized startup</li> </ul>                                    | Yes                        |
| Engineering with   |                            |
| <ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul> | STEP 7 V17 or higher       |
| <ul style="list-style-type: none"> <li>STEP 7 configurable/integrated from version</li> </ul>            | V5.5 SP3 / -               |
| <ul style="list-style-type: none"> <li>PROFIBUS from GSD version/GSD revision</li> </ul>                 | V1.0 / V5.1                |
| <ul style="list-style-type: none"> <li>PROFINET from GSD version/GSD revision</li> </ul>                 | V2.3 / -                   |
| Operating mode   |                            |
| <ul style="list-style-type: none"> <li>DI</li> </ul>   | Yes                        |
| <ul style="list-style-type: none"> <li>Counter</li> </ul>  | Yes                        |
| <ul style="list-style-type: none"> <li>Oversampling</li> </ul>   | Yes                        |
| <ul style="list-style-type: none"> <li>MSI</li> </ul>  | Yes                        |
| Supply voltage   |                            |
| 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                        |
| Input current  |                            |
| Current consumption, max.  | 550 mA                     |
| Encoder supply   |                            |
| Number of outputs  | 16; 2x 24 V DC             |
| Short-circuit protection   | Yes                        |
| 24 V encoder supply  |                            |
| <ul style="list-style-type: none"> <li>24 V</li> </ul>   | Yes                        |
| <ul style="list-style-type: none"> <li>Short-circuit protection</li> </ul>                               | Yes; Per group, electronic |
| <ul style="list-style-type: none"> <li>Output current, max.</li> </ul>                                   | 150 mA; per group          |
| <ul style="list-style-type: none"> <li>Output current per module, max.</li> </ul>                        | 300 mA                     |
| Power  |                            |
| Power available from the backplane bus   | 0.6 W                      |
| Power loss   |                            |
| Power loss, typ.   | 7 W                        |
| Digital inputs   |                            |
| Number of digital inputs   | 16                         |

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|--|---|
| Digital inputs, parameterizable  | Yes   |
| Source/sink input  | P-reading   |
| Input characteristic curve in accordance with IEC 61131, type 2  | Yes   |
| Pulse extension  | Yes; 0.05 s, 0.1 s, 0.2 s, 0.5 s, 1 s, 2 s  |
| Edge evaluation  | Yes; Positive edge, negative edge   |
| Signal change flutter  | Yes; 2 to 32 signal changes   |
| Flutter observation window   | Yes; 0.5 s, 1 s to 100 s in 1-s steps   |
| <b>Digital input functions, parameterizable</b>  |   |
| <ul style="list-style-type: none"> <li>• Gate start/stop</li> <li>• Freely usable digital input</li> <li>• Counter <ul style="list-style-type: none"> <li>— Number, max.</li> <li>— Counting frequency, max.</li> <li>— Counting width</li> <li>— Counting direction up/down</li> </ul> </li> <li>• Digital input with oversampling <ul style="list-style-type: none"> <li>— Number, max.</li> <li>— Values per cycle, max.</li> <li>— Resolution, min.</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>Yes; software/hardware gate</li> <li>Yes</li> <li>4; 4 totalizers max. 10 kHz or 2 totalizers max. 20 kHz + 2 totalizers max. 10 kHz</li> <li>20 kHz</li> <li>32 bit</li> <li>Yes</li> <li>Yes</li> <li>16</li> <li>16</li> <li>15.625 µs</li> </ul> |
| <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> </ul>   | <ul style="list-style-type: none"> <li>24 V</li> <li>-30 to +5 V</li> <li>+11 to +30V</li> </ul>  |
| <b>Input current</b>   |   |
| <ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>   | 9 mA  |
| <b>Input delay (for rated value of input voltage)</b>  |   |
| for standard inputs  |   |
| <ul style="list-style-type: none"> <li>— parameterizable</li> <li>— at "0" to "1", min.</li> <li>— at "0" to "1", max.</li> <li>— at "1" to "0", min.</li> <li>— at "1" to "0", max.</li> </ul>  | <ul style="list-style-type: none"> <li>Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms</li> <li>0.05 ms</li> <li>20 ms</li> <li>0.05 ms</li> <li>20 ms</li> </ul>  |
| for interrupt inputs   |   |
| <ul style="list-style-type: none"> <li>— parameterizable</li> </ul>  | Yes   |
| for technological functions  |   |
| <ul style="list-style-type: none"> <li>— parameterizable</li> </ul>  | Yes   |
| <b>Cable length</b>  |   |
| <ul style="list-style-type: none"> <li>• shielded, max.</li> <li>• unshielded, max.</li> </ul>   | <ul style="list-style-type: none"> <li>1 000 m; 600 m for technological functions; depending on input frequency, encoder and cable quality; max. 50 m at 20 kHz</li> <li>600 m; for technological functions: No</li> </ul>  |
| <b>Encoder</b>   |   |
| Connectable encoders   |   |
| <ul style="list-style-type: none"> <li>• 2-wire sensor <ul style="list-style-type: none"> <li>— permissible quiescent current (2-wire sensor), max.</li> </ul> </li> </ul>   | <ul style="list-style-type: none"> <li>Yes</li> <li>2 mA</li> </ul>   |
| <b>Isochronous mode</b>  |   |
| Filtering and processing time (TCI), min.  | 60 µs; At 50 µs filter time   |
| Bus cycle time (TDP), min.   | 250 µs  |
| <b>Interrupts/diagnostics/status information</b>   |   |
| Diagnostics function   | Yes   |
| <b>Alarms</b>  |   |
| <ul style="list-style-type: none"> <li>• Diagnostic alarm</li> <li>• Hardware interrupt</li> </ul>   | <ul style="list-style-type: none"> <li>Yes</li> <li>Yes</li> </ul>  |
| <b>Diagnoses</b>   |   |
| <ul style="list-style-type: none"> <li>• Monitoring the supply voltage</li> <li>• Monitoring of encoder power supply</li> <li>• Wire-break</li> <li>• Short-circuit</li> </ul>   | <ul style="list-style-type: none"> <li>Yes</li> <li>Yes; short-circuit</li> <li>Yes; to I &lt; 350 µA</li> <li>No</li> </ul>  |
| <b>Diagnostics indication LED</b>  |   |
| <ul style="list-style-type: none"> <li>• RUN LED</li> <li>• ERROR LED</li> </ul>   | <ul style="list-style-type: none"> <li>Yes; green LED</li> <li>Yes; red LED</li> </ul>  |

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| <ul style="list-style-type: none"> <li>• Monitoring of the supply voltage (PWR-LED)</li> <li>• Channel status display</li> <li>• for channel diagnostics</li> <li>• for module diagnostics</li> </ul>  | Yes; green LED<br>Yes; green LED<br>Yes; red LED<br>Yes; red LED       |
| <b>Potential separation</b>  |  |
| Potential separation channels  |  |
| <ul style="list-style-type: none"> <li>• between the channels</li> <li>• between the channels, in groups of</li> <li>• between the channels and backplane bus</li> <li>• Between the channels and load voltage L+</li> <li>• between the channels and the power supply of the electronics</li> </ul> | No<br>8<br>Yes<br>Yes<br>No  |
| <b>Isolation</b>   |  |
| Isolation tested with  | 707 V DC (type test)   |
| <b>Standards, approvals, certificates</b>  |  |
| Suitable for safety functions  | No   |
| <b>Ambient conditions</b>  |  |
| Ambient temperature during operation   |  |
| <ul style="list-style-type: none"> <li>• horizontal installation, min.</li> <li>• horizontal installation, max.</li> <li>• vertical installation, min.</li> <li>• vertical installation, max.</li> </ul>   | -30 °C<br>60 °C<br>-30 °C<br>40 °C                                     |
| Altitude during operation relating to sea level  |  |
| <ul style="list-style-type: none"> <li>• Installation altitude above sea level, max.</li> </ul>  | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual |
| <b>Dimensions</b>  |  |
| Width  | 35 mm  |
| Height   | 147 mm   |
| Depth  | 129 mm   |
| <b>Weights</b>   |  |
| Weight, approx.  | 240 g  |

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