## **SIEMENS**

## Data sheet

## 6ES7215-1AF40-0XB0

SIMATIC S7-1200F, CPU 1215 FC, COMPACT CPU, DC/DC/DC, 2 PROFINET PORT, ONBOARD I/O: 14 DI 24VDC; 10 DO 24V DC 0.5A; 2 AI 0-10V DC, 2 AO 0-20MA DC, POWER SUPPLY: DC 20.4 - 28.8 V DC, PROGRAM/DATA MEMORY 150 KB



| General information                                     |   |
|---|---|
| Product type designation                                | CPU 1215FC DC/DC/DC                           |
| Engineering with  |   |
| Programming package                                     | STEP 7 V13 SP1 or higher                      |
| Display   |   |
| with display  | No  |
| Supply voltage  |   |
| Rated value (DC)  |   |
| • 24 V DC   | Yes   |
| permissible range, lower limit (DC)                     | 20.4 V  |
| permissible range, upper limit (DC)                     | 28.8 V  |
| Load voltage L+   |   |
| • Rated value (DC)                                      | 24 V  |
| <ul> <li>permissible range, lower limit (DC)</li> </ul> | 20.4 V  |
| • permissible range, upper limit (DC)                   | 28.8 V  |
| Input current   |   |
| Current consumption, max.                               | 1 500 mA; max. with all expansion accessories |

| Inrush current, max.                                    | 12 A; at 28.8 V DC  |
|---|---|
|   |   |
| Encoder supply  24 V encoder supply                     |   |
|   | L+ minus 4 V DC min.  |
| • 24 V  | L+ minus 4 V DC min.  |
| Power loss  |   |
| Power loss, typ.  | 12 W  |
| Memory  |   |
| Work memory   |   |
| • integrated  | 150 kbyte   |
| • expandable  | No  |
| Load memory   |   |
| • integrated  | 4 Mbyte   |
| <ul> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul> | with SIMATIC memory card                                      |
| Backup  |   |
| • present   | Yes; maintenance-free   |
| without battery   | Yes   |
| ODL   |   |
| CPU processing times for bit operations, typ.           | 0.08 μs; / Operation  |
| for word operations, typ.                               |   |
| for floating point arithmetic, typ.                     | 1.7 µs; / Operation 2.3 µs; / Operation                       |
| tor hoating point antimietic, typ.                      | 2.0 µ3, / Operation   |
| CPU-blocks  |   |
| Number of blocks (total)                                | 1 024; DBs, FCs, FBs, counters and timers. The maximum        |
|   | number of addressable blocks ranges from 1 to 65535. There is |
| △D.   | no restriction, the entire working memory can be used         |
| OB  | Limited substitut DAM for each                                |
| Number, max.  | Limited only by RAM for code                                  |
| Data areas and their retentivity                        |   |
| retentive data area in total (incl. times, counters,    | 10 kbyte  |
| flags), max.  |   |
| Address area  |   |
| I/O address area  |   |
| • Inputs  | 1 024 byte  |
| Outputs   | 1 024 byte  |
| Process image   |   |
| Inputs, adjustable                                      | 1 024 kbyte   |
| Outputs, adjustable                                     | 1 024 kbyte   |
| Hardware configuration                                  |   |
| Hardware configuration                                  | 9: 2 comm modulos 1 cignal beard 9 cignal modulos             |
| Number of modules per system, max.                      | 8; 3 comm. modules, 1 signal board, 8 signal modules          |
| Time of day   |   |

|  | Clock  |   |
|--|--|---|
| • Deviation per day, max.  bigital inputs  Number of digital inputs  of which inputs usable for technological functions  integrated channels (DI)  m/b-reading  Number of simultaneously controllable inputs  all mounting positions  — up to 40 °C, max.  Input voltage  • Rated value (DC) • for signal "1"  for signal "1"  to for signal "1"  input delay (for rated value of input voltage)  for standard inputs  — at "0" to "1", min. — at "0" to "1", max.  for interrupt inputs  — parameterizable  For counter/technological functions — parameterizable  Selbel length  • shielded, max. • shielded, max.  • of which high-speed outputs  over the substitution of the outputs  • of which sigh-speed outputs  over the substitution of the outputs  over the resistive load, max. • on lamp load, max.    | Hardware clock (real-time clock)               | Yes   |
| Digital inputs  Number of digital inputs  of which inputs usable for technological functions  integrated channels (DI)  m/p-reading  Number of simultaneously controllable inputs  all mounting positions  — up to 40 °C, max.  Input voltage  Rated value (DC)  of ro signal "0"  of or signal "1"  input colleay (for rated value of input voltage)  for standard inputs  — parameterizable  — at "0" to "1", max.  for interrupt inputs  — parameterizable  — parameterizable  for counter/fechnological functions  — parameterizable  for counter/fechnological functions  — parameterizable  for counter/fechnological functions  — parameterizable  of which high-speed outputs  10  No; to be provided externally  No; to be provided externally  No; to be provided externally  which is a so which high-speed outputs  outputs  which is a so which a so which is | Backup time                                    | 480 h; typical; 12 days min. at 40 °C               |
| Number of digital inputs  of which inputs usable for technological functions  integrated channels (DI)  m/p-reading  Number of simultaneously controllable inputs  all mounting positions  — up to 40 °C, max.  Input voltage  Rated value (DC)  of ro signal "0"  of ro signal "1"  of ro signal "1", typ.  Input delay (for rated value of input voltage)  for standard inputs  — parameterizable  — at "0" to "1", max.  for interrupt inputs  — parameterizable  — parameterizable  of counter/technological functions  — parameterizable  of counter/technological functions  — parameterizable  of shielded, max.  of shielded, max.  of which high-speed outputs  integrated channels (DO)  short-circuit protection  No; to be provided externally  of which ligh-speed outputs  of which sigh-speed outputs  of which resistive load, max.  of which ligh-speed outputs  of which resistive load, max.  of which ligh-speed outputs  of which resistive load, max.  of which ligh-speed outputs  which is resistive load, max.  of which ligh-speed outputs  which resistive load, max.  of whice sight and the supputs  with resistive load, max.  of which ligh-speed outputs  with resistive load, max.  of which ligh-speed outputs  of | Deviation per day, max.                        | ±60 s per month                                     |
| of which inputs usable for technological functions  Integrated channels (DI)  My-reading  Number of simultaneously controllable inputs  all mounting positions  — up to 40 °C, max.  Input voltage  Rated value (DC)  of or signal "0"  of or signal "1"  of or signal "1"  of or signal "1", typ.  Input degree (or signal "1", typ.  Input degree (or signal "1", typ.  of signal "1", typ.  of or typ.  of or "1", typ.  of or       | Digital inputs                                 |   |
| functions integrated channels (DI) m/p-reading Number of simultaneously controllable inputs  all mounting positions — up to 40 °C, max.  Input voltage  • Rated value (DC) • for signal "0" • for signal "1" • for signal "1" • for signal "1", typ.  Input delay (for rated value of input voltage)  for standard inputs  — parameterizable — at "0" to "1", max. — at "0" to "1", max. — 20 ms  for interrupt inputs — parameterizable  For counter/technological functions — parameterizable  for counter/technological functions — parameterizable  for counter/technological functions — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  — parameterizable  for owner/technological functions  • with resistive load, max.   for technological functions: No  Digital outputs  • with resistive load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  | Number of digital inputs                       | 14  |
| M/p-reading Number of simultaneously controllable inputs  all mounting positions  — up to 40 °C, max.  14; 14 inputs at 55 °C horizontal or 45 °C vertical  Input voltage  Rated value (DC) • for signal "0" • for signal "1"  15 V DC at 1 mA  15 V DC at 2.5 mA  Input current • for signal "1", typ.  Input delay (for rated value of input voltage)  for standard inputs  — parameterizable  — at "0" to "1", min. — at "0" to "1", max.  20 ms  for interrupt inputs  — parameterizable  for counter/technological functions  • with resistive l  |  | 6; HSC (High Speed Counting)                        |
| Number of simultaneously controllable inputs  all mounting positions  — up to 40 °C, max.  14; 14 inputs at 55 °C horizontal or 45 °C vertical  Input voltage  • Rated value (DC) • for signal "0" • for signal "1"  15 V DC at 1 mA • for signal "1", typ.  Input current • for signal "1", typ.  4 mA; nominal  Input delay (for rated value of input voltage)  for standard inputs  — parameterizable  — at "0" to "1", min. — at "0" to "1", max.  20 ms  for interrupt inputs  — parameterizable  for counter/technological functions — parameterizable  for counter/technological functions — parameterizable  • shielded, max. • unshielded, max.  • of which high-speed outputs  • of which high-speed outputs • with resistive load, max. • on lamp load, max.  | integrated channels (DI)                       | 14  |
| all mounting positions  — up to 40 °C, max.  Input voltage  • Rated value (DC) • for signal "0" • for signal "1" • for signal "1" • for signal "1", typ.  Input delay (for rated value of input voltage)  for standard inputs  — parameterizable — at "0" to "1", max.  for interrupt inputs — parameterizable  for counter/technological functions — parameterizable  for counter/technological functions — parameterizable  for do "1", max.  20 ms  for interrupt inputs  — parameterizable  for counter/technological functions — parameterizable  for do "1", max.  20 ms  for interrupt inputs  — parameterizable  for do "1", max.  20 ms  for interrupt inputs  — parameterizable  for counter/technological functions — parameterizable  for do "1", max.  20 ms  for interrupt inputs  — parameterizable  for counter/technological functions  — parameterizable  for do "1", max.  20 ms  for interrupt inputs  — parameterizable  for counter/technological functions  — parameterizable  for do "1", max.  100 kHz & 3 at 30 kHz. & 3 at 30 kHz. differential: 3 at 80 kHz & 3 at 30 kHz.  Cable length  • shielded, max.  500 m; 50 m for technological functions: No  Digital outputs  Number of digital outputs  • of which high-speed outputs  • with resistive load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.   | m/p-reading                                    | Yes   |
| - up to 40 °C, max.  Input voltage  • Rated value (DC) • for signal "0" • for signal "1" • for signal "1"  Input current • for signal "1", typ.  Input delay (for rated value of input voltage)  for standard inputs  - parameterizable - at "0" to "1", min at "0" to "1", max.  for interrupt inputs  - parameterizable  yes  for counter/technological functions - parameterizable  • for counter/technological functions - parameterizable  • shielded, max. • unshielded, max.  • of which high-speed outputs  Number of digital outputs • of which high-speed outputs • with resistive load, max. • on lamp load, max. • on lamp load, max. • with resistive load, max. • on lamp load, max. • 14; 14 inputs at 55 °C horizontal or 45 °C vertical  14; 14 inputs at 55 °C horizontal or 45 °C vertical  14; 14 inputs at 55 °C horizontal or 45 °C vertical  15 V DC at 1 mA  5 V DC at 1 mA  5 V DC at 1 mA  5 V DC at 2.5 mA  Input careat max  5 V DC at 2.5 mA  Input careat max  5 V DC at 1 mA  5 V DC at 2.5 mA  Input careat max  5 V DC at 2.5 mA  Input careat max  5 V DC at 2.5 mA  Input careat max  5 V DC at 2.5 mA  Input careat max  5 V DC at 2.5 mA  Input careat max  5 V DC at 2.5 mA  Input careat max  5 V DC at 2.5 mA  Input careat max  5 V DC at 2.5 mA  Input careat max  5 V DC at 4 mA nominal  5 V DC at 4 mA  6 v DC at 4 mA  6 v DA A 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1  10 V DC at 2.5 mA  11 V DC at 2.5 mA  11 V DC at 2.5 mA  12 V DC at 4 mA  15 V DC at 4 mA  15 V DC at 4 mA  16 V DC at 4 mA  16 V DC at 2.5 mA  16 V DC at 4 mA  16 V DC at 4 mA  16 V DC at 4 mA  16 V DC at 2.5 mA  17 V DC at 2.5 mA  18 V DC at 4 mA  19 V DC at 2.5 mA  10 V DC at 2.5 mA  10 V DC at 4 mA  10 V DC at 4 mA  10 V DC at 2.5 mA  10 V DC at 4 mA      | Number of simultaneously controllable inputs   |   |
| Input voltage  | all mounting positions                         |   |
| Rated value (DC)     for signal "0"     for signal "1"     for signal "1"     for signal "1", typ.  Input current      for signal "1", typ.  Imput delay (for rated value of input voltage)  for standard inputs      — parameterizable      — at "0" to "1", max.      — at "0" to "1", max.      for interrupt inputs      — parameterizable      for counter/technological functions      — parameterizable      for other technological functions      — parameterizable      for will be shielded, max.      • unshielded, max.      • unshielded, max.      • of which high-speed outputs      • of which high-speed outputs      • with resistive load, max.      • unlamp load, max.      • on lamp load, max.      • on lamp load, max.      5 W         **Cable Length  | — up to 40 °C, max.                            | 14; 14 inputs at 55 °C horizontal or 45 °C vertical |
| • for signal "0" • for signal "1"  15 V DC at 1 mA  15 V DC at 2.5 mA  Input current  • for signal "1", typ.  4 mA; nominal  Input delay (for rated value of input voltage)  for standard inputs  — parameterizable  — at "0" to "1", min. — at "0" to "1", max.  20 ms  for interrupt inputs  — parameterizable  Yes  for counter/technological functions  — parameterizable  • shielded, max. • unshielded, max.  • of which high-speed outputs  Number of digital outputs  • of which high-speed outputs  • with resistive load, max. • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • V MA; nominal  10   | Input voltage                                  |   |
| • for signal "1" 15 ∨ DC at 2.5 mA  Input current • for signal "1", typ. 4 mA; nominal  Input delay (for rated value of input voltage)  for standard inputs — parameterizable 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms — at "0" to "1", min. 0.1 µs — at "0" to "1", max. 20 ms  for interrupt inputs — parameterizable Yes  for counter/technological functions — parameterizable Yes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz  Cable length • shielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; For technological functions: No  Digital outputs  Number of digital outputs 4; 100 kHz Pulse Train Output integrated channels (DO) 10  Short-circuit protection No; to be provided externally  Switching capacity of the outputs • with resistive load, max. 0.5 A • on lamp load, max. 5 W   | • Rated value (DC)                             | 24 V; DC at 4 mA nominal                            |
| Input current  • for signal "1", typ.  Input delay (for rated value of input voltage)  for standard inputs  — parameterizable  — at "0" to "1", min. — at "0" to "1", max.  20 ms  for interrupt inputs  — parameterizable  for counter/technological functions — parameterizable  • shielded, max.  • unshielded, max.  • unshielded, max.  • of which high-speed outputs  integrated channels (DO)  Short-circuit protection  No; to be provided externally  with resistive load, max. • on lamp load, max. • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • on lamp load, max.  • dun / 10.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1  /  | • for signal "0"                               | 5 V DC at 1 mA                                      |
| • for signal "1", typ.  Input delay (for rated value of input voltage)  for standard inputs  — parameterizable  0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 0.2 / 0.2 / 0.4 / 0.8 / 10.0 / 0.2 /   | • for signal "1"                               | 15 V DC at 2.5 mA                                   |
| Input delay (for rated value of input voltage)  for standard inputs  — parameterizable  — at "0" to "1", min. — at "0" to "1", max.  — parameterizable  — parameterizable  — at "0" to "1", max. — at "0" to "1", max. — at "0" to "1", max. — parameterizable  — parameterizable  — parameterizable  — yes  for counter/technological functions — parameterizable  — yes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz  Cable length  — shielded, max. — unshielded, max. — unshielded, max. — of which high-speed outputs  Number of digital outputs  Number of digital outputs  Number of digital outputs  Number of digital outputs — of which high-speed outputs integrated channels (DO)  Short-circuit protection  No; to be provided externally  Switching capacity of the outputs — with resistive load, max. — on lamp load, max. — 5 W   | Input current                                  |   |
| for standard inputs  — parameterizable  — parameterizable  — o.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs  — at "0" to "1", min. — at "0" to "1", max.  20 ms  for interrupt inputs  — parameterizable  Yes  for counter/technological functions — parameterizable  Yes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz.  Cable length  • shielded, max.  • unshielded, max.  500 m; 50 m for technological functions  • unshielded, max.  300 m; For technological functions: No  Digital outputs  Number of digital outputs  • of which high-speed outputs  10  • of which high-speed outputs  11  No; to be provided externally  Switching capacity of the outputs  • with resistive load, max. • on lamp load, max.  • on lamp load, max.  5 W  | • for signal "1", typ.                         | 4 mA; nominal                                       |
| - parameterizable  0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms  - at "0" to "1", min at "0" to "1", max. 20 ms  for interrupt inputs - parameterizable Yes  for counter/technological functions - parameterizable Yes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz.  Cable length  • shielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; For technological functions: No  Digital outputs  Number of digital outputs 10 • of which high-speed outputs 4; 100 kHz Pulse Train Output  integrated channels (DO) 10  Short-circuit protection No; to be provided externally  Switching capacity of the outputs • with resistive load, max. • on lamp load, max.  • on lamp load, max.   | Input delay (for rated value of input voltage) |   |
| / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms  — at "0" to "1", min. — at "0" to "1", max.  20 ms  for interrupt inputs — parameterizable for counter/technological functions — parameterizable  Yes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz  Cable length  • shielded, max. • unshielded, max.  • unshielded, max.  100 m; For technological functions: No  Digital outputs  Number of digital outputs  • of which high-speed outputs  10 • of which high-speed outputs  10 • of which high-speed outputs  10 No; to be provided externally  Switching capacity of the outputs  • with resistive load, max.  • on lamp load, max.  5 W  | for standard inputs                            |   |
| - at "0" to "1", max.  for interrupt inputs  - parameterizable  for counter/technological functions  - parameterizable  Yes; Single phase: 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz  Cable length  • shielded, max.  • unshielded, max.  • unshielded, max.  100 m; For technological functions: No  Digital outputs  Number of digital outputs  • of which high-speed outputs  integrated channels (DO)  Short-circuit protection  Switching capacity of the outputs  • with resistive load, max.  • on lamp load, max.  • on lamp load, max.  500 m; 50 m for technological functions  300 m; For technological functions: No   | — parameterizable                              |   |
| for interrupt inputs  — parameterizable  for counter/technological functions  — parameterizable  Yes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz  Cable length  • shielded, max.  • unshielded, max.  500 m; 50 m for technological functions  300 m; For technological functions: No  Digital outputs  Number of digital outputs  • of which high-speed outputs  integrated channels (DO)  Short-circuit protection  No; to be provided externally  Switching capacity of the outputs  • with resistive load, max.  • on lamp load, max.  • on lamp load, max.  5 W   | — at "0" to "1", min.                          | 0.1 µs  |
| - parameterizable Yes  for counter/technological functions - parameterizable Yes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz  Cable length  • shielded, max.  • unshielded, max.  500 m; 50 m for technological functions 300 m; For technological functions: No  Digital outputs  Number of digital outputs  • of which high-speed outputs  integrated channels (DO)  Short-circuit protection  No; to be provided externally  Switching capacity of the outputs  • with resistive load, max.  • on lamp load, max.  5 W  | — at "0" to "1", max.                          | 20 ms   |
| for counter/technological functions  — parameterizable  Yes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz  Cable length  • shielded, max.  • unshielded, max.  500 m; 50 m for technological functions  300 m; For technological functions: No  Digital outputs  Number of digital outputs  10  • of which high-speed outputs  integrated channels (DO)  Short-circuit protection  No; to be provided externally  Switching capacity of the outputs  • with resistive load, max.  • on lamp load, max.  500 m; 50 m for technological functions  4; 100 kHz Pulse Train Output  No; to be provided externally  Switching capacity of the outputs   | for interrupt inputs                           |   |
| — parameterizable Yes; Single phase : 3 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz  Cable length  ● shielded, max. 500 m; 50 m for technological functions  • unshielded, max. 300 m; For technological functions: No  Digital outputs  Number of digital outputs 10  • of which high-speed outputs 4; 100 kHz Pulse Train Output integrated channels (DO) 10  Short-circuit protection No; to be provided externally  Switching capacity of the outputs  • with resistive load, max. 0.5 A  • on lamp load, max. 5 W   | — parameterizable                              | Yes   |
| Cable length  • shielded, max.  • unshielded, max.  Soo m; 50 m for technological functions  • unshielded, max.  Digital outputs  Number of digital outputs  • of which high-speed outputs  integrated channels (DO)  Short-circuit protection  Switching capacity of the outputs  • with resistive load, max.  • on lamp load, max.  500 m; 50 m for technological functions  300 m; For technological functions: No  10  4; 100 kHz Pulse Train Output  No; to be provided externally  Switching capacity of the outputs  • with resistive load, max.  5 W   | for counter/technological functions            |   |
| <ul> <li>shielded, max.</li> <li>unshielded, max.</li> <li>300 m; For technological functions: No</li> </ul> Digital outputs <ul> <li>Number of digital outputs</li> <li>of which high-speed outputs</li> <li>integrated channels (DO)</li> <li>Short-circuit protection</li> <li>Switching capacity of the outputs</li> <li>with resistive load, max.</li> <li>on lamp load, max.</li> </ul> 500 m; 50 m for technological functions 4; 100 kHz Pulse Train Output No; to be provided externally Switching capacity of the outputs <ul> <li>on lamp load, max.</li> <li>5 W</li> </ul>  | — parameterizable                              |   |
| <ul> <li>unshielded, max.</li> <li>Digital outputs</li> <li>Number of digital outputs</li> <li>of which high-speed outputs</li> <li>integrated channels (DO)</li> <li>Short-circuit protection</li> <li>Switching capacity of the outputs</li> <li>with resistive load, max.</li> <li>on lamp load, max.</li> <li>300 m; For technological functions: No</li> <li>4; 100 kHz Pulse Train Output</li> <li>No; to be provided externally</li> <li>Switching capacity of the outputs</li> <li>on lamp load, max.</li> <li>5 W</li> </ul>  | Cable length                                   |   |
| Digital outputs  Number of digital outputs  of which high-speed outputs  integrated channels (DO)  Short-circuit protection  Switching capacity of the outputs  with resistive load, max.  on lamp load, max.  | • shielded, max.                               | 500 m; 50 m for technological functions             |
| Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection  No; to be provided externally  Switching capacity of the outputs  with resistive load, max.  on lamp load, max.   | • unshielded, max.                             | 300 m; For technological functions: No              |
| of which high-speed outputs     integrated channels (DO)     Short-circuit protection     No; to be provided externally  Switching capacity of the outputs      with resistive load, max.     on lamp load, max.  5 W  | Digital outputs                                |   |
| integrated channels (DO)  Short-circuit protection  No; to be provided externally  Switching capacity of the outputs  • with resistive load, max.  • on lamp load, max.  5 W   | Number of digital outputs                      | 10  |
| Short-circuit protection  No; to be provided externally  Switching capacity of the outputs  with resistive load, max.  on lamp load, max.  5 W   | <ul><li>of which high-speed outputs</li></ul>  | 4; 100 kHz Pulse Train Output                       |
| Switching capacity of the outputs   • with resistive load, max.  • on lamp load, max.  5 W   | integrated channels (DO)                       | 10  |
| <ul> <li>with resistive load, max.</li> <li>on lamp load, max.</li> <li>5 W</li> </ul>   | Short-circuit protection                       | No; to be provided externally                       |
| • on lamp load, max. 5 W   | Switching capacity of the outputs              |   |
| on any loss, man   | • with resistive load, max.                    | 0.5 A   |
| Output voltage   | ● on lamp load, max.                           | 5 W   |
|  | Output voltage                                 |   |

| • for signal "0", max.  | 0.1 V; with 10 kOhm load        |
|---|---------------------------------|
| • for signal "1", min.  | 20 V                            |
| Output current  |                                 |
| • for signal "1" rated value  | 0.5 A                           |
| • for signal "0" residual current, max.                             | 0.1 mA                          |
| Output delay with resistive load                                    |                                 |
| • "0" to "1", max.  | 1 µs                            |
| • "1" to "0", max.  | 3 µs                            |
| Switching frequency   |                                 |
| • of the pulse outputs, with resistive load, max.                   | 100 kHz                         |
| Cable length  |                                 |
| • shielded, max.  | 500 m                           |
| • unshielded, max.  | 150 m                           |
|   |                                 |
| Analog inputs   |                                 |
| Number of analog inputs   | 2: 0 to 10 /                    |
| integrated channels (AI)  | 2; 0 to 10V                     |
| Input ranges  | Yes                             |
| Voltage   | 165                             |
| Input ranges (rated values), voltages                               | Vaa                             |
| • 0 to +10 V  | Yes                             |
| • Input resistance (0 to 10 V)                                      | ≥100k ohms                      |
| Cable length  |                                 |
| • shielded, max.  | 100 m; twisted and shielded     |
| Analog outputs  |                                 |
| Number of analog outputs  | 2                               |
| integrated channels (AO)  | 2; 0 to 20 mA                   |
| Cable length  |                                 |
| • shielded, max.  | 100 m; shielded, twisted pair   |
| Analog value generation   |                                 |
| Integration and conversion time/resolution per channel              |                                 |
| <ul> <li>Resolution with overrange (bit including sign),</li> </ul> | 10 bit                          |
| max.  |                                 |
| Integration time, parameterizable                                   | Yes                             |
| Conversion time (per channel)                                       | 625 µs                          |
|   |                                 |
| Encoder   |                                 |
| Connectable encoders  | V                               |
| • 2-wire sensor   | Yes                             |
| 1. Interface  |                                 |
| Interface type  | PROFINET                        |
| Physics   | Ethernet, 2-port switch, 2*RJ45 |
|   |                                 |

| Isolated  | Yes  |
|---|--|
| automatic detection of transmission rate                                | Yes  |
| Autonegotiation   | Yes  |
| Autocrossing  | Yes  |
| Functionality   |  |
| <ul> <li>PROFINET IO Controller</li> </ul>                              | Yes  |
| <ul> <li>PROFINET IO Device</li> </ul>                                  | Yes  |
| PROFINET IO Controller  |  |
| Services  |  |
| <ul> <li>Number of IO devices with prioritized startup, max.</li> </ul> | 16   |
| Protocols   |  |
| Supports protocol for PROFINET IO                                       | Yes  |
| PROFIBUS  | Yes; CM 1243-5 required  |
| AS-Interface  | Yes  |
| Protocols (Ethernet)  |  |
| • TCP/IP  | Yes  |
| Further protocols   |  |
| • MODBUS  | Yes  |
| Communication functions   |  |
| S7 communication  |  |
| <ul><li>supported</li></ul>   | Yes  |
| • as server   | Yes  |
| • as client   | Yes  |
| Open IE communication   |  |
| • TCP/IP  | Yes  |
| • ISO-on-TCP (RFC1006)  | Yes  |
| • UDP   | Yes  |
| Web server  |  |
| • supported   | Yes  |
| <ul> <li>User-defined websites</li> </ul>                               | Yes  |
| Test commissioning functions  |  |
| Status/control  |  |
| Status/control variable   | Yes  |
| Variables   | Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters |
| Forcing   |  |
| • Forcing   | Yes  |
| Diagnostic buffer   |  |
| • present   | Yes  |
| Traces  |  |

| Number of configurable Traces  | 2; Up to 512 KB of data per trace are possible   |
|--|--|
| Integrated Functions   |  |
| Number of counters   | 6  |
| Counting frequency (counter) max.  | 100 kHz  |
| Frequency meter  | Yes  |
| controlled positioning   | Yes  |
| PID controller   | Yes  |
| Number of alarm inputs   | 4  |
| Number of pulse outputs  | 4  |
| Limit frequency (pulse)  | 100 kHz  |
| Potential separation   |  |
| Potential separation digital inputs  |  |
| <ul> <li>Potential separation digital inputs</li> </ul>  | Functional isolation (Optocoupler)   |
| Permissible potential difference   |  |
| between different circuits   | 500 V DC between 24 V DC and 5 V DC  |
| EMC  |  |
| Interference immunity against discharge of static electric   | city   |
| Interference immunity against discharge of   | Yes  |
| static electricity acc. to IEC 61000-4-2   |  |
| <ul> <li>Test voltage at air discharge</li> </ul>  | 8 kV   |
| <ul> <li>Test voltage at contact discharge</li> </ul>  | 6 kV   |
| Interference immunity to cable-borne interference  |  |
| <ul> <li>Interference immunity on supply lines acc. to<br/>IEC 61000-4-4</li> </ul>                  | Yes  |
| <ul> <li>Interference immunity on signal cables acc. to<br/>IEC 61000-4-4</li> </ul>                 | Yes  |
| Interference immunity against voltage surge  |  |
| • on the supply lines acc. to IEC 61000-4-5  | Yes  |
| Interference immunity against conducted variable distur  | bance induced by high-frequency fields   |
| <ul> <li>Interference immunity against high-frequency<br/>radiation acc. to IEC 61000-4-6</li> </ul> | Yes  |
| Emission of radio interference acc. to EN 55 011   |  |
| Limit class A, for use in industrial areas   | Yes; Group 1   |
| • Limit class B, for use in residential areas  | Yes; When appropriate measures are used to ensure compliance with the limits for Class B according to EN 55011 |
| Degree and class of protection   |  |
| Degree of protection acc. to EN 60529  |  |
| • IP20   | Yes  |
| Standards, approvals, certificates   |  |
| CE mark  | Yes  |
| UL approval  | Yes  |

| cULus  | Yes   |
|--|---|
| FM approval  | Yes   |
| RCM (formerly C-TICK)  | Yes   |
| Marine approval  | 100   |
| Marine approval  | Yes   |
|  |   |
| Ambient conditions   |   |
| Free fall  |   |
| Drop height, max. (in packaging)   | 0.3 m; five times, in product package   |
| Ambient temperature during operation   | 0.00  |
| • min.   | 0 °C  |
| • max.   | 55 °C   |
| <ul> <li>horizontal installation, min.</li> </ul>                              | 0°C   |
| <ul> <li>horizontal installation, max.</li> </ul>                              | 55 °C   |
| <ul><li>vertical installation, min.</li></ul>                                  | O°C   |
| <ul><li>vertical installation, max.</li></ul>                                  | 55 °C   |
| Ambient temperature during storage/transportation                              |   |
| • min.   | -40 °C  |
| • max.   | 70 °C   |
| Air pressure acc. to IEC 60068-2-13  |   |
| Operation, min.  | 795 hPa   |
| <ul> <li>Operation, max.</li> </ul>  | 1 080 hPa   |
| <ul> <li>Storage/transport, min.</li> </ul>                                    | 660 hPa   |
| <ul> <li>Storage/transport, max.</li> </ul>                                    | 1 080 hPa   |
| Relative humidity  |   |
| Operation, max.  | 95 %; no condensation   |
| <ul> <li>permissible range (without condensation) at 25</li> <li>°C</li> </ul> | 95 %  |
| Vibrations   |   |
| Vibrations   | 2G wall mounting, 1G DIN rail   |
| <ul> <li>Operation, tested according to IEC 60068-2-6</li> </ul>               | Yes   |
| Shock test   |   |
| • tested according to IEC 60068-2-27   | Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms |
| Extended ambient conditions  |   |
| Pollutant concentrations   |   |
| — SO2 at RH < 60% without condensation   | S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free                                |
| Configuration  |   |
| Programming  |   |
| Programming language   |   |
| — LAD  | Yes; incl. failsafe   |
| — FBD  | Yes; incl. failsafe   |
|  |   |

| — SCL                 | Yes        |
|-----------------------|------------|
| Cycle time monitoring |            |
| ● adjustable          | Yes        |
| Dimensions            |            |
| Width                 | 130 mm     |
| Height                | 100 mm     |
| Depth                 | 75 mm      |
| Weights               |            |
| Weight, approx.       | 520 g      |
| last modified:        | 24.02.2016 |