



Figure similar

SIPLUS ET 200SP CPU 1512SP F-1 rail based on 6ES7512-1SM03-0AB0 with conformal coating OT4: -40...+70 °C ST1/2: 85 °C for 10 minutes . central processing unit with work memory 600 KB for program and 2 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for port 1 and 2

| General information                                      |                                                             |
|----------------------------------------------------------|-------------------------------------------------------------|
| Product type designation                                 | CPU 1512SP F-1 PN                                           |
| Firmware version                                         |                                                             |
| • FW update possible                                     | Yes                                                         |
| based on                                                 | <a href="#">6ES7512-1SM03-0AB0</a>                          |
| Product function                                         |                                                             |
| • I&M data                                               | Yes; I&M0 to I&M3                                           |
| • Module swapping during operation (hot swapping)        | Yes; Multi-hot swapping                                     |
| • Isochronous mode                                       | Yes; only with PROFINET; with minimum OB 6x cycle of 500 µs |
| • SysLog                                                 | Yes                                                         |
| Engineering with                                         |                                                             |
| • STEP 7 TIA Portal configurable/integrated from version | see entry ID: 109746275                                     |
| Configuration control                                    |                                                             |
| via dataset                                              | Yes                                                         |
| Control elements                                         |                                                             |
| Mode selector switch                                     | 1                                                           |
| 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               | 10 ms                                                       |
| Input current                                            |                                                             |
| Current consumption (rated value)                        | 0.48 A                                                      |
| Current consumption, max.                                | 0.7 A                                                       |
| Inrush current, max.                                     | 1.34 A; Rated value                                         |
| I <sup>2</sup> t                                         | 0.3 A <sup>2</sup> ·s                                       |
| Power                                                    |                                                             |
| Infeed power to the backplane bus                        | 8.05 W                                                      |
| Power loss                                               |                                                             |
| Power loss, typ.                                         | 3.5 W                                                       |
| Storage                                                  |                                                             |
| Number of slots for SIMATIC memory card                  | 1                                                           |
| SIMATIC memory card required                             | Yes                                                         |
| Work memory                                              |                                                             |
| • integrated (for program)                               | 600 kbyte                                                   |
| • integrated (for data)                                  | 2 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                                                                                                                                                 |
| for floating point arithmetic, typ.                       | 170 ns                                                                                                                                                |
| CPU-blocks                                                |                                                                                                                                                       |
| Number of elements (total)                                | 4 000; Blocks (OB, FB, FC, DB) and UDTs                                                                                                               |
| DB                                                        |                                                                                                                                                       |
| • 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 Mbyte; For DBs with absolute addressing, the max. size is 64 KB                                                                                     |
| FB                                                        |                                                                                                                                                       |
| • Number range                                            | 0 ... 65 535                                                                                                                                          |
| • Size, max.                                              | 600 kbyte                                                                                                                                             |
| FC                                                        |                                                                                                                                                       |
| • Number range                                            | 0 ... 65 535                                                                                                                                          |
| • Size, max.                                              | 600 kbyte                                                                                                                                             |
| OB                                                        |                                                                                                                                                       |
| • 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                          | 1                                                                                                                                                     |
| • 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                                                                                                                                                     |
| Nesting depth                                             |                                                                                                                                                       |
| • per priority class                                      | 24; Up to 8 possible for F-blocks                                                                                                                     |
| Counters, timers and their retentivity                    |                                                                                                                                                       |
| S7 counter                                                |                                                                                                                                                       |
| • Number                                                  | 2 048                                                                                                                                                 |
| Retentivity                                               |                                                                                                                                                       |
| — can be set                                              | Yes                                                                                                                                                   |
| IEC counter                                               |                                                                                                                                                       |
| • Number                                                  | Any (only limited by the main memory)                                                                                                                 |
| Retentivity                                               |                                                                                                                                                       |
| — can be set                                              | Yes                                                                                                                                                   |
| S7 timer                                                  |                                                                                                                                                       |
| • Number                                                  | 2 048                                                                                                                                                 |
| Retentivity                                               |                                                                                                                                                       |
| — adjustable                                              | Yes                                                                                                                                                   |
| IEC timer                                                 |                                                                                                                                                       |
| • Number                                                  | Any (only limited by the main memory)                                                                                                                 |
| Retentivity                                               |                                                                                                                                                       |
| — adjustable                                              | Yes                                                                                                                                                   |
| Data areas and their retentivity                          |                                                                                                                                                       |
| 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                           |
| Flag                                                      |                                                                                                                                                       |
| • 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>                       |                                                                                                                                                                                                                                   |
| • Inputs                                      | 32 kbyte; All inputs are in the process image                                                                                                                                                                                     |
| • Outputs                                     | 32 kbyte; All outputs are in the process image                                                                                                                                                                                    |
| <b>per integrated IO subsystem</b>            |                                                                                                                                                                                                                                   |
| — Inputs (volume)                             | 8 kbyte                                                                                                                                                                                                                           |
| — Outputs (volume)                            | 8 kbyte                                                                                                                                                                                                                           |
| <b>per CM/CP</b>                              |                                                                                                                                                                                                                                   |
| — Inputs (volume)                             | 8 kbyte                                                                                                                                                                                                                           |
| — Outputs (volume)                            | 8 kbyte                                                                                                                                                                                                                           |
| <b>Subprocess images</b>                      |                                                                                                                                                                                                                                   |
| • Number of subprocess images, max.           | 32                                                                                                                                                                                                                                |
| <b>Address space per module</b>               |                                                                                                                                                                                                                                   |
| • Address space per module, max.              | 288 byte; For input and output data respectively                                                                                                                                                                                  |
| <b>Address space per station</b>              |                                                                                                                                                                                                                                   |
| • Address space per station, max.             | 2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules                                                                                         |
| <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) |
| <b>Number of DP masters</b>                   |                                                                                                                                                                                                                                   |
| • Via CM                                      | 1                                                                                                                                                                                                                                 |
| <b>Number of IO Controllers</b>               |                                                                                                                                                                                                                                   |
| • Integrated                                  | 1                                                                                                                                                                                                                                 |
| • via CM                                      | 0                                                                                                                                                                                                                                 |
| <b>Rack</b>                                   |                                                                                                                                                                                                                                   |
| • Modules per rack, max.                      | 82; CPU + 64 modules + server module (mounting width max. 1 m) + 16 ET 200AL modules; > 60 °C ambient temperature: CPU + 16 modules + server module + 16 ET 200AL modules                                                         |
| • Quantity of operable ET 200SP modules, max. | 64; > 60 °C ambient temperature: 16 modules                                                                                                                                                                                       |
| • Quantity of operable ET 200AL modules, max. | 16                                                                                                                                                                                                                                |
| • Number of lines, max.                       | 1                                                                                                                                                                                                                                 |
| <b>PtP CM</b>                                 |                                                                                                                                                                                                                                   |
| • Number of PtP CMs                           | the number of connectable PtP CMs is only limited by the number of available slots                                                                                                                                                |
| <b>Time of day</b>                            |                                                                                                                                                                                                                                   |
| <b>Clock</b>                                  |                                                                                                                                                                                                                                   |
| • Type                                        | Hardware clock                                                                                                                                                                                                                    |
| • Backup time                                 | 6 wk; At 40 °C ambient temperature, typically                                                                                                                                                                                     |
| • Deviation per day, max.                     | 10 s; Typ.: 2 s                                                                                                                                                                                                                   |
| <b>Operating hours counter</b>                |                                                                                                                                                                                                                                   |
| • Number                                      | 16                                                                                                                                                                                                                                |
| <b>Clock synchronization</b>                  |                                                                                                                                                                                                                                   |
| • supported                                   | Yes                                                                                                                                                                                                                               |
| • to DP, master                               | Yes; Via CM DP module                                                                                                                                                                                                             |
| • on DP, device                               | Yes; Via CM DP module                                                                                                                                                                                                             |
| • in AS, master                               | Yes                                                                                                                                                                                                                               |
| • in AS, device                               | Yes                                                                                                                                                                                                                               |
| • on Ethernet via NTP                         | Yes                                                                                                                                                                                                                               |
| <b>Interfaces</b>                             |                                                                                                                                                                                                                                   |
| Number of PROFINET interfaces                 | 1                                                                                                                                                                                                                                 |
| Number of PROFIBUS interfaces                 | 1; Via CM DP module                                                                                                                                                                                                               |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Optical interface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>1. Interface</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Interface types</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• RJ 45 (Ethernet)</li> <li>• Number of ports</li> <li>• integrated switch</li> <li>• BusAdapter (PROFINET)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45<br>3; 1. integr. + 2. via BusAdapter<br>Yes<br>Yes                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Protocols</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <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                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>PROFINET IO Controller</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Services</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>— Isochronous mode</li> <li>— Direct data exchange</li> <li>— IRT</li> <li>— Dynamic Frame Packing (DFP)</li> <li>— PROFINergy</li> <li>— Prioritized startup</li> <li>— Number of connectable IO Devices, max.</li> <li>— Of which IO devices with IRT, max.</li> <li>— Number of connectable IO Devices for RT, max.</li> <li>— of which in line, max.</li> <li>— Number of IO Devices that can be simultaneously activated/deactivated, max.</li> <li>— Number of IO Devices per tool, max.</li> <li>— Updating times</li> <li>— PROFINET Security Class</li> </ul> | Yes<br>Yes; Requirement: IRT and isochronous mode (MRPD optional)<br>Yes<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<br>64<br>128<br>128<br>8; in total across all interfaces<br>8<br>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<br>1 |
| <b>Update time for IRT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>— for send cycle of 250 µs</li> <li>— for send cycle of 500 µs</li> <li>— for send cycle of 1 ms</li> <li>— for send cycle of 2 ms</li> <li>— for send cycle of 4 ms</li> <li>— With IRT and parameterization of "odd" send cycles</li> </ul>                                                                                                                                                                                                                                                                                                                          | 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<br>500 µs to 8 ms<br>1 ms to 16 ms<br>2 ms to 32 ms<br>4 ms to 64 ms<br>Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)                                                                                                                                                                                       |
| <b>Update time for RT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>— for send cycle of 250 µs</li> <li>— for send cycle of 500 µs</li> <li>— for send cycle of 1 ms</li> <li>— for send cycle of 2 ms</li> <li>— for send cycle of 4 ms</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                        | 250 µs to 128 ms<br>500 µs to 256 ms<br>1 ms to 512 ms<br>2 ms to 512 ms<br>4 ms to 512 ms                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>PROFINET IO Device</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Services</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>— Isochronous mode</li> <li>— IRT</li> <li>— Dynamic Frame Packing (DFP)</li> <li>— PROFINergy</li> <li>— Prioritized startup</li> <li>— Shared device</li> <li>— Number of IO Controllers with shared device, max.</li> <li>— activation/deactivation of I-devices</li> <li>— Asset management record</li> </ul>                                                                                                                                                                                                                                                      | No<br>Yes<br>No<br>Yes; per user program<br>Yes<br>Yes<br>4<br>Yes; per user program<br>Yes; per user program                                                                                                                                                                                                                                                                                                                                                                              |

**2. Interface**

|                                                   |                                                                                                  |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Interface types</b>                            |                                                                                                  |
| • RS 485                                          | Yes; Via CM DP module                                                                            |
| • Number of ports                                 | 1                                                                                                |
| <b>Protocols</b>                                  |                                                                                                  |
| • PROFIBUS DP master                              | Yes                                                                                              |
| • PROFIBUS DP device                              | Yes                                                                                              |
| • SIMATIC communication                           | Yes                                                                                              |
| <b>PROFIBUS DP master</b>                         |                                                                                                  |
| • Number of connections, max.                     | 48; Of which 4 each reserved for ES and HMI                                                      |
| • max. number of DP devices                       | 125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET |
| <b>Services</b>                                   |                                                                                                  |
| — Equidistance                                    | No                                                                                               |
| — Isochronous mode                                | No                                                                                               |
| — activation/deactivation of DP devices           | Yes                                                                                              |
| <b>Interface types</b>                            |                                                                                                  |
| <b>RJ 45 (Ethernet)</b>                           |                                                                                                  |
| • 100 Mbps                                        | Yes                                                                                              |
| • Autonegotiation                                 | Yes                                                                                              |
| • Autocrossing                                    | Yes                                                                                              |
| • Industrial Ethernet status LED                  | Yes                                                                                              |
| <b>RS 485</b>                                     |                                                                                                  |
| • Transmission rate, max.                         | 12 Mbit/s                                                                                        |
| <b>Protocols</b>                                  |                                                                                                  |
| PROFIsafe                                         | Yes; V2.4 / V2.6                                                                                 |
| <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 connections per CP/CM                 | 32                                                                                               |
| • Number of S7 routing paths                      | 16                                                                                               |
| <b>Redundancy mode</b>                            |                                                                                                  |
| • PROFINET system redundancy (S2)                 | No                                                                                               |
| • PROFINET system redundancy (R1)                 | No                                                                                               |
| • H-Sync forwarding                               | Yes                                                                                              |
| <b>Media redundancy</b>                           |                                                                                                  |
| — Media redundancy                                | Yes; only via BusAdapter                                                                         |
| — 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                                                                                              |
| • S7 communication, as client                     | Yes                                                                                              |
| • User data per job, max.                         | See online help (S7 communication, user data size)                                               |
| <b>Open IE communication</b>                      |                                                                                                  |
| • TCP/IP                                          | Yes                                                                                              |
| — Data length, max.                               | 64 kbyte                                                                                         |
| — several passive connections per port, supported | Yes                                                                                              |
| • ISO-on-TCP (RFC1006)                            | Yes                                                                                              |
| — Data length, max.                               | 64 kbyte                                                                                         |
| • UDP                                             | Yes                                                                                              |

|                                                                                                        |                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| — Data length, max.                                                                                    | 2 kbyte; 1 472 bytes for UDP broadcast                                                                                            |
| — UDP multicast                                                                                        | Yes; max. 78 multicast circuits                                                                                                   |
| • DHCP                                                                                                 | Yes                                                                                                                               |
| • DNS                                                                                                  | Yes                                                                                                                               |
| • SNMP                                                                                                 | Yes                                                                                                                               |
| • DCP                                                                                                  | Yes                                                                                                                               |
| • LLDP                                                                                                 | Yes                                                                                                                               |
| • Encryption                                                                                           | Yes; Optional                                                                                                                     |
| <b>Web server</b>                                                                                      |                                                                                                                                   |
| • HTTP                                                                                                 | Yes; Standard and user pages                                                                                                      |
| • HTTPS                                                                                                | Yes; Standard and user pages                                                                                                      |
| • web API                                                                                              |                                                                                                                                   |
| — Number of sessions, max.                                                                             | 50                                                                                                                                |
| — number of simultaneous HTTP calls, max.                                                              | 4                                                                                                                                 |
| — HTTP request body, max.                                                                              | 131 072 byte                                                                                                                      |
| <b>OPC UA</b>                                                                                          |                                                                                                                                   |
| • Runtime license required                                                                             | Yes; "Small" license required                                                                                                     |
| • OPC UA Client                                                                                        | Yes; Data Access (registered Read/Write), Method Call                                                                             |
| — Application authentication                                                                           | Yes                                                                                                                               |
| — Security policies                                                                                    | Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256                                                   |
| — User authentication                                                                                  | "anonymous" or by user name & password                                                                                            |
| — Number of connections, max.                                                                          | 4                                                                                                                                 |
| — Number of nodes of the client interfaces, recommended max.                                           | 1 000                                                                                                                             |
| — Number of elements for one call of OPC-UA-NodeGetHandleList/OPC-UA-ReadList/OPC-UA-WriteList, max.   | 300                                                                                                                               |
| — Number of elements for one call of OPC-UA-NameSpaceGetIndexList, max.                                | 20                                                                                                                                |
| — Number of elements for one call of OPC-UA-MethodGetHandleList, max.                                  | 100                                                                                                                               |
| — Number of simultaneous calls of the client instructions for session management, per connection, max. | 1                                                                                                                                 |
| — Number of simultaneous calls of the client instructions for data access, per connection, max.        | 5                                                                                                                                 |
| — Number of registerable nodes, max.                                                                   | 5 000                                                                                                                             |
| — Number of registerable method calls of OPC-UA-MethodCall, max.                                       | 100                                                                                                                               |
| — Number of inputs/outputs when calling OPC-UA-MethodCall, max.                                        | 20                                                                                                                                |
| • OPC UA Server                                                                                        | Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control |
| — Application authentication                                                                           | Yes                                                                                                                               |
| — Security policies                                                                                    | available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss          |
| — User authentication                                                                                  | "anonymous" or by user name & password                                                                                            |
| — GDS support (certificate management)                                                                 | Yes                                                                                                                               |
| — Number of sessions, max.                                                                             | 32                                                                                                                                |
| — Number of accessible variables, max.                                                                 | 50 000                                                                                                                            |
| — Number of registerable nodes, max.                                                                   | 10 000                                                                                                                            |
| — Number of subscriptions per session, max.                                                            | 50                                                                                                                                |
| — Sampling interval, min.                                                                              | 100 ms                                                                                                                            |
| — Publishing interval, min.                                                                            | 200 ms                                                                                                                            |
| — Number of server methods, max.                                                                       | 20; max. 20 concurrently running jobs each for asynchronous instructions OPC-UA-ServerMethodPre and OPC-UA-ServerMethodPost       |
| — Number of inputs/outputs per server method, max.                                                     | 20                                                                                                                                |
| — Number of monitored items, recommended max.                                                          | 4 000; for 1 s sampling interval and 1 s send interval                                                                            |
| — Number of server interfaces, max.                                                                    | 10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"                          |
| — 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                                                                                                                                |
| number of subscriptions, max.                                         | 250                                                                                                                               |
| number of tags/attributes for subscriptions, max.                     | 2 000                                                                                                                             |
| 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.                      | 5 000                                                                                                                             |
| 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                                                           | Yes                                                                                                                               |
| Number of breakpoints                                                 | 8                                                                                                                                 |
| Profiling                                                             | Yes                                                                                                                               |
| <b>Status/control</b>                                                 |                                                                                                                                   |
| • Status/control variable                                             | Yes; without fail-safe                                                                                                            |
| • Variables                                                           | inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, 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; without fail-safe                                                                                                            |
| • Forcing, variables                                                  | peripheral inputs/outputs (without fail-safe)                                                                                     |
| • 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                                                                                                                                 |
| • Memory size per trace, max.                                         | 512 kbyte                                                                                                                         |
| <b>Interrupts/diagnostics/status information</b>                      |                                                                                                                                   |
| <b>Diagnostics indication LED</b>                                     |                                                                                                                                   |
| • RUN/STOP LED                                                        | Yes                                                                                                                               |
| • ERROR LED                                                           | Yes                                                                                                                               |
| • MAINT LED                                                           | Yes                                                                                                                               |
| • Monitoring of the supply voltage (PWR-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                                                                                                                                |

|                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Positioning axis <ul style="list-style-type: none"> <li>Number of positioning axes at motion control cycle of 4 ms (typical value)</li> <li>Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul> </li> </ul> | 11<br><br>14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Controller <ul style="list-style-type: none"> <li>PID_Compact</li> <li>PID_3Step</li> <li>PID-Temp</li> </ul>                                                                                                                                                                        | Yes; Universal PID controller with integrated optimization<br>Yes; PID controller with integrated optimization for valves<br>Yes; PID controller with integrated optimization for temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Counting and measuring <ul style="list-style-type: none"> <li>High-speed counter</li> </ul>                                                                                                                                                                                          | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Isolation</b>                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Isolation tested with                                                                                                                                                                                                                                                                | 750 V DC (type test) and according to EN 50155 (routine test); internal voltage limitation between internal chassis and ground to $\pm 300$ V (varistor)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Standards, approvals, certificates</b>                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Highest safety class achievable in safety mode                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>Performance level according to ISO 13849-1</li> <li>SIL acc. to IEC 61508</li> <li>SIL in accordance with EN 50126-1, 50129, 50159, 50716</li> </ul>                                                                                          | PLe<br>SIL 3<br>SIL 2; a higher safety integrity level is possible if tested and approved for the specific application under consideration of all local regulations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Probability of failure (for service life of 20 years and repair time of 100 hours)                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>Low demand mode: PFDavg in accordance with SIL3</li> <li>High demand/continuous mode: PFH in accordance with SIL3</li> </ul>                                                                                                                  | < 2.00E-05<br>< 1.00E-09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Railway application</b>                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>EN 50121-3-2</li> <li>EN 50121-4</li> <li>EN 50121-5</li> <li>EN 50124-1</li> <li>EN 50125-1</li> <li>EN 50125-2</li> <li>EN 50125-3</li> <li>EN 50155</li> <li>EN 61373</li> <li>Fire protection acc. to EN 45545-2</li> </ul>               | Yes; EMC for rail vehicles<br>Yes; EMC for signal and telecommunications systems<br>Yes; EMC for fixed installations and railway power supply equipment<br>Yes; Railway applications - overvoltage category OV2; pollution degree PD2; rated surge voltage UNi = 0.5 kV; UNm = 24 V DC<br>Yes; Rail vehicles - see ambient conditions<br>Yes; Stationary electrical equipment - see ambient conditions<br>Yes; Signal and telecommunications systems - see ambient conditions; vibrations and shocks: Application point outside of tracks (1 m to 3 m away from track)<br>Yes; Rail vehicles - temperature class OT4, ST1/ST2, horizontal mounting position<br>Yes; Rail vehicles - vibrations and shocks: Category 1 Class A/B<br>Yes; For proof of conformity, see Service & Support |
| <b>Security</b>                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| PROFINET Security Class                                                                                                                                                                                                                                                              | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| signed firmware update                                                                                                                                                                                                                                                               | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Secure Boot                                                                                                                                                                                                                                                                          | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| safely removing data                                                                                                                                                                                                                                                                 | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Ambient conditions</b>                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Ambient temperature during operation                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>horizontal installation, min.</li> <li>horizontal installation, max.</li> <li>vertical installation, min.</li> <li>vertical installation, max.</li> </ul>                                                                                     | -40 °C; = Tmin (incl. condensation/frost)<br>70 °C; = Tmax; +85 °C for 10 min (OT4, ST1/ST2 acc. to EN 50155)<br>-40 °C; = Tmin<br>50 °C; = Tmax                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Altitude during operation relating to sea level                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>                                                                                                                          | 2 000 m<br>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Relative humidity                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>                                                                                                                                                                  | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Resistance</b>                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Coolants and lubricants                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>Resistant to commercially available coolants and lubricants</li> </ul>                                                                                                                                                                        | Yes; Incl. diesel and oil droplets in the air                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Use in stationary industrial systems                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |



|                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>— to biologically active substances according to EN 60721-3-3</li> <li>— to chemically active substances according to EN 60721-3-3</li> <li>— to mechanically active substances according to EN 60721-3-3</li> </ul>                                                                                                                                                                                       | <p>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</p> <p>Yes; Class 3C4 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</p> <p>Yes; Class 3S4 incl. sand, dust, *</p> |
| Use on land craft, rail vehicles and special-purpose vehicles                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>— to biologically active substances according to EN 60721-3-5</li> <li>— to chemically active substances according to EN 60721-3-5</li> <li>— to mechanically active substances according to EN 60721-3-5</li> </ul>                                                                                                                                                                                       | <p>Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request</p> <p>Yes; Class 5C3 (RH &lt; 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</p> <p>Yes; Class 5S3 incl. sand, dust; *</p> |
| Usage in industrial process technology                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>— Against chemically active substances acc. to EN 60654-4</li> <li>— Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>                                                                                                                                                                                                                                 | <p>Yes; Class 3 (excluding trichlorethylene)</p> <p>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)</p>            |
| Remark                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>— Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>                                                                                                                                                                                                                                                                                     | <p>* The supplied plug covers must remain in place over the unused interfaces during operation!</p>                                                                                                                                                    |
| Conformal coating                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>• Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>• Protection against fouling acc. to EN 60664-3</li> <li>• Electronic equipment on rolling stock acc. to EN 50155</li> <li>• Military testing according to MIL-I-46058C, Amendment 7</li> <li>• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul> | <p>Yes; Class 2 for high reliability</p> <p>Yes; Type 1 protection</p> <p>Yes; class PC2 protective coating acc. to EN 50155</p> <p>Yes; Discoloration of coating possible during service life</p> <p>Yes; Conformal coating, Class A</p>              |
| Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                        |
| Programming                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                        |
| Programming language                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                        |
| — LAD                                                                                                                                                                                                                                                                                                                                                                                                                                             | Yes; incl. failsafe                                                                                                                                                                                                                                    |
| — FBD                                                                                                                                                                                                                                                                                                                                                                                                                                             | Yes; incl. failsafe                                                                                                                                                                                                                                    |
| — STL                                                                                                                                                                                                                                                                                                                                                                                                                                             | Yes                                                                                                                                                                                                                                                    |
| — SCL                                                                                                                                                                                                                                                                                                                                                                                                                                             | Yes                                                                                                                                                                                                                                                    |
| — CFC                                                                                                                                                                                                                                                                                                                                                                                                                                             | No                                                                                                                                                                                                                                                     |
| — 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                                                                                                                                                                                                                                                    |
| • Protection level: Write protection                                                                                                                                                                                                                                                                                                                                                                                                              | Yes                                                                                                                                                                                                                                                    |
| • Protection level: Read/write protection                                                                                                                                                                                                                                                                                                                                                                                                         | Yes                                                                                                                                                                                                                                                    |
| • Protection level: Write protection for Failsafe                                                                                                                                                                                                                                                                                                                                                                                                 | Yes                                                                                                                                                                                                                                                    |
| • Protection level: Complete protection                                                                                                                                                                                                                                                                                                                                                                                                           | Yes                                                                                                                                                                                                                                                    |
| • User administration                                                                                                                                                                                                                                                                                                                                                                                                                             | Yes; device-wide and centralized                                                                                                                                                                                                                       |
| • Number of users                                                                                                                                                                                                                                                                                                                                                                                                                                 | 100                                                                                                                                                                                                                                                    |
| • Number of groups                                                                                                                                                                                                                                                                                                                                                                                                                                | 100                                                                                                                                                                                                                                                    |
| • Number of roles                                                                                                                                                                                                                                                                                                                                                                                                                                 | 50                                                                                                                                                                                                                                                     |
| Cycle time monitoring                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                        |
| • lower limit                                                                                                                                                                                                                                                                                                                                                                                                                                     | adjustable minimum cycle time                                                                                                                                                                                                                          |
| • upper limit                                                                                                                                                                                                                                                                                                                                                                                                                                     | adjustable maximum cycle time                                                                                                                                                                                                                          |
| Dimensions                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                        |
| Width                                                                                                                                                                                                                                                                                                                                                                                                                                             | 100 mm                                                                                                                                                                                                                                                 |
| Height                                                                                                                                                                                                                                                                                                                                                                                                                                            | 117 mm                                                                                                                                                                                                                                                 |
| Depth                                                                                                                                                                                                                                                                                                                                                                                                                                             | 75 mm                                                                                                                                                                                                                                                  |
| Weights                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                        |

|                 |       |
|-----------------|-------|
| Weight, approx. | 415 g |
|-----------------|-------|

Other

|       |                                                                                                                                            |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Note: | for use in railway applications, also observe the product information "SIPLUS extreme RAIL" A5E37661960A, Online Support article 109736776 |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------|

Classifications

|  |        | Version | Classification |
|--|--------|---------|----------------|
|  | eClass | 14      | 27-24-26-07    |
|  | eClass | 12      | 27-24-26-07    |
|  | eClass | 9.1     | 27-24-26-07    |
|  | eClass | 9       | 27-24-26-07    |
|  | eClass | 8       | 27-24-26-07    |
|  | eClass | 7.1     | 27-24-26-07    |
|  | eClass | 6       | 27-24-26-07    |
|  | ETIM   | 10      | EC001603       |
|  | ETIM   | 9       | EC001603       |
|  | ETIM   | 8       | EC001603       |
|  | ETIM   | 7       | EC001603       |
|  | IDEA   | 4       | 3565           |
|  | UNSPSC | 15      | 32-15-17-05    |

Approvals / Certificates

General Product Approval

[Manufacturer Declaration](#)





[China RoHS](#)



[TUEV](#)

|                          |                   |         |
|--------------------------|-------------------|---------|
| General Product Approval | Functional Safety | Railway |
|--------------------------|-------------------|---------|

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[Confirmation](#)

last modified:

5/21/2026 