

MANUFACTURER DOCUMENT PACKAGE

# Manufacturer's Manual

---

S7-300

**6ES7313-6CG04-0AB0**

CPU 313C-2 DP COMPACT CONTROLLER

Applicable product family: SIMATIC S7-300 automation systems

OFFICIAL SOURCE

6ES7313-6CG04-0AB0.pdf

The following pages are selected from the supplied manufacturer document and retain their original page content.



SIMATIC S7-300, CPU 313C-2 DP Compact CPU with MPI, 16 DI/16 DO, 3 high-speed counters (30 kHz), integrated DP interface, Integr. power supply 24 V DC, work memory 128 KB, Front connector (1x 40-pole) and Micro Memory Card required

| General information                                         |                                                                                         |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| HW functional status                                        | 01                                                                                      |
| Firmware version                                            | V3.3                                                                                    |
| Engineering with                                            |                                                                                         |
| • Programming package                                       | STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203                 |
| Supply voltage                                              |                                                                                         |
| Rated value (DC)                                            | 24 V                                                                                    |
| permissible range, lower limit (DC)                         | 19.2 V                                                                                  |
| permissible range, upper limit (DC)                         | 28.8 V                                                                                  |
| external protection for power supply lines (recommendation) | Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A |
| Mains buffering                                             |                                                                                         |
| • Mains/voltage failure stored energy time                  | 5 ms                                                                                    |
| • Repeat rate, min.                                         | 1 s                                                                                     |
| Load voltage L+                                             |                                                                                         |
| Digital inputs                                              |                                                                                         |
| — Rated value (DC)                                          | 24 V                                                                                    |
| — Reverse polarity protection                               | Yes                                                                                     |
| Digital outputs                                             |                                                                                         |
| — Rated value (DC)                                          | 24 V                                                                                    |
| — Reverse polarity protection                               | No                                                                                      |
| Input current                                               |                                                                                         |
| Current consumption (rated value)                           | 800 mA                                                                                  |
| Current consumption (in no-load operation), typ.            | 110 mA                                                                                  |
| Inrush current, typ.                                        | 5 A                                                                                     |
| I <sup>2</sup> t                                            | 0.7 A <sup>2</sup> ·s                                                                   |
| Digital inputs                                              |                                                                                         |
| • from load voltage L+ (without load), max.                 | 80 mA                                                                                   |
| Digital outputs                                             |                                                                                         |
| • from load voltage L+, max.                                | 50 mA                                                                                   |
| Power loss                                                  |                                                                                         |
| Power loss, typ.                                            | 9 W                                                                                     |
| Memory                                                      |                                                                                         |
| Work memory                                                 |                                                                                         |
| • integrated                                                | 128 kbyte                                                                               |
| • expandable                                                | No                                                                                      |
| Load memory                                                 |                                                                                         |
| • Plug-in (MMC)                                             | Yes                                                                                     |
| • Plug-in (MMC), max.                                       | 8 Mbyte                                                                                 |
| • Data management on MMC (after last                        | 10 a                                                                                    |

|                                               |                                                                                               |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------|
| programming), min.                            |                                                                                               |
| <b>Backup</b>                                 |                                                                                               |
| • present                                     | Yes; Guaranteed by MMC (maintenance-free)                                                     |
| • without battery                             | Yes; Program and data                                                                         |
| <b>CPU processing times</b>                   |                                                                                               |
| for bit operations, typ.                      | 0.07 µs                                                                                       |
| for word operations, typ.                     | 0.15 µs                                                                                       |
| for fixed point arithmetic, typ.              | 0.2 µs                                                                                        |
| for floating point arithmetic, typ.           | 0.72 µs                                                                                       |
| <b>CPU-blocks</b>                             |                                                                                               |
| Number of blocks (total)                      | 1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. |
| <b>DB</b>                                     |                                                                                               |
| • Number, max.                                | 1 024; Number range: 1 to 16000                                                               |
| • Size, max.                                  | 64 kbyte                                                                                      |
| <b>FB</b>                                     |                                                                                               |
| • Number, max.                                | 1 024; Number range: 0 to 7999                                                                |
| • Size, max.                                  | 64 kbyte                                                                                      |
| <b>FC</b>                                     |                                                                                               |
| • Number, max.                                | 1 024; Number range: 0 to 7999                                                                |
| • Size, max.                                  | 64 kbyte                                                                                      |
| <b>OB</b>                                     |                                                                                               |
| • Number, max.                                | see instruction list                                                                          |
| • Size, max.                                  | 64 kbyte                                                                                      |
| • Number of free cycle OBs                    | 1; OB 1                                                                                       |
| • Number of time alarm OBs                    | 1; OB 10                                                                                      |
| • Number of delay alarm OBs                   | 2; OB 20, 21                                                                                  |
| • Number of cyclic interrupt OBs              | 4; OB 32, 33, 34, 35                                                                          |
| • Number of process alarm OBs                 | 1; OB 40                                                                                      |
| • Number of DPV1 alarm OBs                    | 3; OB 55, 56, 57                                                                              |
| • Number of startup OBs                       | 1; OB 100                                                                                     |
| • Number of asynchronous error OBs            | 5; OB 80, 82, 85, 86, 87                                                                      |
| • Number of synchronous error OBs             | 2; OB 121, 122                                                                                |
| <b>Nesting depth</b>                          |                                                                                               |
| • per priority class                          | 16                                                                                            |
| • additional within an error OB               | 4                                                                                             |
| <b>Counters, timers and their retentivity</b> |                                                                                               |
| <b>S7 counter</b>                             |                                                                                               |
| • Number                                      | 256                                                                                           |
| <b>Retentivity</b>                            |                                                                                               |
| — adjustable                                  | Yes                                                                                           |
| — lower limit                                 | 0                                                                                             |
| — upper limit                                 | 255                                                                                           |
| — preset                                      | Z 0 to Z 7                                                                                    |
| <b>Counting range</b>                         |                                                                                               |
| — lower limit                                 | 0                                                                                             |
| — upper limit                                 | 999                                                                                           |
| <b>IEC counter</b>                            |                                                                                               |
| • present                                     | Yes                                                                                           |
| • Type                                        | SFB                                                                                           |
| • Number                                      | Unlimited (limited only by RAM capacity)                                                      |
| <b>S7 times</b>                               |                                                                                               |
| • Number                                      | 256                                                                                           |
| <b>Retentivity</b>                            |                                                                                               |
| — adjustable                                  | Yes                                                                                           |
| — lower limit                                 | 0                                                                                             |
| — upper limit                                 | 255                                                                                           |
| — preset                                      | No retentivity                                                                                |
| <b>Time range</b>                             |                                                                                               |
| — lower limit                                 | 10 ms                                                                                         |
| — upper limit                                 | 9 990 s                                                                                       |
| <b>IEC timer</b>                              |                                                                                               |
| • present                                     | Yes                                                                                           |

|                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Type</li> <li>• Number</li> </ul>                                                                                                                                                                                                                              | SFB<br>Unlimited (limited only by RAM capacity)                                                                                                                                             |
| <b>Data areas and their retentivity</b>                                                                                                                                                                                                                                                                 |                                                                                                                                                                                             |
| Retentive data area (incl. timers, counters, flags), max.                                                                                                                                                                                                                                               | 64 kbyte                                                                                                                                                                                    |
| <b>Flag</b>                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Size, max.</li> <li>• Retentivity available</li> <li>• Retentivity preset</li> <li>• Number of clock memories</li> </ul>                                                                                                                                       | 256 byte<br>Yes; MB 0 to MB 255<br>MB 0 to MB 15<br>8; 1 memory byte                                                                                                                        |
| <b>Data blocks</b>                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Retentivity adjustable</li> <li>• Retentivity preset</li> </ul>                                                                                                                                                                                                | Yes; via non-retain property on DB<br>Yes                                                                                                                                                   |
| <b>Local data</b>                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• per priority class, max.</li> </ul>                                                                                                                                                                                                                            | 32 kbyte; Max. 2048 bytes per block                                                                                                                                                         |
| <b>Address area</b>                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                             |
| <b>I/O address area</b>                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Inputs</li> <li>• Outputs</li> </ul>                                                                                                                                                                                                                           | 2 048 byte<br>2 048 byte                                                                                                                                                                    |
| <b>of which distributed</b>                                                                                                                                                                                                                                                                             |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>— Inputs</li> <li>— Outputs</li> </ul>                                                                                                                                                                                                                           | 2 030 byte<br>2 030 byte                                                                                                                                                                    |
| <b>Process image</b>                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Inputs</li> <li>• Outputs</li> <li>• Inputs, adjustable</li> <li>• Outputs, adjustable</li> <li>• Inputs, default</li> <li>• Outputs, default</li> </ul>                                                                                                       | 2 048 byte<br>2 048 byte<br>2 048 byte<br>2 048 byte<br>128 byte<br>128 byte                                                                                                                |
| <b>Default addresses of the integrated channels</b>                                                                                                                                                                                                                                                     |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>— Digital inputs</li> <li>— Digital outputs</li> </ul>                                                                                                                                                                                                           | 124.0 to 125.7<br>124.0 to 125.7                                                                                                                                                            |
| <b>Digital channels</b>                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Inputs</li> <li>— of which central</li> <li>• Outputs</li> <li>— of which central</li> </ul>                                                                                                                                                                   | 16 256<br>1 008<br>16 256<br>1 008                                                                                                                                                          |
| <b>Analog channels</b>                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Inputs</li> <li>— of which central</li> <li>• Outputs</li> <li>— of which central</li> </ul>                                                                                                                                                                   | 1 015<br>248<br>1 015<br>248                                                                                                                                                                |
| <b>Hardware configuration</b>                                                                                                                                                                                                                                                                           |                                                                                                                                                                                             |
| Number of expansion units, max.                                                                                                                                                                                                                                                                         | 3                                                                                                                                                                                           |
| <b>Number of DP masters</b>                                                                                                                                                                                                                                                                             |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• integrated</li> <li>• via CP</li> </ul>                                                                                                                                                                                                                        | 1<br>4                                                                                                                                                                                      |
| <b>Number of operable FMs and CPs (recommended)</b>                                                                                                                                                                                                                                                     |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• FM</li> <li>• CP, PtP</li> <li>• CP, LAN</li> </ul>                                                                                                                                                                                                            | 8<br>8<br>6                                                                                                                                                                                 |
| <b>Rack</b>                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Racks, max.</li> <li>• Modules per rack, max.</li> </ul>                                                                                                                                                                                                       | 4<br>8; In rack 3 max. 7                                                                                                                                                                    |
| <b>Time of day</b>                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                             |
| <b>Clock</b>                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Hardware clock (real-time)</li> <li>• retentive and synchronizable</li> <li>• Backup time</li> <li>• Deviation per day, max.</li> <li>• Behavior of the clock following POWER-ON</li> <li>• Behavior of the clock following expiry of backup period</li> </ul> | Yes<br>Yes<br>6 wk; At 40 °C ambient temperature<br>10 s; Typ.: 2 s<br>Clock continues running after POWER OFF<br>the clock continues at the time of day it had when power was switched off |
| <b>Operating hours counter</b>                                                                                                                                                                                                                                                                          |                                                                                                                                                                                             |

|                                                                                                                                                                                                                    |                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Number</li> <li>• Number/Number range</li> <li>• Range of values</li> <li>• Granularity</li> <li>• retentive</li> </ul>                                                   | 1<br>0<br>0 to 2 <sup>31</sup> hours (when using SFC 101)<br>1 h<br>Yes; Must be restarted at each restart                                                                                                                                |
| <b>Clock synchronization</b>                                                                                                                                                                                       |                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• supported</li> <li>• to MPI, master</li> <li>• to MPI, slave</li> <li>• to DP, master</li> <li>• to DP, slave</li> <li>• in AS, master</li> <li>• in AS, slave</li> </ul> | Yes<br>Yes<br>Yes<br>Yes; With DP slave only slave clock<br>Yes<br>Yes<br>No                                                                                                                                                              |
| <b>Digital inputs</b>                                                                                                                                                                                              |                                                                                                                                                                                                                                           |
| Number of digital inputs                                                                                                                                                                                           | 16                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>• of which inputs usable for technological functions</li> </ul>                                                                                                             | 12                                                                                                                                                                                                                                        |
| integrated channels (DI)                                                                                                                                                                                           | 16                                                                                                                                                                                                                                        |
| Input characteristic curve in accordance with IEC 61131, type 1                                                                                                                                                    | Yes                                                                                                                                                                                                                                       |
| <b>Number of simultaneously controllable inputs</b>                                                                                                                                                                |                                                                                                                                                                                                                                           |
| <b>horizontal installation</b>                                                                                                                                                                                     |                                                                                                                                                                                                                                           |
| — up to 40 °C, max.                                                                                                                                                                                                | 16                                                                                                                                                                                                                                        |
| — up to 60 °C, max.                                                                                                                                                                                                | 8                                                                                                                                                                                                                                         |
| <b>vertical installation</b>                                                                                                                                                                                       |                                                                                                                                                                                                                                           |
| — up to 40 °C, max.                                                                                                                                                                                                | 8                                                                                                                                                                                                                                         |
| <b>Input voltage</b>                                                                                                                                                                                               |                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• Rated value (DC)</li> <li>• for signal "0"</li> <li>• for signal "1"</li> </ul>                                                                                           | 24 V<br>-3 to +5V<br>+15 to +30 V                                                                                                                                                                                                         |
| <b>Input current</b>                                                                                                                                                                                               |                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>                                                                                                                                           | 8 mA                                                                                                                                                                                                                                      |
| <b>Input delay (for rated value of input voltage)</b>                                                                                                                                                              |                                                                                                                                                                                                                                           |
| <b>for standard inputs</b>                                                                                                                                                                                         |                                                                                                                                                                                                                                           |
| — parameterizable                                                                                                                                                                                                  | Yes; 0.1 / 0.3 / 3 / 15 ms (You can reconfigure the input delay of the standard inputs during program runtime. Please note that under certain circumstances your newly set filter time may not be effective until the next filter cycle.) |
| — Rated value                                                                                                                                                                                                      | 3 ms                                                                                                                                                                                                                                      |
| <b>for technological functions</b>                                                                                                                                                                                 |                                                                                                                                                                                                                                           |
| — at "0" to "1", max.                                                                                                                                                                                              | 16 µs; Minimum pulse width/minimum pause between pulses at maximum counting frequency                                                                                                                                                     |
| <b>Cable length</b>                                                                                                                                                                                                |                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• shielded, max.</li> <li>• unshielded, max.</li> </ul>                                                                                                                     | 1 000 m; 100 m for technological functions<br>600 m; for technological functions: No                                                                                                                                                      |
| <b>for technological functions</b>                                                                                                                                                                                 |                                                                                                                                                                                                                                           |
| — shielded, max.                                                                                                                                                                                                   | 100 m; at maximum count frequency                                                                                                                                                                                                         |
| — unshielded, max.                                                                                                                                                                                                 | not allowed                                                                                                                                                                                                                               |
| <b>Digital outputs</b>                                                                                                                                                                                             |                                                                                                                                                                                                                                           |
| Number of digital outputs                                                                                                                                                                                          | 16                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>• of which high-speed outputs</li> </ul>                                                                                                                                    | 4; Notice: You cannot connect the fast outputs of your CPU in parallel                                                                                                                                                                    |
| integrated channels (DO)                                                                                                                                                                                           | 16                                                                                                                                                                                                                                        |
| Short-circuit protection                                                                                                                                                                                           | Yes; Clocked electronically                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>• Response threshold, typ.</li> </ul>                                                                                                                                       | 1 A                                                                                                                                                                                                                                       |
| Limitation of inductive shutdown voltage to                                                                                                                                                                        | L+ (-48 V)                                                                                                                                                                                                                                |
| Controlling a digital input                                                                                                                                                                                        | Yes                                                                                                                                                                                                                                       |
| <b>Switching capacity of the outputs</b>                                                                                                                                                                           |                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• on lamp load, max.</li> </ul>                                                                                                                                             | 5 W                                                                                                                                                                                                                                       |
| <b>Load resistance range</b>                                                                                                                                                                                       |                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• lower limit</li> <li>• upper limit</li> </ul>                                                                                                                             | 48 Ω<br>4 kΩ                                                                                                                                                                                                                              |
| <b>Output voltage</b>                                                                                                                                                                                              |                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• for signal "1", min.</li> </ul>                                                                                                                                           | L+ (-0.8 V)                                                                                                                                                                                                                               |
| <b>Output current</b>                                                                                                                                                                                              |                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• for signal "1" rated value</li> </ul>                                                                                                                                     | 500 mA                                                                                                                                                                                                                                    |

|                                                                                                                                                                                                                                              |                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| <ul style="list-style-type: none"> <li>• for signal "1" permissible range, min.</li> <li>• for signal "1" permissible range, max.</li> <li>• for signal "1" minimum load current</li> <li>• for signal "0" residual current, max.</li> </ul> | 5 mA<br>0.6 A<br>5 mA<br>0.5 mA          |
| <b>Parallel switching of two outputs</b>                                                                                                                                                                                                     |                                          |
| <ul style="list-style-type: none"> <li>• for uprating</li> <li>• for redundant control of a load</li> </ul>                                                                                                                                  | No<br>Yes                                |
| <b>Switching frequency</b>                                                                                                                                                                                                                   |                                          |
| <ul style="list-style-type: none"> <li>• with resistive load, max.</li> <li>• with inductive load, max.</li> <li>• on lamp load, max.</li> <li>• of the pulse outputs, with resistive load, max.</li> </ul>                                  | 100 Hz<br>0.5 Hz<br>100 Hz<br>2.5 kHz    |
| <b>Total current of the outputs (per group)</b>                                                                                                                                                                                              |                                          |
| <b>horizontal installation</b>                                                                                                                                                                                                               |                                          |
| — up to 40 °C, max.                                                                                                                                                                                                                          | 3 A                                      |
| — up to 60 °C, max.                                                                                                                                                                                                                          | 2 A                                      |
| <b>vertical installation</b>                                                                                                                                                                                                                 |                                          |
| — up to 40 °C, max.                                                                                                                                                                                                                          | 2 A                                      |
| <b>Cable length</b>                                                                                                                                                                                                                          |                                          |
| <ul style="list-style-type: none"> <li>• shielded, max.</li> <li>• unshielded, max.</li> </ul>                                                                                                                                               | 1 000 m<br>600 m                         |
| <b>Analog inputs</b>                                                                                                                                                                                                                         |                                          |
| Number of analog inputs                                                                                                                                                                                                                      | 0                                        |
| integrated channels (AI)                                                                                                                                                                                                                     | 0                                        |
| <b>Analog outputs</b>                                                                                                                                                                                                                        |                                          |
| Number of analog outputs                                                                                                                                                                                                                     | 0                                        |
| integrated channels (AO)                                                                                                                                                                                                                     | 0                                        |
| <b>Encoder</b>                                                                                                                                                                                                                               |                                          |
| <b>Connectable encoders</b>                                                                                                                                                                                                                  |                                          |
| <ul style="list-style-type: none"> <li>• 2-wire sensor</li> <li>— permissible quiescent current (2-wire sensor), max.</li> </ul>                                                                                                             | Yes<br>1.5 mA                            |
| <b>Interfaces</b>                                                                                                                                                                                                                            |                                          |
| Number of industrial Ethernet interfaces                                                                                                                                                                                                     | 0                                        |
| Number of PROFINET interfaces                                                                                                                                                                                                                | 0                                        |
| Number of RS 485 interfaces                                                                                                                                                                                                                  | 2; MPI and PROFIBUS DP                   |
| Number of RS 422 interfaces                                                                                                                                                                                                                  | 0                                        |
| <b>1. Interface</b>                                                                                                                                                                                                                          |                                          |
| Interface type                                                                                                                                                                                                                               | Integrated RS 485 interface              |
| Isolated                                                                                                                                                                                                                                     | No                                       |
| <b>Interface types</b>                                                                                                                                                                                                                       |                                          |
| <ul style="list-style-type: none"> <li>• RS 485</li> <li>• Output current of the interface, max.</li> </ul>                                                                                                                                  | Yes<br>200 mA                            |
| <b>Protocols</b>                                                                                                                                                                                                                             |                                          |
| <ul style="list-style-type: none"> <li>• MPI</li> <li>• PROFIBUS DP master</li> <li>• PROFIBUS DP slave</li> <li>• Point-to-point connection</li> </ul>                                                                                      | Yes<br>No<br>No<br>No                    |
| <b>MPI</b>                                                                                                                                                                                                                                   |                                          |
| <ul style="list-style-type: none"> <li>• Transmission rate, max.</li> </ul>                                                                                                                                                                  | 187.5 kbit/s                             |
| <b>Services</b>                                                                                                                                                                                                                              |                                          |
| — PG/OP communication                                                                                                                                                                                                                        | Yes                                      |
| — Routing                                                                                                                                                                                                                                    | Yes                                      |
| — Global data communication                                                                                                                                                                                                                  | Yes                                      |
| — S7 basic communication                                                                                                                                                                                                                     | Yes                                      |
| — S7 communication                                                                                                                                                                                                                           | Yes; Only server, configured on one side |
| — S7 communication, as client                                                                                                                                                                                                                | No; but via CP and loadable FB           |
| — S7 communication, as server                                                                                                                                                                                                                | Yes                                      |
| <b>2. Interface</b>                                                                                                                                                                                                                          |                                          |
| Interface type                                                                                                                                                                                                                               | Integrated RS 485 interface              |
| Isolated                                                                                                                                                                                                                                     | Yes                                      |
| <b>Interface types</b>                                                                                                                                                                                                                       |                                          |

|                                                                              |                                                                                                                                            |
|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| • RS 485                                                                     | Yes                                                                                                                                        |
| • Output current of the interface, max.                                      | 200 mA                                                                                                                                     |
| <b>Protocols</b>                                                             |                                                                                                                                            |
| • MPI                                                                        | No                                                                                                                                         |
| • PROFINET IO Controller                                                     | No                                                                                                                                         |
| • PROFINET IO Device                                                         | No                                                                                                                                         |
| • PROFINET CBA                                                               | No                                                                                                                                         |
| • PROFIBUS DP master                                                         | Yes                                                                                                                                        |
| • PROFIBUS DP slave                                                          | Yes                                                                                                                                        |
| <b>PROFIBUS DP master</b>                                                    |                                                                                                                                            |
| • Transmission rate, max.                                                    | 12 Mbit/s                                                                                                                                  |
| • Number of DP slaves, max.                                                  | 124                                                                                                                                        |
| <b>Services</b>                                                              |                                                                                                                                            |
| — PG/OP communication                                                        | Yes                                                                                                                                        |
| — Routing                                                                    | Yes                                                                                                                                        |
| — Global data communication                                                  | No                                                                                                                                         |
| — S7 basic communication                                                     | Yes; 1 blocks only                                                                                                                         |
| — S7 communication                                                           | Yes; Yes (only server; connection configured at one end)                                                                                   |
| — S7 communication, as client                                                | No                                                                                                                                         |
| — S7 communication, as server                                                | Yes                                                                                                                                        |
| — Equidistance                                                               | Yes                                                                                                                                        |
| — Isochronous mode                                                           | No                                                                                                                                         |
| — SYNC/FREEZE                                                                | Yes                                                                                                                                        |
| — Activation/deactivation of DP slaves                                       | Yes                                                                                                                                        |
| — Number of DP slaves that can be simultaneously activated/deactivated, max. | 8                                                                                                                                          |
| — Direct data exchange (slave-to-slave communication)                        | Yes; as subscriber                                                                                                                         |
| — DPV1                                                                       | Yes                                                                                                                                        |
| <b>Address area</b>                                                          |                                                                                                                                            |
| — Inputs, max.                                                               | 2 kbyte                                                                                                                                    |
| — Outputs, max.                                                              | 2 kbyte                                                                                                                                    |
| <b>User data per DP slave</b>                                                |                                                                                                                                            |
| — Inputs, max.                                                               | 244 byte                                                                                                                                   |
| — Outputs, max.                                                              | 244 byte                                                                                                                                   |
| <b>PROFIBUS DP slave</b>                                                     |                                                                                                                                            |
| • GSD file                                                                   | The latest GSD file is available on the Internet ( <a href="http://www.siemens.com/profibus-gsd">http://www.siemens.com/profibus-gsd</a> ) |
| • Transmission rate, max.                                                    | 12 Mbit/s                                                                                                                                  |
| • automatic baud rate search                                                 | Yes; only with passive interface                                                                                                           |
| • Address area, max.                                                         | 32                                                                                                                                         |
| • User data per address area, max.                                           | 32 byte                                                                                                                                    |
| <b>Services</b>                                                              |                                                                                                                                            |
| — PG/OP communication                                                        | Yes                                                                                                                                        |
| — Routing                                                                    | Yes; Only with active interface                                                                                                            |
| — Global data communication                                                  | No                                                                                                                                         |
| — S7 basic communication                                                     | No                                                                                                                                         |
| — S7 communication                                                           | Yes; Yes (only server; connection configured at one end)                                                                                   |
| — S7 communication, as client                                                | No                                                                                                                                         |
| — S7 communication, as server                                                | Yes                                                                                                                                        |
| — Direct data exchange (slave-to-slave communication)                        | Yes                                                                                                                                        |
| — DPV1                                                                       | No                                                                                                                                         |
| <b>Transfer memory</b>                                                       |                                                                                                                                            |
| — Inputs                                                                     | 244 byte                                                                                                                                   |
| — Outputs                                                                    | 244 byte                                                                                                                                   |
| <b>Protocols</b>                                                             |                                                                                                                                            |
| PROFIsafe                                                                    | No                                                                                                                                         |
| <b>communication functions / header</b>                                      |                                                                                                                                            |
| PG/OP communication                                                          | Yes                                                                                                                                        |
| Data record routing                                                          | Yes                                                                                                                                        |
| <b>Global data communication</b>                                             |                                                                                                                                            |
| • supported                                                                  | Yes                                                                                                                                        |
| • Number of GD loops, max.                                                   | 8                                                                                                                                          |

|                                                      |                                                                                    |
|------------------------------------------------------|------------------------------------------------------------------------------------|
| • Number of GD packets, max.                         | 8                                                                                  |
| • Number of GD packets, transmitter, max.            | 8                                                                                  |
| • Number of GD packets, receiver, max.               | 8                                                                                  |
| • Size of GD packets, max.                           | 22 byte                                                                            |
| • Size of GD packet (of which consistent), max.      | 22 byte                                                                            |
| <b>S7 basic communication</b>                        |                                                                                    |
| • supported                                          | Yes                                                                                |
| • User data per job, max.                            | 76 byte                                                                            |
| • User data per job (of which consistent), max.      | 76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server) |
| <b>S7 communication</b>                              |                                                                                    |
| • supported                                          | Yes                                                                                |
| • as server                                          | Yes                                                                                |
| • as client                                          | Yes; Via CP and loadable FB                                                        |
| • User data per job, max.                            | 180 kbyte; With PUT/GET                                                            |
| • User data per job (of which consistent), max.      | 240 byte; as server                                                                |
| <b>S5 compatible communication</b>                   |                                                                                    |
| • supported                                          | Yes; via CP and loadable FC                                                        |
| <b>Number of connections</b>                         |                                                                                    |
| • overall                                            | 8                                                                                  |
| • usable for PG communication                        | 7                                                                                  |
| — reserved for PG communication                      | 1                                                                                  |
| — adjustable for PG communication, min.              | 1                                                                                  |
| — adjustable for PG communication, max.              | 7                                                                                  |
| • usable for OP communication                        | 7                                                                                  |
| — reserved for OP communication                      | 1                                                                                  |
| — adjustable for OP communication, min.              | 1                                                                                  |
| — adjustable for OP communication, max.              | 7                                                                                  |
| • usable for S7 basic communication                  | 4                                                                                  |
| — reserved for S7 basic communication                | 0                                                                                  |
| — adjustable for S7 basic communication, min.        | 0                                                                                  |
| — adjustable for S7 basic communication, max.        | 4                                                                                  |
| • usable for routing                                 | 4; max.                                                                            |
| <b>S7 message functions</b>                          |                                                                                    |
| Number of login stations for message functions, max. | 8; Depending on the configured connections for PG/OP and S7 basic communication    |
| Process diagnostic messages                          | Yes                                                                                |
| simultaneously active Alarm-S blocks, max.           | 300                                                                                |
| <b>Test commissioning functions</b>                  |                                                                                    |
| Status block                                         | Yes; Up to 2 simultaneously                                                        |
| Single step                                          | Yes                                                                                |
| Number of breakpoints                                | 4                                                                                  |
| <b>Status/control</b>                                |                                                                                    |
| • Status/control variable                            | Yes                                                                                |
| • Variables                                          | Inputs, outputs, memory bits, DB, times, counters                                  |
| • Number of variables, max.                          | 30                                                                                 |
| — of which status variables, max.                    | 30                                                                                 |
| — of which control variables, max.                   | 14                                                                                 |
| <b>Forcing</b>                                       |                                                                                    |
| • Forcing                                            | Yes                                                                                |
| • Forcing, variables                                 | Inputs, outputs                                                                    |
| • Number of variables, max.                          | 10                                                                                 |
| <b>Diagnostic buffer</b>                             |                                                                                    |
| • present                                            | Yes                                                                                |
| • Number of entries, max.                            | 500                                                                                |
| — adjustable                                         | No                                                                                 |
| — of which powerfail-proof                           | 100; Only the last 100 entries are retained                                        |
| • Number of entries readable in RUN, max.            | 499                                                                                |
| — adjustable                                         | Yes; From 10 to 499                                                                |
| — preset                                             | 10                                                                                 |
| <b>Service data</b>                                  |                                                                                    |
| • can be read out                                    | Yes                                                                                |
| <b>Interrupts/diagnostics/status information</b>     |                                                                                    |
| <b>Diagnostics indication LED</b>                    |                                                                                    |

|                                                                                                 |                                                                                               |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Status indicator digital input (green)</li> </ul>      | Yes                                                                                           |
| <ul style="list-style-type: none"> <li>• Status indicator digital output (green)</li> </ul>     | Yes                                                                                           |
| <b>Integrated Functions</b>                                                                     |                                                                                               |
| Frequency measurement                                                                           | Yes                                                                                           |
| <ul style="list-style-type: none"> <li>• Number of frequency meters</li> </ul>                  | 3; up to 30 kHz (see "Technological Functions" manual)                                        |
| controlled positioning                                                                          | No                                                                                            |
| integrated function blocks (closed-loop control)                                                | Yes; PID controller (see "Technological Functions" manual)                                    |
| PID controller                                                                                  | Yes                                                                                           |
| Number of pulse outputs                                                                         | 3; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)                |
| Limit frequency (pulse)                                                                         | 2.5 kHz                                                                                       |
| <b>Potential separation</b>                                                                     |                                                                                               |
| <b>Potential separation digital inputs</b>                                                      |                                                                                               |
| <ul style="list-style-type: none"> <li>• Potential separation digital inputs</li> </ul>         | Yes                                                                                           |
| <ul style="list-style-type: none"> <li>• between the channels</li> </ul>                        | No                                                                                            |
| <ul style="list-style-type: none"> <li>• between the channels and backplane bus</li> </ul>      | Yes                                                                                           |
| <b>Potential separation digital outputs</b>                                                     |                                                                                               |
| <ul style="list-style-type: none"> <li>• Potential separation digital outputs</li> </ul>        | Yes                                                                                           |
| <ul style="list-style-type: none"> <li>• between the channels</li> </ul>                        | Yes                                                                                           |
| <ul style="list-style-type: none"> <li>• between the channels, in groups of</li> </ul>          | 8                                                                                             |
| <ul style="list-style-type: none"> <li>• between the channels and backplane bus</li> </ul>      | Yes                                                                                           |
| <b>Isolation</b>                                                                                |                                                                                               |
| Isolation tested with                                                                           | 600 V DC                                                                                      |
| <b>Ambient conditions</b>                                                                       |                                                                                               |
| <b>Ambient temperature during operation</b>                                                     |                                                                                               |
| <ul style="list-style-type: none"> <li>• min.</li> </ul>                                        | 0 °C                                                                                          |
| <ul style="list-style-type: none"> <li>• max.</li> </ul>                                        | 60 °C                                                                                         |
| <b>configuration / header</b>                                                                   |                                                                                               |
| <b>Configuration software</b>                                                                   |                                                                                               |
| <ul style="list-style-type: none"> <li>• STEP 7</li> </ul>                                      | Yes; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203                  |
| <ul style="list-style-type: none"> <li>• STEP 7 Lite</li> </ul>                                 | No                                                                                            |
| <b>configuration / programming / header</b>                                                     |                                                                                               |
| <ul style="list-style-type: none"> <li>• Command set</li> </ul>                                 | see instruction list                                                                          |
| <ul style="list-style-type: none"> <li>• Nesting levels</li> </ul>                              | 8                                                                                             |
| <ul style="list-style-type: none"> <li>• System functions (SFC)</li> </ul>                      | see instruction list                                                                          |
| <ul style="list-style-type: none"> <li>• System function blocks (SFB)</li> </ul>                | see instruction list                                                                          |
| <b>Programming language</b>                                                                     |                                                                                               |
| — LAD                                                                                           | Yes                                                                                           |
| — FBD                                                                                           | Yes                                                                                           |
| — STL                                                                                           | Yes                                                                                           |
| — SCL                                                                                           | Yes                                                                                           |
| — CFC                                                                                           | Yes                                                                                           |
| — GRAPH                                                                                         | Yes                                                                                           |
| — HiGraph®                                                                                      | Yes                                                                                           |
| <b>Know-how protection</b>                                                                      |                                                                                               |
| <ul style="list-style-type: none"> <li>• User program protection/password protection</li> </ul> | Yes                                                                                           |
| <ul style="list-style-type: none"> <li>• Block encryption</li> </ul>                            | Yes; With S7 block Privacy                                                                    |
| <b>Dimensions</b>                                                                               |                                                                                               |
| Width                                                                                           | 80 mm                                                                                         |
| Height                                                                                          | 125 mm                                                                                        |
| Depth                                                                                           | 130 mm                                                                                        |
| <b>Weights</b>                                                                                  |                                                                                               |
| Weight, approx.                                                                                 | 500 g                                                                                         |
| <b>last modified:</b>                                                                           | 8/24/2021  |