



SIMATIC S7-300 CPU 319-3 PN/DP, Central processing unit with 2 MB work memory, 1st interface MPI/DP 12 Mbit/s, 2nd interface DP master/slave 3rd interface Ethernet PROFINET, with 2-port switch, Micro Memory Card required

| General information                                         |                                                |
|-------------------------------------------------------------|------------------------------------------------|
| HW functional status                                        | 01                                             |
| Firmware version                                            | V3.2                                           |
| Product function                                            |                                                |
| • Isochronous mode                                          | Yes; Via 2nd PROFIBUS DP or PROFINET interface |
| Engineering with                                            |                                                |
| • Programming package                                       | STEP 7 V5.5 or higher                          |
| Supply voltage                                              |                                                |
| Rated value (DC)                                            | 24 V                                           |
| permissible range, lower limit (DC)                         | 19.2 V                                         |
| permissible range, upper limit (DC)                         | 28.8 V                                         |
| external protection for power supply lines (recommendation) | 2 A min.                                       |
| Mains buffering                                             |                                                |
| • Mains/voltage failure stored energy time                  | 5 ms                                           |
| • Repeat rate, min.                                         | 1 s                                            |
| Input current                                               |                                                |
| Current consumption (rated value)                           | 1 250 mA                                       |
| Current consumption (in no-load operation), typ.            | 500 mA                                         |
| Inrush current, typ.                                        | 4 A                                            |
| $I^2t$                                                      | 1.2 A <sup>2</sup> ·s                          |
| Power loss                                                  |                                                |
| Power loss, typ.                                            | 14 W                                           |
| Memory                                                      |                                                |
| Work memory                                                 |                                                |
| • integrated                                                | 2 048 kbyte                                    |
| • expandable                                                | No                                             |
| Load memory                                                 |                                                |
| • Plug-in (MMC)                                             | Yes                                            |
| • Plug-in (MMC), max.                                       | 8 Mbyte                                        |
| • Data management on MMC (after last programming), min.     | 10 a                                           |
| Backup                                                      |                                                |
| • present                                                   | Yes                                            |
| • without battery                                           | Yes                                            |
| CPU processing times                                        |                                                |
| for bit operations, typ.                                    | 0.004 µs                                       |
| for word operations, typ.                                   | 0.01 µs                                        |
| for fixed point arithmetic, typ.                            | 0.01 µs                                        |
| for floating point arithmetic, typ.                         | 0.04 µs                                        |
| CPU-blocks                                                  |                                                |

|                                                           |                                                                                               |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Number of blocks (total)                                  | 4 096; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. |
| <b>DB</b>                                                 |                                                                                               |
| • Number, max.                                            | 4 096; Number range: 1 to 16000                                                               |
| • Size, max.                                              | 64 kbyte                                                                                      |
| <b>FB</b>                                                 |                                                                                               |
| • Number, max.                                            | 4 096; Number range: 0 to 7999                                                                |
| • Size, max.                                              | 64 kbyte                                                                                      |
| <b>FC</b>                                                 |                                                                                               |
| • Number, max.                                            | 4 096; Number range: 0 to 7999                                                                |
| • Size, max.                                              | 64 kbyte                                                                                      |
| <b>OB</b>                                                 |                                                                                               |
| • Size, max.                                              | 64 kbyte                                                                                      |
| • Number of free cycle OBs                                | 1; OB 1                                                                                       |
| • Number of time alarm OBs                                | 1; OB 10                                                                                      |
| • Number of delay alarm OBs                               | 2; OB 20, 21                                                                                  |
| • Number of cyclic interrupt OBs                          | 4; OB 32, 33, 34, 35 (OB 35: smallest settable clock pulse = 500 µs)                          |
| • Number of process alarm OBs                             | 1; OB 40                                                                                      |
| • Number of DPV1 alarm OBs                                | 3; OB 55, 56, 57                                                                              |
| • Number of isochronous mode OBs                          | 1; OB 61                                                                                      |
| • Number of startup OBs                                   | 1; OB 100                                                                                     |
| • Number of asynchronous error OBs                        | 6; OB 80, 82, 83, 85, 86, 87 (OB83 only for PROFINET IO)                                      |
| • Number of synchronous error OBs                         | 2; OB 121, 122                                                                                |
| <b>Nesting depth</b>                                      |                                                                                               |
| • per priority class                                      | 16                                                                                            |
| • additional within an error OB                           | 4                                                                                             |
| <b>Counters, timers and their retentivity</b>             |                                                                                               |
| <b>S7 counter</b>                                         |                                                                                               |
| • Number                                                  | 2 048                                                                                         |
| <b>Retentivity</b>                                        |                                                                                               |
| — adjustable                                              | Yes                                                                                           |
| — preset                                                  | Z 0 to Z 7                                                                                    |
| <b>Counting range</b>                                     |                                                                                               |
| — adjustable                                              | Yes                                                                                           |
| — lower limit                                             | 0                                                                                             |
| — upper limit                                             | 999                                                                                           |
| <b>IEC counter</b>                                        |                                                                                               |
| • present                                                 | Yes                                                                                           |
| • Type                                                    | SFB                                                                                           |
| • Number                                                  | Unlimited (limited only by RAM capacity)                                                      |
| <b>S7 times</b>                                           |                                                                                               |
| • Number                                                  | 2 048                                                                                         |
| <b>Retentivity</b>                                        |                                                                                               |
| — adjustable                                              | Yes                                                                                           |
| — preset                                                  | No retentivity                                                                                |
| <b>Time range</b>                                         |                                                                                               |
| — lower limit                                             | 10 ms                                                                                         |
| — upper limit                                             | 9 990 s                                                                                       |
| <b>IEC timer</b>                                          |                                                                                               |
| • present                                                 | Yes                                                                                           |
| • Type                                                    | SFB                                                                                           |
| • Number                                                  | Unlimited (limited only by RAM capacity)                                                      |
| <b>Data areas and their retentivity</b>                   |                                                                                               |
| Retentive data area (incl. timers, counters, flags), max. | 700 kbyte                                                                                     |
| <b>Flag</b>                                               |                                                                                               |
| • Size, max.                                              | 8 192 byte                                                                                    |
| • Retentivity available                                   | Yes; From MB 0 to MB 8 191                                                                    |
| • Retentivity preset                                      | MB 0 to MB 15                                                                                 |
| • Number of clock memories                                | 8; 1 memory byte                                                                              |
| <b>Data blocks</b>                                        |                                                                                               |
| • Retentivity adjustable                                  | Yes; via non-retain property on DB                                                            |

|                                                           |                                                                           |
|-----------------------------------------------------------|---------------------------------------------------------------------------|
| • Retentivity preset                                      | Yes                                                                       |
| <b>Local data</b>                                         |                                                                           |
| • per priority class, max.                                | 32 768 byte; Max. 2048 bytes per block                                    |
| <b>Address area</b>                                       |                                                                           |
| <b>I/O address area</b>                                   |                                                                           |
| • Inputs                                                  | 8 192 byte                                                                |
| • Outputs                                                 | 8 192 byte                                                                |
| of which distributed                                      |                                                                           |
| — Inputs                                                  | 8 192 byte                                                                |
| — Outputs                                                 | 8 192 byte                                                                |
| <b>Process image</b>                                      |                                                                           |
| • Inputs                                                  | 8 192 byte                                                                |
| • Outputs                                                 | 8 192 byte                                                                |
| • Inputs, adjustable                                      | 8 192 byte                                                                |
| • Outputs, adjustable                                     | 8 192 byte                                                                |
| • Inputs, default                                         | 256 byte                                                                  |
| • Outputs, default                                        | 256 byte                                                                  |
| <b>Subprocess images</b>                                  |                                                                           |
| • Number of subprocess images, max.                       | 1; With PROFINET IO, the length of the user data is limited to 1600 bytes |
| <b>Digital channels</b>                                   |                                                                           |
| • Inputs                                                  | 65 536                                                                    |
| — of which central                                        | 1 024                                                                     |
| • Outputs                                                 | 65 536                                                                    |
| — of which central                                        | 1 024                                                                     |
| <b>Analog channels</b>                                    |                                                                           |
| • Inputs                                                  | 4 096                                                                     |
| — of which central                                        | 256                                                                       |
| • Outputs                                                 | 4 096                                                                     |
| — of which central                                        | 256                                                                       |
| <b>Hardware configuration</b>                             |                                                                           |
| <b>Number of DP masters</b>                               |                                                                           |
| • integrated                                              | 2                                                                         |
| • via CP                                                  | 4                                                                         |
| <b>Number of operable FMs and CPs (recommended)</b>       |                                                                           |
| • FM                                                      | 8                                                                         |
| • CP, PtP                                                 | 8                                                                         |
| • CP, LAN                                                 | 10                                                                        |
| <b>Rack</b>                                               |                                                                           |
| • Racks, max.                                             | 4                                                                         |
| • Modules per rack, max.                                  | 8                                                                         |
| <b>Time of day</b>                                        |                                                                           |
| <b>Clock</b>                                              |                                                                           |
| • Hardware clock (real-time)                              | Yes                                                                       |
| • retentive and synchronizable                            | Yes                                                                       |
| • Backup time                                             | 6 wk; At 40 °C ambient temperature                                        |
| • Deviation per day, max.                                 | 10 s; Typ.: 2 s                                                           |
| • Behavior of the clock following POWER-ON                | Clock continues running after POWER OFF                                   |
| • Behavior of the clock following expiry of backup period | the clock continues at the time of day it had when power was switched off |
| <b>Operating hours counter</b>                            |                                                                           |
| • Number                                                  | 4                                                                         |
| • Number/Number range                                     | 0 to 3                                                                    |
| • Range of values                                         | 0 to 2 <sup>31</sup> hours (when using SFC 101)                           |
| • Granularity                                             | 1 h                                                                       |
| • retentive                                               | Yes; Must be restarted at each restart                                    |
| <b>Clock synchronization</b>                              |                                                                           |
| • supported                                               | Yes                                                                       |
| • to MPI, master                                          | Yes                                                                       |
| • to MPI, slave                                           | Yes                                                                       |
| • to DP, master                                           | Yes; With DP slave only slave clock                                       |
| • to DP, slave                                            | Yes                                                                       |

|                                                                              |                                                                   |
|------------------------------------------------------------------------------|-------------------------------------------------------------------|
| • in AS, master                                                              | Yes                                                               |
| • in AS, slave                                                               | Yes                                                               |
| • on Ethernet via NTP                                                        | Yes; As client                                                    |
| <b>Digital inputs</b>                                                        |                                                                   |
| Number of digital inputs                                                     | 0                                                                 |
| <b>Digital outputs</b>                                                       |                                                                   |
| Number of digital outputs                                                    | 0                                                                 |
| <b>Analog inputs</b>                                                         |                                                                   |
| Number of analog inputs                                                      | 0                                                                 |
| <b>Analog outputs</b>                                                        |                                                                   |
| Number of analog outputs                                                     | 0                                                                 |
| <b>Interfaces</b>                                                            |                                                                   |
| Number of industrial Ethernet interfaces                                     | 1; 2 ports (switch) RJ45                                          |
| Number of PROFINET interfaces                                                | 1; 2 ports (switch) RJ45                                          |
| Number of RS 485 interfaces                                                  | 2; Combined MPI / PROFIBUS DP and PROFIBUS DP                     |
| Number of RS 422 interfaces                                                  | 0                                                                 |
| <b>1. Interface</b>                                                          |                                                                   |
| Interface type                                                               | Integrated RS 485 interface                                       |
| Isolated                                                                     | Yes                                                               |
| <b>Interface types</b>                                                       |                                                                   |
| • RS 485                                                                     | Yes                                                               |
| • Output current of the interface, max.                                      | 150 mA                                                            |
| <b>Protocols</b>                                                             |                                                                   |
| • MPI                                                                        | Yes                                                               |
| • PROFIBUS DP master                                                         | Yes                                                               |
| • PROFIBUS DP slave                                                          | Yes; A DP slave at both interfaces simultaneously is not possible |
| • Point-to-point connection                                                  | No                                                                |
| <b>MPI</b>                                                                   |                                                                   |
| • Transmission rate, max.                                                    | 12 Mbit/s                                                         |
| <b>Services</b>                                                              |                                                                   |
| — PG/OP communication                                                        | Yes                                                               |
| — Routing                                                                    | Yes                                                               |
| — Global data communication                                                  | Yes                                                               |
| — S7 basic communication                                                     | Yes                                                               |
| — S7 communication                                                           | Yes                                                               |
| — S7 communication, as client                                                | No; but via CP and loadable FB                                    |
| — S7 communication, as server                                                | Yes                                                               |
| <b>PROFIBUS DP master</b>                                                    |                                                                   |
| • Transmission rate, max.                                                    | 12 Mbit/s                                                         |
| • Number of DP slaves, max.                                                  | 124                                                               |
| <b>Services</b>                                                              |                                                                   |
| — PG/OP communication                                                        | Yes                                                               |
| — Routing                                                                    | Yes                                                               |
| — Global data communication                                                  | No                                                                |
| — S7 basic communication                                                     | Yes; I blocks only                                                |
| — S7 communication                                                           | Yes                                                               |
| — S7 communication, as client                                                | No                                                                |
| — S7 communication, as server                                                | Yes                                                               |
| — Equidistance                                                               | Yes                                                               |
| — Isochronous mode                                                           | No                                                                |
| — SYNC/FREEZE                                                                | Yes                                                               |
| — Activation/deactivation of DP slaves                                       | Yes                                                               |
| — Number of DP slaves that can be simultaneously activated/deactivated, max. | 8                                                                 |
| — Direct data exchange (slave-to-slave communication)                        | Yes; as subscriber                                                |
| — DPV1                                                                       | Yes                                                               |
| <b>Address area</b>                                                          |                                                                   |
| — Inputs, max.                                                               | 8 kbyte                                                           |
| — Outputs, max.                                                              | 8 kbyte                                                           |
| <b>User data per DP slave</b>                                                |                                                                   |

|                                                                              |                                                                                            |
|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| — Inputs, max.                                                               | 244 byte                                                                                   |
| — Outputs, max.                                                              | 244 byte                                                                                   |
| <b>PROFIBUS DP slave</b>                                                     |                                                                                            |
| • Transmission rate, max.                                                    | 12 Mbit/s                                                                                  |
| • automatic baud rate search                                                 | Yes; only with passive interface                                                           |
| • Address area, max.                                                         | 32                                                                                         |
| • User data per address area, max.                                           | 32 byte                                                                                    |
| <b>Services</b>                                                              |                                                                                            |
| — PG/OP communication                                                        | Yes                                                                                        |
| — Routing                                                                    | Yes; with interface active                                                                 |
| — Global data communication                                                  | No                                                                                         |
| — S7 basic communication                                                     | No                                                                                         |
| — S7 communication                                                           | Yes                                                                                        |
| — S7 communication, as client                                                | No                                                                                         |
| — S7 communication, as server                                                | Yes; Connection configured on one side only                                                |
| — Direct data exchange (slave-to-slave communication)                        | Yes                                                                                        |
| — DPV1                                                                       | No                                                                                         |
| <b>Transfer memory</b>                                                       |                                                                                            |
| — Inputs                                                                     | 244 byte                                                                                   |
| — Outputs                                                                    | 244 byte                                                                                   |
| <b>2. Interface</b>                                                          |                                                                                            |
| Interface type                                                               | Integrated RS 485 interface                                                                |
| Isolated                                                                     | Yes                                                                                        |
| <b>Interface types</b>                                                       |                                                                                            |
| • RS 485                                                                     | Yes                                                                                        |
| • Output current of the interface, max.                                      | 200 mA                                                                                     |
| <b>Protocols</b>                                                             |                                                                                            |
| • MPI                                                                        | No                                                                                         |
| • PROFINET IO Controller                                                     | No                                                                                         |
| • PROFINET IO Device                                                         | No                                                                                         |
| • PROFINET CBA                                                               | No                                                                                         |
| • PROFIBUS DP master                                                         | Yes                                                                                        |
| • PROFIBUS DP slave                                                          | Yes; A DP slave at both interfaces simultaneously is not possible                          |
| • Open IE communication                                                      | No                                                                                         |
| • Web server                                                                 | No                                                                                         |
| <b>PROFIBUS DP master</b>                                                    |                                                                                            |
| • Transmission rate, max.                                                    | 12 Mbit/s                                                                                  |
| • Number of DP slaves, max.                                                  | 124                                                                                        |
| <b>Services</b>                                                              |                                                                                            |
| — PG/OP communication                                                        | Yes                                                                                        |
| — Routing                                                                    | Yes                                                                                        |
| — Global data communication                                                  | No                                                                                         |
| — S7 basic communication                                                     | Yes; I blocks only                                                                         |
| — S7 communication                                                           | Yes                                                                                        |
| — S7 communication, as client                                                | No                                                                                         |
| — S7 communication, as server                                                | Yes; Connection configured on one side only                                                |
| — Equidistance                                                               | Yes                                                                                        |
| — Isochronous mode                                                           | Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) |
| — SYNC/FREEZE                                                                | Yes                                                                                        |
| — Activation/deactivation of DP slaves                                       | Yes                                                                                        |
| — Number of DP slaves that can be simultaneously activated/deactivated, max. | 8                                                                                          |
| — Direct data exchange (slave-to-slave communication)                        | Yes; as subscriber                                                                         |
| — DPV1                                                                       | Yes                                                                                        |
| <b>Address area</b>                                                          |                                                                                            |
| — Inputs, max.                                                               | 8 kbyte                                                                                    |
| — Outputs, max.                                                              | 8 kbyte                                                                                    |
| <b>User data per DP slave</b>                                                |                                                                                            |
| — Inputs, max.                                                               | 244 byte                                                                                   |

|                                                                   |                                                                                                                            |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| — Outputs, max.                                                   | 244 byte                                                                                                                   |
| <b>PROFIBUS DP slave</b>                                          |                                                                                                                            |
| • GSD file                                                        | The latest GSD file is available at: <a href="http://www.siemens.com/profibus-gsd">http://www.siemens.com/profibus-gsd</a> |
| • Transmission rate, max.                                         | 12 Mbit/s                                                                                                                  |
| • automatic baud rate search                                      | Yes; only with passive interface                                                                                           |
| • Address area, max.                                              | 32                                                                                                                         |
| • User data per address area, max.                                | 32 byte                                                                                                                    |
| <b>Services</b>                                                   |                                                                                                                            |
| — PG/OP communication                                             | Yes                                                                                                                        |
| — Routing                                                         | Yes; with interface active                                                                                                 |
| — Global data communication                                       | No                                                                                                                         |
| — S7 basic communication                                          | No                                                                                                                         |
| — S7 communication                                                | Yes                                                                                                                        |
| — S7 communication, as client                                     | No                                                                                                                         |
| — S7 communication, as server                                     | Yes; Connection configured on one side only                                                                                |
| — Direct data exchange (slave-to-slave communication)             | Yes                                                                                                                        |
| — DPV1                                                            | No                                                                                                                         |
| <b>Transfer memory</b>                                            |                                                                                                                            |
| — Inputs                                                          | 244 byte                                                                                                                   |
| — Outputs                                                         | 244 byte                                                                                                                   |
| <b>3. Interface</b>                                               |                                                                                                                            |
| Interface type                                                    | PROFINET                                                                                                                   |
| Isolated                                                          | Yes                                                                                                                        |
| automatic detection of transmission rate                          | Yes; 10/100 Mbit/s                                                                                                         |
| Autonegotiation                                                   | Yes                                                                                                                        |
| Autocrossing                                                      | Yes                                                                                                                        |
| Change of IP address at runtime, supported                        | Yes                                                                                                                        |
| <b>Interface types</b>                                            |                                                                                                                            |
| • RJ 45 (Ethernet)                                                | Yes                                                                                                                        |
| • Number of ports                                                 | 2                                                                                                                          |
| • integrated switch                                               | Yes                                                                                                                        |
| <b>Protocols</b>                                                  |                                                                                                                            |
| • MPI                                                             | No                                                                                                                         |
| • PROFINET IO Controller                                          | Yes; Also simultaneously with I-Device functionality                                                                       |
| • PROFINET IO Device                                              | Yes; Also simultaneously with IO Controller functionality                                                                  |
| • PROFINET CBA                                                    | Yes                                                                                                                        |
| • PROFIBUS DP master                                              | No                                                                                                                         |
| • PROFIBUS DP slave                                               | No                                                                                                                         |
| • Open IE communication                                           | Yes; Via TCP/IP, ISO on TCP, and UDP                                                                                       |
| • Web server                                                      | Yes                                                                                                                        |
| • Media redundancy                                                | Yes                                                                                                                        |
| <b>PROFINET IO Controller</b>                                     |                                                                                                                            |
| • Transmission rate, max.                                         | 100 Mbit/s                                                                                                                 |
| <b>Services</b>                                                   |                                                                                                                            |
| — PG/OP communication                                             | Yes                                                                                                                        |
| — Routing                                                         | Yes                                                                                                                        |
| — S7 communication                                                | Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32                                    |
| — Isochronous mode                                                | Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)                                 |
| — Shared device                                                   | Yes                                                                                                                        |
| — Prioritized startup                                             | Yes                                                                                                                        |
| — Number of IO devices with prioritized startup, max.             | 32                                                                                                                         |
| — Number of connectable IO Devices, max.                          | 256                                                                                                                        |
| — Of which IO devices with IRT, max.                              | 64                                                                                                                         |
| — of which in line, max.                                          | 64                                                                                                                         |
| — Number of IO Devices with IRT and the option "high flexibility" | 256                                                                                                                        |
| — of which in line, max.                                          | 61                                                                                                                         |
| — Number of connectable IO Devices for RT, max.                   | 256                                                                                                                        |
| — of which in line, max.                                          | 256                                                                                                                        |

|                                                                               |                                                                                                                               |
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| — Activation/deactivation of IO Devices                                       | Yes                                                                                                                           |
| — Number of IO Devices that can be simultaneously activated/deactivated, max. | 8                                                                                                                             |
| — IO Devices changing during operation (partner ports), supported             | Yes                                                                                                                           |
| — Number of IO Devices per tool, max.                                         | 8                                                                                                                             |
| — Device replacement without swap medium                                      | Yes                                                                                                                           |
| — Send cycles                                                                 | 250 µs, 500 µs, 1 ms; 2 ms, 4 ms (not in the case of IRT with "high flexibility" option)                                      |
| — Updating time                                                               | 250 µs to 512 ms (depending on the operating mode, see Manual "S7-300 CPU 31xC and CPU 31x, technical Data" for more details) |
| <b>Address area</b>                                                           |                                                                                                                               |
| — Inputs, max.                                                                | 8 kbyte                                                                                                                       |
| — Outputs, max.                                                               | 8 kbyte                                                                                                                       |
| — User data consistency, max.                                                 | 1 024 byte                                                                                                                    |
| <b>PROFINET IO Device</b>                                                     |                                                                                                                               |
| <b>Services</b>                                                               |                                                                                                                               |
| — PG/OP communication                                                         | Yes                                                                                                                           |
| — Routing                                                                     | Yes                                                                                                                           |
| — S7 communication                                                            | Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32                                       |
| — Isochronous mode                                                            | No                                                                                                                            |
| — IRT                                                                         | Yes                                                                                                                           |
| — PROFINergy                                                                  | Yes; With SFB 73 / 74 prepared for loadable PROFINergy standard FB for I-Device                                               |
| — Shared device                                                               | Yes                                                                                                                           |
| — Number of IO Controllers with shared device, max.                           | 2                                                                                                                             |
| <b>Transfer memory</b>                                                        |                                                                                                                               |
| — Inputs, max.                                                                | 1 440 byte; Per IO Controller with shared device                                                                              |
| — Outputs, max.                                                               | 1 440 byte; Per IO Controller with shared device                                                                              |
| <b>Submodules</b>                                                             |                                                                                                                               |
| — Number, max.                                                                | 64                                                                                                                            |
| — User data per submodule, max.                                               | 1 024 byte                                                                                                                    |
| <b>PROFINET CBA</b>                                                           |                                                                                                                               |
| • acyclic transmission                                                        | Yes                                                                                                                           |
| • cyclic transmission                                                         | Yes                                                                                                                           |
| <b>Open IE communication</b>                                                  |                                                                                                                               |
| • Number of connections, max.                                                 | 32                                                                                                                            |
| • Local port numbers used at the system end                                   | 0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535                              |
| • Keep-alive function, supported                                              | Yes                                                                                                                           |
| <b>Protocols</b>                                                              |                                                                                                                               |
| PROFIsafe                                                                     | No                                                                                                                            |
| <b>Redundancy mode</b>                                                        |                                                                                                                               |
| <b>Media redundancy</b>                                                       |                                                                                                                               |
| — Switchover time on line break, typ.                                         | 200 ms; PROFINET MRP                                                                                                          |
| — Number of stations in the ring, max.                                        | 50                                                                                                                            |
| <b>Open IE communication</b>                                                  |                                                                                                                               |
| • TCP/IP                                                                      | Yes; via integrated PROFINET interface and loadable FBs                                                                       |
| — Number of connections, max.                                                 | 32                                                                                                                            |
| — Data length for connection type 01H, max.                                   | 1 460 byte                                                                                                                    |
| — Data length for connection type 11H, max.                                   | 32 768 byte                                                                                                                   |
| — several passive connections per port, supported                             | Yes                                                                                                                           |
| • ISO-on-TCP (RFC1006)                                                        | Yes; via integrated PROFINET interface and loadable FBs                                                                       |
| — Number of connections, max.                                                 | 32                                                                                                                            |
| — Data length, max.                                                           | 32 768 byte                                                                                                                   |
| • UDP                                                                         | Yes; via integrated PROFINET interface and loadable FBs                                                                       |
| — Number of connections, max.                                                 | 32                                                                                                                            |
| — Data length, max.                                                           | 1 472 byte                                                                                                                    |
| <b>Web server</b>                                                             |                                                                                                                               |
| • supported                                                                   | Yes                                                                                                                           |
| • User-defined websites                                                       | Yes                                                                                                                           |
| • Number of HTTP clients                                                      | 5                                                                                                                             |

| communication functions / header                                                                                                              |                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| PG/OP communication                                                                                                                           | Yes                                                                                                   |
| Data record routing                                                                                                                           | Yes                                                                                                   |
| Global data communication                                                                                                                     |                                                                                                       |
| • supported                                                                                                                                   | Yes                                                                                                   |
| • Number of GD loops, max.                                                                                                                    | 8                                                                                                     |
| • Number of GD packets, max.                                                                                                                  | 8                                                                                                     |
| • Number of GD packets, transmitter, max.                                                                                                     | 8                                                                                                     |
| • Number of GD packets, receiver, max.                                                                                                        | 8                                                                                                     |
| • Size of GD packets, max.                                                                                                                    | 22 byte                                                                                               |
| • Size of GD packet (of which consistent), max.                                                                                               | 22 byte                                                                                               |
| S7 basic communication                                                                                                                        |                                                                                                       |
| • communication function / S7 basic communication                                                                                             | Yes                                                                                                   |
| • User data per job, max.                                                                                                                     | 76 byte                                                                                               |
| • User data per job (of which consistent), max.                                                                                               | 76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)                    |
| S7 communication                                                                                                                              |                                                                                                       |
| • supported                                                                                                                                   | Yes                                                                                                   |
| • as server                                                                                                                                   | Yes                                                                                                   |
| • as client                                                                                                                                   | Yes; via integrated PROFINET interface and loadable FB or via CP and loadable FB                      |
| • User data per job, max.                                                                                                                     | See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication) |
| S5 compatible communication                                                                                                                   |                                                                                                       |
| • supported                                                                                                                                   | Yes; via CP and loadable FC                                                                           |
| communication functions / PROFINET CBA (with set target communication load) / header                                                          |                                                                                                       |
| • Setpoint for the CPU communication load                                                                                                     | 20 %                                                                                                  |
| • Number of remote interconnection partners                                                                                                   | 32                                                                                                    |
| • Number of functions, master/slave                                                                                                           | 50                                                                                                    |
| • Total of all master/slave connections                                                                                                       | 3 000                                                                                                 |
| • Data length of all incoming connections master/slave, max.                                                                                  | 24 000 byte                                                                                           |
| • Data length of all outgoing connections master/slave, max.                                                                                  | 24 000 byte                                                                                           |
| • Number of device-internal and PROFIBUS interconnections                                                                                     | 1 000                                                                                                 |
| • Data length of device-internal und PROFIBUS interconnections, max.                                                                          | 8 000 byte                                                                                            |
| • Data length per connection, max.                                                                                                            | 1 400 byte                                                                                            |
| performance data / PROFINET CBA / remote interconnection / with acyclic transfer / header                                                     |                                                                                                       |
| — Sampling interval, min.                                                                                                                     | 200 ms                                                                                                |
| — Number of incoming interconnections                                                                                                         | 100                                                                                                   |
| — Number of outgoing interconnections                                                                                                         | 100                                                                                                   |
| — Data length of all incoming interconnections, max.                                                                                          | 3 200 byte                                                                                            |
| — Data length of all outgoing interconnections, max.                                                                                          | 3 200 byte                                                                                            |
| — data volume / as user data for remote interconnections / in the case of acyclic transmission / with PROFINET CBA / per connection / maximum | 1 400 byte                                                                                            |
| performance data / PROFINET CBA / remote interconnection / with cyclic transfer / header                                                      |                                                                                                       |
| — Transmission frequency: Transmission interval, min.                                                                                         | 1 ms                                                                                                  |
| — number of remote connections to input variables / with PROFINET CBA / with cyclic transfer / maximum                                        | 300                                                                                                   |
| — number of remote connections to output variables / with cyclical transfer / with PROFINET CBA / maximum                                     | 300                                                                                                   |
| — data volume / as user data for remote interconnections with input variables / with cyclical transfer / with PROFINET CBA / maximum          | 4 800 byte                                                                                            |
| — data volume / as user data for remote interconnections with output variables / with cyclical transfer / with PROFINET CBA / maximum         | 4 800 byte                                                                                            |
| — data volume / as user data for remote interconnections / with cyclical transfer / with PROFINET CBA / per connection / maximum              | 450 byte                                                                                              |
| performance data / PROFINET CBA / HMI variables via PROFINET / acyclic / header                                                               |                                                                                                       |
| — Number of stations that can log on for HMI variables (PN OPC/iMap)                                                                          | 3; 2x PN OPC/1x iMap                                                                                  |



|                                                                         |                                                                                                                                                                     |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| — HMI variable updating                                                 | 500 ms                                                                                                                                                              |
| — Number of HMI variables                                               | 600                                                                                                                                                                 |
| — Data length of all HMI variables, max.                                | 9 600 byte                                                                                                                                                          |
| performance data / PROFINET CBA / PROFIBUS proxy functionality / header |                                                                                                                                                                     |
| — supported                                                             | Yes                                                                                                                                                                 |
| — Number of linked PROFIBUS devices                                     | 32                                                                                                                                                                  |
| — Data length per connection, max.                                      | 240 byte; Slave-dependent                                                                                                                                           |
| Number of connections                                                   |                                                                                                                                                                     |
| • overall                                                               | 32                                                                                                                                                                  |
| • usable for PG communication                                           | 31                                                                                                                                                                  |
| — reserved for PG communication                                         | 1                                                                                                                                                                   |
| — adjustable for PG communication, min.                                 | 1                                                                                                                                                                   |
| — adjustable for PG communication, max.                                 | 31                                                                                                                                                                  |
| • usable for OP communication                                           | 31                                                                                                                                                                  |
| — reserved for OP communication                                         | 1                                                                                                                                                                   |
| — adjustable for OP communication, min.                                 | 1                                                                                                                                                                   |
| — adjustable for OP communication, max.                                 | 31                                                                                                                                                                  |
| • usable for S7 basic communication                                     | 30                                                                                                                                                                  |
| — reserved for S7 basic communication                                   | 0                                                                                                                                                                   |
| — adjustable for S7 basic communication, min.                           | 0                                                                                                                                                                   |
| — adjustable for S7 basic communication, max.                           | 30                                                                                                                                                                  |
| • usable for S7 communication                                           | 16                                                                                                                                                                  |
| — reserved for S7 communication                                         | 0                                                                                                                                                                   |
| — adjustable for S7 communication, min.                                 | 0                                                                                                                                                                   |
| — adjustable for S7 communication, max.                                 | 16                                                                                                                                                                  |
| • total number of instances, max.                                       | 32                                                                                                                                                                  |
| • usable for routing                                                    | X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as DP master: max. 24; X2 as DP slave (active): max. 14; X3 as PROFINET: 48 max. |
| S7 message functions                                                    |                                                                                                                                                                     |
| Number of login stations for message functions, max.                    | 32; Depending on the configured connections for PG/OP and S7 basic communication                                                                                    |
| Process diagnostic messages                                             | Yes                                                                                                                                                                 |
| simultaneously active Alarm-S blocks, max.                              | 300                                                                                                                                                                 |
| Test commissioning functions                                            |                                                                                                                                                                     |
| Status block                                                            | Yes; Up to 2 simultaneously                                                                                                                                         |
| Single step                                                             | Yes                                                                                                                                                                 |
| Number of breakpoints                                                   | 4                                                                                                                                                                   |
| Status/control                                                          |                                                                                                                                                                     |
| • Status/control variable                                               | Yes                                                                                                                                                                 |
| • Variables                                                             | Inputs, outputs, memory bits, DB, times, counters                                                                                                                   |
| • Number of variables, max.                                             | 30                                                                                                                                                                  |
| — of which status variables, max.                                       | 30                                                                                                                                                                  |
| — of which control variables, max.                                      | 14                                                                                                                                                                  |
| Forcing                                                                 |                                                                                                                                                                     |
| • Forcing                                                               | Yes                                                                                                                                                                 |
| • Forcing, variables                                                    | Inputs, outputs                                                                                                                                                     |
| • Number of variables, max.                                             | 10                                                                                                                                                                  |
| Diagnostic buffer                                                       |                                                                                                                                                                     |
| • present                                                               | Yes                                                                                                                                                                 |
| • Number of entries, max.                                               | 500                                                                                                                                                                 |
| — adjustable                                                            | No                                                                                                                                                                  |
| — of which powerfail-proof                                              | 100                                                                                                                                                                 |
| • Number of entries readable in RUN, max.                               | 499                                                                                                                                                                 |
| — adjustable                                                            | Yes; From 10 to 499                                                                                                                                                 |
| — preset                                                                | 10                                                                                                                                                                  |
| Service data                                                            |                                                                                                                                                                     |
| • can be read out                                                       | Yes                                                                                                                                                                 |
| Ambient conditions                                                      |                                                                                                                                                                     |
| Ambient temperature during operation                                    |                                                                                                                                                                     |
| • min.                                                                  | 0 °C                                                                                                                                                                |

|                                               |                            |
|-----------------------------------------------|----------------------------|
| • max.                                        | 60 °C                      |
| <b>configuration / header</b>                 |                            |
| Configuration software                        |                            |
| • STEP 7                                      | Yes; V5.5 or higher        |
| <b>configuration / programming / header</b>   |                            |
| • Command set                                 | see instruction list       |
| • Nesting levels                              | 8                          |
| • System functions (SFC)                      | see instruction list       |
| • System function blocks (SFB)                | see instruction list       |
| <b>Programming language</b>                   |                            |
| — LAD                                         | Yes                        |
| — FBD                                         | Yes                        |
| — STL                                         | Yes                        |
| — SCL                                         | Yes                        |
| — CFC                                         | Yes                        |
| — GRAPH                                       | Yes                        |
| — HiGraph®                                    | Yes                        |
| <b>Know-how protection</b>                    |                            |
| • User program protection/password protection | Yes                        |
| • Block encryption                            | Yes; With S7 block Privacy |
| <b>Dimensions</b>                             |                            |
| Width                                         | 120 mm                     |
| Height                                        | 125 mm                     |
| Depth                                         | 130 mm                     |
| <b>Weights</b>                                |                            |
| Weight, approx.                               | 1 250 g                    |

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