



Figure similar

SIMATIC S7-1500T, CPU 1511T-1 PN, central processing unit with work memory 450 KB for program and 1.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 6 ns bit performance, SIMATIC Memory Card required

| General information                                      |                                                                                                            |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Product type designation                                 | CPU 1511T-1 PN                                                                                             |
| HW functional status                                     | FS04                                                                                                       |
| Firmware version                                         | V4.0                                                                                                       |
| • FW update possible                                     | Yes                                                                                                        |
| Product function                                         |                                                                                                            |
| • I&M data                                               | Yes; I&M0 to I&M3                                                                                          |
| • Isochronous mode                                       | Yes; Distributed and central; with minimum OB 6x cycle of 500 µs (distributed) and 1 ms (central)          |
| • SysLog                                                 | Yes                                                                                                        |
| Engineering with                                         |                                                                                                            |
| • STEP 7 TIA Portal configurable/integrated from version | V20 (FW V4.0) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7511-1TK01-0AB0 |
| Configuration control                                    |                                                                                                            |
| via dataset                                              | Yes                                                                                                        |
| Display                                                  |                                                                                                            |
| Screen diagonal [cm]                                     | 3.45 cm                                                                                                    |
| Control elements                                         |                                                                                                            |
| Number of keys                                           | 8                                                                                                          |
| Mode buttons                                             | 2                                                                                                          |
| Supply voltage                                           |                                                                                                            |
| Rated value (DC)                                         | 24 V                                                                                                       |
| permissible range, lower limit (DC)                      | 19.2 V                                                                                                     |
| permissible range, upper limit (DC)                      | 28.8 V                                                                                                     |
| Reverse polarity protection                              | Yes                                                                                                        |
| Mains buffering                                          |                                                                                                            |
| • Mains/voltage failure stored energy time               | 5 ms                                                                                                       |
| • Repeat rate, min.                                      | 1/s                                                                                                        |
| Input current                                            |                                                                                                            |
| Current consumption (rated value)                        | 0.56 A                                                                                                     |
| Current consumption, max.                                | 0.94 A                                                                                                     |
| Inrush current, max.                                     | 1.15 A; Rated value                                                                                        |
| I <sup>2</sup> t                                         | 0.5 A <sup>2</sup> ·s                                                                                      |
| Power                                                    |                                                                                                            |
| Infeed power to the backplane bus                        | 10 W                                                                                                       |
| Power consumption from the backplane bus (balanced)      | 5.5 W                                                                                                      |
| Power loss                                               |                                                                                                            |
| Power loss, typ.                                         | 3.4 W                                                                                                      |
| Memory                                                   |                                                                                                            |

|                                                           |                                                                                                                                                       |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of slots for SIMATIC memory card                   | 1                                                                                                                                                     |
| SIMATIC memory card required                              | Yes                                                                                                                                                   |
| <b>Work memory</b>                                        |                                                                                                                                                       |
| • integrated (for program)                                | 450 kbyte                                                                                                                                             |
| • integrated (for data)                                   | 1.5 Mbyte                                                                                                                                             |
| <b>Load memory</b>                                        |                                                                                                                                                       |
| • Plug-in (SIMATIC Memory Card), max.                     | 32 Gbyte                                                                                                                                              |
| <b>Backup</b>                                             |                                                                                                                                                       |
| • maintenance-free                                        | Yes                                                                                                                                                   |
| <b>CPU processing times</b>                               |                                                                                                                                                       |
| for bit operations, typ.                                  | 6 ns                                                                                                                                                  |
| for word operations, typ.                                 | 7 ns                                                                                                                                                  |
| for fixed point arithmetic, typ.                          | 9 ns                                                                                                                                                  |
| for floating point arithmetic, typ.                       | 37 ns                                                                                                                                                 |
| <b>CPU-blocks</b>                                         |                                                                                                                                                       |
| Number of elements (total)                                | 4 000; Blocks (OB, FB, FC, DB) and UDTs                                                                                                               |
| <b>DB</b>                                                 |                                                                                                                                                       |
| • Number range                                            | 1 ... 60 999; subdivided into: number range that can be used by the user: 1 ... 59 999, and number range of DBs created via SFC 86: 60 000 ... 60 999 |
| • Size, max.                                              | 1.5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB                                                                                   |
| <b>FB</b>                                                 |                                                                                                                                                       |
| • Number range                                            | 0 ... 65 535                                                                                                                                          |
| • Size, max.                                              | 450 kbyte                                                                                                                                             |
| <b>FC</b>                                                 |                                                                                                                                                       |
| • Number range                                            | 0 ... 65 535                                                                                                                                          |
| • Size, max.                                              | 450 kbyte                                                                                                                                             |
| <b>OB</b>                                                 |                                                                                                                                                       |
| • Size, max.                                              | 450 kbyte                                                                                                                                             |
| • Number of free cycle OBs                                | 100                                                                                                                                                   |
| • Number of time alarm OBs                                | 20                                                                                                                                                    |
| • Number of delay alarm OBs                               | 20                                                                                                                                                    |
| • Number of cyclic interrupt OBs                          | 20; With minimum OB 3x cycle of 250 µs                                                                                                                |
| • Number of process alarm OBs                             | 50                                                                                                                                                    |
| • Number of DPV1 alarm OBs                                | 3                                                                                                                                                     |
| • Number of isochronous mode OBs                          | 2                                                                                                                                                     |
| • Number of technology synchronous alarm OBs              | 2                                                                                                                                                     |
| • Number of startup OBs                                   | 100                                                                                                                                                   |
| • Number of asynchronous error OBs                        | 4                                                                                                                                                     |
| • Number of synchronous error OBs                         | 2                                                                                                                                                     |
| • Number of diagnostic alarm OBs                          | 1                                                                                                                                                     |
| <b>Nesting depth</b>                                      |                                                                                                                                                       |
| • per priority class                                      | 24                                                                                                                                                    |
| <b>Counters, timers and their retentivity</b>             |                                                                                                                                                       |
| <b>S7 counter</b>                                         |                                                                                                                                                       |
| • Number                                                  | 2 048                                                                                                                                                 |
| <b>Retentivity</b>                                        |                                                                                                                                                       |
| — adjustable                                              | Yes                                                                                                                                                   |
| <b>IEC counter</b>                                        |                                                                                                                                                       |
| • Number                                                  | Any (only limited by the main memory)                                                                                                                 |
| <b>Retentivity</b>                                        |                                                                                                                                                       |
| — adjustable                                              | Yes                                                                                                                                                   |
| <b>S7 times</b>                                           |                                                                                                                                                       |
| • Number                                                  | 2 048                                                                                                                                                 |
| <b>Retentivity</b>                                        |                                                                                                                                                       |
| — adjustable                                              | Yes                                                                                                                                                   |
| <b>IEC timer</b>                                          |                                                                                                                                                       |
| • Number                                                  | Any (only limited by the main memory)                                                                                                                 |
| <b>Retentivity</b>                                        |                                                                                                                                                       |
| — adjustable                                              | Yes                                                                                                                                                   |
| <b>Data areas and their retentivity</b>                   |                                                                                                                                                       |
| Retentive data area (incl. timers, counters, flags), max. | 256 kbyte; in total; available retentive memory for bit memories, timers,                                                                             |

|                                                                    |                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                    | counters, DBs, and technology data (axes): 216 KB                                                                                                                                                                                 |
| Extended retentive data area (incl. timers, counters, flags), max. | 1.5 Mbyte; When using PS 6 0W 24/48/60 V DC HF                                                                                                                                                                                    |
| <b>Flag</b>                                                        |                                                                                                                                                                                                                                   |
| • Size, max.                                                       | 16 kbyte                                                                                                                                                                                                                          |
| • Number of clock memories                                         | 8; 8 clock memory bit, grouped into one clock memory byte                                                                                                                                                                         |
| <b>Data blocks</b>                                                 |                                                                                                                                                                                                                                   |
| • Retentivity adjustable                                           | Yes                                                                                                                                                                                                                               |
| • Retentivity preset                                               | No                                                                                                                                                                                                                                |
| <b>Local data</b>                                                  |                                                                                                                                                                                                                                   |
| • per priority class, max.                                         | 64 kbyte; max. 16 KB per block                                                                                                                                                                                                    |
| <b>Address area</b>                                                |                                                                                                                                                                                                                                   |
| Number of IO modules                                               | 2 048; max. number of modules / submodules                                                                                                                                                                                        |
| <b>I/O address area</b>                                            |                                                                                                                                                                                                                                   |
| • Inputs                                                           | 32 kbyte; All inputs are in the process image                                                                                                                                                                                     |
| • Outputs                                                          | 32 kbyte; All outputs are in the process image                                                                                                                                                                                    |
| per integrated IO subsystem                                        |                                                                                                                                                                                                                                   |
| — Inputs (volume)                                                  | 8 kbyte                                                                                                                                                                                                                           |
| — Outputs (volume)                                                 | 8 kbyte                                                                                                                                                                                                                           |
| per CM/CP                                                          |                                                                                                                                                                                                                                   |
| — Inputs (volume)                                                  | 8 kbyte                                                                                                                                                                                                                           |
| — Outputs (volume)                                                 | 8 kbyte                                                                                                                                                                                                                           |
| <b>Subprocess images</b>                                           |                                                                                                                                                                                                                                   |
| • Number of subprocess images, max.                                | 32                                                                                                                                                                                                                                |
| <b>Hardware configuration</b>                                      |                                                                                                                                                                                                                                   |
| Number of distributed IO systems                                   | 32; A distributed I/O system is characterized not only by the integration of distributed I/O via PROFINET or PROFIBUS communication modules, but also by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Link) |
| <b>Number of DP masters</b>                                        |                                                                                                                                                                                                                                   |
| • Via CM                                                           | 4; A maximum of 4 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total                                                                                                                                                 |
| <b>Number of IO Controllers</b>                                    |                                                                                                                                                                                                                                   |
| • integrated                                                       | 1                                                                                                                                                                                                                                 |
| • Via CM                                                           | 4; A maximum of 4 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total                                                                                                                                                 |
| <b>Rack</b>                                                        |                                                                                                                                                                                                                                   |
| • Modules per rack, max.                                           | 32; CPU + 31 modules                                                                                                                                                                                                              |
| • 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 PROFIBUS CM / CP                                                                                                                                                                                                         |
| • on DP, device                                                    | Yes; via PROFIBUS CM / CP                                                                                                                                                                                                         |
| • in AS, master                                                    | Yes                                                                                                                                                                                                                               |
| • in AS, device                                                    | Yes                                                                                                                                                                                                                               |
| • on Ethernet via NTP                                              | Yes                                                                                                                                                                                                                               |
| <b>Interfaces</b>                                                  |                                                                                                                                                                                                                                   |
| Number of PROFINET interfaces                                      | 1                                                                                                                                                                                                                                 |
| <b>1. Interface</b>                                                |                                                                                                                                                                                                                                   |
| <b>Interface types</b>                                             |                                                                                                                                                                                                                                   |
| • RJ 45 (Ethernet)                                                 | Yes; X1                                                                                                                                                                                                                           |
| • Number of ports                                                  | 2                                                                                                                                                                                                                                 |
| • integrated switch                                                | 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> | <p>Yes; IPv4</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes; Optionally also encrypted</p> <p>Yes</p> <p>Yes</p>                                                          |
| <b>PROFINET IO Controller</b>                                                                                                                                                                                                                       |                                                                                                                                                                        |
| <b>Services</b>                                                                                                                                                                                                                                     |                                                                                                                                                                        |
| — Isochronous mode                                                                                                                                                                                                                                  | Yes                                                                                                                                                                    |
| — Direct data exchange                                                                                                                                                                                                                              | Yes; Requirement: IRT and isochronous mode (MRPD optional)                                                                                                             |
| — IRT                                                                                                                                                                                                                                               | Yes                                                                                                                                                                    |
| — PROFINergy                                                                                                                                                                                                                                        | Yes; per user program                                                                                                                                                  |
| — Prioritized startup                                                                                                                                                                                                                               | Yes; Max. 32 PROFINET devices                                                                                                                                          |
| — Number of connectable IO Devices, max.                                                                                                                                                                                                            | 128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET                                                                       |
| — Of which IO devices with IRT, max.                                                                                                                                                                                                                | 64                                                                                                                                                                     |
| — Number of connectable IO Devices for RT, max.                                                                                                                                                                                                     | 128                                                                                                                                                                    |
| — of which in line, max.                                                                                                                                                                                                                            | 128                                                                                                                                                                    |
| — Number of IO Devices that can be simultaneously activated/deactivated, max.                                                                                                                                                                       | 8; in total across all interfaces                                                                                                                                      |
| — Number of IO Devices per tool, max.                                                                                                                                                                                                               | 8                                                                                                                                                                      |
| — Updating times                                                                                                                                                                                                                                    | The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data |
| — PROFINET Security Class                                                                                                                                                                                                                           | 1                                                                                                                                                                      |
| <b>Update time for IRT</b>                                                                                                                                                                                                                          |                                                                                                                                                                        |
| — for send cycle of 250 µs                                                                                                                                                                                                                          | 250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive                                    |
| — for send cycle of 500 µs                                                                                                                                                                                                                          | 500 µs to 8 ms                                                                                                                                                         |
| — for send cycle of 1 ms                                                                                                                                                                                                                            | 1 ms to 16 ms                                                                                                                                                          |
| — for send cycle of 2 ms                                                                                                                                                                                                                            | 2 ms to 32 ms                                                                                                                                                          |
| — for send cycle of 4 ms                                                                                                                                                                                                                            | 4 ms to 64 ms                                                                                                                                                          |
| — With IRT and parameterization of "odd" send cycles                                                                                                                                                                                                | Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)                                                                               |
| <b>Update time for RT</b>                                                                                                                                                                                                                           |                                                                                                                                                                        |
| — for send cycle of 250 µs                                                                                                                                                                                                                          | 250 µs to 128 ms                                                                                                                                                       |
| — for send cycle of 500 µs                                                                                                                                                                                                                          | 500 µs to 256 ms                                                                                                                                                       |
| — for send cycle of 1 ms                                                                                                                                                                                                                            | 1 ms to 512 ms                                                                                                                                                         |
| — for send cycle of 2 ms                                                                                                                                                                                                                            | 2 ms to 512 ms                                                                                                                                                         |
| — for send cycle of 4 ms                                                                                                                                                                                                                            | 4 ms to 512 ms                                                                                                                                                         |
| <b>PROFINET IO Device</b>                                                                                                                                                                                                                           |                                                                                                                                                                        |
| <b>Services</b>                                                                                                                                                                                                                                     |                                                                                                                                                                        |
| — Isochronous mode                                                                                                                                                                                                                                  | No                                                                                                                                                                     |
| — IRT                                                                                                                                                                                                                                               | Yes                                                                                                                                                                    |
| — PROFINergy                                                                                                                                                                                                                                        | Yes; per user program                                                                                                                                                  |
| — Shared device                                                                                                                                                                                                                                     | Yes                                                                                                                                                                    |
| — Number of IO Controllers with shared device, max.                                                                                                                                                                                                 | 4                                                                                                                                                                      |
| — activation/deactivation of I-devices                                                                                                                                                                                                              | Yes; per user program                                                                                                                                                  |
| — Asset management record                                                                                                                                                                                                                           | Yes; per user program                                                                                                                                                  |
| — PROFINET Security Class                                                                                                                                                                                                                           | SNMP Configuration and DCP Read Only                                                                                                                                   |
| <b>Interface types</b>                                                                                                                                                                                                                              |                                                                                                                                                                        |
| <b>RJ 45 (Ethernet)</b>                                                                                                                                                                                                                             |                                                                                                                                                                        |
| • 100 Mbps                                                                                                                                                                                                                                          | Yes                                                                                                                                                                    |
| • Autonegotiation                                                                                                                                                                                                                                   | Yes                                                                                                                                                                    |
| • Autocrossing                                                                                                                                                                                                                                      | Yes                                                                                                                                                                    |
| • Industrial Ethernet status LED                                                                                                                                                                                                                    | Yes                                                                                                                                                                    |
| <b>Protocols</b>                                                                                                                                                                                                                                    |                                                                                                                                                                        |
| PROFIsafe                                                                                                                                                                                                                                           | No                                                                                                                                                                     |
| <b>Number of connections</b>                                                                                                                                                                                                                        |                                                                                                                                                                        |
| • Number of connections, max.                                                                                                                                                                                                                       | 128; via integrated interfaces of the CPU and connected CPs / CMs                                                                                                      |
| • Number of connections reserved for ES/HMI/web                                                                                                                                                                                                     | 10                                                                                                                                                                     |

|                                                                                                        |                                                                                    |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| • Number of connections via integrated interfaces                                                      | 88                                                                                 |
| • Number of S7 routing paths                                                                           | 16                                                                                 |
| <b>Redundancy mode</b>                                                                                 |                                                                                    |
| • H-Sync forwarding                                                                                    | Yes                                                                                |
| <b>Media redundancy</b>                                                                                |                                                                                    |
| — Media redundancy                                                                                     | only via 1st interface (X1)                                                        |
| — MRP                                                                                                  | Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client |
| — MRP interconnection, supported                                                                       | Yes; as MRP ring node according to IEC 62439-2 Edition 3.0                         |
| — MRPD                                                                                                 | Yes; Requirement: IRT                                                              |
| — Switchover time on line break, typ.                                                                  | 200 ms; For MRP, bumpless for MRPD                                                 |
| — Number of stations in the ring, max.                                                                 | 50                                                                                 |
| <b>SIMATIC communication</b>                                                                           |                                                                                    |
| • PG/OP communication                                                                                  | Yes; encryption with TLS V1.3 pre-selected                                         |
| • S7 routing                                                                                           | Yes                                                                                |
| • Data record routing                                                                                  | Yes                                                                                |
| • S7 communication, as server                                                                          | Yes                                                                                |
| • 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                                                                                                                                |
| Further protocols                                                |                                                                                                                                   |
| • 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                                                      | No                                                                                                                                |
| Number of breakpoints                                            | 8                                                                                                                                 |
| Profiling                                                        | Yes                                                                                                                               |
| Status/control                                                   |                                                                                                                                   |
| • Status/control variable                                        | Yes                                                                                                                               |
| • Variables                                                      | Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters                                                              |
| • Number of variables, max.                                      |                                                                                                                                   |
| — of which status variables, max.                                | 200; per job                                                                                                                      |
| — of which control variables, max.                               | 200; per job                                                                                                                      |
| Forcing                                                          |                                                                                                                                   |
| • Forcing                                                        | Yes                                                                                                                               |
| • Forcing, variables                                             | Peripheral inputs/outputs                                                                                                         |
| • Number of variables, max.                                      | 200                                                                                                                               |
| Diagnostic buffer                                                |                                                                                                                                   |
| • present                                                        | Yes                                                                                                                               |
| • Number of entries, max.                                        | 1 000                                                                                                                             |
| — of which powerfail-proof                                       | 500                                                                                                                               |
| Traces                                                           |                                                                                                                                   |

|                                                                                                                                                                                                      |                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Number of configurable Traces</li> </ul>                                                                                                                    | 4                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• Memory size per trace, max.</li> </ul>                                                                                                                      | 512 kbyte                                                                                                                         |
| <b>Interrupts/diagnostics/status information</b>                                                                                                                                                     |                                                                                                                                   |
| Diagnostics indication LED                                                                                                                                                                           |                                                                                                                                   |
| <ul style="list-style-type: none"> <li>• RUN/STOP LED</li> </ul>                                                                                                                                     | Yes                                                                                                                               |
| <ul style="list-style-type: none"> <li>• ERROR LED</li> </ul>                                                                                                                                        | Yes                                                                                                                               |
| <ul style="list-style-type: none"> <li>• MAINT LED</li> </ul>                                                                                                                                        | Yes                                                                                                                               |
| <ul style="list-style-type: none"> <li>• STOP ACTIVE LED</li> </ul>                                                                                                                                  | Yes                                                                                                                               |
| <ul style="list-style-type: none"> <li>• Connection display LINK TX/RX</li> </ul>                                                                                                                    | 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 |
| <ul style="list-style-type: none"> <li>• Number of available Motion Control resources for technology objects</li> </ul>                                                                              | 1 120                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Required Motion Control resources <ul style="list-style-type: none"> <li>— per speed-controlled axis</li> </ul> </li> </ul>                                 | 40                                                                                                                                |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— per positioning axis</li> </ul> </li> </ul>                                                                         | 80                                                                                                                                |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— per synchronous axis</li> </ul> </li> </ul>                                                                         | 160                                                                                                                               |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— per external encoder</li> </ul> </li> </ul>                                                                         | 80                                                                                                                                |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— per output cam</li> </ul> </li> </ul>                                                                               | 20                                                                                                                                |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— per cam track</li> </ul> </li> </ul>                                                                                | 160                                                                                                                               |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— per probe</li> </ul> </li> </ul>                                                                                    | 40                                                                                                                                |
| <ul style="list-style-type: none"> <li>• Number of available Extended Motion Control resources for technology objects</li> </ul>                                                                     | 90                                                                                                                                |
| <ul style="list-style-type: none"> <li>• Required Extended Motion Control resources <ul style="list-style-type: none"> <li>— per cam (1 000 points and 50 segments)</li> </ul> </li> </ul>           | 2                                                                                                                                 |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— per cam (10 000 points and 50 segments)</li> </ul> </li> </ul>                                                      | 20                                                                                                                                |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— per cam (50 points and 600 segments)</li> </ul> </li> </ul>                                                         | 2                                                                                                                                 |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— per cam (50 points and 6 000 segments)</li> </ul> </li> </ul>                                                       | 20                                                                                                                                |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— for each set of kinematics</li> </ul> </li> </ul>                                                                   | 30                                                                                                                                |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— per Interpreter</li> </ul> </li> </ul>                                                                              | 60                                                                                                                                |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— Per leading axis proxy</li> </ul> </li> </ul>                                                                       | 3                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• kinematics functions <ul style="list-style-type: none"> <li>— kinematics with up to 4 interpolating axes</li> </ul> </li> </ul>                             | Yes; max. 3D + orientation                                                                                                        |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— kinematics with 5 or more interpolating axes</li> </ul> </li> </ul>                                                 | No                                                                                                                                |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— user-defined kinematics</li> </ul> </li> </ul>                                                                      | No                                                                                                                                |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— SIMATIC Safe Kinematics</li> </ul> </li> </ul>                                                                      | No                                                                                                                                |
| <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> </ul> </li> </ul> | 11                                                                                                                                |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul> </li> </ul>                   | 14                                                                                                                                |
| Controller                                                                                                                                                                                           |                                                                                                                                   |
| <ul style="list-style-type: none"> <li>• PID_Compact</li> </ul>                                                                                                                                      | Yes; Universal PID controller with integrated optimization                                                                        |
| <ul style="list-style-type: none"> <li>• PID_3Step</li> </ul>                                                                                                                                        | Yes; PID controller with integrated optimization for valves                                                                       |
| <ul style="list-style-type: none"> <li>• PID-Temp</li> </ul>                                                                                                                                         | 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>Standards, approvals, certificates</b>                                                                                                                                                            |                                                                                                                                   |
| Ecological footprint                                                                                                                                                                                 |                                                                                                                                   |
| Global warming potential                                                                                                                                                                             |                                                                                                                                   |
| <ul style="list-style-type: none"> <li>— global warming potential, (total) [CO2 eq]</li> </ul>                                                                                                       | 80.1 kg                                                                                                                           |
| <ul style="list-style-type: none"> <li>— global warming potential, (during production) [CO2 eq]</li> </ul>                                                                                           | 23.8 kg                                                                                                                           |
| <ul style="list-style-type: none"> <li>— global warming potential, (during operation) [CO2 eq]</li> </ul>                                                                                            | 57.4 kg                                                                                                                           |
| <ul style="list-style-type: none"> <li>— global warming potential, (after end of life cycle) [CO2 eq]</li> </ul>                                                                                     | -1.29 kg                                                                                                                          |
| <b>product functions / security / header</b>                                                                                                                                                         |                                                                                                                                   |
| PROFINET Security Class                                                                                                                                                                              | 1                                                                                                                                 |
| signed firmware update                                                                                                                                                                               | Yes                                                                                                                               |
| Secure Boot                                                                                                                                                                                          | Yes                                                                                                                               |
| safely removing data                                                                                                                                                                                 | Yes                                                                                                                               |

|                                                   |                                                                                                    |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>Ambient conditions</b>                         |                                                                                                    |
| Ambient temperature during operation              |                                                                                                    |
| • horizontal installation, min.                   | -30 °C; No condensation                                                                            |
| • horizontal installation, max.                   | 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off |
| • vertical installation, min.                     | -30 °C; No condensation                                                                            |
| • vertical installation, max.                     | 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off |
| Ambient temperature during storage/transportation |                                                                                                    |
| • min.                                            | -40 °C                                                                                             |
| • max.                                            | 70 °C                                                                                              |
| Altitude during operation relating to sea level   |                                                                                                    |
| • Installation altitude above sea level, max.     | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual                             |
| <b>configuration / header</b>                     |                                                                                                    |
| configuration / programming / header              |                                                                                                    |
| Programming language                              |                                                                                                    |
| — LAD                                             | Yes                                                                                                |
| — FBD                                             | Yes                                                                                                |
| — STL                                             | Yes                                                                                                |
| — SCL                                             | Yes                                                                                                |
| — CFC                                             | Yes                                                                                                |
| — GRAPH                                           | Yes                                                                                                |
| Know-how protection                               |                                                                                                    |
| • User program protection/password protection     | Yes                                                                                                |
| • Copy protection                                 | Yes                                                                                                |
| • Block protection                                | Yes                                                                                                |
| Access protection                                 |                                                                                                    |
| • protection of confidential configuration data   | Yes                                                                                                |
| • Password for display                            | Yes                                                                                                |
| • Protection level: Write protection              | Yes                                                                                                |
| • Protection level: Read/write protection         | Yes                                                                                                |
| • Protection level: Write protection for Failsafe | No                                                                                                 |
| • Protection level: Complete protection           | Yes                                                                                                |
| • User administration                             | Yes; device-wide and centralized                                                                   |
| • Number of users                                 | 100                                                                                                |
| • Number of groups                                | 100                                                                                                |
| • Number of roles                                 | 50                                                                                                 |
| programming / cycle time monitoring / header      |                                                                                                    |
| • lower limit                                     | adjustable minimum cycle time                                                                      |
| • upper limit                                     | adjustable maximum cycle time                                                                      |
| <b>Dimensions</b>                                 |                                                                                                    |
| Width                                             | 35 mm                                                                                              |
| Height                                            | 147 mm                                                                                             |
| Depth                                             | 129 mm                                                                                             |
| <b>Weights</b>                                    |                                                                                                    |
| Weight, approx.                                   | 336 g                                                                                              |
| <b>Classifications</b>                            |                                                                                                    |

|        | Version | Classification |
|--------|---------|----------------|
| eClass | 14      | 27-24-22-07    |
| eClass | 12      | 27-24-22-07    |
| eClass | 9.1     | 27-24-22-07    |
| eClass | 9       | 27-24-22-07    |
| eClass | 8       | 27-24-22-07    |
| eClass | 7.1     | 27-24-22-07    |
| eClass | 6       | 27-24-22-07    |
| ETIM   | 9       | EC000236       |
| ETIM   | 8       | EC000236       |
| ETIM   | 7       | EC000236       |
| IDEA   | 4       | 3565           |

## Approvals / Certificates

## General Product Approval

[Manufacturer Declaration](#)[Miscellaneous](#)[Miscellaneous](#)

## General Product Approval

## For use in hazardous locations

[KC](#)[FM](#)[CCC-Ex](#)

## For use in hazardous locations

## Test Certificates

[FM](#)[Miscellaneous](#)

IECEX



ATEX

[CCC-Ex](#)[Type Test Certificates/Test Report](#)

## Marine / Shipping



ABS

BUREAU  
VERITAS

DNV



LRS

[NK / Nippon Kaiji Kyokai](#)

RINA

## Marine / Shipping

## other

## Environment

[CCS \(China Classification Society\)](#)KR  
KOREAN REGISTER[PROFINET](#)

EPD

Siemens  
EcoTech

last modified:

12/8/2024