



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                  |
| Engineering with                                            |                       |
| • Programming package                                       | STEP 7 V5.5 or higher |
| Supply voltage                                              |                       |
| Rated value (DC)                                            |                       |
| • 24 V DC                                                   | Yes                   |
| 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                                                                         |
| <b>Power loss</b>                                       |                                                                                               |
| Power loss, typ.                                        | 14 W                                                                                          |
| <b>Memory</b>                                           |                                                                                               |
| <b>Work memory</b>                                      |                                                                                               |
| • integrated                                            | 2 048 kbyte                                                                                   |
| • expandable                                            | No                                                                                            |
| • Size of retentive memory for retentive data blocks    | 700 kbyte                                                                                     |
| <b>Load memory</b>                                      |                                                                                               |
| • Plug-in (MMC)                                         | Yes                                                                                           |
| • Plug-in (MMC), max.                                   | 8 Mbyte                                                                                       |
| • Data management on MMC (after last programming), min. | 10 y                                                                                          |
| <b>Backup</b>                                           |                                                                                               |
| • present                                               | Yes                                                                                           |
| • without battery                                       | Yes                                                                                           |
| <b>CPU processing times</b>                             |                                                                                               |
| 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                                                                                       |
| <b>CPU-blocks</b>                                       |                                                                                               |
| 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                                                                    |

## Counters, timers and their retentivity

|                       |                                          |
|-----------------------|------------------------------------------|
| <b>S7 counter</b>     |                                          |
| • Number              | 2 048                                    |
| <b>Retentivity</b>    |                                          |
| — adjustable          | Yes                                      |
| — lower limit         | 0                                        |
| — upper limit         | 2 047                                    |
| — 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                                      |
| — lower limit         | 0                                        |
| — upper limit         | 2 047                                    |
| — 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) |

|                                     |                                                                           |
|-------------------------------------|---------------------------------------------------------------------------|
| Data areas and their retentivity    |                                                                           |
| retentive data area in total        | All, max. 700 KB                                                          |
| Flag                                |                                                                           |
| • Number, 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                                                          |
| Data blocks                         |                                                                           |
| • Retentivity adjustable            | Yes; via non-retain property on DB                                        |
| • Retentivity preset                | Yes                                                                       |
| Local data                          |                                                                           |
| • per priority class, max.          | 32 768 byte; Max. 2048 bytes per block                                    |
| Address area                        |                                                                           |
| I/O address area                    |                                                                           |
| • Inputs                            | 8 192 byte                                                                |
| • Outputs                           | 8 192 byte                                                                |
| of which distributed                |                                                                           |
| — Inputs                            | 8 192 byte                                                                |
| — Outputs                           | 8 192 byte                                                                |
| Process image                       |                                                                           |
| • 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                                                                  |
| Subprocess images                   |                                                                           |
| • Number of subprocess images, max. | 1; With PROFINET IO, the length of the user data is limited to 1600 bytes |
| Digital channels                    |                                                                           |
| • Inputs                            | 65 536                                                                    |
| — of which central                  | 1 024                                                                     |
| • Outputs                           | 65 536                                                                    |
| — of which central                  | 1 024                                                                     |
| Analog channels                     |                                                                           |
| • Inputs                            | 4 096                                                                     |
| — of which central                  | 256                                                                       |
| • Outputs                           | 4 096                                                                     |
| — of which central                  | 256                                                                       |
| Hardware configuration              |                                                                           |
| Number of DP masters                |                                                                           |

|                                                           |                                                                          |
|-----------------------------------------------------------|--------------------------------------------------------------------------|
| • integrated                                              | 2                                                                        |
| • via CP                                                  | 4                                                                        |
| Number of operable FMs and CPs (recommended)              |                                                                          |
| • FM                                                      | 8                                                                        |
| • CP, PtP                                                 | 8                                                                        |
| • CP, LAN                                                 | 10                                                                       |
| Rack                                                      |                                                                          |
| • Racks, max.                                             | 4                                                                        |
| • Modules per rack, max.                                  | 8                                                                        |
| Time of day                                               |                                                                          |
| Clock                                                     |                                                                          |
| • 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 | Clock continues to run with the time at which the power failure occurred |
| Operating hours counter                                   |                                                                          |
| • 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                                   |
| Clock synchronization                                     |                                                                          |
| • 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                                                           |
| Digital inputs                                            |                                                                          |
| Number of digital inputs                                  | 0                                                                        |
| Digital outputs                                           |                                                                          |
| Number of digital outputs                                 | 0                                                                        |
| Analog inputs                                             |                                                                          |
| Number of analog inputs                                   | 0                                                                        |
| Analog outputs                                            |                                                                          |

|                          |   |
|--------------------------|---|
| Number of analog outputs | 0 |
|--------------------------|---|

## Interfaces

|                                          |                                               |
|------------------------------------------|-----------------------------------------------|
| 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                                             |

## 1. Interface

|                                                 |                             |
|-------------------------------------------------|-----------------------------|
| Interface type                                  | Integrated RS 485 interface |
| Physics                                         | RS 485                      |
| Isolated                                        | Yes                         |
| Power supply to interface (15 to 30 V DC), max. | 150 mA                      |

## Protocols

|                             |                                                                   |
|-----------------------------|-------------------------------------------------------------------|
| • 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                                                                |

## MPI

|                           |           |
|---------------------------|-----------|
| • Transmission rate, max. | 12 Mbit/s |
|---------------------------|-----------|

## Services

|                               |                                |
|-------------------------------|--------------------------------|
| — 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                            |

## PROFIBUS DP master

|                             |           |
|-----------------------------|-----------|
| • Transmission rate, max.   | 12 Mbit/s |
| • Number of DP slaves, max. | 124       |

## Services

|                                        |                    |
|----------------------------------------|--------------------|
| — 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                                    |

## 2. Interface

|                                                 |                                                                   |
|-------------------------------------------------|-------------------------------------------------------------------|
| Interface type                                  | Integrated RS 485 interface                                       |
| Physics                                         | RS 485                                                            |
| Isolated                                        | Yes                                                               |
| Power supply to interface (15 to 30 V DC), 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:<br><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                                                                                   |
| Physics                                               | Ethernet RJ45                                                                              |
| 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>                                |                                                                                            |
| • Number of ports                                     | 2                                                                                          |
| • integrated switch                                   | Yes                                                                                        |
| <b>Media redundancy</b>                               |                                                                                            |
| • supported                                           | Yes                                                                                        |
| • Switchover time on line break, typ.                 | 200 ms; PROFINET MRP                                                                       |
| • Number of stations in the ring, max.                | 50                                                                                         |
| <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                                                                                        |
| <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) |
| — Open IE communication                               | Yes; Via TCP/IP, ISO on TCP, and UDP                                                       |

|                                                                               |                                                                                                                               |
|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| — 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                                                                                                                           |
| — 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) |

#### Address area

|                               |            |
|-------------------------------|------------|
| — Inputs, max.                | 8 kbyte    |
| — Outputs, max.               | 8 kbyte    |
| — User data consistency, max. | 1 024 byte |

#### PROFINET IO Device

##### Services

|                                                     |                                                                                         |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------|
| — PG/OP communication                               | Yes                                                                                     |
| — Routing                                           | Yes                                                                                     |
| — S7 communication                                  | Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 |
| — Isochronous mode                                  | No                                                                                      |
| — Open IE communication                             | Yes; Via TCP/IP, ISO on TCP, and UDP                                                    |
| — 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                                                                                       |

|                                                                 |                                                                                                  |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Transfer memory                                                 |                                                                                                  |
| — Inputs, max.                                                  | 1 440 byte; Per IO Controller with shared device                                                 |
| — Outputs, max.                                                 | 1 440 byte; Per IO Controller with shared device                                                 |
| Submodules                                                      |                                                                                                  |
| — Number, max.                                                  | 64                                                                                               |
| — User data per submodule, max.                                 | 1 024 byte                                                                                       |
| PROFINET CBA                                                    |                                                                                                  |
| • acyclic transmission                                          | Yes                                                                                              |
| • cyclic transmission                                           | Yes                                                                                              |
| Open IE communication                                           |                                                                                                  |
| • 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                                                                                              |
| Protocols                                                       |                                                                                                  |
| Open IE communication                                           |                                                                                                  |
| • 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                                                                                       |
| Web server                                                      |                                                                                                  |
| • supported                                                     | Yes                                                                                              |
| • User-defined websites                                         | Yes                                                                                              |
| • Number of HTTP clients                                        | 5                                                                                                |
| Isochronous mode                                                |                                                                                                  |
| Isochronous operation (application synchronized up to terminal) | Yes; Via 2nd PROFIBUS DP or PROFINET interface                                                   |
| Communication functions                                         |                                                                                                  |
| 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                                                                                               |
| <b>S7 basic communication</b>                                        |                                                                                                       |
| • supported                                                          | 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)                    |
| <b>S7 communication</b>                                              |                                                                                                       |
| • 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) |
| <b>S5 compatible communication</b>                                   |                                                                                                       |
| • supported                                                          | Yes; via CP and loadable FC                                                                           |
| <b>PROFINET CBA (at set setpoint communication load)</b>             |                                                                                                       |
| • 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                                                                                            |
| <b>Remote interconnections with acyclic transmission</b>             |                                                                                                       |
| — Sampling frequency: Sampling time, 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 length per connection, max.                                   | 1 400 byte                                                                                            |
| <b>Remote interconnections with cyclic transmission</b>              |                                                                                                       |

|                                                                      |                                                                                                                                                                     |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| — Transmission frequency: Transmission interval, min.                | 1 ms                                                                                                                                                                |
| — Number of incoming interconnections                                | 300                                                                                                                                                                 |
| — Number of outgoing interconnections                                | 300                                                                                                                                                                 |
| — Data length of all incoming interconnections, max.                 | 4 800 byte                                                                                                                                                          |
| — Data length of all outgoing interconnections, max.                 | 4 800 byte                                                                                                                                                          |
| — Data length per connection, max.                                   | 450 byte                                                                                                                                                            |
| <b>HMI variables via PROFINET (acyclic)</b>                          |                                                                                                                                                                     |
| — 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                                                                                                                                                          |
| <b>PROFIBUS proxy functionality</b>                                  |                                                                                                                                                                     |
| — supported                                                          | Yes                                                                                                                                                                 |
| — Number of linked PROFIBUS devices                                  | 32                                                                                                                                                                  |
| — Data length per connection, max.                                   | 240 byte; Slave-dependent                                                                                                                                           |
| <b>Number of connections</b>                                         |                                                                                                                                                                     |
| • 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 |

## Configuration

|                          |                      |
|--------------------------|----------------------|
| Configuration software   |                      |
| • STEP 7                 | Yes; V5.5 or higher  |
| Programming              |                      |
| • Command set            | see instruction list |
| • Nesting levels         | 8                    |
| • System functions (SFC) | see instruction list |

|                                               |                            |
|-----------------------------------------------|----------------------------|
| • System function blocks (SFB)                | see instruction list       |
| Programming language                          |                            |
| — LAD                                         | Yes                        |
| — FBD                                         | Yes                        |
| — STL                                         | Yes                        |
| — SCL                                         | Yes                        |
| — CFC                                         | Yes                        |
| — GRAPH                                       | Yes                        |
| — HiGraph®                                    | Yes                        |
| Know-how protection                           |                            |
| • User program protection/password protection | Yes                        |
| • Block encryption                            | Yes; With S7 block Privacy |
| Dimensions                                    |                            |
| Width                                         | 120 mm                     |
| Height                                        | 125 mm                     |
| Depth                                         | 130 mm                     |
| Weights                                       |                            |
| Weight, approx.                               | 1 250 g                    |
| <b>last modified:</b>                         | 08/27/2019                 |