

## Specyfikacja układów sterownika PLC w ilości 2 sztuk

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### Specyfikacja układów sterownika PLC w ilości 2 sztuk

(poniżej wymieniono ilości dla pojedynczego zestawu, do oszacowania wartości dostawy, należy wszystkie ilości wymienione poniżej pomnożyć przez 2)

### PLC specification

(CPU + Digital Inputs + Digital Outputs + Analog Inputs + Analog Outputs + Communication modules) + HMI

#### CPU x1

Engineering with: STEP 7 TIA Portal

#### Supply voltage

Type of supply voltage: **24 V DC**

permissible range, lower limit (DC): **19.2 V**

permissible range, upper limit (DC): **28.8 V**

Reverse polarity protection: **Yes**

Mains/voltage failure stored energy time: **5 ms**

#### Input current

Current consumption (rated value): **0.6 A**

Inrush current, max.: **4.7 A**; Rated value

I<sup>2</sup>t: **0.14 A<sup>2</sup>·s**

#### Power:

Infeed power: **8.75 W**

Power loss: **5.6 W**

#### Memory:

Number of slots for memory card: **1**

Work memory integrated (for program): **100 kbyte**

Work memory integrated (for data): **750 kbyte**

Load memory: **Plug-in, max. 32 Gbyte**

#### CPU processing times

for bit operations: **72 ns**

for word operations: **86 ns**

for fixed point arithmetic: **115 ns**

for floating point arithmetic: **461 ns**

#### CPU-blocks

Number of elements (total): **4000**

**DB**

Number range: **1 ... 60 999**; subdivided into: number range that can be used by the user: **1 ... 59 999**, and number range of DBs created via SFC 86: **60 000 ... 60 999**  
Size, max.: **750 kbyte**; For DBs with absolute addressing, the max. size is **64 KB**

#### **FB**

Number range: **0 ... 65 535**

Size, max.: **100 kbyte**

#### **FC**

Number range: **0 ... 65 535**

Size, max.: **100 kbyte**

#### **OB**

Size, max.: **100 kbyte**

Number of free cycle OBs: **100**

Number of time alarm OBs: **20**

Number of delay alarm OBs: **20**

Number of cyclic interrupt OBs: **20**; With minimum OB 3x cycle of 500  $\mu$ s

Number of process alarm OBs: **50**

Number of DPV1 alarm OBs: **3**

Number of isochronous mode OBs: **1**

Number of technology synchronous alarm OBs: **2**

Number of startup OBs: **100**

Number of asynchronous error OBs: **4**

Number of synchronous error OBs: **2**

Number of diagnostic alarm OBs: **1**

#### **Nesting depth**

per priority class: **24**

### **Counters, timers and their retentivity**

#### **S7 counter**

Number: **2 048**

Retentivity adjustable: **Yes**

#### **IEC counter**

Number: **Any (only limited by the main memory)**

Retentivity adjustable: **Yes**

#### **S7 times**

Number: **2 048**

Retentivity adjustable: **Yes**

#### **IEC timer**

Number: **Any (only limited by the main memory)**

Retentivity adjustable: **Yes**

### **Data areas and their retentivity**

Retentive data area (incl. timers, counters, flags), max.: **128 kbyte**; Available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): **88 KB**

#### **Flag**

Size, max.: **16 kbyte**

Number of clock memories: **8**; **8 clock memory bit, grouped into one clock memory byte**

#### **Data blocks**

Retentivity adjustable: **Yes**

Retentivity preset: **No**

#### **Local data**

Per priority class, max. : 64 kbyte; max. 16 KB per block

### Address area

Number of IO modules: **1 024; max. number of modules / submodules**

### I/O address area

Inputs: **32 kbyte; All inputs are in the process image**

Outputs: **32 kbyte; All outputs are in the process image**

### Interfaces:

Number of PROFINET interfaces: **1**

Number of PROFIBUS interfaces: **1; Via CM DP module**

With optical interface: **No**

### Interface types

RJ 45 (Ethernet): **Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45**

Number of ports: **3; 1. integr. + 2. via BusAdapter**

integrated switch: **Yes**

BusAdapter (PROFINET): **Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12**

### Protocols

IP protocol: Yes; **IPv4**

PROFINET IO Controller: **Yes**

PROFINET IO Device: **Yes**

SIMATIC communication: **Yes**

Open IE communication: **Yes; Optionally also encrypted**

Web server: **Yes**

Media redundancy: **Yes; MRP Automanager according to IEC 62439-2 Edition 2.0**

### PROFINET IO Controller

#### Services

PG/OP communication: **Yes**

Isochronous mode: **Yes**

Direct data exchange: **Yes; Requirement: IRT and isochronous mode (MRPD optional)**

IRT: **Yes**

PROFINergy: **Yes; b**

Prioritized startup: **Yes; Max. 32 PROFINET devices**

Number of connectable IO Devices, max.: **64; In total, up to 256 distributed I/O devices can be connected via PROFIBUS or PROFINET**

Of which IO devices with IRT, max: **64**

Number of connectable IO Devices for RT, max.: **64**

of which in line, max.: **64**

Number of IO Devices that can be simultaneously activated/deactivated, max.: **8; in total across all interfaces**

Number of IO Devices per tool, max: **8**

Updating Times: **The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data**

### PROFINET IO Device

#### Services

PG/OP communication: **Yes**

Isochronous mode: **No**

IRT: **Yes**

PROFIenergy: **Yes; per user program**

Shared device: **Yes**

Number of IO Controllers with shared device, max.: **4**

activation/deactivation of I-devices: **Yes; per user program**

Asset management record: **Yes; per user program**

### **Interface types**

RS 485: **Yes; Via CM DP module**

Number of ports: **1**

### **Protocols**

PROFIBUS DP master: **Yes**

PROFIBUS DP slave: **Yes**

SIMATIC communication: **Yes**

### **PROFIBUS DP master**

Number of connections, max.: **48; Of which 4 each reserved for ES and HMI**

Number of DP slaves, max.: **125; In total, up to 256 distributed I/O devices can be connected via ASi, PROFIBUS or**

### **PROFINET**

### **Services**

PG/OP communication: **Yes**

Equidistance: **No**

Isochronous mode: **No**

Activation/deactivation of DP slaves: **Yes**

### **RJ 45 (Ethernet)**

100 Mbps: **Yes**

Autonegotiation: **Yes**

Autocrossing: **Yes**

Industrial Ethernet status LED: **Yes**

### **RS 485**

Transmission rate, max.: **12 Mbit/s**

### **Protocols**

PROFIsafe: **No**

### **Number of connections**

Number of connections, max.: **96; via integrated interfaces of the CPU and connected CPs / CMs**

Number of connections reserved for ES/HMI/web: **10**

Number of connections via integrated interfaces: **64**

Number of connections per CP/CM: **32**

Number of S7 routing paths: **16**

### **Web server**

HTTP: **Yes; Standard and user-defined pages**

HTTPS: **Yes; Standard and user-defined pages**

### **Test commissioning functions**

Joint commission (Team Engineering): **Yes; Parallel online access possible for up to 5 engineering systems**

Status block: **Yes; Up to 8 simultaneously (in total across all ES clients)**

Single step: **No**

Number of breakpoints: **8**

### Status/control

Status/control variable: **Yes**

Variables: **Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters**

Number of which status variables, max.: **200; per job**

Number of which control variables, max.: **200; per job**

### Forcing

Forcing: **Yes**

Forcing, variables: **Peripheral inputs/outputs**

Number of variables, max.: **200**

### Diagnostic buffer

present: **Yes**

Number of entries, max.: **1000**

Number of which powerfail-proof: **500**

### Traces

Number of configurable Traces: **4; Up to 512KB of data per trace are possible**

### Diagnostics indication LED

RUN/STOP LED: **Yes**

ERROR LED: **Yes**

MAINT LED: **Yes**

Monitoring of the supply voltage (PWR-LED): **Yes**

Connection display LINK TX/RX: **Yes**

### Supported technology objects

Motion Control: **Yes; ; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool**

Number of available Motion Control resources for technology objects: **800**

### Required Motion Control resources

per speed-controlled axis: **40**

per positioning axis: **80**

per synchronous axis: **160**

per external encoder: **80**

per output cam: **20**

per cam track: **160**

per probe: **40**

### Positioning axis

Number of positioning axes at motion control cycle of 4 ms (typical value): **5**

Number of positioning axes at motion control cycle of 8 ms (typical value): **10**

### Controller

PID\_Compact: **Yes; Universal PID controller with integrated optimization**

PID\_3Step: **Yes; PID controller with integrated optimization for valves**

PID-Temp: **Yes; PID controller with integrated optimization for temperature**

### Counting and measuring

High-speed counter: **Yes**

### Ambient temperature during operation

horizontal installation, min.: **-25 °C; No condensation**

horizontal installation, max.: **60 °C**

vertical installation, min.: **-25 °C; No condensation**

vertical installation, max.: 50 °C

#### Programming language

LAD: **Yes**

FBD: **Yes**

STL: **Yes**

SCL: **Yes**

GRAPH: **Yes**

#### Dimensions

Width: **100 mm**

Height: **117 mm**

Depth: **75 mm**

#### Weights

Weight, approx.: **310 g**

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### BusAdapter BA 2xRJ45, 2 RJ45 sockets for PROFINET x1

Product type designation: **BA 2x RJ45**

Number of PROFINET interfaces: **1**

Number of RJ45 ports: **2**

#### Cable length

Cu conductors: **100 m**

#### Dimensions

Width: **20 mm**

Height: **69.5 mm**

Depth: **59 mm**

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### MEMORY CARD FOR CPU, 3,3 V FLASH, 24 MBYTE x1

Type of memory: **Flash-EPROM**

Flash: **Yes**

Memory size: **24 Mbyte**

Number of write/delete operations, min.: **500 000**

Data retention (after final programming action), min.: **10 y; If the delete/write processes < 50 000 (1 a if the delete/write processes > 450 000)**

#### Dimensions

Width: **24 mm**

Height: **32 mm**

Depth: **2.1 mm**

#### Weights

Weight, approx: **3 g**

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**Each group of modules should be powered from a separate potential (bases for modules enabling the creation of new and continuing potential groups). In total 6 bases for new potential groups and 21 bases for continuation of potential groups are required. All modules must be delivered with the appropriate base.**

## **Digital Input module x1**

**Product type designation:** DI 8x24 VDC

**Engineering with:** STEP 7 TIA Portal

### **Operating mode**

DI Yes

Counter No

Oversampling No

MSI No

### **Supply voltage**

Rated value (DC) 24 V

permissible range, lower limit (DC) 19.2 V

permissible range, upper limit (DC) 28.8 V

Reverse polarity protection Yes

### **Input current**

Current consumption, max. 50 mA; All channels are supplied from the encoder supply

### **Encoder supply**

Number of outputs 8

Output voltage, min. 19.2 V

Short-circuit protection Yes; per module

24 V encoder supply

24 V Yes

Short-circuit protection Yes

Output current, max. 700 mA

Output current per channel, max. 700 mA

Output current per module, max. 700 mA

### **Power loss**

Power loss, typ. 1 W; 24 V, 8 inputs supplied via encoder supply

### **Address area**

Address space per module

Inputs 1 byte; + 1 byte for QI information

### **Hardware configuration**

Automatic encoding Yes

Mechanical coding element Yes

Type of mechanical coding element Type A

### **Selection of BaseUnit for connection variants**

1-wire connection BU type A0

2-wire connection BU type A0

3-wire connection BU type A0 with AUX terminals or potential distributor module

4-wire connection BU type A0 + Potential distributor module

### **Digital inputs**

Number of digital inputs 8

Digital inputs, parameterizable Yes

Source/sink input P-reading

Input characteristic curve in accordance with IEC 61131, type 3 -Yes

### **Input voltage**

Rated value (DC) 24 V

for signal "0" -30 to +5 V

for signal "1" +11 to +30V

### **Input current**

for signal "1", typ. 2.5 mA

### **Input delay (for rated value of input voltage)**

for standard inputs

parameterizable Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)

at "0" to "1", min. 0.05 ms

at "0" to "1", max. 20 ms

at "1" to "0", min. 0.05 ms

at "1" to "0", max. 20 ms

### **Cable length**

shielded, max. 1 000 m

unshielded, max. 600 m

### **Encoder**

Connectable encoders

2-wire sensor Yes

permissible quiescent current (2-wire sensor), max. 1.5 mA

### **Interrupts/diagnostics/status information**

Diagnostics function Yes

### **Alarms**

Diagnostic alarm Yes

### **Diagnoses**

Diagnostic information readable Yes

Monitoring the supply voltage Yes

parameterizable Yes

Monitoring of encoder power supply Yes; Module-by-module, optional protective circuit for preventing wirebreak diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm



Wire-break Yes; Module-wise  
Short-circuit Yes; Module-wise

#### **Diagnostics indication LED**

Monitoring of the supply voltage (PWR-LED) Yes; green PWR LED  
Channel status display Yes; green LED  
for channel diagnostics No  
for module diagnostics Yes; green/red DIAG LED

#### **Potential separation**

Potential separation channels  
between the channels No  
between the channels and backplane bus Yes  
between the channels and the power supply of the Electronics No

#### **Isolation**

Isolation tested with 707 V DC (type test)

#### **Standards, approvals, certificates**

Suitable for safety functions No

#### **Ambient conditions**

Ambient temperature during operation  
horizontal installation, min. -30 °C; < 0 °C as of FS02  
horizontal installation, max. 60 °C  
vertical installation, min. -30 °C; < 0 °C as of FS02  
vertical installation, max. 50 °C  
Altitude during operation relating to sea level  
Installation altitude above sea level, max. 5 000 m; Restrictions for installation altitudes > 2 000 m

#### **Dimensions**

Width 15 mm  
Height 73 mm  
Depth 58 mm

#### **Weights**

Weight, approx. 28 g

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## **Digital Output module x1**

**Product type designation:** DQ 8x24VDC/0.5A ST

**Engineering with:** STEP 7 TIA Portal

#### **Operating mode**

DQ Yes  
DQ with energy-saving function No  
PWM No

Oversampling No

MSO No

### Supply voltage

Rated value (DC) 24 V

permissible range, lower limit (DC) 19.2 V

permissible range, upper limit (DC) 28.8 V

Reverse polarity protection Yes

### Input current

Current consumption, max. 35 mA; without load

### output voltage / header

Rated value (DC) 24 V

### Power loss

Power loss, typ. 1 W

### Address area

Address space per module

Address space per module, max. 1 byte; + 1 byte for QI information

### Hardware configuration

Automatic encoding Yes

Mechanical coding element Yes

Type of mechanical coding element Type A

Selection of BaseUnit for connection variants

1-wire connection BU type A0

2-wire connection BU type A0

3-wire connection BU type A0 with AUX terminals or potential distributor module

4-wire connection BU type A0 + Potential distributor module

### Digital outputs

Type of digital output Source output (PNP, current-sourcing)

Number of digital outputs 8

Current-sourcing Yes

Digital outputs, parameterizable Yes

Short-circuit protection Yes

Response threshold, typ. 1 A

Limitation of inductive shutdown voltage to Typ. L+ (-50 V)

Controlling a digital input Yes

### Switching capacity of the outputs

with resistive load, max. 0.5 A

on lamp load, max. 5 W

### Load resistance range

lower limit 48  $\Omega$

upper limit 12 k $\Omega$

### Output voltage

for signal "1", min. L+ (-0.8 V)

**Output current**

for signal "1" rated value 0.5 A

for signal "1" permissible range, max. 0.5 A

for signal "0" residual current, max. 0.1 mA

**Output delay with resistive load**

"0" to "1", max. 50  $\mu$ s; at rated load

"1" to "0", max. 100  $\mu$ s; at rated load

**Parallel switching of two outputs**

for uprating No

for redundant control of a load Yes

**Switching frequency**

with resistive load, max. 100 Hz

with inductive load, max. 2 Hz

on lamp load, max. 10 Hz

**Total current of the outputs**

Current per channel, max. 0.5 A

Current per module, max. 4 A

**Total current of the outputs (per module)**

horizontal installation

up to 60 °C, max. 4 A

vertical installation

up to 50 °C, max. 4 A

**Cable length**

shielded, max. 1 000 m

unshielded, max. 600 m

**Interruptions/diagnostics/status information**

Diagnostics function Yes

Substitute values connectable Yes

**Alarms**

Diagnostic alarm Yes

**Diagnoses**

Monitoring the supply voltage Yes

Wire-break Yes; Module-wise

Short-circuit to M Yes; Module-wise

Short-circuit to L+ Yes; Module-wise

Group error Yes

**Diagnostics indication LED**

Monitoring of the supply voltage (PWR-LED) Yes; green PWR LED

Channel status display Yes; green LED

for channel diagnostics No

for module diagnostics Yes; green/red DIAG LED

**Potential separation**

Potential separation channels

between the channels No

between the channels and backplane bus Yes

between the channels and the power supply of the Electronics No

**Isolation**

Isolation tested with 707 V DC (type test)

**Standards, approvals, certificates**

Suitable for safety functions No

Suitable for safety-related tripping of standard modules Yes; see FAQ Entry ID: 39198632

Highest safety class achievable in safety mode

Performance level according to ISO 13849-1 PL d

SIL acc. to IEC 61508 SIL 2

Ambient conditions

Ambient temperature during operation

horizontal installation, min. -30 °C; < 0 °C as of FS02

horizontal installation, max. 60 °C

vertical installation, min. -30 °C; < 0 °C as of FS02

vertical installation, max. 50 °C

**Altitude during operation relating to sea level**

Installation altitude above sea level, max. 5 000 m; Restrictions for installation altitudes > 2 000 m

**Dimensions**

Width 15 mm

Height 73 mm

Depth 58 mm

**Weights**

Weight, approx. 30 g

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**Analog Input module x1**

**Product type designation:** AI 8xI 2-/4-wire

**Engineering with:** STEP 7 TIA Portal

**Operating mode**

Oversampling No

MSI No

**CiR - Configuration in RUN**

Reparameterization possible in RUN Yes

Calibration possible in RUN No

**Supply voltage**

Rated value (DC) 24 V  
permissible range, lower limit (DC) 19.2 V  
permissible range, upper limit (DC) 28.8 V  
Reverse polarity protection Yes

**Input current**

Current consumption, max. 25 mA; without sensor supply

**Encoder supply**

24 V encoder supply  
24 V Yes  
Short-circuit protection Yes  
Output current, max. 0.7 A; total current of all encoders/channels

**Power loss**

Power loss, typ. 0.7 W; Without encoder supply voltage

**Address area**

Address space per module  
Address space per module, max. 16 byte

**Hardware configuration**

Automatic encoding Yes  
Mechanical coding element Yes  
Type of mechanical coding element Type A

Selection of BaseUnit for connection variants

1-wire connection BU type A0, A1  
2-wire connection BU type A0, A1  
4-wire connection BU type A0, A1 + potential distributor module

**Analog inputs**

Number of analog inputs 8; Single-ended  
For current measurement 8 permissible input current for current input (destruction limit), max. 50 mA  
Cycle time (all channels), min. 1 ms; per channel

**Input ranges (rated values), currents**

0 to 20 mA Yes  
Input resistance (0 to 20 mA) 100  $\Omega$ ; 15 bit  
-20 mA to +20 mA Yes  
Input resistance (-20 mA to +20 mA) 100  $\Omega$ ; 16 bit incl. sign  
4 mA to 20 mA Yes  
Input resistance (4 mA to 20 mA) 100  $\Omega$ ; 15 bit

**Cable length**

shielded, max. 200 m

**Analog value generation for the inputs**

Integration and conversion time/resolution per channel  
Resolution with overrange (bit including sign), max. 16 bit

Integration time, parameterizable Yes

Interference voltage suppression for interference frequency  $f_1$  in Hz 16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)

Conversion time (per channel) 180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms

Smoothing of measured values

Number of smoothing levels 4; None; 4/8/16 times  
parameterizable Yes

### Encoder

Connection of signal encoders

for voltage measurement No

for current measurement as 2-wire transducer Yes, Burden of 2-wire transmitter, max. 650  $\Omega$

for current measurement as 4-wire transducer Yes

### Errors/accuracies

Linearity error (relative to input range), (+/-) 0.01 %

Temperature error (relative to input range), (+/-) 0.005 %/K

Crosstalk between the inputs, min. 50 dB

Repeat accuracy in steady state at 25 °C (relative to input range), (+/-) 0.05 %

Operational error limit in overall temperature range

Current, relative to input range, (+/-) 0.5 %

Basic error limit (operational limit at 25 °C)

Current, relative to input range, (+/-) 0.3 %

Interference voltage suppression for  $f = n \times (f_1 \pm 1 \%)$ ,  $f_1$  = interference frequency

Series mode interference (peak value of interference < rated value of input range), min.

70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB

### Interrupts/diagnostics/status information

Diagnostics function Yes

#### Alarms

Diagnostic alarm Yes

Limit value alarm No

#### Diagnoses

Monitoring the supply voltage Yes

Wire-break Yes; at 4 to 20 mA

Short-circuit Yes; Sensor supply to M; module by module

Group error Yes

Overflow/underflow Yes

Diagnostics indication LED

Monitoring of the supply voltage (PWR-LED) Yes; green LED

Channel status display Yes; green LED

for channel diagnostics No

for module diagnostics Yes; green/red DIAG LED

**Potential separation**

Potential separation channels

between the channels No

between the channels and backplane bus Yes

between the channels and the power supply of the electronics No

**Isolation**

Isolation tested with 707 V DC (type test)

**Ambient conditions**

Ambient temperature during operation

horizontal installation, min. -30 °C; < 0 °C as of FS04

horizontal installation, max. 60 °C

vertical installation, min. -30 °C; < 0 °C as of FS04

vertical installation, max. 50 °C

Altitude during operation relating to sea level

Installation altitude above sea level, max. 5 000 m; Restrictions for installation altitudes > 2 000 m

**Dimensions**

Width 15 mm

Height 73 mm

Depth 58 mm

**Weights**

Weight, approx. 31 g

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**Analog Output module x1**

**Product type designation:** AQ 4xU/I

**Engineering with:** STEP 7 TIA Portal

**Operating mode**

Oversampling No

MSO No

**CiR - Configuration in RUN**

Reparameterization possible in RUN Yes

Calibration possible in RUN No

**Supply voltage**

Rated value (DC) 24 V

permissible range, lower limit (DC) 19.2 V

permissible range, upper limit (DC) 28.8 V

Reverse polarity protection Yes

**Input current**

Current consumption, max. 150 mA

**Power loss**

Power loss, typ. 1.5 W

**Address area**

Address space per module

Address space per module, max. 8 byte; + 1 byte for QI information

**Hardware configuration**

Automatic encoding

Type of mechanical coding element Type A

**Analog outputs**

Number of analog outputs 4

Voltage output, short-circuit current, max. 45 mA

Cycle time (all channels), min. 5 ms

Analog output with oversampling No

Output ranges, voltage

0 to 10 V Yes; 15 bit

1 V to 5 V Yes; 13 bit

-5 V to +5 V Yes; 15 bit incl. sign

-10 V to +10 V Yes; 16 bit incl. sign

Output ranges, current

0 to 20 mA Yes; 15 bit

-20 mA to +20 mA Yes; 16 bit incl. sign

4 mA to 20 mA Yes; 14 bit

Connection of actuators

for voltage output two-wire connection Yes

for voltage output four-wire connection Yes

for current output two-wire connection Yes

Load impedance (in rated range of output)

with voltage outputs, min. 2 k $\Omega$

with voltage outputs, capacitive load, max. 1  $\mu$ F

with current outputs, max. 500  $\Omega$

with current outputs, inductive load, max. 1 mH

Destruction limits against externally applied voltages and currents

Voltages at the outputs 30 V

Cable length

shielded, max. 1 000 m; 200 m for voltage output

**Analog value generation for the outputs**

Integration and conversion time/resolution per channel

Resolution with overrange (bit including sign), max. 16 bit

Settling time

for resistive load 0.1 ms



for capacitive load 1 ms  
for inductive load 0.5 ms

### Errors/accuracies

Linearity error (relative to output range), (+/-) 0.03 %  
Temperature error (relative to output range), (+/-) 0.005 %/K  
Crosstalk between the outputs, min. -50 dB  
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) 0.05 %

Operational error limit in overall temperature range

Voltage, relative to output range, (+/-) 0.5 %  
Current, relative to output range, (+/-) 0.5 %

Basic error limit (operational limit at 25 °C)

Voltage, relative to output range, (+/-) 0.3 %  
Current, relative to output range, (+/-) 0.3 %

### Interrupts/diagnostics/status information

Diagnostics function Yes  
Substitute values connectable Yes

#### Alarms

Diagnostic alarm Yes

#### Diagnoses

Monitoring the supply voltage Yes  
Wire-break Yes  
Short-circuit Yes  
Group error Yes  
Overflow/underflow Yes

Diagnostics indication LED

Monitoring of the supply voltage (PWR-LED) Yes; green PWR LED  
Channel status display Yes; green LED  
for channel diagnostics No  
for module diagnostics Yes; green/red DIAG LED

### Potential separation

Potential separation channels  
between the channels No  
between the channels and backplane bus Yes  
between the channels and the power supply of the electronics Yes

### Isolation

Isolation tested with 707 V DC (type test)  
Ambient conditions  
Ambient temperature during operation  
horizontal installation, min. -30 °C; < 0 °C as of FS07  
horizontal installation, max. 60 °C; Observe derating  
vertical installation, min. -30 °C; < 0 °C as of FS07  
vertical installation, max. 50 °C; Observe derating

Altitude during operation relating to sea level

Installation altitude above sea level, max. 5 000 m; Restrictions for installation altitudes > 2 000 m

### Dimensions

Width 15 mm

Height 73 mm

Depth 58 mm

### Weights

Weight, approx. 31 g

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## CM PtP Communications module with RS-232/422/485 interface x2

**Product type designation:** CM PtP

### General information

- I&M data Yes: I&M 0 to I&M3
- Engineering with STEP 7 TIA Portal can be configured/integrated as of version: V12.0 / V12.0
- STEP 7 can be configured/integrated as of version: V5.5 SP2 or higher with a GSD file
- PROFIBUS from GSD version/GSD revision: GSD as of Revision 5
- PROFINET from GSD version/GSD revision: GSDML V2.3

### Supply voltage

- Rated value (DC) 24 V
- Low limit of valid range (DC) 19.2 V
- High limit of valid range (DC) 28.8 V
- Reverse polarity protection Yes

### Input current

- Current consumption (rated value) 29 mA

### Power loss

- Power loss, typ. 0.7 W

### Address area

Occupied address area

- Inputs 8 bytes

### Interfaces

1. Interface

Interface types

- RS 232 Yes
- RS 422 Yes
- RS 485 Yes

### Interface hardware

#### RS 232

- Transmission rate, max. 115.2 kbps
- Max. cable length 15 m

RS-232 accompanying signals RTS, CTS, DTR, DSR, RI, DCD

#### RS 485

- Transmission rate, max. 115.2 kbps
- Max. cable length 1200 m

#### RS 422

- Transmission rate, max. 115.2 kbps
- Max. cable length 1200 m
- 4-wire full duplex connection Yes
- 4-wire multipoint connection Yes

### Protocols

Integrated protocols

Freeport

- Frame length, max. 2 kbyte
- Bits per character 7 or 8
- Number of stop bits 1 or 2 bits
- Parity None, even, odd, always 1, always 0, any 3964 (R)
- Frame length, max. 2 kbyte
- Bits per character 7 or 8
- Number of stop bits 1 or 2 bits
- Parity None, even, odd, always 1, always 0, any

Modbus RTU master

Address area 1 to 247, extended 1 to 65,535

- Max. number of slaves 32

Modbus RTU slave

Address area 1 to 247, extended 1 to 65,535

Frame buffer

- Buffer memory for frames 4 kbyte
- Number of frames which can be buffered 255

### Ambient conditions

Ambient temperature during operation

- Horizontal installation, min. -30 °C ; From FS03
- Horizontal installation, max. 60 °C
- Vertical installation, min. -30 °C; From FS03
- Vertical installation, max. 50 °C

### Dimensions

- Width 15 mm
- Height 73 mm
- Depth 58 mm

### Weights

- Weight, approx. 30 g
-

## PANEL HMI x1

**Design of display:** TFT widescreen display, LED backlighting

**Screen diagonal:** 12 in

**Display width:** 261.1 mm

**Display height:** 163.2 mm

**Number of colors:** 65 536

**Horizontal image resolution:** 1 280 Pixel

**Vertical image resolution:** 800 Pixel

**MTBF backlighting (at 25 °C):** 20 000 h

**Backlight dimmable:** Yes

Number of function keys: 10

Keys with LED No

System keys No

**Numeric keyboard:** Yes; Onscreen keyboard

**alphanumeric keyboard:** Yes; Onscreen keyboard

**Design as touch screen:** Yes; Analog-resistive

**Type of supply voltage:** 24 V DC

**Rated value (DC):** 24 V

**permissible range, lower limit (DC):** 19.2 V

**permissible range, upper limit (DC):** 28.8 V

**Current consumption (rated value):** 510 mA

**Starting current inrush  $I^2t$ :** 0.2 A<sup>2</sup>·s

**Processor type:** ARM

### Memory

Flash: Yes

RAM: Yes

Memory available for user data: 10 Mbyte

### Type of output

**Buzzer:** Yes

**Speaker:** No

Number of industrial Ethernet interfaces: 1

Number of USB interfaces: 1; Up to 16 GB

Industrial Ethernet status LED: 2

PROFINET: Yes

Supports protocol for PROFINET IO: No

IRT: No

MRP: No

PROFIBUS: No

MPI: No

Protocols (Ethernet)

- TCP/IP: Yes

- DHCP: Yes

- SNMP: Yes
- DCP: Yes
- LLDP: Yes
- http: No
- HTML: No
- CAN: No
- EtherNet/IP: Yes
- MODBUS: Yes; Modicon (MODBUS TCP/IP)

**Configuration software:** STEP 7 (TIA Portal)

Transfer (upload/download)

MPI/PROFIBUS DP: No

USB: No

Ethernet: Yes

using external storage medium: Yes

**Process coupling**

- S7-1200: Yes
- S7-1500: Yes
- S7-200: Yes
- S7-300/400: Yes
- LOGO!: Yes
- WinAC: Yes
- SINUMERIK Yes; No access to NCK data
- SIMOTION: Yes

Service tools/configuration aids

- Backup/Restore manually: Yes
- Backup/Restore automatically: No
- Simulation: Yes
- Device switchover: Yes

**Dimensions**

Width of the housing front: 330 mm

Height of housing front: 245 mm

Mounting cutout, width: 310 mm

Mounting cutout, height: 221 mm

Overall depth: 60 mm

**Weights**

Weight without packaging: 1 710 g

Weight incl. Packaging: 2.2 kg