

# Bảng thông số sản phẩm

Thông số kỹ thuật



logic controller, Modicon M221, 24  
IO, transistor, PNP

TM221C24T

## Main

|                           |                                                                  |
|---------------------------|------------------------------------------------------------------|
| Range Of Product          | Modicon M221                                                     |
| Product Or Component Type | Logic controller                                                 |
| [Us] Rated Supply Voltage | 24 V DC                                                          |
| Discrete Input Number     | 14, discrete input 4 fast input conforming to IEC 61131-2 Type 1 |
| Analogue Input Number     | 2 at 0...10 V                                                    |
| Discrete Output Type      | Transistor                                                       |
| Discrete Output Number    | 10 transistor 2 fast output                                      |
| Discrete Output Voltage   | 24 V DC                                                          |
| Discrete Output Current   | 0.5 A                                                            |

## Complementary

|                                        |                                                                                                        |
|----------------------------------------|--------------------------------------------------------------------------------------------------------|
| Discrete I/O Number                    | 24                                                                                                     |
| Maximum Number Of I/O Expansion Module | 7 (local I/O-Architecture)<br>14 (remote I/O-Architecture)                                             |
| Supply Voltage Limits                  | 20.4...28.8 V                                                                                          |
| Inrush Current                         | 35 A                                                                                                   |
| Maximum Power Consumption In W         | 13 W at 24 V (with max number of I/O expansion module)<br>4.1 W at 24 V (without I/O expansion module) |
| Power Supply Output Current            | 0.52 A 5 V for expansion bus<br>0.2 A 24 V for expansion bus                                           |
| Discrete Input Logic                   | Sink or source (positive/negative)                                                                     |
| Discrete Input Voltage                 | 24 V                                                                                                   |
| Discrete Input Voltage Type            | DC                                                                                                     |
| Analogue Input Resolution              | 10 bits                                                                                                |
| LSB Value                              | 10 mV                                                                                                  |
| Conversion Time                        | 1 ms per channel + 1 controller cycle time for analogue input analog input                             |
| Permitted Overload On Inputs           | +/- 30 V DC for 5 min (maximum) for analog input<br>+/- 13 V DC (permanent) for analog input           |
| Voltage State 1 Guaranteed             | >= 15 V for input                                                                                      |
| Voltage State 0 Guaranteed             | <= 5 V for input                                                                                       |
| Discrete Input Current                 | 7 mA for discrete input<br>5 mA for fast input                                                         |
| Input Impedance                        | 3.4 kOhm for discrete input<br>100 kOhm for analog input<br>4.9 kOhm for fast input                    |

Miễn trừ trách nhiệm: Tài liệu này không nhằm thay thế và không được sử dụng để xác định tính phù hợp hoặc độ tin cậy của các sản phẩm này cho các ứng dụng người dùng cụ thể

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Response Time</b>                     | 35 µs turn-off, I2...I5 terminal(s) for input<br>5 µs turn-on, I0, I1, I6, I7 terminal(s) for fast input<br>35 µs turn-on, other terminals terminal(s) for input<br>5 µs turn-off, I0, I1, I6, I7 terminal(s) for fast input<br>100 µs turn-off, other terminals terminal(s) for input<br>5 µs turn-on, turn-off, Q0...Q1 terminal(s) for output<br>50 µs turn-on, turn-off, Q2...Q3 terminal(s) for output<br>300 µs turn-on, turn-off, other terminals terminal(s) for output |
| <b>Configurable Filtering Time</b>       | 0 ms for input<br>3 ms for input<br>12 ms for input                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Discrete Output Logic</b>             | Positive logic (source)                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Maximum Current Per Output Common</b> | 5 A                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Output Frequency</b>                  | 100 kHz for fast output (PWM/PLS mode) at Q0...Q1<br>5 kHz for output at Q2...Q3<br>0.1 kHz for output at Q4...Q9                                                                                                                                                                                                                                                                                                                                                               |
| <b>Absolute Accuracy Error</b>           | +/- 1 % of full scale for analog input                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Maximum Leakage Current</b>           | 0.1 mA for transistor output                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Maximum Voltage Drop</b>              | <1 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Mechanical Durability</b>             | 20000000 cycles for transistor output                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Maximum Tungsten Load</b>             | <12 W for output and fast output                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Protection Type</b>                   | Overload and short-circuit protection at 1 A                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Reset Time</b>                        | 1 s automatic reset                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Memory Capacity</b>                   | 256 kB for user application and data RAM with 10000 instructions<br>256 kB for internal variables RAM                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Data Backed Up</b>                    | 256 kB built-in flash memory for backup of application and data                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Data Storage Equipment</b>            | 2 GB SD card (optional)                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Battery Type</b>                      | BR2032 or CR2032X lithium non-rechargeable                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Backup Time</b>                       | 1 year at 25 °C (by interruption of power supply)                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Execution Time For 1 Kinstruction</b> | 0.3 ms for event and periodic task                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Execution Time Per Instruction</b>    | 0.2 µs Boolean                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Exct Time For Event Task</b>          | 60 µs response time                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Maximum Size Of Object Areas</b>      | 512 %KW constant words<br>255 %C counters<br>8000 %MW memory words<br>255 %TM timers<br>512 %M memory bits                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Realtime Clock</b>                    | With                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Clock Drift</b>                       | <= 30 s/month at 25 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Regulation Loop</b>                   | Adjustable PID regulator up to 14 simultaneous loops                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Positioning Functions</b>             | Position PTO 2 axe(s)pulse/direction mode (100 kHz)<br>Position PTO 1 axe(s)CW/CCW mode (100 kHz)                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Function Available</b>                | PWM<br>PLS<br>Frequency generator                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Counting Input Number</b>             | 4 fast input (HSC mode) at 100 kHz 32 bits                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Counter Function</b>                  | A/B<br>Single phase<br>Pulse/direction                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Integrated Connection Type</b>        | USB port with mini B USB 2.0 connector<br>Non isolated serial link serial 1 with RJ45 connector and RS485 interface<br>Non isolated serial link serial 2 with RJ45 connector and RS232/RS485 interface                                                                                                                                                                                                                                                                          |

|                                        |                                                                                                                                                                                                                                                                                        |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply                                 | (serial)serial link supply: 5 V, <200 mA                                                                                                                                                                                                                                               |
| Transmission Rate                      | 1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 15 m for RS485<br>1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 3 m for RS232<br>480 Mbit/s for USB                                                                                                    |
| Communication Port Protocol            | USB port: USB - SoMachine-Network<br>Non isolated serial link: Modbus master/slave - RTU/ASCII or SoMachine-Network                                                                                                                                                                    |
| Local Signalling                       | 1 LED (green) for PWR<br>1 LED (green) for RUN<br>1 LED (red) for module error (ERR)<br>1 LED (green) for SD card access (SD)<br>1 LED (red) for BAT<br>1 LED (green) for SL1<br>1 LED (green) for SL2<br>1 LED per channel (green) for I/O state                                      |
| Electrical Connection                  | removable screw terminal block for inputs<br>removable screw terminal block for outputs<br>terminal block, 3 terminal(s) for connecting the 24 V DC power supply<br>connector, 4 terminal(s) for analogue inputs<br>Mini B USB 2.0 connector for a programming terminal                |
| Maximum Cable Distance Between Devices | Shielded cable: <10 m for fast input<br>Unshielded cable: <30 m for output<br>Unshielded cable: <30 m for digital input<br>Unshielded cable: <1 m for analog input<br>Shielded cable: <3 m for fast output                                                                             |
| Insulation                             | Between input and internal logic at 500 V AC<br>Between fast input and internal logic at 500 V AC<br>Non-insulated between inputs<br>Between output and internal logic at 500 V AC<br>Non-insulated between analogue input and internal logic<br>Non-insulated between analogue inputs |
| Marking                                | CE                                                                                                                                                                                                                                                                                     |
| Mounting Support                       | Top hat type TH35-15 rail conforming to IEC 60715<br>Top hat type TH35-7.5 rail conforming to IEC 60715<br>plate or panel with fixing kit                                                                                                                                              |
| Height                                 | 90 mm                                                                                                                                                                                                                                                                                  |
| Depth                                  | 70 mm                                                                                                                                                                                                                                                                                  |
| Width                                  | 110 mm                                                                                                                                                                                                                                                                                 |
| Net Weight                             | 0.395 kg                                                                                                                                                                                                                                                                               |

## Environment

|                                       |                                                                                                                                                         |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards                             | IEC 61131-2<br>UL 508<br>CAN/CSA C22.2 No. 213<br>IACS E10<br>ANSI/ISA 12-12-01                                                                         |
| Product Certifications                | DNV-GL<br>LR<br>cULus<br>RCM<br>EAC<br>ABS<br>CE<br>UKCA<br>cULus HazLoc                                                                                |
| Environmental Characteristic          | Ordinary and hazardous location                                                                                                                         |
| Resistance To Electrostatic Discharge | 8 kV in air conforming to IEC 61000-4-2<br>4 kV on contact conforming to IEC 61000-4-2                                                                  |
| Resistance To Electromagnetic Fields  | 10 V/m 80 MHz...1 GHz conforming to IEC 61000-4-3<br>3 V/m 1.4 GHz...2 GHz conforming to IEC 61000-4-3<br>1 V/m 2...2.7 GHz conforming to IEC 61000-4-3 |
| Resistance To Magnetic Fields         | 30 A/m 50/60 Hz conforming to IEC 61000-4-8                                                                                                             |

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Resistance To Fast Transients         | 2 kV (power lines) conforming to IEC 61000-4-4<br>2 kV (relay output) conforming to IEC 61000-4-4<br>1 kV (I/O) conforming to IEC 61000-4-4<br>1 kV (Ethernet line) conforming to IEC 61000-4-4<br>1 kV (serial link) conforming to IEC 61000-4-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Surge Withstand                       | 2 kV power lines (AC) common mode conforming to IEC 61000-4-5<br>2 kV relay output common mode conforming to IEC 61000-4-5<br>1 kV I/O common mode conforming to IEC 61000-4-5<br>1 kV shielded cable common mode conforming to IEC 61000-4-5<br>0.5 kV power lines (DC) differential mode conforming to IEC 61000-4-5<br>1 kV power lines (AC) differential mode conforming to IEC 61000-4-5<br>1 kV relay output differential mode conforming to IEC 61000-4-5<br>0.5 kV power lines (DC) common mode conforming to IEC 61000-4-5                                                                                                                                                                                                                                                                               |
| Resistance To Conducted Disturbances  | 10 V 0.15...80 MHz conforming to IEC 61000-4-6<br>3 V 0.1...80 MHz conforming to Marine specification (LR, ABS, DNV, GL)<br>10 V spot frequency (2, 3, 4, 6.2, 8.2, 12.6, 16.5, 18.8, 22, 25 MHz) conforming to Marine specification (LR, ABS, DNV, GL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Electromagnetic Emission              | Conducted emissions - test level: 79 dBµV/m QP/66 dBµV/m AV ( power lines (AC)) at 0.15...0.5 MHz conforming to IEC 55011<br>Conducted emissions - test level: 73 dBµV/m QP/60 dBµV/m AV ( power lines (AC)) at 0.5...300 MHz conforming to IEC 55011<br>Conducted emissions - test level: 120...69 dBµV/m QP ( power lines) at 10...150 kHz conforming to IEC 55011<br>Conducted emissions - test level: 63 dBµV/m QP ( power lines) at 1.5...30 MHz conforming to IEC 55011<br>Radiated emissions - test level: 40 dBµV/m QP class A ( 10 m) at 30...230 MHz conforming to IEC 55011<br>Conducted emissions - test level: 79...63 dBµV/m QP ( power lines) at 150...1500 kHz conforming to IEC 55011<br>Radiated emissions - test level: 47 dBµV/m QP class A ( 10 m) at 200...1000 MHz conforming to IEC 55011 |
| Immunity To Microbreaks               | 10 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Ambient Air Temperature For Operation | -10...55 °C (horizontal installation)<br>-10...35 °C (vertical installation)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Ambient Air Temperature For Storage   | -25...70 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Relative Humidity                     | 10...95 %, without condensation (in operation)<br>10...95 %, without condensation (in storage)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Ip Degree Of Protection               | IP20 with protective cover in place                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Pollution Degree                      | <= 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Operating Altitude                    | 0...2000 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Storage Altitude                      | 0...3000 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Vibration Resistance                  | 3.5 mm at 5...8.4 Hz on symmetrical rail<br>3.5 mm at 5...8.4 Hz on panel mounting<br>1 gn at 8.4...150 Hz on symmetrical rail<br>1 gn at 8.4...150 Hz on panel mounting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Shock Resistance                      | 147 m/s² for 11 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Packing Units

|                              |           |
|------------------------------|-----------|
| Unit Type Of Package 1       | PCE       |
| Number Of Units In Package 1 | 1         |
| Package 1 Height             | 11.021 cm |
| Package 1 Width              | 14.142 cm |
| Package 1 Length             | 15.497 cm |
| Package 1 Weight             | 601.0 g   |
| Unit Type Of Package 2       | CAR       |
| Number Of Units In Package 2 | 20        |

|                              |          |
|------------------------------|----------|
| Package 2 Height             | 29.2 cm  |
| Package 2 Width              | 39.6 cm  |
| Package 2 Length             | 56.4 cm  |
| Package 2 Weight             | 13.16 kg |
| Unit Type Of Package 3       | P12      |
| Number Of Units In Package 3 | 240      |
| Package 3 Height             | 120.0 cm |
| Package 3 Width              | 105.0 cm |
| Package 3 Length             | 80.0 cm  |
| Package 3 Weight             | 164.8 kg |

Bền vững



Nhãn **Green Premium™** là cam kết của Schneider Electric trong việc cung cấp sản phẩm với hiệu suất môi trường tốt nhất. Green Premium cam kết tuân thủ các quy định mới nhất, minh bạch về tác động môi trường, cũng như các sản phẩm tuần hoàn và CO<sub>2</sub> thấp.

**Hướng dẫn đánh giá tính bền vững của sản phẩm** là tài liệu kỹ thuật phổ thông giúp làm rõ các tiêu chuẩn nhãn sinh thái toàn cầu và cách diễn giải việc khai báo môi trường.

[Tìm hiểu thêm về Green Premium >](#)

[Hướng dẫn đánh giá về sự bền vững của sản phẩm >](#)



Minh bạch    RoHS/REACH

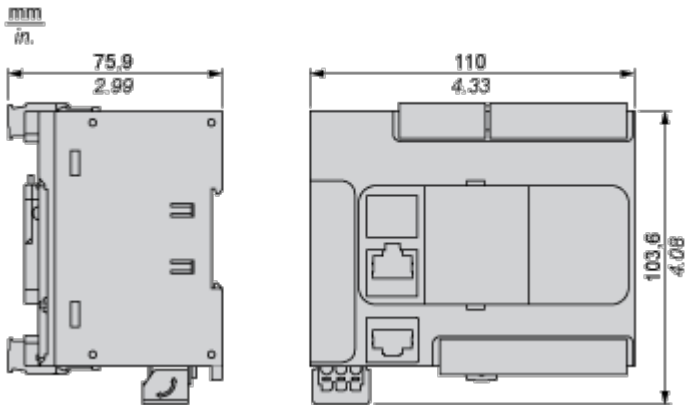
## Hiệu suất sức khỏe

|                                                              |                |
|--------------------------------------------------------------|----------------|
| <div><div>✓</div><div>Mercury Free</div></div>               |                |
| <div><div>✓</div><div>Rohs Exemption Information</div></div> | <div>Yes</div> |
| <div><div>✓</div><div>Pvc Free</div></div>                   |                |

## Chứng nhận & Tiêu chuẩn

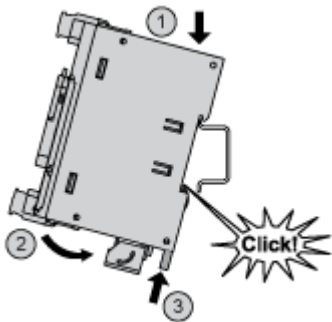
|                          |                                                                                                                                        |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Reach Regulation         | <div><a href="#">REACH Declaration</a></div>                                                                                           |
| Eu Rohs Directive        | <div>Pro-active compliance (Product out of EU RoHS legal scope)</div>                                                                  |
| China Rohs Regulation    | <div><a href="#">China RoHS declaration</a></div>                                                                                      |
| Environmental Disclosure | <div><a href="#">Product Environmental Profile</a></div>                                                                               |
| Weee                     | <div>The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins</div> |
| Circularity Profile      | <div><a href="#">End of Life Information</a></div>                                                                                     |

Dimensions



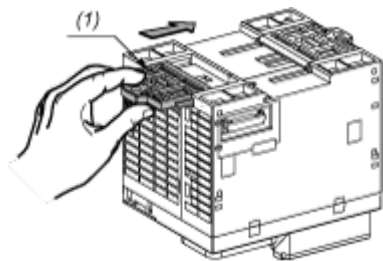
Mounting on a Rail

---



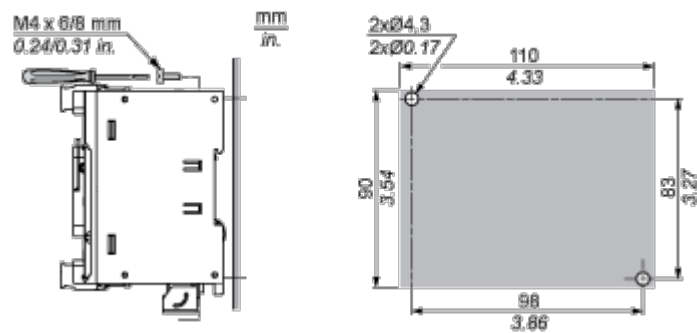


Direct Mounting on a Panel Surface



- (1) Install a mounting strip

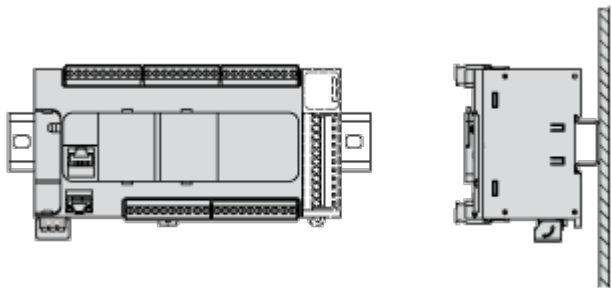
Mounting Hole Layout



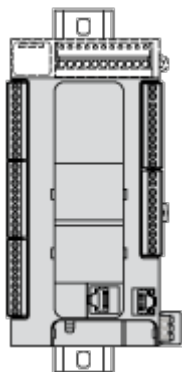
Mounting

---

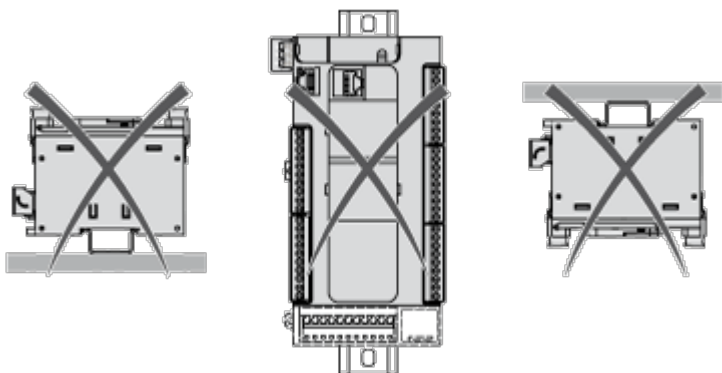
Correct Mounting Position



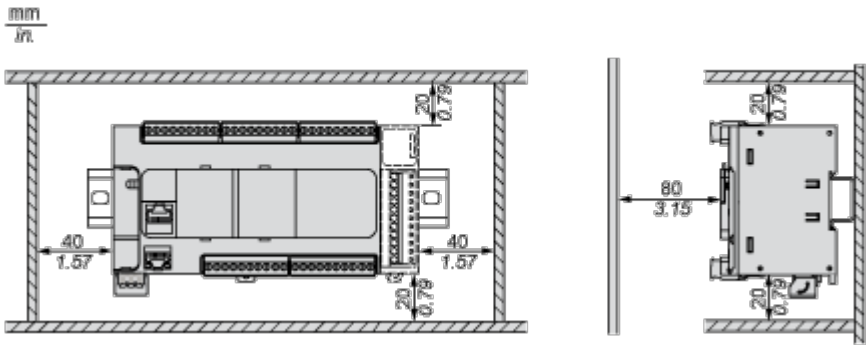
Acceptable Mounting Position



Incorrect Mounting Position

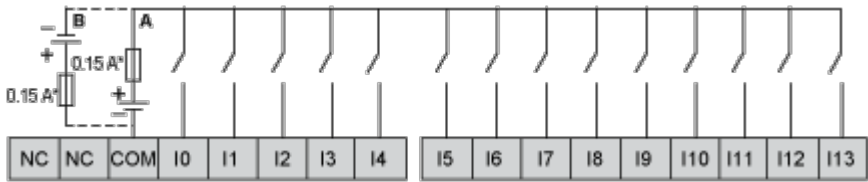


Clearance



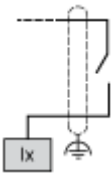
Connections and Schema

Digital Inputs



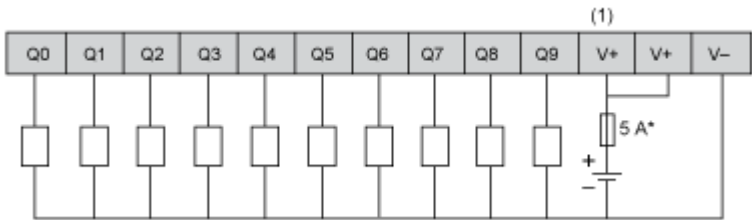
- (\*) Type T fuse
- (A) Sink wiring (positive logic).
- (B) Source wiring (negative logic).

Connection of the Fast Inputs



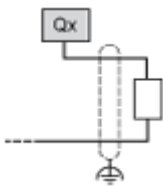
I0, I1, I6, I7

Transistor Outputs



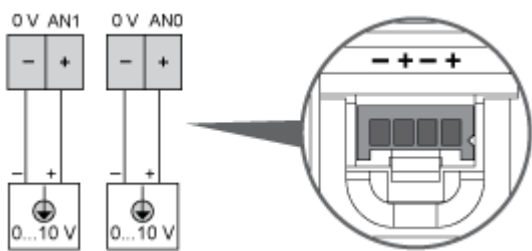
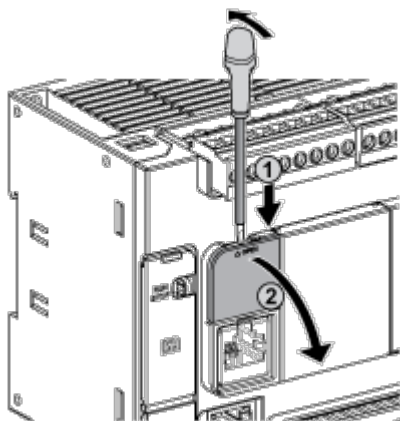
- (\*) Type T fuse
- (1) The V+ terminals are connected internally.

Connection of the Fast Outputs



Q0, Q1

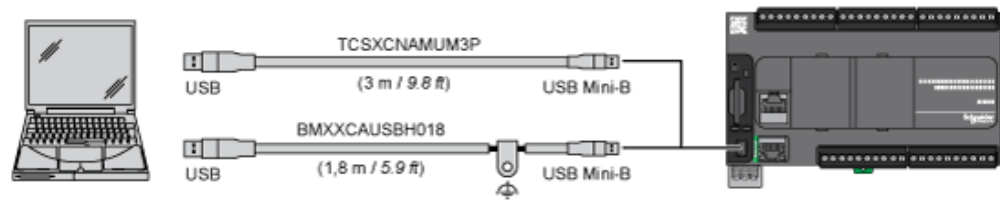
Analog Inputs



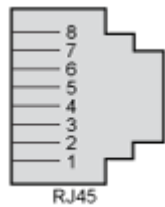
The (-) poles are connected internally.

| Pin | Wire Color |
|-----|------------|
| 0 V | Black      |
| AN1 | Red        |
| 0 V | Black      |
| AN0 | Red        |

USB Mini-B Connection



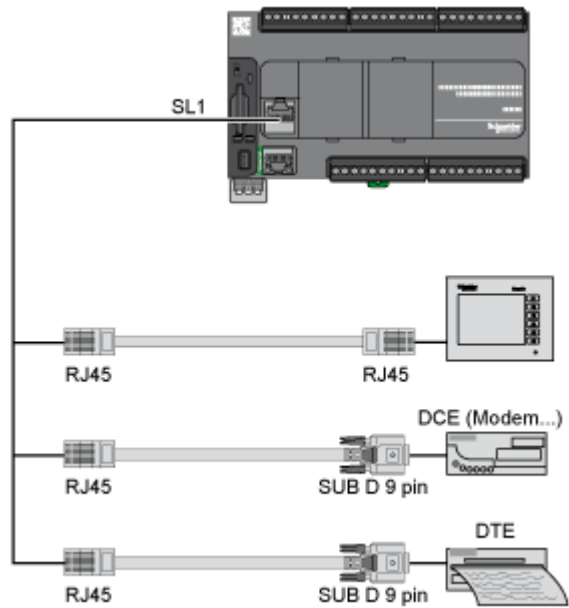
SL1 Connection



SL1

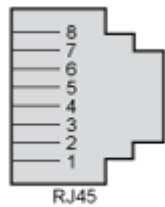
| N ° | RS 232 | RS 485 |
|-----|--------|--------|
| 1   | RxD    | N.C.   |
| 2   | TxD    | N.C.   |
| 3   | RTS    | N.C.   |
| 4   | N.C.   | D1     |
| 5   | N.C.   | D0     |
| 6   | CTS    | N.C.   |
| 7   | N.C.*  | 5 Vdc  |
| 8   | Common | Common |

N.C.: not connected  
\*: 5 Vdc delivered by the controller. Do not connect.





SL2 Connection



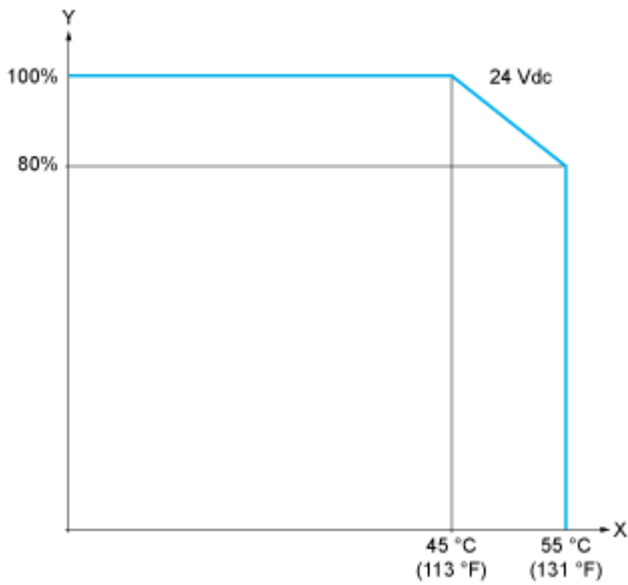
| N ° | RS 485 |
|-----|--------|
| 1   | N.C.   |
| 2   | N.C.   |
| 3   | N.C.   |
| 4   | D1     |
| 5   | D0     |
| 6   | N.C.   |
| 7   | N.C.   |
| 8   | Common |

N.C.: not connected

Performance Curves

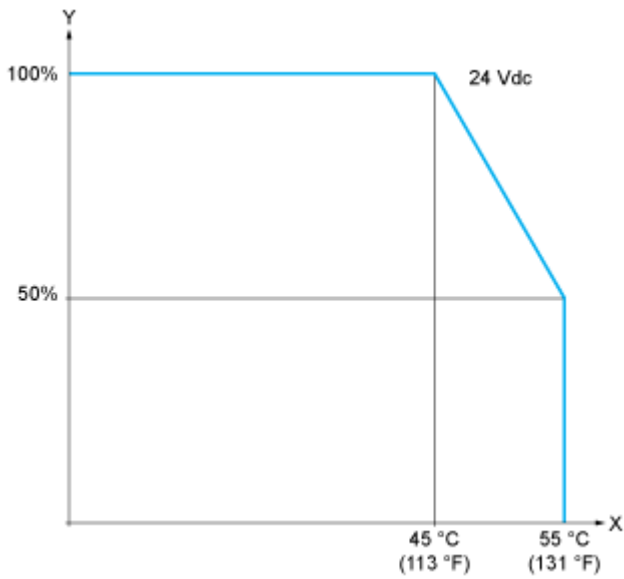
Derating Curves

Embedded Digital Inputs (No Cartridge)



X : Ambient temperature  
Y : Input simultaneous ON ratio

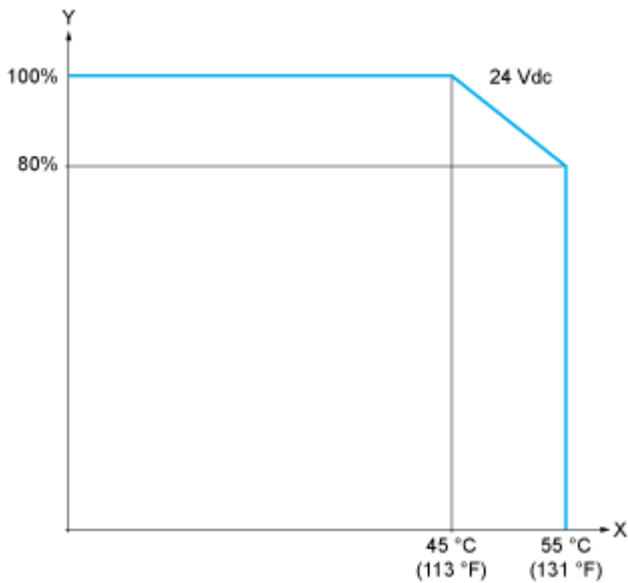
Embedded Digital Inputs (with Cartridge)



X : Ambient temperature  
Y : Input simultaneous ON ratio

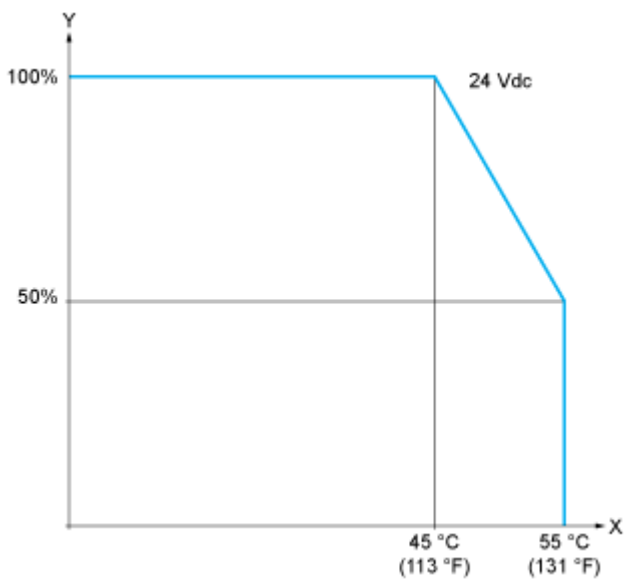
Derating Curves

Embedded Digital Outputs (No Cartridge)



X : Ambient temperature  
Y : Output simultaneous ON ratio

Embedded Digital Outputs (with Cartridge)



X : Ambient temperature  
Y : Output simultaneous ON ratio