

SIPLUS S7-1500 CPU 1513-1 PN based on 6ES7513-1AM03-0AB0 with conformal coating -40...+70 °C . central processing unit with work memory 600 KB for program and 2.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 25 ns bit performance, SIMATIC Memory Card required

| General information                                      |                                                                                                   |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Product type designation                                 | CPU 1513-1 PN                                                                                     |
| Firmware version                                         |                                                                                                   |
| • FW update possible                                     | Yes                                                                                               |
| Product function                                         |                                                                                                   |
| • I&M data                                               | Yes; I&M0 to I&M3                                                                                 |
| • Isochronous mode                                       | Yes; Distributed and central; with minimum OB 6x cycle of 500 µs (distributed) and 1 ms (central) |
| Engineering with                                         |                                                                                                   |
| • STEP 7 TIA Portal configurable/integrated from version | see entry ID: 109746275                                                                           |
| Configuration control                                    |                                                                                                   |
| via dataset                                              | Yes                                                                                               |
| Display                                                  |                                                                                                   |
| Screen diagonal [cm]                                     | 3.45 cm                                                                                           |
| Control elements                                         |                                                                                                   |
| Number of keys                                           | 8                                                                                                 |
| Mode buttons                                             | 2                                                                                                 |
| 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                                                                                               |
| Mains buffering                                          |                                                                                                   |
| • Mains/voltage failure stored energy time               | 5 ms                                                                                              |
| • Repeat rate, min.                                      | 1/s                                                                                               |
| Input current                                            |                                                                                                   |
| Current consumption (rated value)                        | 0.73 A                                                                                            |
| Current consumption, max.                                | 0.9 A                                                                                             |
| Inrush current, max.                                     | 1.15 A; Rated value                                                                               |
| I <sup>2</sup> t                                         | 0.5 A <sup>2</sup> s                                                                              |
| Power                                                    |                                                                                                   |
| Infeed power to the backplane bus                        | 10 W                                                                                              |
| Power consumption from the backplane bus (balanced)      | 5.5 W                                                                                             |
| Power loss                                               |                                                                                                   |
| Power loss, typ.                                         | 7.5 W                                                                                             |
| Memory                                                   |                                                                                                   |
| Number of slots for SIMATIC memory card                  | 1                                                                                                 |
| SIMATIC memory card required                             | Yes                                                                                               |
| Work memory                                              |                                                                                                   |
| • integrated (for program)                               | 600 kbyte                                                                                         |
| • integrated (for data)                                  | 2.5 Mbyte                                                                                         |
| Load memory                                              |                                                                                                   |
| • Plug-in (SIMATIC Memory Card), max.                    | 32 Gbyte                                                                                          |
| Backup                                                   |                                                                                                   |
| • maintenance-free                                       | Yes                                                                                               |
| CPU processing times                                     |                                                                                                   |
| for bit operations, typ.                                 | 25 ns                                                                                             |
| for word operations, typ.                                | 32 ns                                                                                             |
| for fixed point arithmetic, typ.                         | 42 ns                                                                                             |

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| for floating point arithmetic, typ.                                | 170 ns                                                                                                                                                |
| <b>CPU-blocks</b>                                                  |                                                                                                                                                       |
| Number of elements (total)                                         | 4 000; Blocks (OB, FB, FC, DB) and UDTs                                                                                                               |
| <b>DB</b>                                                          |                                                                                                                                                       |
| • Number range                                                     | 1 ... 60 999; subdivided into: number range that can be used by the user: 1 ... 59 999, and number range of DBs created via SFC 86: 60 000 ... 60 999 |
| • Size, max.                                                       | 2.5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB                                                                                   |
| <b>FB</b>                                                          |                                                                                                                                                       |
| • Number range                                                     | 0 ... 65 535                                                                                                                                          |
| • Size, max.                                                       | 600 kbyte                                                                                                                                             |
| <b>FC</b>                                                          |                                                                                                                                                       |
| • Number range                                                     | 0 ... 65 535                                                                                                                                          |
| • Size, max.                                                       | 600 kbyte                                                                                                                                             |
| <b>OB</b>                                                          |                                                                                                                                                       |
| • Size, max.                                                       | 600 kbyte                                                                                                                                             |
| • Number of free cycle OBs                                         | 100                                                                                                                                                   |
| • Number of time alarm OBs                                         | 20                                                                                                                                                    |
| • Number of delay alarm OBs                                        | 20                                                                                                                                                    |
| • Number of cyclic interrupt OBs                                   | 20; With minimum OB 3x cycle of 250 µs                                                                                                                |
| • Number of process alarm OBs                                      | 50                                                                                                                                                    |
| • Number of DPV1 alarm OBs                                         | 3                                                                                                                                                     |
| • Number of isochronous mode OBs                                   | 2                                                                                                                                                     |
| • Number of technology synchronous alarm OBs                       | 2                                                                                                                                                     |
| • Number of startup OBs                                            | 100                                                                                                                                                   |
| • Number of asynchronous error OBs                                 | 4                                                                                                                                                     |
| • Number of synchronous error OBs                                  | 2                                                                                                                                                     |
| • Number of diagnostic alarm OBs                                   | 1                                                                                                                                                     |
| <b>Nesting depth</b>                                               |                                                                                                                                                       |
| • per priority class                                               | 24                                                                                                                                                    |
| <b>Counters, timers and their retentivity</b>                      |                                                                                                                                                       |
| <b>S7 counter</b>                                                  |                                                                                                                                                       |
| • Number                                                           | 2 048                                                                                                                                                 |
| <b>Retentivity</b>                                                 |                                                                                                                                                       |
| — adjustable                                                       | Yes                                                                                                                                                   |
| <b>IEC counter</b>                                                 |                                                                                                                                                       |
| • Number                                                           | Any (only limited by the main memory)                                                                                                                 |
| <b>Retentivity</b>                                                 |                                                                                                                                                       |
| — adjustable                                                       | Yes                                                                                                                                                   |
| <b>S7 times</b>                                                    |                                                                                                                                                       |
| • Number                                                           | 2 048                                                                                                                                                 |
| <b>Retentivity</b>                                                 |                                                                                                                                                       |
| — adjustable                                                       | Yes                                                                                                                                                   |
| <b>IEC timer</b>                                                   |                                                                                                                                                       |
| • Number                                                           | Any (only limited by the main memory)                                                                                                                 |
| <b>Retentivity</b>                                                 |                                                                                                                                                       |
| — adjustable                                                       | Yes                                                                                                                                                   |
| <b>Data areas and their retentivity</b>                            |                                                                                                                                                       |
| Retentive data area (incl. timers, counters, flags), max.          | 256 kbyte; in total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 216 KB                           |
| Extended retentive data area (incl. timers, counters, flags), max. | 2.5 Mbyte; When using PS 6 0W 24/48/60 V DC HF                                                                                                        |
| <b>Flag</b>                                                        |                                                                                                                                                       |
| • Size, max.                                                       | 16 kbyte                                                                                                                                              |
| • Number of clock memories                                         | 8; 8 clock memory bit, grouped into one clock memory byte                                                                                             |
| <b>Data blocks</b>                                                 |                                                                                                                                                       |
| • Retentivity adjustable                                           | Yes                                                                                                                                                   |
| • Retentivity preset                                               | No                                                                                                                                                    |
| <b>Local data</b>                                                  |                                                                                                                                                       |
| • per priority class, max.                                         | 64 kbyte; max. 16 KB per block                                                                                                                        |
| <b>Address area</b>                                                |                                                                                                                                                       |
| Number of IO modules                                               | 2 048; max. number of modules / submodules                                                                                                            |
| <b>I/O address area</b>                                            |                                                                                                                                                       |

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| <ul style="list-style-type: none"> <li>Inputs</li> <li>Outputs</li> </ul>                                                                                                                                                                   | 32 kbyte; All inputs are in the process image<br>32 kbyte; All outputs are in the process image                                                                                                                                               |
| per integrated IO subsystem                                                                                                                                                                                                                 |                                                                                                                                                                                                                                               |
| — Inputs (volume)                                                                                                                                                                                                                           | 8 kbyte                                                                                                                                                                                                                                       |
| — Outputs (volume)                                                                                                                                                                                                                          | 8 kbyte                                                                                                                                                                                                                                       |
| per CM/CP                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                               |
| — Inputs (volume)                                                                                                                                                                                                                           | 8 kbyte                                                                                                                                                                                                                                       |
| — Outputs (volume)                                                                                                                                                                                                                          | 8 kbyte                                                                                                                                                                                                                                       |
| Subprocess images                                                                                                                                                                                                                           |                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>Number of subprocess images, max.</li> </ul>                                                                                                                                                         | 32                                                                                                                                                                                                                                            |
| <b>Hardware configuration</b>                                                                                                                                                                                                               |                                                                                                                                                                                                                                               |
| Number of distributed IO systems                                                                                                                                                                                                            | 32; A distributed I/O system is characterized not only by the integration of distributed I/O via PROFINET or PROFIBUS communication modules, but also by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Link)             |
| Number of DP masters                                                                                                                                                                                                                        |                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>Via CM</li> </ul>                                                                                                                                                                                    | 6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total                                                                                                                                                                          |
| Number of IO Controllers                                                                                                                                                                                                                    |                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>integrated</li> <li>Via CM</li> </ul>                                                                                                                                                                | 1<br>6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total                                                                                                                                                                     |
| Rack                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>Modules per rack, max.</li> <li>Number of lines, max.</li> </ul>                                                                                                                                     | 32; CPU + 31 modules<br>1                                                                                                                                                                                                                     |
| PtP CM                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>Number of PtP CMs</li> </ul>                                                                                                                                                                         | the number of connectable PtP CMs is only limited by the number of available slots                                                                                                                                                            |
| <b>Time of day</b>                                                                                                                                                                                                                          |                                                                                                                                                                                                                                               |
| Clock                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>Type</li> <li>Backup time</li> <li>Deviation per day, max.</li> </ul>                                                                                                                                | Hardware clock<br>6 wk; At 40 °C ambient temperature, typically<br>10 s; Typ.: 2 s                                                                                                                                                            |
| Operating hours counter                                                                                                                                                                                                                     |                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>Number</li> </ul>                                                                                                                                                                                    | 16                                                                                                                                                                                                                                            |
| Clock synchronization                                                                                                                                                                                                                       |                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>supported</li> <li>in AS, master</li> <li>in AS, slave</li> <li>on Ethernet via NTP</li> </ul>                                                                                                       | Yes<br>Yes<br>Yes<br>Yes                                                                                                                                                                                                                      |
| <b>Interfaces</b>                                                                                                                                                                                                                           |                                                                                                                                                                                                                                               |
| Number of PROFINET interfaces                                                                                                                                                                                                               | 1                                                                                                                                                                                                                                             |
| <b>1. Interface</b>                                                                                                                                                                                                                         |                                                                                                                                                                                                                                               |
| Interface types                                                                                                                                                                                                                             |                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>RJ 45 (Ethernet)</li> <li>Number of ports</li> <li>integrated switch</li> </ul>                                                                                                                      | Yes; X1<br>2<br>Yes                                                                                                                                                                                                                           |
| Protocols                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>IP protocol</li> <li>PROFINET IO Controller</li> <li>PROFINET IO Device</li> <li>SIMATIC communication</li> <li>Open IE communication</li> <li>Web server</li> <li>Media redundancy</li> </ul>       | Yes; IPv4<br>Yes<br>Yes<br>Yes<br>Yes; Optionally also encrypted<br>Yes<br>Yes                                                                                                                                                                |
| PROFINET IO Controller                                                                                                                                                                                                                      |                                                                                                                                                                                                                                               |
| Services                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>PG/OP communication</li> <li>Isochronous mode</li> <li>Direct data exchange</li> <li>IRT</li> <li>PROFInergy</li> <li>Prioritized startup</li> <li>Number of connectable IO Devices, max.</li> </ul> | Yes<br>Yes<br>Yes; Requirement: IRT and isochronous mode (MRPD optional)<br>Yes<br>Yes; per user program<br>Yes; Max. 32 PROFINET devices<br>128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET |

|                                                                               |                                                                                                                                                                        |
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| — Of which IO devices with IRT, max.                                          | 64                                                                                                                                                                     |
| — Number of connectable IO Devices for RT, max.                               | 128                                                                                                                                                                    |
| — of which in line, max.                                                      | 128                                                                                                                                                                    |
| — Number of IO Devices that can be simultaneously activated/deactivated, max. | 8; in total across all interfaces                                                                                                                                      |
| — Number of IO Devices per tool, max.                                         | 8                                                                                                                                                                      |
| — Updating times                                                              | The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data |
| <b>Update time for IRT</b>                                                    |                                                                                                                                                                        |
| — for send cycle of 250 µs                                                    | 250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive                                    |
| — for send cycle of 500 µs                                                    | 500 µs to 8 ms                                                                                                                                                         |
| — for send cycle of 1 ms                                                      | 1 ms to 16 ms                                                                                                                                                          |
| — for send cycle of 2 ms                                                      | 2 ms to 32 ms                                                                                                                                                          |
| — for send cycle of 4 ms                                                      | 4 ms to 64 ms                                                                                                                                                          |
| — With IRT and parameterization of "odd" send cycles                          | Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)                                                                               |
| <b>Update time for RT</b>                                                     |                                                                                                                                                                        |
| — for send cycle of 250 µs                                                    | 250 µs to 128 ms                                                                                                                                                       |
| — for send cycle of 500 µs                                                    | 500 µs to 256 ms                                                                                                                                                       |
| — for send cycle of 1 ms                                                      | 1 ms to 512 ms                                                                                                                                                         |
| — for send cycle of 2 ms                                                      | 2 ms to 512 ms                                                                                                                                                         |
| — for send cycle of 4 ms                                                      | 4 ms to 512 ms                                                                                                                                                         |
| <b>PROFINET IO Device</b>                                                     |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| — PG/OP communication                                                         | Yes                                                                                                                                                                    |
| — Isochronous mode                                                            | No                                                                                                                                                                     |
| — IRT                                                                         | Yes                                                                                                                                                                    |
| — PROFINergy                                                                  | Yes; per user program                                                                                                                                                  |
| — Shared device                                                               | Yes                                                                                                                                                                    |
| — Number of IO Controllers with shared device, max.                           | 4                                                                                                                                                                      |
| — activation/deactivation of I-devices                                        | Yes; per user program                                                                                                                                                  |
| — Asset management record                                                     | Yes; per user program                                                                                                                                                  |
| <b>Interface types</b>                                                        |                                                                                                                                                                        |
| <b>RJ 45 (Ethernet)</b>                                                       |                                                                                                                                                                        |
| • 100 Mbps                                                                    | Yes                                                                                                                                                                    |
| • Autonegotiation                                                             | Yes                                                                                                                                                                    |
| • Autocrossing                                                                | Yes                                                                                                                                                                    |
| • Industrial Ethernet status LED                                              | Yes                                                                                                                                                                    |
| <b>Protocols</b>                                                              |                                                                                                                                                                        |
| PROFIsafe                                                                     | No                                                                                                                                                                     |
| <b>Number of connections</b>                                                  |                                                                                                                                                                        |
| • Number of connections, max.                                                 | 128; via integrated interfaces of the CPU and connected CPs / CMs                                                                                                      |
| • Number of connections reserved for ES/HMI/web                               | 10                                                                                                                                                                     |
| • Number of connections via integrated interfaces                             | 88                                                                                                                                                                     |
| • Number of S7 routing paths                                                  | 16                                                                                                                                                                     |
| <b>Redundancy mode</b>                                                        |                                                                                                                                                                        |
| • H-Sync forwarding                                                           | Yes                                                                                                                                                                    |
| <b>Media redundancy</b>                                                       |                                                                                                                                                                        |
| — Media redundancy                                                            | only via 1st interface (X1)                                                                                                                                            |
| — MRP                                                                         | Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client                                                                                     |
| — MRP interconnection, supported                                              | Yes; as MRP ring node according to IEC 62439-2 Edition 3.0                                                                                                             |
| — MRPD                                                                        | Yes; Requirement: IRT                                                                                                                                                  |
| — Switchover time on line break, typ.                                         | 200 ms; For MRP, bumpless for MRPD                                                                                                                                     |
| — Number of stations in the ring, max.                                        | 50                                                                                                                                                                     |
| <b>SIMATIC communication</b>                                                  |                                                                                                                                                                        |
| • PG/OP communication                                                         | Yes; encryption with TLS V1.3 pre-selected                                                                                                                             |
| • S7 routing                                                                  | Yes                                                                                                                                                                    |
| • Data record routing                                                         | Yes                                                                                                                                                                    |
| • S7 communication, as server                                                 | Yes                                                                                                                                                                    |

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| <ul style="list-style-type: none"> <li>• S7 communication, as client</li> <li>• User data per job, max.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>Yes</p> <p>See online help (S7 communication, user data size)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Open IE communication                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• TCP/IP <ul style="list-style-type: none"> <li>— Data length, max.</li> <li>— several passive connections per port, supported</li> </ul> </li> <li>• ISO-on-TCP (RFC1006) <ul style="list-style-type: none"> <li>— Data length, max.</li> </ul> </li> <li>• UDP <ul style="list-style-type: none"> <li>— Data length, max.</li> <li>— UDP multicast</li> </ul> </li> <li>• DHCP</li> <li>• DNS</li> <li>• SNMP</li> <li>• DCP</li> <li>• LLDP</li> <li>• Encryption</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>Yes</p> <p>64 kbyte</p> <p>Yes</p> <p>Yes</p> <p>64 kbyte</p> <p>Yes</p> <p>2 kbyte; 1 472 bytes for UDP broadcast</p> <p>Yes; max. 78 multicast circuits</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes; Optional</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Web server                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• HTTP</li> <li>• HTTPS</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <p>Yes; Standard and user pages</p> <p>Yes; Standard and user pages</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| OPC UA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Runtime license required</li> <li>• OPC UA Client <ul style="list-style-type: none"> <li>— Application authentication</li> <li>— Security policies</li> <li>— User authentication</li> <li>— Number of connections, max.</li> <li>— Number of nodes of the client interfaces, recommended max.</li> <li>— Number of elements for one call of OPC-UA_NodeGetHandleList/OPC-UA_ReadList/OPC-UA_WriteList, max.</li> <li>— Number of elements for one call of OPC-UA_NameSpaceGetIndexList, max.</li> <li>— Number of elements for one call of OPC-UA_MethodGetHandleList, max.</li> <li>— Number of simultaneous calls of the client instructions for session management, per connection, max.</li> <li>— Number of simultaneous calls of the client instructions for data access, per connection, max.</li> <li>— Number of registerable nodes, max.</li> <li>— Number of registerable method calls of OPC-UA_MethodCall, max.</li> <li>— Number of inputs/outputs when calling OPC-UA_MethodCall, max.</li> </ul> </li> <li>• OPC UA Server <ul style="list-style-type: none"> <li>— Application authentication</li> <li>— Security policies</li> <li>— User authentication</li> <li>— GDS support (certificate management)</li> <li>— Number of sessions, max.</li> <li>— Number of accessible variables, max.</li> <li>— Number of registerable nodes, max.</li> <li>— Number of subscriptions per session, max.</li> <li>— Sampling interval, min.</li> <li>— Publishing interval, min.</li> <li>— Number of server methods, max.</li> <li>— Number of inputs/outputs per server method, max.</li> <li>— Number of monitored items, recommended max.</li> <li>— Number of server interfaces, max.</li> </ul> </li> </ul> | <p>Yes; "Small" license required</p> <p>Yes; Data Access (registered Read/Write), Method Call</p> <p>Yes</p> <p>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</p> <p>"anonymous" or by user name &amp; password</p> <p>4</p> <p>1 000</p> <p>300</p> <p>20</p> <p>100</p> <p>1</p> <p>5</p> <p>5 000</p> <p>100</p> <p>20</p> <p>Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms &amp; Condition (A&amp;C), Custom Address Space</p> <p>Yes</p> <p>available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss</p> <p>"anonymous" or by user name &amp; password</p> <p>Yes</p> <p>32</p> <p>50 000</p> <p>10 000</p> <p>50</p> <p>100 ms</p> <p>200 ms</p> <p>20</p> <p>20</p> <p>4 000; for 1 s sampling interval and 1 s send interval</p> <p>10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"</p> |

|                                                                              |                                                                                                                                   |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| — Number of nodes for user-defined server interfaces, max.                   | 15 000                                                                                                                            |
| • Alarms and Conditions                                                      | Yes                                                                                                                               |
| — Number of program alarms                                                   | 100                                                                                                                               |
| — Number of alarms for system diagnostics                                    | 50                                                                                                                                |
| <b>Further protocols</b>                                                     |                                                                                                                                   |
| • MODBUS                                                                     | Yes; MODBUS TCP                                                                                                                   |
| <b>S7 message functions</b>                                                  |                                                                                                                                   |
| Number of login stations for message functions, max.                         | 32                                                                                                                                |
| Program alarms                                                               | Yes                                                                                                                               |
| Number of configurable program messages, max.                                | 5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH                                              |
| Number of loadable program messages in RUN, max.                             | 2 500                                                                                                                             |
| Number of simultaneously active program alarms                               |                                                                                                                                   |
| • Number of program alarms                                                   | 600                                                                                                                               |
| • Number of alarms for system diagnostics                                    | 100                                                                                                                               |
| • Number of alarms for motion technology objects                             | 160                                                                                                                               |
| <b>Test commissioning functions</b>                                          |                                                                                                                                   |
| Joint commission (Team Engineering)                                          | Yes; Parallel online access possible for up to 5 engineering systems                                                              |
| Status block                                                                 | Yes; Up to 8 simultaneously (in total across all ES clients)                                                                      |
| Single step                                                                  | No                                                                                                                                |
| Number of breakpoints                                                        | 8                                                                                                                                 |
| <b>Status/control</b>                                                        |                                                                                                                                   |
| • Status/control variable                                                    | Yes                                                                                                                               |
| • Variables                                                                  | Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters                                                              |
| • Number of variables, max.                                                  |                                                                                                                                   |
| — of which status variables, max.                                            | 200; per job                                                                                                                      |
| — of which control variables, max.                                           | 200; per job                                                                                                                      |
| <b>Forcing</b>                                                               |                                                                                                                                   |
| • Forcing                                                                    | Yes                                                                                                                               |
| • Forcing, variables                                                         | Peripheral inputs/outputs                                                                                                         |
| • Number of variables, max.                                                  | 200                                                                                                                               |
| <b>Diagnostic buffer</b>                                                     |                                                                                                                                   |
| • present                                                                    | Yes                                                                                                                               |
| • Number of entries, max.                                                    | 1 000                                                                                                                             |
| — of which powerfail-proof                                                   | 500                                                                                                                               |
| <b>Traces</b>                                                                |                                                                                                                                   |
| • Number of configurable Traces                                              | 4; Up to 512 KB of data per trace are possible                                                                                    |
| <b>Interrupts/diagnostics/status information</b>                             |                                                                                                                                   |
| <b>Diagnostics indication LED</b>                                            |                                                                                                                                   |
| • RUN/STOP LED                                                               | Yes                                                                                                                               |
| • ERROR LED                                                                  | Yes                                                                                                                               |
| • MAINT LED                                                                  | Yes                                                                                                                               |
| • STOP ACTIVE LED                                                            | Yes                                                                                                                               |
| • Connection display LINK TX/RX                                              | Yes                                                                                                                               |
| <b>Supported technology objects</b>                                          |                                                                                                                                   |
| Motion Control                                                               | Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool |
| • Number of available Motion Control resources for technology objects        | 1 120                                                                                                                             |
| • Required Motion Control resources                                          |                                                                                                                                   |
| — per speed-controlled axis                                                  | 40                                                                                                                                |
| — per positioning axis                                                       | 80                                                                                                                                |
| — per synchronous axis                                                       | 160                                                                                                                               |
| — per external encoder                                                       | 80                                                                                                                                |
| — per output cam                                                             | 20                                                                                                                                |
| — per cam track                                                              | 160                                                                                                                               |
| — per probe                                                                  | 40                                                                                                                                |
| • Positioning axis                                                           |                                                                                                                                   |
| — Number of positioning axes at motion control cycle of 4 ms (typical value) | 11                                                                                                                                |
| — Number of positioning axes at motion control cycle                         | 14                                                                                                                                |

|                                                                                                                         |                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| of 8 ms (typical value)                                                                                                 |                                                                                                                                                                                     |
| Controller                                                                                                              |                                                                                                                                                                                     |
| • PID_Compact                                                                                                           | Yes; Universal PID controller with integrated optimization                                                                                                                          |
| • PID_3Step                                                                                                             | Yes; PID controller with integrated optimization for valves                                                                                                                         |
| • PID-Temp                                                                                                              | Yes; PID controller with integrated optimization for temperature                                                                                                                    |
| Counting and measuring                                                                                                  |                                                                                                                                                                                     |
| • High-speed counter                                                                                                    | Yes                                                                                                                                                                                 |
| <b>Ambient conditions</b>                                                                                               |                                                                                                                                                                                     |
| Ambient temperature during operation                                                                                    |                                                                                                                                                                                     |
| • horizontal installation, min.                                                                                         | -40 °C; = Tmin (incl. condensation/frost)                                                                                                                                           |
| • horizontal installation, max.                                                                                         | 70 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C                                                                           |
| • vertical installation, min.                                                                                           | -40 °C; = Tmin                                                                                                                                                                      |
| • vertical installation, max.                                                                                           | 40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off                                                                          |
| Ambient temperature during storage/transportation                                                                       |                                                                                                                                                                                     |
| • min.                                                                                                                  | -40 °C                                                                                                                                                                              |
| • max.                                                                                                                  | 70 °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                                                                                                              |
| 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                                                                                   |
| <b>Resistance</b>                                                                                                       |                                                                                                                                                                                     |
| 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, *                                                                                                                                                  |
| Use on ships/at sea                                                                                                     |                                                                                                                                                                                     |
| — to biologically active substances according to EN 60721-3-6                                                           | Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)                                                                                                                    |
| — 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; *                                                                                                                                                  |
| Usage in industrial process technology                                                                                  |                                                                                                                                                                                     |
| — 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) |
| Remark                                                                                                                  |                                                                                                                                                                                     |
| — 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!                                                                                        |
| Conformal coating                                                                                                       |                                                                                                                                                                                     |
| • Coatings for printed circuit board assemblies acc. to EN 61086                                                        | Yes; Class 2 for high reliability                                                                                                                                                   |
| • Protection against fouling acc. to EN 60664-3                                                                         | Yes; Type 1 protection                                                                                                                                                              |
| • Military testing according to MIL-I-46058C, Amendment 7                                                               | Yes; Discoloration of coating possible during service life                                                                                                                          |
| • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A | Yes; Conformal coating, Class A                                                                                                                                                     |
| <b>configuration / header</b>                                                                                           |                                                                                                                                                                                     |
| configuration / programming / header                                                                                    |                                                                                                                                                                                     |
| Programming language                                                                                                    |                                                                                                                                                                                     |
| — LAD                                                                                                                   | Yes                                                                                                                                                                                 |
| — FBD                                                                                                                   | Yes                                                                                                                                                                                 |
| — STL                                                                                                                   | Yes                                                                                                                                                                                 |
| — SCL                                                                                                                   | Yes                                                                                                                                                                                 |

|                                                   |                               |
|---------------------------------------------------|-------------------------------|
| — CFC                                             | Yes                           |
| — GRAPH                                           | Yes                           |
| Know-how protection                               |                               |
| • User program protection/password protection     | Yes                           |
| • Copy protection                                 | Yes                           |
| • Block protection                                | Yes                           |
| Access protection                                 |                               |
| • protection of confidential configuration data   | Yes                           |
| • Password for display                            | Yes                           |
| • Protection level: Write protection              | Yes                           |
| • Protection level: Read/write protection         | Yes                           |
| • Protection level: Write protection for Failsafe | No                            |
| • Protection level: Complete protection           | Yes                           |
| programming / cycle time monitoring / header      |                               |
| • lower limit                                     | adjustable minimum cycle time |
| • upper limit                                     | adjustable maximum cycle time |
| Dimensions                                        |                               |
| Width                                             | 35 mm                         |
| Height                                            | 147 mm                        |
| Depth                                             | 129 mm                        |
| Weights                                           |                               |
| Weight, approx.                                   | 400 g                         |

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10/21/2023 