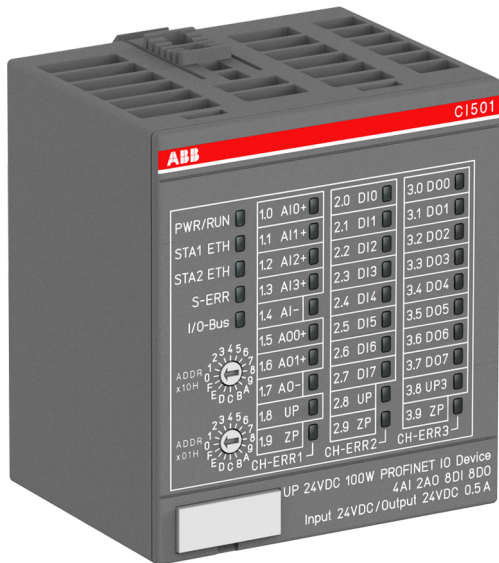


DATA SHEET

CI501

PROFINET Communication Interface Module



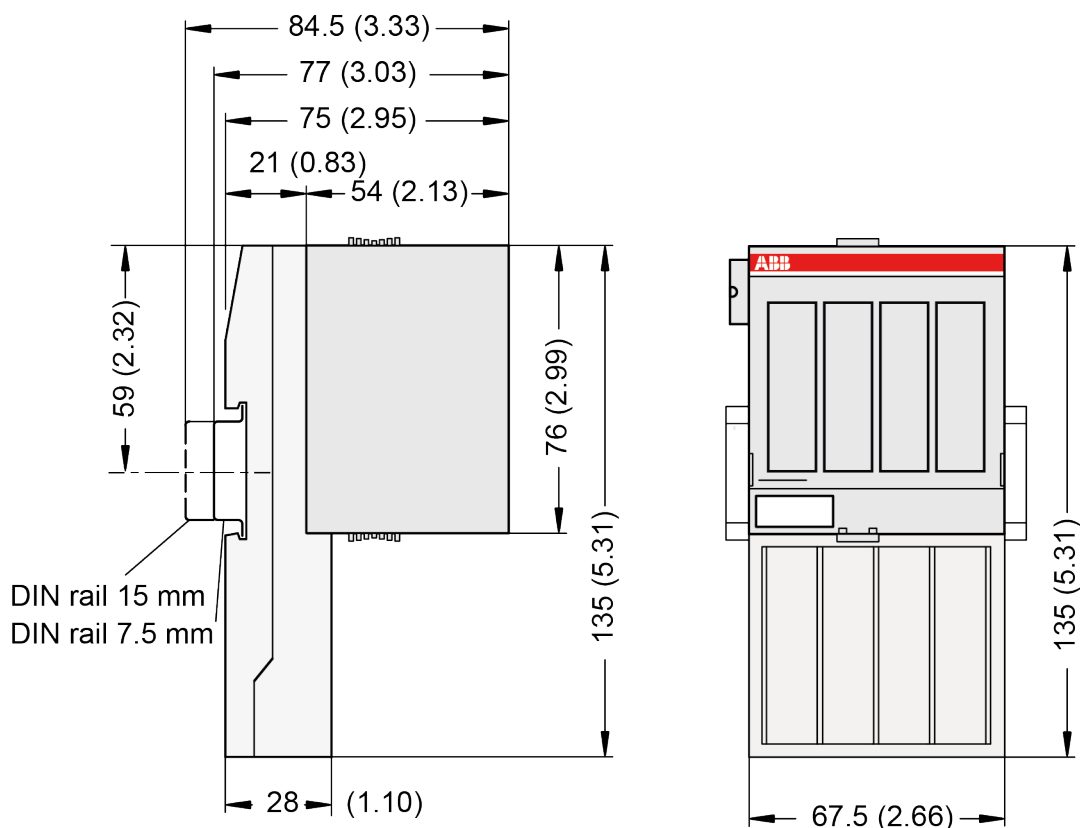
1 Ordering Data

| Part no. | Description | Product Life Cycle Phase *) |
|--------------------|--|-----------------------------|
| 1SAP 220 600 R0001 | CI501-PNIO (V3), PROFINET bus module, 8 DI, 8 DO, 4 AI and 2 AO | Active |
| 1SAP 420 600 R0001 | CI501-PNIO-XC (V3), PROFINET bus module, 8 DI, 8 DO, 4 AI and 2 AO, XC version | Active |



*) For planning and commissioning of new installations use modules in Active status only.

2 Dimensions



The dimensions are in mm and in brackets in inch.

3 Technical Data

The System Data of AC500 and S500 ↗ *Chapter 4 "System Data AC500" on page 8* are valid for standard version.

The System Data of AC500-XC ↗ *Chapter 5 "System Data AC500-XC" on page 12* are valid for the XC version.

Only additional details are therefore documented below.

The technical data are also valid for the XC version.

3.1 Technical Data of the Module

| Parameter | Value |
|-------------------------------------|---------------------------------|
| Process supply voltages UP/UP3 | |
| Rated value | 24 VDC (for inputs and outputs) |
| Max. load for the terminals | 10 A |
| Protection against reversed voltage | Yes |
| Rated protection fuse on UP/UP3 | 10 A fast |

| Parameter | Value |
|--|---|
| Electrical isolation | Ethernet interface against the rest of the module |
| Inrush current from UP (at power up) | On request |
| Current consumption via UP (normal operation) | 0.2 A |
| Current consumption via UP3 | 0.06 A + 0.5 A max. per output |
| Connections | Terminals 1.8 and 2.8 for +24 V (UP) Terminal 3.8 for +24 V (UP3) Terminals 1.9, 2.9 and 3.9 for 0 V (ZP) |
| Max. power dissipation within the module | 6 W |
| Number of digital inputs | 8 |
| Number of digital outputs | 8 |
| Number of analog inputs | 4 |
| Number of analog outputs | 2 |
| Input data length | 2 bytes |
| Output data length | 2 bytes |
| Reference potential for all digital inputs and outputs | Minus pole of the supply voltage, signal name ZP |
| Setting of the IO device identifier | With 2 rotary switches at the front side of the module |
| Diagnose | See Diagnosis and Displays |
| Operation and error displays | 32 LEDs (totally) |
| Weight (without terminal unit) | Ca. 125 g |
| Mounting position | Horizontal or vertical with derating (output load reduced to 50 % at 40 °C per group) |
| Extended ambient temperature (XC version) | >60 °C on request |
| Cooling | The natural convection cooling must not be hindered by cable ducts or other parts in the switch-gear cabinet. |


NOTICE!
Attention:

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply, short circuit and continuous overvoltage up to 30 VDC.


Multiple overloads

No effects of multiple overloads on isolated multi-channel modules occur, as every channel is protected individually by an internal smart high-side switch.

| Parameter | Value |
|----------------|------------|
| Bus connection | 2 x RJ45 |
| Switch | Integrated |

| Parameter | Value |
|---|--|
| Technology | Hilscher netX100 |
| Transfer rate | 10/100 Mbit/s (full-duplex) |
| Transfer method | According to Ethernet II, IEE802.3 |
| Ethernet | 100 base-TX, internal switch, 2x RJ45 socket |
| Expandability | Max. 10 S500 I/O modules |
| Adjusting elements | 2 rotary switches for generation of an explicit name |
| Supported protocols | RTC - real time cyclic protocol, class 1 *) RTA - real time acyclic protocol DCP - discovery and configuration protocol CL-RPC - connectionless remote procedure Call LLDP - link layer discovery protocol MRP - MRP Client |
| Acyclic services | PNIO read / write sequence (max. 1024 bytes per telegram) Process-Alarm service |
| Supported alarm types | Process Alarm, Diagnostic Alarm, Return of Sub-Module, Plug Alarm, Pull Alarm |
| Min. bus cycle | 1 ms |
| Conformance class | CC A |
| Protective functions (according to IEC 61131-3) | Protected against: <ul style="list-style-type: none"> • short circuit • reverse supply • overvoltage • reverse polarity Electrical isolation from the rest of the module |

*) Priorization with the aid of VLAN-ID including priority level

3.2 Technical Data of the Digital Inputs

| Parameter | Value |
|--|--|
| Number of channels per module | 8 |
| Distribution of the channels into groups | 1 group of 8 channels |
| Terminals of the channels DI0 to DI7 | Terminals 2.0 to 2.7 |
| Reference potential for all inputs | Terminals 1.9...3.9 (Minus pole of the supply voltage, signal name ZP) |
| Indication of the input signals | 1 yellow LED per channel, the LED is ON when the input signal is high (signal 1) |
| Input type (according EN 61131-2) | Type 1 |
| Input delay (0->1 or 1->0) | Typ. 0.1 ms, configurable from 0.1...32 ms |
| Input signal voltage | 24 VDC |
| 0-Signal | -3 V...+5 V |
| Undefined Signal | > +5 V...< +15 V |

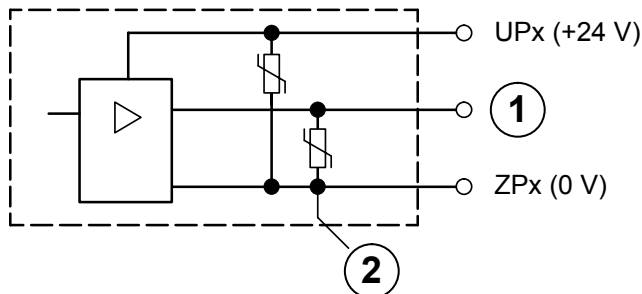
| Parameter | | Value |
|---------------------------|---------------------|----------------------|
| | 1-Signal | +15 V...+30 V |
| Ripple with signal 0 | | Within -3 V...+5 V |
| Ripple with signal 1 | | Within +15 V...+30 V |
| Input current per channel | | |
| | Input voltage +24 V | Typ. 5 mA |
| | Input voltage +5 V | > 1 mA |
| | Input voltage +15 V | > 2 mA |
| | Input voltage +30 V | < 8 mA |
| Max. cable length | | |
| | Shielded | 1000 m |
| | Unshielded | 600 m |

3.3 Technical Data of the Digital Outputs

| Parameter | | Value |
|---|------------------------------------|---|
| Number of channels per module | | 8 |
| Distribution of the channels into groups | | 1 group of 8 channels |
| Terminals of the channels DO0 to DO7 | | Terminals 3.0 to 3.7 |
| Reference potential for all outputs | | Terminals 1.9...3.9 (minus pole of the supply voltage, signal name ZP) |
| Common power supply voltage | | For all outputs terminal 3.8 (plus pole of the supply voltage, signal name UP3) |
| Output voltage for signal 1 | | UP3 (-0.8 V) |
| Output delay (0->1 or 1->0) | | On request |
| Output current | | |
| | Rated value per channel | 500 mA at UP3 = 24 V |
| | Max. value (all channels together) | 4 A |
| Leakage current with signal 0 | | < 0.5 mA |
| | Fuse for UP3 | 10 A fast |
| Demagnetization with inductive DC load | | Via internal varistors (see figure below this table) |
| Output switching frequency | | |
| | With resistive load | On request |
| | With inductive loads | Max. 0.5 Hz |
| | With lamp loads | 11 Hz max. at 5 W max. |
| Short-circuit-proof / overload-proof | | Yes |
| Overload message ($I > 0.7$ A) | | Yes, after ca. 100 ms |
| Output current limitation | | Yes, automatic reactivation after short circuit/overload |
| Resistance to feedback against 24 V signals | | Yes (software-controlled supervision) |
| Max. cable length | | |

| Parameter | Value |
|------------|--------|
| Shielded | 1000 m |
| Unshielded | 600 m |

The following drawing shows the circuitry of a digital input/output with the varistors for demagnetization when inductive loads are switched off.



- 1 Digital output
- 2 Varistors for demagnetization when inductive loads are turned off

3.4 Technical Data of the Analog Inputs

| Parameter | Value |
|--------------------------------------|--|
| Number of channels per module | 4 |
| Distribution of channels into groups | 1 group with 4 channels |
| Connection if channels AI0+ to AI3+ | Terminals 1.0 to 1.3 |
| Reference potential for AI0+ to AI3+ | Terminal 1.4 (AI-) for voltage and RTD measurement Terminal 1.9, 2.9 and 3.9 for current measurement |
| Input type | |
| Unipolar | Voltage 0 V... 10 V, current or Pt100/Pt1000/ Ni1000 |
| Bipolar | Voltage -10 V... +10 V |
| Electrical isolation | Against Ethernet network |
| Configurability | 0 V...10 V, -10 V...+10 V, 0 mA...20 mA, 4 mA...20 mA Pt100/1000, Ni1000 (each input can be config- ured individually) |
| Channel input resistance | Voltage: > 100 kΩ Current: ca. 330 Ω |
| Time constant of the input filter | Voltage: 100 μs Current: 100 μs |
| Indication of the input signals | 1 LED per channel (brightness depends on the value of the analog signal) |
| Conversion cycle | 1 ms (for 4 inputs + 2 outputs); with RTDs Pt/Ni... 1 s |

| Parameter | Value |
|---|---|
| Resolution | Range 0 V...10 V: 12 bits Range -10 V...+10 V: 12 bits + sign Range 0 mA...20 mA: 12 bits Range 4 mA...20 mA: 12 bits Range RTD (Pt100, PT1000, Ni1000): 0.1 °C |
| Conversion error of the analog values caused by non-linearity, adjustment error at factory and resolution within the normal range | Typ. 0.5 %, max. 1 % |
| Relationship between input signal and hex code | Tables Input ranges voltage, current and digital input and Input range resistor |
| Unused inputs | Are configured as "unused" (default value) |
| Overvoltage protection | Yes |

3.5 Technical Data of the Analog Inputs, if used as Digital Inputs

| Parameter | Value |
|--|---------------------------------|
| Number of channels per module | Max. 4 |
| Distribution of channels into groups | 1 group of 4 channels |
| Connections of the channels AI0+ to AI3+ | Terminals 1.0 to 1.3 |
| Reference potential for the inputs | Terminals 1.9, 2.9 and 3.9 (ZP) |
| Indication of the input signals | 1 LED per channel |
| Input signal voltage | 24 VDC |
| Signal 0 | -30 V...+5 V |
| Undefined signal | +5 V ... +13 V |
| Signal 1 | +13 V...+30 V |
| Input current per channel | |
| Input voltage +24 V | Typ. 7 mA |
| Input voltage +5 V | Typ. 1.4 mA |
| Input voltage +15 V | Typ. 3.7 mA |
| Input voltage +30 V | < 9 mA |
| Input resistance | Ca. 3.5 kΩ |

3.6 Technical Data of the Analog Outputs

| Parameter | Value |
|--|--|
| Number of channels per module | 2 |
| Distribution of channels into groups | 1 group for 2 channels |
| Connection of the channels AO0+...AO1+ | Terminals 1.5...1.6 |
| Reference potential for AO0+ to AO1+ | Terminal 1.7 (AO-) for voltage output terminal 1.9, 2.9 and 3.9 for current output |
| Output type | |

| Parameter | Value |
|---|--|
| Unipolar | Current |
| Bipolar | Voltage |
| Electrical isolation | Against internal supply and other modules |
| Configurability | -10 V...+10 V, 0 mA...20 mA, 4 mA...20 mA (each output can be configured individually) |
| Output resistance (load), as current output | 0 Ω ...500 Ω |
| Output loadability, as voltage output | \pm 10 mA max. |
| Indication of the output signals | 1 LED per channel (brightness depends on the value of the analog signal) |
| Resolution | 12 bits (+ sign) |
| Conversion error of the analog values caused by non-linearity, adjustment error at factory and resolution within the normal range | Typ. 0.5 %, max. 1 % |
| Relationship between input signal and hex code | Table Output ranges voltage and current |
| Unused outputs | Are configured as "unused" (default value) and can be left open-circuited |

3.7 Technical Data of the Fast Counter

| Parameter | Value |
|----------------------|--|
| Used inputs | Terminal 2.0 (DI0), 2.1 (DI1) |
| Used outputs | Terminal 3.0 (DO0) |
| Counting frequency | Depending on operation mode: Mode 1 - 6: max. 200 kHz Mode 7: max. 50 kHz Mode 9: max. 35 kHz Mode 10: max. 20 kHz |
| Detailed description | See <i>Fast Counter</i> |
| Operating modes | See <i>Operating Modes</i> |

4 System Data AC500

4.1 Environmental Conditions

Table 1: Process and supply voltages

| Parameter | Value |
|-------------------------------------|---------------------|
| 24 VDC | |
| Voltage | 24 V (-15 %, +20 %) |
| Protection against reverse polarity | Yes |

| Parameter | | Value |
|--|-----------|--|
| 120 VAC | | |
| | Voltage | 120 V (-15 %, +10 %) |
| | Frequency | 50/60 Hz (-6 %, +4 %) |
| 230 VAC | | |
| | Voltage | 230 VAC (-15 %, +10 %) |
| | Frequency | 50/60 Hz (-6 %, +4 %) |
| 120 VAC...240 VAC wide range supply | | |
| | Voltage | 120 V...240 V (-15 %, +10 %) |
| | Frequency | 50/60 Hz (-6 %, +4 %) |
| Allowed interruptions of power supply, according to EN 61131-2 | | |
| | DC supply | Interruption < 10 ms, time between 2 interruptions > 1 s, PS2 |
| | AC supply | Interruption < 0.5 periods, time between 2 interruptions > 1 s |

**NOTICE!**

Exceeding the maximum power supply voltage for process or supply voltages could lead to unrecoverable damage of the system. The system could be destroyed.

**NOTICE!**

Improper voltage level or frequency range which cause damage of AC inputs:

- AC voltage above 264 V
- Frequency below 47 Hz or above 62.4 Hz

**NOTICE!**

Improper connection leads cause overtemperature on terminals.

PLC modules may be destroyed by using wrong cable type, wire size and cable temperature classification.

| Parameter | | Value |
|--------------------|-----------|--|
| Temperature | | |
| | Operating | 0 °C...+60 °C: Horizontal mounting of modules. 0 °C...+40 °C: Vertical mounting of modules. Output load reduced to 50 % per group. |
| | Storage | -40 °C...+70 °C |
| | Transport | -40 °C...+70 °C |
| Humidity | | Max. 95 %, without condensation |
| Air pressure | | |
| | Operating | > 800 hPa / < 2000 m |
| | Storage | > 660 hPa / < 3500 m |
| Ingress protection | | IP20 |

4.2 Creepage Distances and Clearances

The creepage distances and clearances meet the requirements of the overvoltage category II, pollution degree 2.

4.3 Insulation Test Voltages, Routine Test

According to EN 61131-2

| Parameter | Value | |
|---|----------------|----------------|
| 230 V circuits against other circuitry | 2500 V | 1.2/50 μ s |
| 120 V circuits against other circuitry | 1500 V | 1.2/50 μ s |
| 120 V...240 V circuits against other circuitry | 2500 V | 1.2/50 μ s |
| | | |
| 24 V circuits (supply, 24 V inputs/outputs, analogue inputs/outputs), if they are electrically isolated against other circuitry | 500 V | 1.2/50 μ s |
| COM interfaces, electrically isolated | 500 V | 1.2/50 μ s |
| COM interfaces, electrically not isolated | Not applicable | Not applicable |
| FBP interface | 500 V | 1.2/50 μ s |
| Ethernet | 500 V | 1.2/50 μ s |
| ARCNET | 500 V | 1.2/50 μ s |
| | | |
| 230 V circuits against other circuitry | 1350 V | AC 2 s |
| 120 V circuits against other circuitry | 820 V | AC 2 s |
| 120 V...240 V circuits against other circuitry | 1350 V | AC 2 s |
| | | |
| 24 V circuits (supply, 24 V inputs/outputs, analogue inputs/outputs), if they are electrically isolated against other circuitry | 350 V | AC 2 s |
| COM interfaces, electrically isolated | 350 V | AC 2 s |
| COM interfaces, electrically not isolated | Not applicable | Not applicable |
| FBP interface | 350 V | AC 2 s |
| Ethernet | 350 V | AC 2 s |
| ARCNET | 350 V | AC 2 s |

4.4 Power Supply Units

For the supply of the modules, power supply units according to PELV specifications must be used.

4.5 Electromagnetic Compatibility

| Electromagnetic Compatibility | | |
|---|---|---|
| Device suitable for: | | |
| | Industrial applications | Yes |
| | Domestic applications | No |
| Immunity against electrostatic discharge (ESD): | | According to IEC 61000-4-2, zone B, criterion B |
| | Electrostatic voltage in case of air discharge | 8 kV |
| | Electrostatic voltage in case of contact discharge | 4 kV, in a closed switch-gear cabinet 6 kV ¹⁾ |
| | ESD with communication connectors | In order to prevent operating malfunctions, it is recommended, that the operating personnel discharge themselves prior to touching communication connectors or perform other suitable measures to reduce effects of electrostatic discharges. |
| | ESD with connectors of Terminal Bases | The connectors between the Terminal Bases and Processor Modules or Communication Modules must not be touched during operation. The same is valid for the I/O-Bus with all modules involved. |
| Immunity against the influence of radiated (CW radiated): | | According to IEC 61000-4-3, zone B, criterion A |
| | Test field strength | 10 V/m |
| Immunity against fast transient interference voltages (burst): | | According to IEC 61000-4-4, zone B, criterion B |
| | Supply voltage units (DC) | 2 kV |
| | Supply voltage units (AC) | 2 kV |
| | Digital inputs/outputs (24 VDC) | 1 kV |
| | Digital inputs/outputs (120 VAC...240 VAC) | 2 kV |
| | Analog inputs/outputs | 1 kV |
| | CS31 system bus | 1 kV |
| | Serial RS-485 interfaces (COM) | 1 kV |
| | Serial RS-232 interfaces (COM, not for PM55x and PM56x) | 1 kV |
| | ARCNET | 1 kV |
| | FBP | 1 kV |
| | Ethernet | 1 kV |
| | I/O supply (DC-out) | 1 kV |
| Immunity against the influence of line-conducted interferences (CW conducted): | | According to IEC 61000-4-6, zone B, criterion A |
| | Test voltage | 3V zone B, 10 V is also met. |
| High energy surges | | According to IEC 61000-4-5, zone B, criterion B |
| | Power supply DC | 1 kV CM / 0.5 kV DM ²⁾ |
| | DC I/O supply | 0.5 kV CM / 0.5 kV DM ²⁾ |

| Electromagnetic Compatibility | | |
|-------------------------------|-------------------------------|--|
| | Communication Lines, shielded | 1 kV CM ²⁾) |
| | AC I/O unshielded | 2 kV CM / 1 kV DM ²⁾) |
| | I/O analog, I/O DC unshielded | 1 kV CM / 0.5 kV DM ²⁾) |
| Radiation (radio disturbance) | | According to IEC 55011, group 1, class A |

¹⁾ High requirement for shipping classes are achieved with additional specific measures (see specific documentation).

²⁾ CM = Common Mode, DM = Differential Mode

4.6 Mechanical Data

| Parameter | Value |
|---|--|
| Mounting | Horizontal |
| Degree of protection | IP 20 |
| Housing | Classification V-2 according to UL 94 |
| Vibration resistance acc. to EN 61131-2 | all three axes 2 Hz...8.4 Hz, continuous 3.5 mm 8.4 Hz...150 Hz, continuous 1 g (higher values on request) |
| Shock test | All three axes 15 g, 11 ms, half-sinusoidal |
| Mounting of the modules: | |
| DIN rail according to DIN EN 50022 | 35 mm, depth 7.5 mm or 15 mm |
| Mounting with screws | Screws with a diameter of 4 mm |
| Fastening torque | 1.2 Nm |

4.7 Approvals and certifications

Information on approvals and certificates can be found in the corresponding chapter of the *Main catalog, PLC Automation*.

5 System Data AC500-XC



Assembly, construction and connection of devices of the variant AC500-XC is identical to AC500 (standard). The following description provides information on general technical data of AC500-XC system.

5.1 Environmental Conditions

Table 2: Process and Supply Voltages

| Parameter | Value |
|---------------------------------------|---|
| 24 VDC | |
| Voltage | 24 V (-15 %, +20 %) |
| Protection against reverse polarity | Yes |
| 120 VAC...240 VAC wide range supply | |
| Voltage | 120...240 V (-15 %, +10 %) |
| Frequency | 50/60 Hz (-6 %, +4 %) |
| Allowed interruptions of power supply | |
| DC supply | Interruption < 10 ms, time between 2 interruptions > 1 s, PS2 |



NOTICE!

Exceeding the maximum power supply voltage for process or supply voltages could lead to unrecoverable damage of the system. The system could be destroyed.



NOTICE!

For the supply of the modules, power supply units according to PELV or SELV specifications must be used.



The creepage distances and clearances meet the requirements of the overvoltage category II, pollution degree 2.

| Parameter | Value |
|-----------------------------|--|
| Temperature | |
| Operating | <p>-40 °C...+70 °C</p> <p>-40 °C...-30 °C: Proper start-up of system; technical data not guaranteed</p> <p>-40 °C...0 °C: Due to the LCD technology, the display might respond very slowly.</p> <p>-40 °C...+40 °C: Vertical mounting of modules possible, output load limited to 50 % per group</p> <p>+60 °C...+70 °C with the following deratings:</p> <ul style="list-style-type: none"> • System is limited to max. 2 communication modules per terminal base • Applications certified for cULus up to +60 °C • Digital inputs: maximum number of simultaneously switched on input channels limited to 75 % per group (e.g. 8 channels => 6 channels) • Digital outputs: output current maximum value (all channels together) limited to 75 % per group (e.g. 8 A => 6 A) • Analog outputs only if configured as voltage output: maximum total output current per group is limited to 75 % (e.g. 40 mA => 30 mA) • Analog outputs only if configured as current output: maximum number of simultaneously used output channels limited to 75 % per group (e.g. 4 channels => 3 channels) |
| Storage / Transport | -40 °C...+85 °C |
| Humidity | Operating / Storage: 100 % r. H. with condensation |
| Air pressure | <p>Operating:</p> <p>-1000 m...4000 m (1080 hPa...620 hPa)</p> <p>> 2000 m (< 795 hPa):</p> <ul style="list-style-type: none"> • max. operating temperature must be reduced by 10 K (e.g. 70 °C to 60°C) • I/O module relay contacts must be operated with 24 V nominal only |
| Immunity to corrosive gases | <p>Operating: Yes, according to:</p> <p>ISA S71.04.1985 Harsh group A, G3/GX</p> <p>IEC 60721-3-3 3C2 / 3C3</p> |
| Immunity to salt mist | <p>Operating: Yes, horizontal mounting only, according to IEC 60068-2-52 severity level: 1</p> |

**NOTICE!****Risk of corrosion!**

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices
TA535.

Table 3: Electromagnetic Compatibility

| Parameter | Value |
|---|---|
| Device suitable for: | |
| Industrial applications | Yes |
| Domestic applications | No |
| Radiated emission (radio disturbances) | Yes, according to: CISPR 16-2-3 |
| Conducted emission (radio disturbances) | Yes, according to: CISPR 16-2-1, CISPR 16-1-2 |
| Electrostatic discharge (ESD) | Yes, according to: IEC 61000-4-2, zone B, cri- terion B |
| Fast transient interference voltages (burst) | Yes, according to: IEC 61000-4-4, zone B, cri- terion B |
| High energy transient interference voltages (surge) | Yes, according to: IEC 61000-4-5, zone B, cri- terion B |
| Influence of radiated disturbances | Yes, according to: IEC 61000-4-3, zone B, cri- terion A |
| Influence of line-conducted interferences | Yes, according to: IEC 61000-4-6, zone B, cri- terion A |
| Influence of power frequency magnetic fields | Yes, according to: IEC 61000-4-8, zone B, cri- terion A |



In order to prevent malfunctions, it is recommended, that the operating personnel discharge themselves prior to touching communication connectors or perform other suitable measures to reduce effects of electrostatic discharges.



NOTICE!
Risk of malfunctions!

Unused slots for communication modules are not protected against accidental physical contact.

- Unused slots for communication modules must be covered with dummy communication modules (TA524) to achieve IP20 rating.
- I/O bus connectors must not be touched during operation.

5.2 Mechanical Data

| Parameter | Value |
|----------------------|--|
| Wiring method | Spring terminals |
| Degree of protection | IP 20 |
| Vibration resistance | Yes, according to: IEC 61131-2 IEC 60068-2-6 IEC 60068-2-64 |
| Shock resistance | Yes, according to: IEC 60068-2-27 |
| Assembly position | Horizontal Vertical (no application in salt mist environment) |
| Assembly on DIN rail | |
| DIN rail type | According to IEC 60715 35 mm, depth 7.5 mm or 15 mm |
| Assembly with screws | |
| Screw diameter | 4 mm |
| Fastening torque | 1.2 Nm |

5.3 Environmental Tests

| Parameter | Value |
|----------------------|---|
| Storage | IEC 60068-2-1 Test Ab: cold withstand test -40 °C / 16 h IEC 60068-2-2 Test Bb: dry heat withstand test +85 °C / 16 h |
| Humidity | IEC 60068-2-30 Test Db: Cyclic (12 h / 12 h) damp-heat test 55 °C, 93 % r. H. / 25 °C, 95 % r. H., 6 cycles IEC 60068-2-78, stationary humidity test: 40 °C, 93 % r. H., 240 h |
| Insulation Test | IEC 61131-2 |
| Vibration resistance | IEC 61131-2 / IEC 60068-26: 5 Hz...500 Hz, 2 g (with SD memory card inserted) IEC 60068-2-64: 5 Hz...500 Hz, 4 g rms |
| Shock resistance | IEC 60068-2-27: all 3 axes 15 g, 11 ms, half-sinusoidal |

Table 4: EMC Immunity

| Parameter | Value |
|--|--|
| Electrostatic discharge (ESD) | Electrostatic voltage in case of air discharge: 8 kV Electrostatic voltage in case of contact discharge: 6 kV |
| Fast transient interference voltages (burst) | Supply voltage units (DC): 4 kV Digital inputs/outputs (24 VDC): 2 kV Analog inputs/outputs: 2 kV Communication lines shielded: 2 kV I/O supply (DC-out): 2 kV |

| Parameter | Value |
|---|---|
| High energy transient interference voltages (surge) | Supply voltage units (DC): 1 kV CM *) / 0.5 kV DM *) Digital inputs/outputs (24 VDC): 1 kV CM *) / 0.5 kV DM *) Digital inputs/outputs (AC): 4 kV Analog inputs/outputs: 1 kV CM *) / 0.5 kV DM *) Communication lines shielded: 1 kV CM *) I/O supply (DC-out): 0,5 kV CM *) / 0.5 kV DM *) |
| Influence of radiated disturbances | Test field strength: 10 V/m |
| Influence of line-conducted interferences | Test voltage: 10 V |
| Power frequency magnetic fields | 30 A/m 50 Hz 30 A/m 60 Hz |

*) CM = Common Mode, * DM = Differential Mode