



Figure similar

SIMATIC DP, CPU 1516pro-2 PN for ET 200pro, central processing unit with 2 MB work memory for program and 7.5 MB for data, 1st interface: PROFINET IRT with 3-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, degree of protection: IP65/67, SIMATIC Memory Card required, connection module required

| General information                                                                                      |                                                                                                            |
|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Product type designation                                                                                 | CPU 1516pro-2 PN                                                                                           |
| HW functional status                                                                                     | FS01                                                                                                       |
| Firmware version                                                                                         | V4.0                                                                                                       |
| <ul style="list-style-type: none"> <li>FW update possible</li> </ul>                                     | Yes                                                                                                        |
| Product function                                                                                         |                                                                                                            |
| <ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>                                           | Yes; I&M0 to I&M3                                                                                          |
| <ul style="list-style-type: none"> <li>Isochronous mode</li> </ul>                                       | Yes; Via X1, with minimum OB 6x cycle of 500 µs                                                            |
| <ul style="list-style-type: none"> <li>SysLog</li> </ul>                                                 | Yes                                                                                                        |
| Engineering with                                                                                         |                                                                                                            |
| <ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul> | V20 (FW V4.0) / V19 (FW V3.1) or higher; configurable with older TIA Portal versions as 6ES7516-2PN00-0AB0 |
| Configuration control                                                                                    |                                                                                                            |
| via dataset                                                                                              | No                                                                                                         |
| Control elements                                                                                         |                                                                                                            |
| Mode selector switch                                                                                     | 1                                                                                                          |
| Supply voltage                                                                                           |                                                                                                            |
| Rated value (DC)                                                                                         | 24 V                                                                                                       |
| permissible range, lower limit (DC)                                                                      | 20.4 V                                                                                                     |
| permissible range, upper limit (DC)                                                                      | 28.8 V                                                                                                     |
| Reverse polarity protection                                                                              | Yes                                                                                                        |
| Mains buffering                                                                                          |                                                                                                            |
| <ul style="list-style-type: none"> <li>Mains/voltage failure stored energy time</li> </ul>               | 5 ms                                                                                                       |
| Input current                                                                                            |                                                                                                            |
| Current consumption (rated value)                                                                        | 0.22 A                                                                                                     |
| Current consumption, max.                                                                                | 0.35 A                                                                                                     |
| Inrush current, max.                                                                                     | 0.63 A; Rated value                                                                                        |
| I <sup>2</sup> t                                                                                         | 0.3 A <sup>2</sup> ·s                                                                                      |
| Power                                                                                                    |                                                                                                            |
| Infeed power to the backplane bus                                                                        | 2.275 W                                                                                                    |
| Power loss                                                                                               |                                                                                                            |
| Power loss, typ.                                                                                         | 3.3 W                                                                                                      |
| Memory                                                                                                   |                                                                                                            |
| Number of slots for SIMATIC memory card                                                                  | 1                                                                                                          |
| SIMATIC memory card required                                                                             | Yes                                                                                                        |
| Work memory                                                                                              |                                                                                                            |
| <ul style="list-style-type: none"> <li>integrated (for program)</li> </ul>                               | 2 Mbyte                                                                                                    |
| <ul style="list-style-type: none"> <li>integrated (for data)</li> </ul>                                  | 7.5 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)                                | 8 000; 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.                                              | 7.5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB                                                                                   |
| <b>FB</b>                                                 |                                                                                                                                                       |
| • Number range                                            | 0 ... 65 535                                                                                                                                          |
| • Size, max.                                              | 1 Mbyte                                                                                                                                               |
| <b>FC</b>                                                 |                                                                                                                                                       |
| • Number range                                            | 0 ... 65 535                                                                                                                                          |
| • Size, max.                                              | 1 Mbyte                                                                                                                                               |
| <b>OB</b>                                                 |                                                                                                                                                       |
| • Size, max.                                              | 1 Mbyte                                                                                                                                               |
| • Number of free cycle OBs                                | 100                                                                                                                                                   |
| • Number of time alarm OBs                                | 20                                                                                                                                                    |
| • Number of delay alarm OBs                               | 20                                                                                                                                                    |
| • Number of cyclic interrupt OBs                          | 20; With minimum OB 3x cycle of 250 µs                                                                                                                |
| • Number of process alarm OBs                             | 50                                                                                                                                                    |
| • Number of DPV1 alarm OBs                                | 3                                                                                                                                                     |
| • Number of isochronous mode OBs                          | 1                                                                                                                                                     |
| • Number of technology synchronous alarm OBs              | 2                                                                                                                                                     |
| • Number of startup OBs                                   | 100                                                                                                                                                   |
| • Number of asynchronous error OBs                        | 4                                                                                                                                                     |
| • Number of synchronous error OBs                         | 2                                                                                                                                                     |
| • Number of diagnostic alarm OBs                          | 1                                                                                                                                                     |
| <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. | 512 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 472 KB                           |
| <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             | 8 192; 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                                                                                                                                                                                                                           |
| <b>Hardware configuration</b>    |                                                                                                                                                                                                                                   |
| Number of distributed IO systems | 64; 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 IO Controllers</b>  |                                                                                                                                                                                                                                   |
| • integrated                     | 2                                                                                                                                                                                                                                 |
| • Via CM                         | 0                                                                                                                                                                                                                                 |
| <b>Rack</b>                      |                                                                                                                                                                                                                                   |
| • Modules per rack, max.         | 16; Expansion width max. 1.2 m                                                                                                                                                                                                    |
| • Number of lines, max.          | 1                                                                                                                                                                                                                                 |
| <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                                                                                                                                                                                                                               |
| • in AS, master                  | Yes                                                                                                                                                                                                                               |
| • in AS, device                  | Yes                                                                                                                                                                                                                               |
| • on Ethernet via NTP            | Yes                                                                                                                                                                                                                               |
| <b>Interfaces</b>                |                                                                                                                                                                                                                                   |
| Number of PROFINET interfaces    | 2                                                                                                                                                                                                                                 |
| Number of PROFIBUS interfaces    | 0                                                                                                                                                                                                                                 |
| <b>1. Interface</b>              |                                                                                                                                                                                                                                   |
| <b>Interface types</b>           |                                                                                                                                                                                                                                   |
| • RJ 45 (Ethernet)               | Yes; X1 P3                                                                                                                                                                                                                        |
| • Number of ports                | 3; 2x M12 + 1x RJ45                                                                                                                                                                                                               |
| • integrated switch              | Yes                                                                                                                                                                                                                               |
| <b>Protocols</b>                 |                                                                                                                                                                                                                                   |
| • IP protocol                    | Yes; IPv4                                                                                                                                                                                                                         |
| • PROFINET IO Controller         | Yes                                                                                                                                                                                                                               |
| • PROFINET IO Device             | Yes                                                                                                                                                                                                                               |
| • SIMATIC communication          | Yes                                                                                                                                                                                                                               |
| • Open IE communication          | Yes; Optionally also encrypted                                                                                                                                                                                                    |
| • Web server                     | Yes                                                                                                                                                                                                                               |
| • Media redundancy               | Yes                                                                                                                                                                                                                               |
| <b>PROFINET IO Controller</b>    |                                                                                                                                                                                                                                   |
| <b>Services</b>                  |                                                                                                                                                                                                                                   |
| — Isochronous mode               | Yes                                                                                                                                                                                                                               |
| — Direct data exchange           | Yes; Requirement: IRT and isochronous mode (MRPD optional)                                                                                                                                                                        |
| — IRT                            | Yes                                                                                                                                                                                                                               |
| — PROFlenergy                    | Yes; per user program                                                                                                                                                                                                             |
| — Prioritized startup            | Yes; Max. 32 PROFINET devices                                                                                                                                                                                                     |

|                                                                               |                                                                                                                                                                        |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| — Number of connectable IO Devices, max.                                      | 256; in total, up to 1024 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.                               | 256                                                                                                                                                                    |
| — of which in line, max.                                                      | 256                                                                                                                                                                    |
| — 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                                                                                                                                                                    |
| — PROFlenergy                                                                 | 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>2. Interface</b>                                                           |                                                                                                                                                                        |
| <b>Interface types</b>                                                        |                                                                                                                                                                        |
| ● RJ 45 (Ethernet)                                                            | No                                                                                                                                                                     |
| ● Number of ports                                                             | 1; 1x M12                                                                                                                                                              |
| ● integrated switch                                                           | No                                                                                                                                                                     |
| <b>Protocols</b>                                                              |                                                                                                                                                                        |
| ● IP protocol                                                                 | Yes; IPv4                                                                                                                                                              |
| ● PROFINET IO Controller                                                      | Yes                                                                                                                                                                    |
| ● PROFINET IO Device                                                          | Yes                                                                                                                                                                    |
| ● SIMATIC communication                                                       | Yes                                                                                                                                                                    |
| ● Open IE communication                                                       | Yes; Optionally also encrypted                                                                                                                                         |
| ● Web server                                                                  | Yes                                                                                                                                                                    |
| ● Media redundancy                                                            | No                                                                                                                                                                     |
| <b>PROFINET IO Controller</b>                                                 |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| — Isochronous mode                                                            | No                                                                                                                                                                     |
| — Direct data exchange                                                        | No                                                                                                                                                                     |
| — IRT                                                                         | No                                                                                                                                                                     |
| — PROFlenergy                                                                 | Yes; per user program                                                                                                                                                  |
| — Prioritized startup                                                         | No                                                                                                                                                                     |
| — Number of connectable IO Devices, max.                                      | 32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET                                                                       |
| — Number of connectable IO Devices for RT, max.                               | 32                                                                                                                                                                     |
| — of which in line, max.                                                      | 32                                                                                                                                                                     |

|                                                                               |                                                                                                                                                                        |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| — 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 RT</b>                                                     |                                                                                                                                                                        |
| — for send cycle of 1 ms                                                      | 1 ms to 512 ms                                                                                                                                                         |
| <b>PROFINET IO Device</b>                                                     |                                                                                                                                                                        |
| <b>Services</b>                                                               |                                                                                                                                                                        |
| — Isochronous mode                                                            | No                                                                                                                                                                     |
| — IRT                                                                         | No                                                                                                                                                                     |
| — PROFIenergy                                                                 | Yes; per user program                                                                                                                                                  |
| — Prioritized startup                                                         | No                                                                                                                                                                     |
| — 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                                                                                                                              |
| • Number of connections reserved for ES/HMI/web                               | 10                                                                                                                                                                     |
| • Number of connections via integrated interfaces                             | 128                                                                                                                                                                    |
| • Number of S7 routing paths                                                  | 16                                                                                                                                                                     |
| <b>Redundancy mode</b>                                                        |                                                                                                                                                                        |
| • H-Sync forwarding                                                           | Yes                                                                                                                                                                    |
| <b>Media redundancy</b>                                                       |                                                                                                                                                                        |
| — Media redundancy                                                            | Yes; 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                                                                                                                                                                    |
| • 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. 118 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.                                                                             | 100                                                                                                                               |
| — number of simultaneous HTTP calls, max.                                                              | 4                                                                                                                                 |
| — HTTP request body, max.                                                                              | 131 072 byte                                                                                                                      |
| <b>OPC UA</b>                                                                                          |                                                                                                                                   |
| • Runtime license required                                                                             | Yes; "Medium" 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.                                                                          | 10                                                                                                                                |
| — Number of nodes of the client interfaces, recommended max.                                           | 2 000                                                                                                                             |
| — 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.                                                                             | 48                                                                                                                                |
| — Number of accessible variables, max.                                                                 | 100 000                                                                                                                           |
| — Number of registerable nodes, max.                                                                   | 20 000                                                                                                                            |
| — Number of subscriptions per session, max.                                                            | 50                                                                                                                                |
| — Sampling interval, min.                                                                              | 100 ms                                                                                                                            |
| — Publishing interval, min.                                                                            | 100 ms                                                                                                                            |
| — Number of server methods, max.                                                                       | 50; 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; or 20, depending on type of server interface                                                                                  |
| — Number of nodes for user-defined server interfaces, max.                                             | 30 000                                                                                                                            |
| • Alarms and Conditions                                                                                | Yes                                                                                                                               |
| — Number of program alarms                                                                             | 200                                                                                                                               |
| — Number of alarms for system diagnostics                                                              | 100                                                                                                                               |
| <b>Further protocols</b>                                                                               |                                                                                                                                   |
| • MODBUS                                                                                               | Yes; MODBUS TCP                                                                                                                   |

| S7 message functions                                                         |                                                                                                                              |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Number of login stations for message functions, max.                         | 32                                                                                                                           |
| number of subscriptions, max.                                                | 500                                                                                                                          |
| number of tags/attributes for subscriptions, max.                            | 8 000                                                                                                                        |
| Program alarms                                                               | Yes                                                                                                                          |
| Number of configurable program messages, max.                                | 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH                                        |
| Number of loadable program messages in RUN, max.                             | 10 000                                                                                                                       |
| Number of simultaneously active program alarms                               |                                                                                                                              |
| • Number of program alarms                                                   | 1 000                                                                                                                        |
| • Number of alarms for system diagnostics                                    | 200                                                                                                                          |
| • Number of alarms for motion technology objects                             | 160                                                                                                                          |
| Test commissioning functions                                                 |                                                                                                                              |
| Joint commission (Team Engineering)                                          | Yes; Parallel online access possible for up to 8 engineering systems                                                         |
| Status block                                                                 | Yes; Up to 8 simultaneously (in total across all ES clients)                                                                 |
| Single step                                                                  | Yes                                                                                                                          |
| 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.                                                    | 3 200                                                                                                                        |
| — of which powerfail-proof                                                   | 500                                                                                                                          |
| Traces                                                                       |                                                                                                                              |
| • Number of configurable Traces                                              | 4                                                                                                                            |
| • Memory size per trace, max.                                                | 512 kbyte                                                                                                                    |
| Interrupts/diagnostics/status information                                    |                                                                                                                              |
| Diagnostics indication LED                                                   |                                                                                                                              |
| • RUN/STOP LED                                                               | Yes                                                                                                                          |
| • ERROR LED                                                                  | Yes                                                                                                                          |
| • MAINT LED                                                                  | Yes                                                                                                                          |
| • Monitoring of the supply voltage (PWR-LED)                                 | Yes; green "24 V DC" LED                                                                                                     |
| • Connection display LINK TX/RX                                              | Yes                                                                                                                          |
| Supported technology objects                                                 |                                                                                                                              |
| Motion Control                                                               | Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER |
| • Number of available Motion Control resources for technology objects        | 2 400                                                                                                                        |
| • Required Motion Control resources                                          |                                                                                                                              |
| — per speed-controlled axis                                                  | 40                                                                                                                           |
| — per positioning axis                                                       | 80                                                                                                                           |
| — per synchronous axis                                                       | 160                                                                                                                          |
| — per external encoder                                                       | 80                                                                                                                           |
| — per output cam                                                             | 20                                                                                                                           |
| — per cam track                                                              | 160                                                                                                                          |
| — per probe                                                                  | 40                                                                                                                           |
| • Positioning axis                                                           |                                                                                                                              |
| — Number of positioning axes at motion control cycle of 4 ms (typical value) | 11                                                                                                                           |
| — Number of positioning axes at motion control cycle of 8 ms (typical value) | 20                                                                                                                           |

|                                                   |        |                                                                        |                       |
|---------------------------------------------------|--------|------------------------------------------------------------------------|-----------------------|
| Controller                                        |        |                                                                        |                       |
| • PID_Compact                                     |        | Yes; Universal PID controller with integrated optimization             |                       |
| • PID_3Step                                       |        | Yes; PID controller with integrated optimization for valves            |                       |
| • PID-Temp                                        |        | Yes; PID controller with integrated optimization for temperature       |                       |
| Counting and measuring                            |        |                                                                        |                       |
| • High-speed counter                              |        | Yes                                                                    |                       |
| <b>Security</b>                                   |        |                                                                        |                       |
| PROFINET Security Class                           |        | 1                                                                      |                       |
| signed firmware update                            |        | Yes                                                                    |                       |
| Secure Boot                                       |        | Yes                                                                    |                       |
| safely removing data                              |        | Yes                                                                    |                       |
| <b>Ambient conditions</b>                         |        |                                                                        |                       |
| Ambient temperature during operation              |        |                                                                        |                       |
| • horizontal installation, min.                   |        | -25 °C                                                                 |                       |
| • horizontal installation, max.                   |        | 55 °C                                                                  |                       |
| • vertical installation, min.                     |        | -25 °C                                                                 |                       |
| • vertical installation, max.                     |        | 55 °C                                                                  |                       |
| 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</b>                              |        |                                                                        |                       |
| Programming                                       |        |                                                                        |                       |
| Programming language                              |        |                                                                        |                       |
| — LAD                                             |        | Yes                                                                    |                       |
| — FBD                                             |        | Yes                                                                    |                       |
| — STL                                             |        | Yes                                                                    |                       |
| — SCL                                             |        | 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                                                                    |                       |
| • 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                                                                     |                       |
| Cycle time monitoring                             |        |                                                                        |                       |
| • lower limit                                     |        | adjustable minimum cycle time                                          |                       |
| • upper limit                                     |        | adjustable maximum cycle time                                          |                       |
| <b>Dimensions</b>                                 |        |                                                                        |                       |
| Width                                             |        | 135 mm                                                                 |                       |
| Height                                            |        | 130 mm                                                                 |                       |
| Depth                                             |        | 65 mm; without connection module M12 7/8 inch                          |                       |
| <b>Weights</b>                                    |        |                                                                        |                       |
| Weight, approx.                                   |        | 474 g; device only                                                     |                       |
| <b>Classifications</b>                            |        |                                                                        |                       |
|                                                   |        | <b>Version</b>                                                         | <b>Classification</b> |
|                                                   | eClass | 14                                                                     | 27-24-26-07           |
|                                                   | eClass | 12                                                                     | 27-24-26-07           |
|                                                   | eClass | 9.1                                                                    | 27-24-26-07           |

|        |     |             |
|--------|-----|-------------|
| eClass | 9   | 27-24-26-07 |
| eClass | 8   | 27-24-26-07 |
| eClass | 7.1 | 27-24-26-07 |
| eClass | 6   | 27-24-26-07 |
| ETIM   | 10  | EC001603    |
| ETIM   | 9   | EC001603    |
| ETIM   | 8   | EC001603    |
| ETIM   | 7   | EC001603    |

**Approvals / Certificates**

**General Product Approval**



[Miscellaneous](#)

[China RoHS](#)



**General Product Approval**

**EMV**

**Maritime application**



[TUEV](#)



**Maritime application**

**other**



[NK / Nippon Kaiji Kyokai](#)



[CCS \(China Classification Society\)](#)



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