



SIPLUS S7-400 CPU 416-3 -25... +70°C with conformal coating based on 6ES7416-3XS07-0AB0. Central processing unit with: Work memory 16 MB, (8 MB code, 8 MB data), Interfaces 1st interface MPI/DP 12 Mbit/s, 2nd interface PROFIBUS DP, 3rd interface plug-in IFM module

### General information

|                          |                                    |
|--------------------------|------------------------------------|
| Product type designation | CPU 416-3                          |
| HW functional status     | 01                                 |
| Firmware version         | V7.0                               |
| Product function         |                                    |
| • Isochronous mode       | Yes; For PROFIBUS only             |
| Engineering with         |                                    |
| • Programming package    | STEP 7 V5.4 or higher with HSP 261 |

### CiR – Configuration in RUN

|                                             |        |
|---------------------------------------------|--------|
| CiR synchronization time, basic load        | 100 ms |
| CiR synchronization time, time per I/O byte | 10 µs  |

### Supply voltage

|                  |                                          |
|------------------|------------------------------------------|
| Rated value (DC) |                                          |
| • 24 V DC        | No; Power supply via system power supply |

### Input current

|                                  |                                 |
|----------------------------------|---------------------------------|
| from backplane bus 5 V DC, typ.  | 1.1 A                           |
| from backplane bus 5 V DC, max.  | 1.3 A                           |
| from backplane bus 24 V DC, max. | 450 mA; 150 mA per DP interface |

|                                             |                                                                                                 |
|---------------------------------------------|-------------------------------------------------------------------------------------------------|
| from interface 5 V DC, max.                 | 90 mA; At each DP interface                                                                     |
| <b>Power loss</b>                           |                                                                                                 |
| Power loss, typ.                            | 5.5 W                                                                                           |
| Power loss, max.                            | 6.5 W                                                                                           |
| <b>Memory</b>                               |                                                                                                 |
| Type of memory                              | RAM                                                                                             |
| <b>Work memory</b>                          |                                                                                                 |
| • integrated                                | 16 Mbyte                                                                                        |
| • integrated (for program)                  | 8 Mbyte                                                                                         |
| • integrated (for data)                     | 8 Mbyte                                                                                         |
| • expandable                                | No                                                                                              |
| <b>Load memory</b>                          |                                                                                                 |
| • expandable FEPRM                          | Yes; with Memory Card (FLASH)                                                                   |
| • expandable FEPRM, max.                    | 64 Mbyte                                                                                        |
| • integrated RAM, max.                      | 1 Mbyte                                                                                         |
| • expandable RAM                            | Yes; with Memory Card (RAM)                                                                     |
| • expandable RAM, max.                      | 64 Mbyte                                                                                        |
| <b>Backup</b>                               |                                                                                                 |
| • present                                   | Yes                                                                                             |
| • with battery                              | Yes; all data                                                                                   |
| • without battery                           | No                                                                                              |
| <b>Battery</b>                              |                                                                                                 |
| <b>Backup battery</b>                       |                                                                                                 |
| • Backup current, typ.                      | 180 µA; up to 40 °C                                                                             |
| • Backup current, max.                      | 850 µA                                                                                          |
| • Backup time, max.                         | Dealt with in the module data manual with the secondary conditions and the factors of influence |
| • Feeding of external backup voltage to CPU | 5 V DC to 15 V DC                                                                               |
| <b>CPU processing times</b>                 |                                                                                                 |
| for bit operations, typ.                    | 12.5 ns                                                                                         |
| for word operations, typ.                   | 12.5 ns                                                                                         |
| for fixed point arithmetic, typ.            | 12.5 ns                                                                                         |
| for floating point arithmetic, typ.         | 25 ns                                                                                           |
| <b>CPU-blocks</b>                           |                                                                                                 |
| <b>DB</b>                                   |                                                                                                 |
| • Number, max.                              | 10 000; Number range: 1 to 16000                                                                |
| • Size, max.                                | 64 kbyte                                                                                        |
| <b>FB</b>                                   |                                                                                                 |
| • Number, max.                              | 5 000; Number range: 0 to 7999                                                                  |
| • Size, max.                                | 64 kbyte                                                                                        |

|                                        |                                                       |
|----------------------------------------|-------------------------------------------------------|
| FC                                     |                                                       |
| • Number, max.                         | 5 000; Number range: 0 to 7999                        |
| • Size, max.                           | 64 kbyte                                              |
| OB                                     |                                                       |
| • Number, max.                         | see instruction list                                  |
| • Size, max.                           | 64 kbyte                                              |
| • Number of free cycle OBs             | 1; OB 1                                               |
| • Number of time alarm OBs             | 8; OB 10-17                                           |
| • Number of delay alarm OBs            | 4; OB 20-23                                           |
| • Number of cyclic interrupt OBs       | 9; OB 30-38 (shortest cycle that can be set = 500 µs) |
| • Number of process alarm OBs          | 8; OB 40-47                                           |
| • Number of DPV1 alarm OBs             | 3; OB 55-57                                           |
| • Number of isochronous mode OBs       | 4; OB 61-64                                           |
| • Number of multicomputing OBs         | 1; OB 60                                              |
| • Number of background OBs             | 1; OB 90                                              |
| • Number of startup OBs                | 3; OB 100-102                                         |
| • Number of asynchronous error OBs     | 9; OB 80-88                                           |
| • Number of synchronous error OBs      | 2; OB 121, 122                                        |
| Nesting depth                          |                                                       |
| • per priority class                   | 24                                                    |
| • additional within an error OB        | 2                                                     |
| Counters, timers and their retentivity |                                                       |
| S7 counter                             |                                                       |
| • Number                               | 2 048                                                 |
| Retentivity                            |                                                       |
| — adjustable                           | Yes                                                   |
| — lower limit                          | 0                                                     |
| — upper limit                          | 2 047                                                 |
| — preset                               | Z 0 to Z 7                                            |
| Counting range                         |                                                       |
| — lower limit                          | 0                                                     |
| — upper limit                          | 999                                                   |
| IEC counter                            |                                                       |
| • present                              | Yes                                                   |
| • Type                                 | SFB                                                   |
| • Number                               | Unlimited (limited only by RAM capacity)              |
| S7 times                               |                                                       |
| • Number                               | 2 048                                                 |
| Retentivity                            |                                                       |
| — adjustable                           | Yes                                                   |
| — lower limit                          | 0                                                     |

|                                              |                                                     |
|----------------------------------------------|-----------------------------------------------------|
| — upper limit                                | 2 047                                               |
| — preset                                     | No times retentive                                  |
| Time range                                   |                                                     |
| — lower limit                                | 10 ms                                               |
| — upper limit                                | 9 990 s                                             |
| IEC timer                                    |                                                     |
| • present                                    | Yes                                                 |
| • Type                                       | SFB                                                 |
| • Number                                     | Unlimited (limited only by RAM capacity)            |
| Data areas and their retentivity             |                                                     |
| retentive data area in total                 | Total working and load memory (with backup battery) |
| Flag                                         |                                                     |
| • Number, max.                               | 16 kbyte; Size of bit memory address area           |
| • Retentivity available                      | Yes                                                 |
| • Retentivity preset                         | MB 0 to MB 15                                       |
| • Number of clock memories                   | 8; in 1 memory byte                                 |
| Local data                                   |                                                     |
| • adjustable, max.                           | 32 kbyte                                            |
| • preset                                     | 16 kbyte                                            |
| Address area                                 |                                                     |
| I/O address area                             |                                                     |
| • Inputs                                     | 16 kbyte                                            |
| • Outputs                                    | 16 kbyte                                            |
| Process image                                |                                                     |
| • Inputs, adjustable                         | 16 kbyte                                            |
| • Outputs, adjustable                        | 16 kbyte                                            |
| • Inputs, default                            | 512 byte                                            |
| • Outputs, default                           | 512 byte                                            |
| • consistent data, max.                      | 244 byte                                            |
| • Access to consistent data in process image | Yes                                                 |
| Subprocess images                            |                                                     |
| • Number of subprocess images, max.          | 15                                                  |
| Digital channels                             |                                                     |
| • Inputs                                     | 131 072                                             |
| — of which central                           | 131 072                                             |
| • Outputs                                    | 131 072                                             |
| — of which central                           | 131 072                                             |
| Analog channels                              |                                                     |
| • Inputs                                     | 8 192                                               |
| — of which central                           | 8 192                                               |
| • Outputs                                    | 8 192                                               |

## Hardware configuration

|                                                                                |                                                                                                                                                 |
|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of expansion units, max.                                                | 21                                                                                                                                              |
| connectable OPs                                                                | 95                                                                                                                                              |
| Multicomputing                                                                 | Yes; 4 CPUs max. (with UR1 or UR2)                                                                                                              |
| <b>Interface modules</b>                                                       |                                                                                                                                                 |
| • Number of connectable IMs (total), max.                                      | 6                                                                                                                                               |
| • Number of connectable IM 460s, max.                                          | 6                                                                                                                                               |
| • Number of connectable IM 463s, max.                                          | 4; IM 463-2                                                                                                                                     |
| <b>Number of DP masters</b>                                                    |                                                                                                                                                 |
| • integrated                                                                   | 2                                                                                                                                               |
| • via CP                                                                       | 10; CP 443-5 Extended                                                                                                                           |
| • via IM 467                                                                   | 4                                                                                                                                               |
| • Mixed mode IM + CP permitted                                                 | No; IM 467 cannot be used jointly with CP 443-5 Ext. or CP 443-1 in PROFINET IO mode                                                            |
| • via interface module                                                         | 1                                                                                                                                               |
| • Number of pluggable S5 modules (via adapter capsule in central device), max. | 6                                                                                                                                               |
| <b>Number of IO Controllers</b>                                                |                                                                                                                                                 |
| • integrated                                                                   | 0                                                                                                                                               |
| • via CP                                                                       | 4; No mixed operation of CP443-1 EX40 and CP443-1 EX 41/EX20/GX20, max. 4 in central controller                                                 |
| <b>Number of operable FMs and CPs (recommended)</b>                            |                                                                                                                                                 |
| • FM                                                                           | Limited by number of slots and number of connections                                                                                            |
| • CP, PtP                                                                      | CP 440: Limited by number of slots; CP 441: limited by number of connections                                                                    |
| • PROFIBUS and Ethernet CPs                                                    | 14; In total max. 10 CPs as DP master and PROFINET controller, of which up to 10 IMs or CPs as DP master and up to 4 CPs as PROFINET controller |
| <b>Slots</b>                                                                   |                                                                                                                                                 |
| • required slots                                                               | 2                                                                                                                                               |
| <b>Time of day</b>                                                             |                                                                                                                                                 |
| <b>Clock</b>                                                                   |                                                                                                                                                 |
| • Hardware clock (real-time)                                                   | Yes                                                                                                                                             |
| • retentive and synchronizable                                                 | Yes                                                                                                                                             |
| • Resolution                                                                   | 1 ms                                                                                                                                            |
| • Deviation per day (buffered), max.                                           | 1.7 s; Power off                                                                                                                                |
| • Deviation per day (unbuffered), max.                                         | 8.6 s; For power On                                                                                                                             |
| <b>Operating hours counter</b>                                                 |                                                                                                                                                 |
| • Number                                                                       | 16                                                                                                                                              |
| • Number/Number range                                                          | 0 to 15                                                                                                                                         |
| • Range of values                                                              | SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2 <sup>31</sup> - 1 hours                                                                       |

|                                                  |                                                                                                                   |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| • Granularity                                    | 1 h                                                                                                               |
| • retentive                                      | Yes                                                                                                               |
| Clock synchronization                            |                                                                                                                   |
| • supported                                      | Yes                                                                                                               |
| • to MPI, master                                 | Yes                                                                                                               |
| • to MPI, slave                                  | Yes                                                                                                               |
| • to DP, master                                  | Yes                                                                                                               |
| • to DP, slave                                   | Yes                                                                                                               |
| • in AS, master                                  | Yes                                                                                                               |
| • in AS, slave                                   | Yes                                                                                                               |
| • on Ethernet via NTP                            | No; Via CP                                                                                                        |
| • to IF 964 DP                                   | Yes                                                                                                               |
| Time difference in system when synchronizing via |                                                                                                                   |
| • MPI, max.                                      | 200 ms                                                                                                            |
| Interfaces                                       |                                                                                                                   |
| Interfaces/bus type                              | 1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP, 1 x PROFIBUS DP (optionally pluggable)                                      |
| Number of RS 485 interfaces                      | 2; Combined MPI / PROFIBUS DP and PROFIBUS DP                                                                     |
| Number of other interfaces                       | 1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)                                          |
| 1. Interface                                     |                                                                                                                   |
| Interface type                                   | Integrated                                                                                                        |
| Physics                                          | RS 485 / PROFIBUS + MPI                                                                                           |
| 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                                                                                                               |
| MPI                                              |                                                                                                                   |
| • Number of connections                          | 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 |
| • 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                    | Yes                                                                                                               |
| — S7 communication, as server                    | Yes                                                                                                               |
| PROFIBUS DP master                               |                                                                                                                   |

|                                                       |                                                                                                                               |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| • Number of connections, max.                         | 32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1             |
| • Transmission rate, max.                             | 12 Mbit/s                                                                                                                     |
| • Number of DP slaves, max.                           | 32                                                                                                                            |
| <b>Services</b>                                       |                                                                                                                               |
| — PG/OP communication                                 | Yes                                                                                                                           |
| — Routing                                             | Yes; S7 routing                                                                                                               |
| — Global data communication                           | No                                                                                                                            |
| — S7 basic communication                              | Yes                                                                                                                           |
| — S7 communication                                    | Yes                                                                                                                           |
| — S7 communication, as client                         | Yes                                                                                                                           |
| — S7 communication, as server                         | Yes                                                                                                                           |
| — Equidistance                                        | Yes                                                                                                                           |
| — Isochronous mode                                    | Yes                                                                                                                           |
| — SYNC/FREEZE                                         | Yes                                                                                                                           |
| — Activation/deactivation of DP slaves                | Yes                                                                                                                           |
| — Direct data exchange (slave-to-slave communication) | Yes                                                                                                                           |
| — DPV1                                                | Yes                                                                                                                           |
| <b>Address area</b>                                   |                                                                                                                               |
| — Inputs, max.                                        | 2 kbyte                                                                                                                       |
| — Outputs, max.                                       | 2 kbyte                                                                                                                       |
| <b>User data per DP slave</b>                         |                                                                                                                               |
| — User data per DP slave, max.                        | 244 byte                                                                                                                      |
| — Inputs, max.                                        | 244 byte                                                                                                                      |
| — Outputs, max.                                       | 244 byte                                                                                                                      |
| — Slots, max.                                         | 244                                                                                                                           |
| — per slot, max.                                      | 128 byte                                                                                                                      |
| <b>PROFIBUS DP slave</b>                              |                                                                                                                               |
| • Number of connections                               | 32                                                                                                                            |
| • GSD file                                            | <a href="http://support.automation.siemens.com/WW/view/en/113652">http://support.automation.siemens.com/WW/view/en/113652</a> |
| • Transmission rate, max.                             | 12 Mbit/s                                                                                                                     |
| • automatic baud rate search                          | No                                                                                                                            |
| • Address area, max.                                  | 32; Virtual slots                                                                                                             |
| • User data per address area, max.                    | 32 byte                                                                                                                       |
| — of which consistent, max.                           | 32 byte                                                                                                                       |
| <b>Services</b>                                       |                                                                                                                               |
| — PG/OP communication                                 | Yes; with interface active                                                                                                    |
| — Routing                                             | Yes; with interface active                                                                                                    |
| — Global data communication                           | No                                                                                                                            |
| — S7 basic communication                              | No                                                                                                                            |

|                                                       |          |
|-------------------------------------------------------|----------|
| — S7 communication                                    | Yes      |
| — S7 communication, as client                         | Yes      |
| — S7 communication, as server                         | Yes      |
| — Direct data exchange (slave-to-slave communication) | No       |
| — DPV1                                                | No       |
| <b>Transfer memory</b>                                |          |
| — Inputs                                              | 244 byte |
| — Outputs                                             | 244 byte |

## 2. Interface

|                                                       |                   |
|-------------------------------------------------------|-------------------|
| Interface type                                        | Integrated        |
| Physics                                               | RS 485 / PROFIBUS |
| Isolated                                              | Yes               |
| Power supply to interface (15 to 30 V DC), max.       | 150 mA            |
| Number of connection resources                        | 32                |
| <b>Protocols</b>                                      |                   |
| • PROFIBUS DP master                                  | Yes               |
| • PROFIBUS DP slave                                   | Yes               |
| <b>PROFIBUS DP master</b>                             |                   |
| • Number of connections, max.                         | 32                |
| • Transmission rate, max.                             | 12 Mbit/s         |
| • Number of DP slaves, max.                           | 125               |
| <b>Services</b>                                       |                   |
| — PG/OP communication                                 | Yes               |
| — Routing                                             | Yes; S7 routing   |
| — Global data communication                           | No                |
| — S7 basic communication                              | Yes               |
| — S7 communication                                    | Yes               |
| — S7 communication, as client                         | Yes               |
| — S7 communication, as server                         | Yes               |
| — Equidistance                                        | Yes               |
| — Isochronous mode                                    | Yes               |
| — SYNC/FREEZE                                         | Yes               |
| — Activation/deactivation of DP slaves                | Yes               |
| — Direct data exchange (slave-to-slave communication) | Yes               |
| — DPV1                                                | Yes               |
| <b>Address area</b>                                   |                   |
| — Inputs, max.                                        | 8 kbyte           |
| — Outputs, max.                                       | 8 kbyte           |
| <b>User data per DP slave</b>                         |                   |

|                                                 |                                                                                                                               |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| — User data per DP slave, max.                  | 244 byte                                                                                                                      |
| — Inputs, max.                                  | 244 byte                                                                                                                      |
| — Outputs, max.                                 | 244 byte                                                                                                                      |
| — Slots, max.                                   | 244                                                                                                                           |
| — per slot, max.                                | 128 byte                                                                                                                      |
| <b>PROFIBUS DP slave</b>                        |                                                                                                                               |
| • Number of connections                         | 32                                                                                                                            |
| • GSD file                                      | <a href="http://support.automation.siemens.com/WW/view/en/113652">http://support.automation.siemens.com/WW/view/en/113652</a> |
| • Transmission rate, max.                       | 12 Mbit/s                                                                                                                     |
| • Address area, max.                            | 32                                                                                                                            |
| • User data per address area, max.              | 32 byte                                                                                                                       |
| — of which consistent, max.                     | 32 byte                                                                                                                       |
| <b>Services</b>                                 |                                                                                                                               |
| — Routing                                       | Yes; with interface active                                                                                                    |
| <b>Transfer memory</b>                          |                                                                                                                               |
| — Inputs                                        | 244 byte                                                                                                                      |
| — Outputs                                       | 244 byte                                                                                                                      |
| <b>3. Interface</b>                             |                                                                                                                               |
| Interface type                                  | pluggable interface module (IF), technical data as for 2nd interface                                                          |
| Plug-in interface modules                       | IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)                                                                                          |
| Physics                                         | RS 485 / PROFIBUS                                                                                                             |
| Isolated                                        | Yes                                                                                                                           |
| Power supply to interface (15 to 30 V DC), max. | 150 mA                                                                                                                        |
| automatic detection of transmission rate        | No                                                                                                                            |
| Number of connection resources                  | 32                                                                                                                            |
| <b>Protocols</b>                                |                                                                                                                               |
| • MPI                                           | No                                                                                                                            |
| • PROFIBUS DP master                            | Yes                                                                                                                           |
| • PROFIBUS DP slave                             | Yes                                                                                                                           |
| <b>PROFIBUS DP master</b>                       |                                                                                                                               |
| • Number of connections, max.                   | 32                                                                                                                            |
| • Transmission rate, max.                       | 12 Mbit/s                                                                                                                     |
| • Number of DP slaves, max.                     | 125                                                                                                                           |
| <b>Services</b>                                 |                                                                                                                               |
| — PG/OP communication                           | Yes                                                                                                                           |
| — Routing                                       | Yes; S7 routing                                                                                                               |
| — Global data communication                     | No                                                                                                                            |
| — S7 basic communication                        | Yes                                                                                                                           |
| — S7 communication                              | Yes                                                                                                                           |
| — S7 communication, as client                   | Yes                                                                                                                           |

|                                                       |                                                                                                                               |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| — S7 communication, as server                         | Yes                                                                                                                           |
| — Equidistance                                        | Yes                                                                                                                           |
| — Isochronous mode                                    | Yes                                                                                                                           |
| — SYNC/FREEZE                                         | Yes                                                                                                                           |
| — Activation/deactivation of DP slaves                | Yes                                                                                                                           |
| — Direct data exchange (slave-to-slave communication) | Yes                                                                                                                           |
| — DPV0                                                | Yes                                                                                                                           |
| — DPV1                                                | Yes                                                                                                                           |
| <b>Address area</b>                                   |                                                                                                                               |
| — Inputs, max.                                        | 8 kbyte                                                                                                                       |
| — Outputs, max.                                       | 8 kbyte                                                                                                                       |
| <b>User data per DP slave</b>                         |                                                                                                                               |
| — User data per DP slave, max.                        | 244 byte                                                                                                                      |
| — Inputs, max.                                        | 244 byte                                                                                                                      |
| — Outputs, max.                                       | 244 byte                                                                                                                      |
| — Slots, max.                                         | 244                                                                                                                           |
| — per slot, max.                                      | 128 byte                                                                                                                      |
| <b>PROFIBUS DP slave</b>                              |                                                                                                                               |
| • Number of connections                               | 32                                                                                                                            |
| • GSD file                                            | <a href="http://support.automation.siemens.com/WW/view/en/113652">http://support.automation.siemens.com/WW/view/en/113652</a> |
| • Transmission rate, max.                             | 12 Mbit/s                                                                                                                     |
| • automatic baud rate search                          | No                                                                                                                            |
| • Address area, max.                                  | 32                                                                                                                            |
| • User data per address area, max.                    | 32 byte                                                                                                                       |
| — of which consistent, 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                         | Yes                                                                                                                           |
| — S7 communication, as server                         | Yes                                                                                                                           |
| — Direct data exchange (slave-to-slave communication) | No                                                                                                                            |
| — DPV1                                                | No                                                                                                                            |
| <b>Transfer memory</b>                                |                                                                                                                               |
| — Inputs                                              | 244 byte                                                                                                                      |
| — Outputs                                             | 244 byte                                                                                                                      |

## Protocols

|                                                                                                                 |                                                                |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Open IE communication                                                                                           |                                                                |
| <ul style="list-style-type: none"> <li>• ISO-on-TCP (RFC1006)</li> </ul>                                        | Via CP 443-1 and loadable FB                                   |
| — Data length, max.                                                                                             | 1 452 bytes via CP 443-1 Adv.                                  |
| Web server                                                                                                      |                                                                |
| <ul style="list-style-type: none"> <li>• supported</li> </ul>                                                   | No                                                             |
| Isochronous mode                                                                                                |                                                                |
| Equidistance                                                                                                    | Yes                                                            |
| Number of DP masters with isochronous mode                                                                      | 3                                                              |
| User data per isochronous slave, max.                                                                           | 244 byte                                                       |
| shortest clock pulse                                                                                            | 1 ms; 0.5 ms without use of SFC 126, 127                       |
| max. cycle                                                                                                      | 32 ms                                                          |
| Communication functions                                                                                         |                                                                |
| PG/OP communication                                                                                             | Yes                                                            |
| <ul style="list-style-type: none"> <li>• Number of connectable OPs without message processing</li> </ul>        | 95                                                             |
| <ul style="list-style-type: none"> <li>• Number of connectable OPs with message processing</li> </ul>           | 95; When using Alarm_S/SQ and Alarm_D/DQ                       |
| Data record routing                                                                                             | Yes                                                            |
| Global data communication                                                                                       |                                                                |
| <ul style="list-style-type: none"> <li>• supported</li> </ul>                                                   | Yes                                                            |
| <ul style="list-style-type: none"> <li>• Number of GD loops, max.</li> </ul>                                    | 16                                                             |
| <ul style="list-style-type: none"> <li>• Number of GD packets, transmitter, max.</li> </ul>                     | 16                                                             |
| <ul style="list-style-type: none"> <li>• Number of GD packets, receiver, max.</li> </ul>                        | 32                                                             |
| <ul style="list-style-type: none"> <li>• Size of GD packets, max.</li> </ul>                                    | 54 byte                                                        |
| <ul style="list-style-type: none"> <li>• Size of GD packet (of which consistent), max.</li> </ul>               | 1 variable                                                     |
| S7 basic communication                                                                                          |                                                                |
| <ul style="list-style-type: none"> <li>• supported</li> </ul>                                                   | Yes                                                            |
| <ul style="list-style-type: none"> <li>• User data per job, max.</li> </ul>                                     | 76 byte                                                        |
| <ul style="list-style-type: none"> <li>• User data per job (of which consistent), max.</li> </ul>               | 1 variable                                                     |
| S7 communication                                                                                                |                                                                |
| <ul style="list-style-type: none"> <li>• supported</li> </ul>                                                   | Yes                                                            |
| <ul style="list-style-type: none"> <li>• as server</li> </ul>                                                   | Yes                                                            |
| <ul style="list-style-type: none"> <li>• as client</li> </ul>                                                   | Yes                                                            |
| <ul style="list-style-type: none"> <li>• User data per job, max.</li> </ul>                                     | 64 kbyte                                                       |
| <ul style="list-style-type: none"> <li>• User data per job (of which consistent), max.</li> </ul>               | 462 byte; 1 variable                                           |
| S5 compatible communication                                                                                     |                                                                |
| <ul style="list-style-type: none"> <li>• supported</li> </ul>                                                   | Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5 |
| <ul style="list-style-type: none"> <li>• User data per job, max.</li> </ul>                                     | 8 kbyte                                                        |
| <ul style="list-style-type: none"> <li>• User data per job (of which consistent), max.</li> </ul>               | 240 byte                                                       |
| <ul style="list-style-type: none"> <li>• Number of simultaneous AG-SEND/AG-RECV orders per CPU, max.</li> </ul> | 64/64                                                          |

|                                                                     |                                                                                                                           |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Standard communication (FMS)                                        |                                                                                                                           |
| • supported                                                         | Yes; Via CP and loadable FB                                                                                               |
| Number of connections                                               |                                                                                                                           |
| • overall                                                           | 96                                                                                                                        |
| • usable for PG communication                                       | 95                                                                                                                        |
| — reserved for PG communication                                     | 1                                                                                                                         |
| — adjustable for PG communication, max.                             | 0                                                                                                                         |
| • usable for OP communication                                       | 95                                                                                                                        |
| — reserved for OP communication                                     | 1                                                                                                                         |
| — adjustable for OP communication, max.                             | 0                                                                                                                         |
| • usable for S7 basic communication                                 | 94                                                                                                                        |
| — reserved for S7 basic communication                               | 0                                                                                                                         |
| — adjustable for S7 basic communication, max.                       | 0                                                                                                                         |
| • usable for S7 communication                                       | 94                                                                                                                        |
| — reserved for S7 communication                                     | 0                                                                                                                         |
| — adjustable for S7 communication, max.                             | 0                                                                                                                         |
| • usable for routing                                                | 47                                                                                                                        |
| — reserved for routing                                              | 0                                                                                                                         |
| — adjustable for routing, max.                                      | 0                                                                                                                         |
| S7 message functions                                                |                                                                                                                           |
| Number of login stations for message functions, max.                | 95; Max. 95 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 16 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) |
| Symbol-related messages                                             | Yes                                                                                                                       |
| SCAN procedure                                                      | Yes                                                                                                                       |
| Program alarms                                                      | Yes                                                                                                                       |
| Process diagnostic messages                                         | Yes                                                                                                                       |
| simultaneously active Alarm-S blocks, max.                          | 1 000; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks                                                       |
| Alarm 8-blocks                                                      | Yes                                                                                                                       |
| • Number of instances for alarm 8 and S7 communication blocks, max. | 4 000                                                                                                                     |
| • preset, max.                                                      | 600                                                                                                                       |
| Process control messages                                            | Yes                                                                                                                       |
| Number of archives that can log on simultaneously (SFB 37 AR_SEND)  | 32                                                                                                                        |
| Number of messages                                                  |                                                                                                                           |
| • overall, max.                                                     | 1 024                                                                                                                     |
| • in 100 ms grid, max.                                              | 128                                                                                                                       |
| • in 500 ms grid, max.                                              | 512                                                                                                                       |
| • in 1000 ms grid, max.                                             | 1 024                                                                                                                     |
| Number of additional values                                         |                                                                                                                           |

|                                                                     |                                                                                                                                                                                                                 |
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| • with 100 ms grid, max.                                            | 1                                                                                                                                                                                                               |
| • with 500, 1000 ms grid, max.                                      | 10                                                                                                                                                                                                              |
| <b>Test commissioning functions</b>                                 |                                                                                                                                                                                                                 |
| Status block                                                        | Yes; Up to 16 simultaneously                                                                                                                                                                                    |
| Single step                                                         | Yes                                                                                                                                                                                                             |
| Number of breakpoints                                               | 16                                                                                                                                                                                                              |
| <b>Status/control</b>                                               |                                                                                                                                                                                                                 |
| • Status/control variable                                           | Yes; Up to 16 variable tables                                                                                                                                                                                   |
| • Variables                                                         | Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters                                                                                                                                            |
| • Number of variables, max.                                         | 70; Status/control                                                                                                                                                                                              |
| <b>Forcing</b>                                                      |                                                                                                                                                                                                                 |
| • Forcing                                                           | Yes                                                                                                                                                                                                             |
| • Forcing, variables                                                | Inputs, outputs, bit memories, peripheral inputs, peripheral outputs                                                                                                                                            |
| • Number of variables, max.                                         | 512                                                                                                                                                                                                             |
| <b>Diagnostic buffer</b>                                            |                                                                                                                                                                                                                 |
| • present                                                           | Yes                                                                                                                                                                                                             |
| • Number of entries, max.                                           | 3 200                                                                                                                                                                                                           |
| — adjustable                                                        | Yes                                                                                                                                                                                                             |
| — preset                                                            | 120                                                                                                                                                                                                             |
| <b>Service data</b>                                                 |                                                                                                                                                                                                                 |
| • can be read out                                                   | Yes                                                                                                                                                                                                             |
| <b>Standards, approvals, certificates</b>                           |                                                                                                                                                                                                                 |
| CE mark                                                             | Yes                                                                                                                                                                                                             |
| EAC (formerly Gost-R)                                               | Yes                                                                                                                                                                                                             |
| <b>Ambient conditions</b>                                           |                                                                                                                                                                                                                 |
| <b>Ambient temperature during operation</b>                         |                                                                                                                                                                                                                 |
| • min.                                                              | -25 °C; = Tmin                                                                                                                                                                                                  |
| • max.                                                              | 70 °C; = Tmax                                                                                                                                                                                                   |
| <b>Altitude during operation relating to sea level</b>              |                                                                                                                                                                                                                 |
| • Installation altitude above sea level, max.                       | 5 000 m                                                                                                                                                                                                         |
| • Ambient air temperature-barometric pressure-altitude              | Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m) |
| <b>Relative humidity</b>                                            |                                                                                                                                                                                                                 |
| • With condensation, tested in accordance with IEC 60068-2-38, max. | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation                                                                                                               |
| <b>Resistance</b>                                                   |                                                                                                                                                                                                                 |
| <b>Use in stationary industrial systems</b>                         |                                                                                                                                                                                                                 |
| — to biologically active substances according to EN 60721-3-3       | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request                                                                                                              |

|                                                                                                                         |                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| — to chemically active substances according to EN 60721-3-3                                                             | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *                                                                                            |
| — to mechanically active substances according to EN 60721-3-3                                                           | Yes; Class 3S4 incl. sand, dust, *                                                                                                                                                  |
| <b>Use on ships/at sea</b>                                                                                              |                                                                                                                                                                                     |
| — to biologically active substances according to EN 60721-3-6                                                           | Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request                                                                                                       |
| — to chemically active substances according to EN 60721-3-6                                                             | Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *                                                                                            |
| — to mechanically active substances according to EN 60721-3-6                                                           | Yes; Class 6S3 incl. sand, dust; *                                                                                                                                                  |
| <b>Usage in industrial process technology</b>                                                                           |                                                                                                                                                                                     |
| — Against chemically active substances acc. to EN 60654-4                                                               | Yes; Class 3 (excluding trichlorethylene)                                                                                                                                           |
| — Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04                            | Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil) |
| <b>Remark</b>                                                                                                           |                                                                                                                                                                                     |
| — Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04             | * The supplied plug covers must remain in place over the unused interfaces during operation!                                                                                        |
| <b>Conformal coating</b>                                                                                                |                                                                                                                                                                                     |
| • Coatings for printed circuit board assemblies acc. to EN 61086                                                        | Yes; Class 2 for high reliability                                                                                                                                                   |
| • Protection against fouling acc. to EN 60664-3                                                                         | Yes; Type 1 protection                                                                                                                                                              |
| • Military testing according to MIL-I-46058C, Amendment 7                                                               | Yes; Discoloration of coating possible during service life                                                                                                                          |
| • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A | Yes; Conformal coating, Class A                                                                                                                                                     |
| <b>Configuration</b>                                                                                                    |                                                                                                                                                                                     |
| <b>Configuration software</b>                                                                                           |                                                                                                                                                                                     |
| • STEP 7                                                                                                                | Yes                                                                                                                                                                                 |
| <b>Programming</b>                                                                                                      |                                                                                                                                                                                     |
| • Command set                                                                                                           | see instruction list                                                                                                                                                                |
| • Nesting levels                                                                                                        | 7                                                                                                                                                                                   |
| • Access to consistent data in process image                                                                            | Yes                                                                                                                                                                                 |
| • 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                                                                           |
| Number of simultaneously active SFCs          |                                                                               |
| — DPSYC_FR                                    | 2; SFC 11; per interface                                                      |
| — D_ACT_DP                                    | 8; SFC 12; per interface                                                      |
| — RD_REC                                      | 8; SFC 59; per interface                                                      |
| — WR_REC                                      | 8; SFC 58; per interface                                                      |
| — WR_PARM                                     | 8; SFC 55; per interface                                                      |
| — PARM_MOD                                    | 1; SFC 57; per interface                                                      |
| — WR_DPARM                                    | 2; SFC 56; per interface                                                      |
| — DPNRM_DG                                    | 8; SFC 13; per interface                                                      |
| — RDSYSST                                     | 8; SFC 51                                                                     |
| — DP_TOPOL                                    | 1; SFC 103; per interface                                                     |
| Number of simultaneously active SFBs          |                                                                               |
| — RDREC                                       | 8; SFB 52; per interface, but not more than 32 across all external interfaces |
| — WRREC                                       | 8; SFB 53; per interface, but not more than 32 across all external interfaces |
| Know-how protection                           |                                                                               |
| • User program protection/password protection | Yes                                                                           |
| • Block encryption                            | Yes; With S7 block Privacy                                                    |
| Dimensions                                    |                                                                               |
| Width                                         | 50 mm                                                                         |
| Height                                        | 290 mm                                                                        |
| Depth                                         | 219 mm                                                                        |
| Weights                                       |                                                                               |
| Weight, approx.                               | 900 g                                                                         |
| <b>last modified:</b>                         | 06/22/2020                                                                    |