SIEMENS

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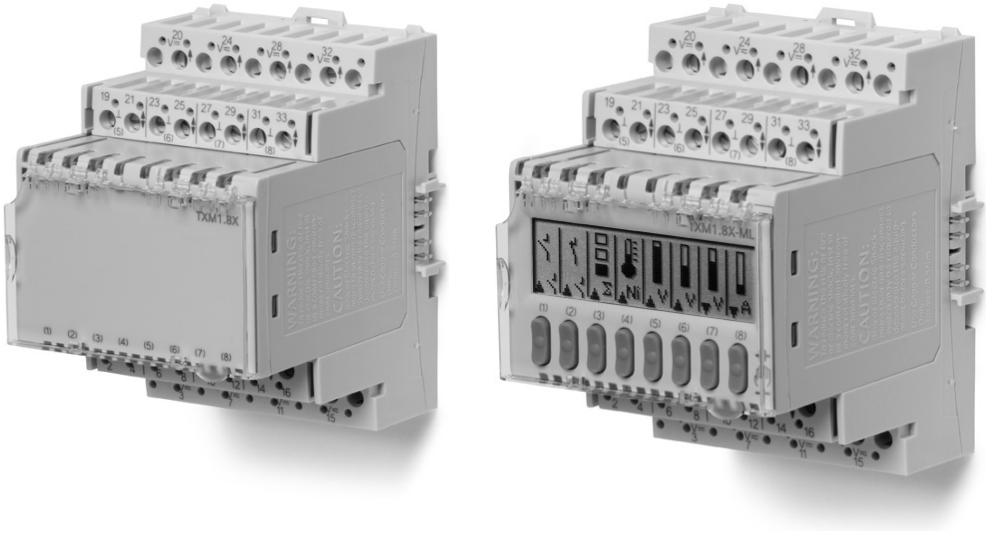


TX-I/O™

# Super universal modules TXM1.8X TXM1.8X-ML

- **Two fully compatible versions:**
  - **TXM1.8X: 8 inputs/outputs with LED signal / fault indication**
  - **TXM1.8X-ML: As TXM1.8X, but with additional local override facility with LCD display (LO/ID to ISO 16 484-2)**
- **8 universal I/O points, individually configurable as**
  - **Digital input: maintained contact, pulse or counter**
  - **Analog input: sensor, 0..10V, 4..20mA**
  - **Analog output: 0..10V, 4..20mA (I/O points 5 ... 8)**
- **Compact DIN format, small footprint**
- **Separate terminal base and plug-in I/O module for convenient handling**
  - **Self-establishing bus connection for maximum ease of installation**
  - **Terminal isolation function for fast commissioning**
  - **I/O module replaceable in seconds, without rewiring and without affecting the full functioning of the remaining I/O modules**
- **All terminals are directly on the I/O modules, allowing direct connection of field devices without additional terminal strips.**
- **Simple strategy for operation and display**
  - **I/O status LED for each I/O point; mode of operation (N/C or N/O) and brightness depend on I/O function**
  - **LEDs and LCD for fast diagnostics**
- **Double-sided labels for identification of all I/O points**

## Functions

The modules support the following I/O functions:

| Function | Signal type (TRA) | Signal type | Description |
|---|---|---|---|
| **Status signal** | **BI NO**<br>**BI NC** | **D20**<br>**D20R** | Volt-free, interrogation (maintained contact), N/O contact<br>Volt-free, interrogation (maintained contact), N/C contact |
| **Status pulses** | **BI Pulse NO**<br>**BI Pulse NC** | **D20S** | Volt-free, interrogation (pulse), N/O, N/C contact |
| **Counter pulses** | **CI EI (100Hz)**<br>**CI Mech (10/25Hz)** | **C** | Volt-free, N/O contact, interrogation (pulse)<br>Counting frequency max. 100 Hz (electronic counter)<br>max. 25 Hz (mech. counter) |
| **Voltage, current, resistance and temperature** | **AI 0-10V** | **U10** | DC voltage 0 ... 10 V |
| | **AI 4-20mA** | **I420** | DC current 4 ... 20 mA |
| | **AI 0-20mA** | **I25** | DC current 0 ... 20 mA<br>*Please note that the max. current is 20 mA!* |
| | **AI 2500 Ohm** | **R2K5** | Resistance 2500 Ω |
| | **AI Ni1000 extended** | **Ni1K** | Temperature sensor LG-Ni 1000 ohms, up to 180 °C |
| | **AI Ni1000** | **R1K** | Temperature sensor LG-Ni 1000 ohms |
| | **AI PT1K375** | **Pt1K 375** | Temperature sensor Pt 1000 (USA) |
| | **AI PT1K385** | **Pt1K 385** | Temperature sensor Pt 1000 (Europe) |
| | **AI Pt1000** | **P1K** | Resistance Pt 1000 ohms and resistance transmitter |
| | **AI T1 (PTC)** | **T1** | Temperature sensor PTC |
| | **AI NTC10K** | **NTC10 K** | Temperature sensor NTC 10 K |
| | **AI NTC100K** | **NTC100 K** | Temperature sensor NTC 100 K |
| **Proportional output signals** | **AO 0-10V** | **Y10S** | Proportional control output, DC 0 ... 10 V, with storage of control value |
| | **AO 4-20mA** | **Y420** | Proportional control output, current DC 4 ... 20 mA (I/O points 5 … 8 only) |

For a detailed description of these functions, please refer to document CA110561, "TX-I/O™ functions and operation".

## Compatibility

Support of signal types and functions in different building automation and control systems: see TX-I/O Engineering and installation manual, CM110562

## Type summary

**ASN**

Super universal module **TXM1.8X**
Super universal module **TXM1.8X-ML** with LCD display and local override

**Delivery**

The terminal base and the electronic plug-in unit are interconnected and delivered in the same box.

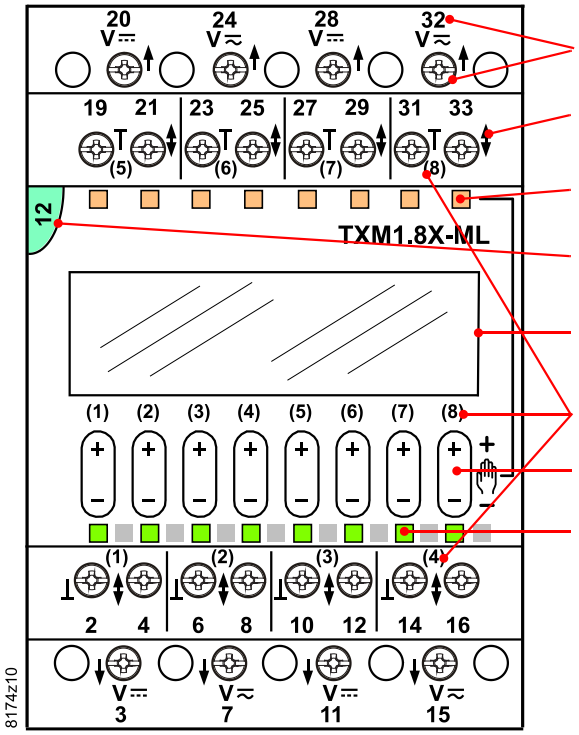
**Accessories**

The available accessories include address keys, label sheets, and spare transparent label holders. Refer to data sheet CM2N8170.

## Technical and mechanical design

For a description of the features common to all TX-I/O™ modules, please refer to the TX-I/O™ Engineering and installation manual, document CM110562.

## Indicators and operator controls




Connection terminals (No. 1 screwdriver for slotted or recessed-head * screws)
with test pickup (for 1.8...2 mm pins) and terminal number

Signal designation

Override status LEDs (yellow)

Address key and module status LED

LCD panel (TXM1.8X-ML only)

I/O point numbers

Override button (TXM18X-ML only)

I/O status LEDs (green)

* Combined slotted / recessed-head screws from mid-2012

**I/O status LEDs**

- The I/O status LEDs (green) indicate the status of the inputs and outputs (peripheral devices)
- They are also used for diagnostics

**Module status LED**

- The module status LED illuminates the transparent address key
- The LED (green) shows the module status as a whole (as opposed to the status of the I/O points)
- It is also used for diagnostics

**Address key**

- The module operates only with the address key inserted
- The module address is mechanically encoded in the address key
- When replacing the I/O module, the address key must be swiveled outward. It remains plugged into in the terminal base.

## Local override and LCD display (TXM1.8X-ML only)

For a detailed description, please refer to document CM110561, "TX-I/O™ Functions and operation".

**Override button**

- Pressing an button in the middle enables or disables the local override
- Pressing "+" or "–" respectively increases or reduces the output value.
- Only outputs can be overwritten. Any attempt to overwrite an input results in an error indication.

**Override status LED**

- The yellow "Override" LED indicates that local override is active

**LCD display**

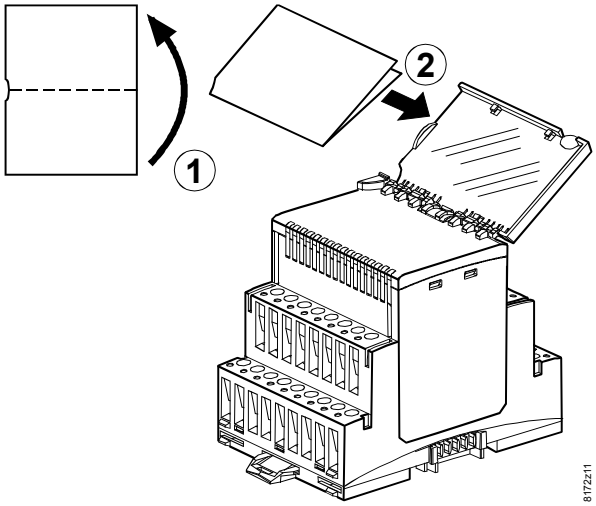
- The following information is displayed for each I/O point:
  - Configured signal type
  - Symbolic display of process value
  - Information for diagnostics.

**Warning**

- **All safety-relevant functions must be implemented with external solutions**
- **The local override must not be used for safety shutdown operations**
- **In compliance with the standard (ISO 16 484-2, Section 3.110), the module executes all local overrides directly, without safety precautions or interlocks.**
  **➔ *Full responsibility lies with the operator.* ←**

## Module labeling

The plug-in I/O module has a removable transparent cover (the label holder) for insertion of a label.




## Disposal

The devices are considered electronics devices for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic garbage.

- Dispose of the devices through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

## Engineering, mounting, installation

Please refer to the following documents

| Document | Number |
|---|---|
| TX-I/O™ functions and operation | CM110561 |
| TX-I/O™ Engineering and installation manual | CM110562 |
| Replacement of legacy modules | CM110563 |

## Mounting

**Permitted orientation**

The TX-I/O™ devices can be installed in any orientation:

It is important to provide adequate ventilation so that the admissible ambient temperature (max. 50°C) is not exceeded.

## Technical data

| | | | |
|---|---|---|---|
| Supply (bus connector on side) | Operating voltage range | | DC 21.5 ... 26 V (SELV / PELV) or DC 24 V class 2 (US) |
| | Max. power consumption | TXM1.8X | 2.2 W |
| | | TXM1.8X-ML | 2.3 W |
| | (for the sizing of power supplies, see CM110562) | | |
| Protection | All terminals of the modules | | Against shortcut and incorrect wiring with AC / DC 24 V |
| | Bus connector on side | | No protection! |
| Field devices | | | |
| Insulation resistance | The of the connected field devices against mains voltage must comply with the requirements for safety extra-low voltage (SELV) or protection by extra-low voltage (PELV) as per HD 384. | | |
| Measuring cables | Cable material | | Solid or stranded copper wire |
| | Cable cross section | | See manual CM110562 |
| | Permitted cable length | | max. 300 m |
| DC output (field supply) (⎓, Terminals 3, 11, 20, 28) | Nominal voltage (derived in the module from the module supply voltage) | | DC24 V |
| | Admissible current per module | | Max. 200 mA (total for all 4 terminals) |
| AC/DC output (field supply) | Voltage | | AC / DC 12 ... 24 V |
| | Admissible current per module | | Max. 4 A (total for all 4 terminals) |
| (⏦, Terminals 7, 15, 24, 32) | Fuse | | T 10A, in power supply module / bus connection module |
| ⚠ **Caution!** | Wiring of the AC/DC 24 V supply: Use cable cross section suited for 10 A according to local regulations. | | |
| **Digital inputs / counter inputs** | Digital inputs are not electrically separated from the system electronics. Mechanical contacts must be volt-free. Electronic switches must comply with SELV / PELV standards. *Counter inputs faster than 1 Hz that are routed for more than 10 m in the same trunking as analog inputs must be shielded.* | | |
| | Contact sensing voltage | | DC 21.5 ...25 V |
| | Contact sensing current | | 1.0 mA (initial current 6 mA) |
| | Contact resistance with contacts closed | | Max. 200Ω |
| | Contact resistance with contacts open | | Min. 50kΩ |

| | Min. closing / opening time [ms] including bouncing | Max. bounce time [ms] | Max. Counting frequency (symmetric) |
|---|---|---|---|
| Maintained contact | 60 | 20 | |
| Pulse contact | 30 | 10 | |
| Counter mechanic | 20 | 10 | 25 Hz |
| Counter electronic | ..5 | ..0 | 100 Hz |
| Counter memory | | 0 ... 4.3 x $10^9$ (32 bit counter) | |

**Analog inputs**

| | |
|---|---|
| Correction of line resistance | 1 Ω (calibrated In module) |

| | Signal type (see page 2) | Range | Under / over range | Resolution |
|---|---|---|---|---|
| Resistance Pt 1000 and resistance transmitter | AI Pt1000 | 0...2500 Ohm | 0...2650 Ohm | 100 mOhm |
| | AI 2500 Ohm | 0...2500 Ohm | 0...2650 Ohm | 100 mOhm |
| Temp. measurement | AI PT1K 375 | -50…180 | -52.5...185.0 °C | 10 mK |
| | AI PT1K 385 1) | -50...400 (600) °C 1) | -52.5...610°C | 20 mK |
| | AI NI1000 extended 1) | -50…150 (180) °C 1) | -52.5...185.0 °C | 10 mK |
| | AI NI1000 | -50...150°C | -52.5...155.0 °C | 10 mK |
| | AI T1 (PTC) 1) | -50...130 (150) °C 1) | -52.5...155.0 °C | 10 mK |
| | AI NTC10K 1) | (-40...115 °C) 1) | -52.5...155°C | 10 mK (25°C) |
| | AI NTC100K 1) | (-40 ...125 °C) 1) | -52.5...155°C | 10 mK (25°C) |
| | *1) 180 °C, 600°C, NTC: only with reduced hum injection* | | | |
| Voltage measurement | AI 0-10V 2) | 0 ... 10 V 2) | -1.5...11.5 V | 1 mV |
| | *2) In case of open connection: negative voltage –3.1 V, 0.05 mA (open circuit detection)* | | | |
| Current measurement | AI 4-20mA | 4...20 mA | 1.6...22.4 mA | 1 µA |
| | AI 0-20mA | ***0...20 mA*** *(25 mA see CM10563)* | -3.0...23 mA | 1 µA |
| Load resistance | 490 / 440 ohms, pulsing (cyclic interrogation of the I/O points) *Note: if the peripheral device can not drive this load, the signal must be connected via a current measuring converter.* | | | |

**Analog outputs**

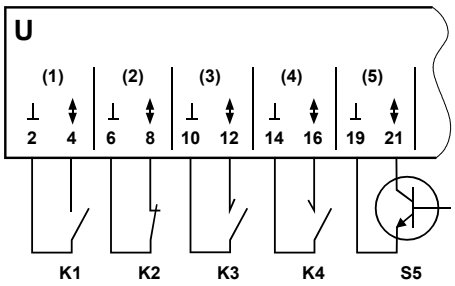
| | Signal type | Range | Under / over range | Resolution |
|---|---|---|---|---|
| Output voltage | AO 0-10V | 0 … 10 V | -0.05...10.6 V | 1 mV |
| Output current | | max. 1 mA | | |
| Output current ***I/O points 5 ... 8 only)*** | AO 4-20mA | 4 ... 20 mA | 3.92...20.96 mA | 1 µA |
| Output voltage | | ca. DC 15 V | | |
| Load resistance | | 0 ... 500 Ohm | | |

| | | |
|---|---|---|
| Connection terminals | Mechanical design | Rising cage terminals |
| | Solid conductors | 1 x 0.5 mm² to 4mm² or 2 x 0,6 mm∅ to 1.5 mm² |
| | Stranded conductors without connector sleeves | 1 x 0.5 mm² to 2.5 mm² or 2 x 0,6 mm∅ to 1.5 mm² |
| | Stranded conductors with connector sleeves (DIN 46228/1) | 1 x 0.25 mm² to 2.5 mm² or 2 x 0,6 mm∅ to 1.5 mm² |
| | Screwdriver | No. 1 Screwdriver for slotted or recessed-head * screws *with shaft diameter ≤ 4.5 mm* * Combined slotted / recessed-head screws from mid-2012 |
| | Max. tightening torque | 0.6 Nm |
| Test pickups (test terminals) | For pin diameter | 1.8 … 2.0 mm |

| | | |
|---|---|---|
| Local override (TXM1.8X-ML only) | Local override / indication device | ISO 16 484-2, Section 3.11 |
| Classification to EN 60730 | Mode of operation of automatic electrical controls | Type 1 |
| | Contamination level | 2 |
| | Mechanical design | Protection class III |
| Housing protection standard | Protection standard to EN 65029 | |
| | Front-plate components in DIN cut-out | IP30 |
| | Terminal base | IP20 |
| Ambient conditions | Operation | To IEC 60721-3-3 |
| | Climatic conditions | Class 3K5 |
| | Temperature | –5 ... 50 °C |
| | Humidity | 5 … 95 % rh |
| | Mechanical conditions | Class 3M2 |
| | Transport / storage | To IEC 60721-3-2 |
| | Climatic conditions | Class 2K3 |
| | Temperature | –25…70 °C |
| | Humidity | 5 … 95 % rh |
| | Mechanical conditions | Class 2M2 |
| Standards, directives and approvals | Product standard EN 60730-1 | Automatic electrical controls for household and similar use |
| | Electromagnetic compatibility (Applications) | For use in residential, commercial, light-industrial and industrial environments |
| | EU conformity (CE) | CM1T10870xx *) |
| | UL certification (US) | UL 916, UL 864, http://ul.com/database |
| | CSA certification | Class 4812 http://directories.csa-international.org/ |
| | RCM-conformity (EMC) | CM1T10870en_C1 *) |
| | EAC conformity | Eurasia conformity |
| Environmental compatibility | Product environmental declaration (contains data on RoHS compliance, materials composition, packaging, environmental benefit, disposal) | CM2E8174 *) |
| Color | Terminal base and plug-in I/O module | RAL 7035 (light gray) |
| Dimensions | Housing to DIN 43 880, see "Dimensions" | |
| Weight | Without / with packaging | TXM1.8X 194 / 215 g<br>TXM1.8X-ML 211 / 232 g |

*) The documents can be downloaded from http://siemens.com/bt/download.

## Digital inputs




**U** Super universal module
**K1** Status contact (N/O)
**K2** Status contact (N/C)
**K3** Pulse contact (N/O)
**K4** Pulse contact (N/C)
**S5** Electronic switch

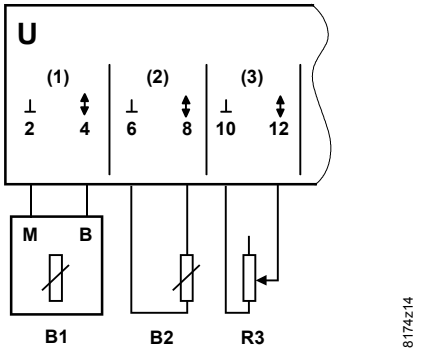
Terminal layout

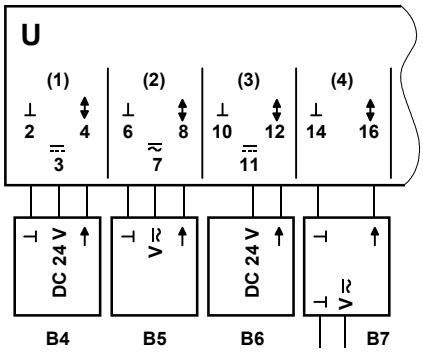
| I/O point | TXM1.8X, TXM1.8X-ML (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| System neutral ⊥ (–) [1] | 2 | 6 | 10 | 14 | 19 | 23 | 27 | 31 |
| Input ↕ (+) | 4 | 8 | 12 | 16 | 21 | 25 | 29 | 33 |

**Counter inputs**

Counter inputs faster than 1 Hz that are routed for more than 10 m in the same trunking as analog inputs must be shielded.

## Analog inputs



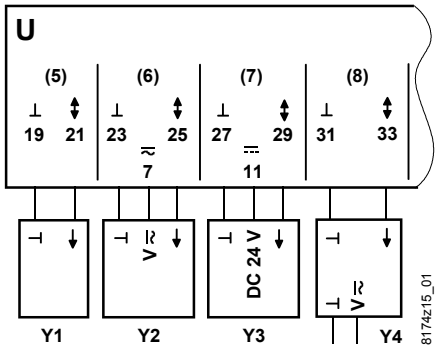




**U** Super universal module
**B1** LG-Ni 1000 temperature sensor
**B2** General temperature sensor
**R3** Resistance transmitter r
**B4** Active sensor with DC 24 V supply
**B5** Active sensor with AC / DC supply
**B6** Active sensor 0 … 20 mA or 4 … 20 mA (2-wire)
**B7** Active sensor with external supply
***External supply must NOT be earthed (earth loop)***

Terminal layout

| I/O point | TXM1.8X, TXM1.8X-ML (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Measuring neutral ⊥ (–) [1] | 2 | 6 | 10 | 14 | 19 | 23 | 27 | 31 |
| Input ↕ (+) | 4 | 8 | 12 | 16 | 21 | 25 | 29 | 33 |
| AC/DC sensor supply voltage [2] | Selected from: 7, 15, 24, 32 | | | | | | | |
| DC +24 V sensor supply voltage [3] | Selected from: 3, 11, 20, 28 | | | | | | | |

## Analog outputs




**U** **Super universal module**

**Y1** **Actuator with input DC 0 ..10 V or 4 ... 20 mA**

**Y2 … Y4** **General device with input DC 0 ..10 V or 4 ... 20 mA, Supply AC / DC, DC 24 V or externally**
***External supply must NOT be earthed (earth loop)***

Terminal layout tension

| I/O point | TXM1.8X, TXM1.8X-ML (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| System neutral ⊥ (–) [1] | 2 | 6 | 10 | 14 | 19 | 23 | 27 | 31 |
| Output ↕ (+) | 4 | 8 | 12 | 16 | 21 | 25 | 29 | 33 |
| AC/DC operating voltage [2] | Selected from: 7, 15, 24, 32 [2] | | | | | | | |
| DC +24 V operating voltage [3] | Selected from: 3, 11, 20, 28 [3] | | | | | | | |

Terminal layout current

| I/O point | TXM1.8X, TXM1.8X-ML (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| System neutral ⊥ (–) [1] | -- | -- | -- | -- | 19 | 23 | 27 | 31 |
| Output ↕ (+) | -- | -- | -- | -- | 21 | 25 | 29 | 33 |
| AC/DC operating voltage [2] | Selected from: 7, 15, 24, 32 [2] | | | | | | | |
| DC +24 V operating voltage [3] | Selected from: 3, 11, 20, 28 [3] | | | | | | | |

[1] All measuring / system neutral terminals are interconnected, not in the terminal base but in the plug-in I/O module. When this unit is pulled outward (into the "parking" position) there is no connection.
- The system neutral of a digital input can be connected to any system neutral terminal
- With analog inputs and outputs, the measuring / system neutral must always be connected to the terminal associated with that I/O point.

[2] All **AC/DC** 24V supply terminals are interconnected (in the I/O module, not in the terminal base).
They are protected in the **power supply module / bus connection module** (T10A).

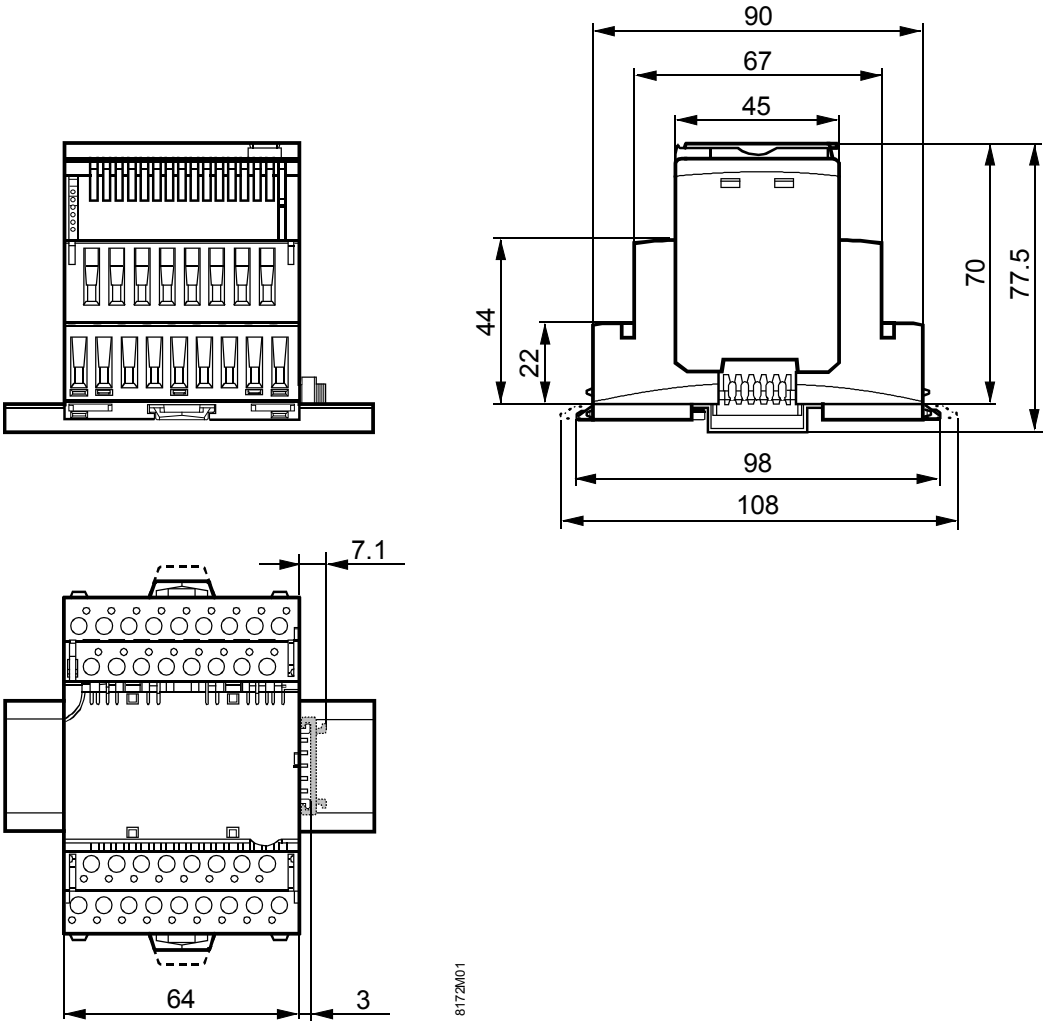
⚠ **Caution!**
Wiring of the AC 24/DC V supply (terminals 7, 15, 24, 32):
Use cable cross section suited for 10 A according to local regulations.

[3] All **DC 24 V** supply terminals are interconnected.
They are protected in the **module** against shortcut and incorrect wiring.

For wiring details refer to the TX-I/O™ Engineering and installation manual, CM110562.

## Dimensions

Dimensions in mm

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