



MX-EXT5 shown. MX-EXT3 uses the same housing and supply/bus terminals, with three contact outputs (COM, O1–O3).

MX

MX is a standalone DIN-rail relay module for light loads in HVAC and building control. It provides switched outputs in the electrical cabinet for the Alledio Room Unit / Room Controller and for other Modbus controllers. Two variants are available: MX-EXT5 with five normally-open contacts, and MX-EXT3 with three. Typical loads are fan-coil motors, on/off valves, curtain drives and lighting.

The contacts share a common COM. They can switch a 230 V nominal AC circuit (contact maximum 250 V AC) and are separated from the 24 V supply by reinforced insulation. Three application modes are provided. As shipped, Mode 1 is for a 3-speed AC fan-coil on O1–O3: MX-EXT5 also switches two on/off valves on O4 and O5; MX-EXT3 has no valve contacts. Mode 2 is independent relays. Mode 3 is curtain-drive control. The module mounts on DIN rail EN 60715 TH35, in a closed electrical cabinet or fan-coil enclosure.

Two variants

Variant	Role	Typical use
MX-EXT5	Relay module – 5× NO contacts, Modbus	Mode 1: 2 × valve + 3-speed fan · Mode 2: 5 channels · Mode 3: 2 curtain drives
MX-EXT3	Relay module – 3× NO contacts, Modbus	Mode 1: 3-speed fan · Mode 2: 3 channels · Mode 3: 1 curtain drive + free relay

Highlights

Contacts	MX-EXT5: 5 × SPST-NO · MX-EXT3: 3 × SPST-NO. Shared common COM
Current limits	5 A per Ox, 250 V AC resistive · 3 A at 30 V DC resistive · COM max. 16 A · can switch 230 V nominal AC, 250 V AC max.
Intended loads	Fan-coil motors, on/off valves, curtain drives, lighting
Supply DC 	24 V nominal, 18–42 V, polarity-insensitive
Supply AC 	24 V ± 25 %, 50–60 Hz
Power	0.2 W, contacts open · 1.5 W max., all contacts held at 100 % hold duty
Communication	RS485 Modbus RTU. As shipped: address 8, 115200, 8N1
Mounting	DIN rail EN 60715 TH35, in a closed electrical cabinet or fan-coil enclosure

Note. Data in this document are subject to change without notice. Product photographs are for illustration and may differ from the delivered product. Photos and drawings do not constitute a contractual specification.

Technical data

The current limits are 5 A per Ox contact and 16 A through COM. They apply at make, carry and break. 5 A at 250 V AC and 3 A at 30 V DC are resistive ratings.

Supply

DC 	24 V nominal, 18–42 V. Polarity-insensitive
AC 	24 V ± 25 %, 50–60 Hz
Power	0.2 W, contacts open · 1.5 W max., all contacts held at 100 % hold duty

Contacts

Form	SPST-NO. EXT5: 5 contacts · EXT3: 3. Shared COM
Current limits	5 A per Ox, 250 V AC resistive · 3 A at 30 V DC resistive · 16 A through COM
Voltage	Can switch 230 V nominal AC. Max. 250 V AC or 30 V DC. One voltage band on COM
Intended loads	Fan-coil motors, on/off valves, curtain drives, lighting
Durability	Electrical: 100,000 ops at 5 A, 250 V AC resistive · 200,000 ops at 3 A, 30 V DC resistive. Mechanical: 5,000,000 ops min.
De-energized	Contacts open (NO). Micro-disconnection — not a disconnecting safety device
Protection	Ox and COM not fused. Fit an MCB or fuse matched to the load, not exceeding 5 A per Ox. Combined current through COM max. 16 A; any device on COM must not exceed 16 A

Housing and environment

Housing	DIN-rail. Top PC, UL 94 V-0 · bottom PPO, UL 94 V-0. IP30 as installed in a closed cabinet or fan-coil enclosure
Ambient	–20 °C to +50 °C, max. 85 % rH, non-condensing. 5 A / 16 A apply across this range
Altitude	Up to 2,000 m (IEC 60664-1, OVC III, PD2)
Storage	–25 °C to +70 °C, max. 85 % rH, non-condensing
Dimensions	35 × 89.6 × 31.25 mm (W × H × D) · about 100 g

Communication

RS485	Modbus RTU. As shipped: address 8, 115200, 8N1
Cable	Twisted pair with drain wire and foil wrap, or equivalent
LED	AUTO: breathing glow and activity. Not a contact or bus indicator
Bus-loss	Removing VIN opens the contacts. Timeout is not a safety function

Terminal assignment

Supply and bus terminals are the same on both variants. Contact assignment is listed separately for MX-EXT5 and MX-EXT3. Both ship in Mode 1.

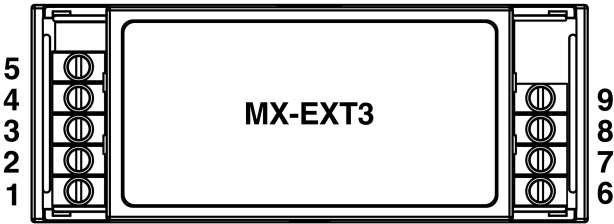
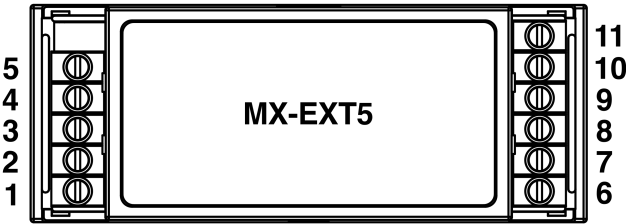
Terminal	Name	Function · both variants
1	VIN	Supply, 24 V $\overline{\text{=}}$ nominal (18–42 V) or 24 V $\sim$ $\pm$ 25 %. Polarity-insensitive — DC may be connected either way
2		
3	GND	Signal ground. Not a protective earth. Recommended on long runs or where devices use different supplies
4	B	RS485 B
5	A	RS485 A

MX-EXT5 · COM, O1–O5

Term.	Name	Mode 1	Mode 2	Mode 3
6	COM	Common	Common	Common
7	O1	Motor — stage 1	Relay 1	Motor — open 1
8	O2	Motor — stage 2	Relay 2	Motor — close 1
9	O3	Motor — stage 3	Relay 3	Unused
10	O4	Valve	Relay 4	Motor — open 2
11	O5	Valve	Relay 5	Motor — close 2

MX-EXT3 · COM, O1–O3

Term.	Name	Mode 1	Mode 2	Mode 3
6	COM	Common	Common	Common
7	O1	Motor — stage 1	Relay 1	Motor — open
8	O2	Motor — stage 2	Relay 2	Motor — close
9	O3	Motor — stage 3	Relay 3	Relay 3 · free



Note. Loads connect between each Ox contact and COM. Combined current through COM max. 16 A. All Ox that share COM must be in one voltage band — do not mix 230 V AC and extra-low voltage on the same COM. Ox contacts and COM are not fused. Fit an MCB or fuse matched to the load, not exceeding 5 A per Ox; any device on COM must not exceed 16 A. We recommend to use $\geq 0.75\text{ mm}^2$ per Ox and $\geq 2.5\text{ mm}^2$ for COM.

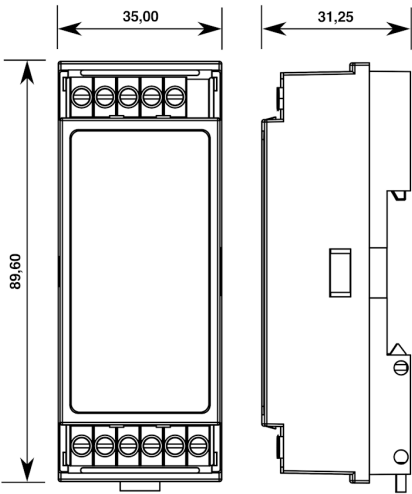
Isolation

The NO relay contacts can switch a 230 V nominal AC circuit (contact maximum 250 V AC). That circuit is separated from the low-voltage side (24 V $\sim$ / $\overline{\text{=}}$ supply and RS485) by reinforced insulation. The reinforced-insulation barrier is designed in accordance with IEC 60664-1 for OVC III, PD2, at altitudes up to 2,000 m. Construction is Class II: double insulated, no protective-earth terminal.

Relay-contact circuit	Can switch 230 V nominal AC, contact max. 250 V AC. SPST-NO, isolated from the 24 V and RS485 circuits
Low-voltage side	24 V $\sim$ / $\overline{\text{=}}$ supply and RS485. GND is signal ground, not PE. RS485 is not isolated from VIN
Insulation	Reinforced-insulation barrier between the contact circuit and the 24 V / RS485 side
Disconnection	Micro-disconnection. Control contacts only. Not a disconnecting safety device
Construction	Class II. No protective-earth terminal
Overvoltage category	III (OVC III)
Pollution degree	2 (PD2), as provided by the closed cabinet or fan-coil enclosure. The enclosure must keep the module non-condensing
Design Uimp	6 kV (IEC 60664-1, OVC III, PD2, 230 V)
Reference	IEC 60664-1

Mounting

Type	DIN rail EN 60715 TH35, in a closed electrical cabinet or fan-coil enclosure
Wall clips	Optional, inside the same enclosure only. Not for open-wall use. Not in the standard package. Part number pending
Location	Closed electrical cabinet, lockable control panel, or fan-coil enclosure. Terminals not accessible to untrained persons in intended use
Terminals	Screw terminals, 5.00 mm pitch, M2.5
Terminal capacity	30–12 AWG / 0.05–3.31 mm² (clamp range). Use ferrules matched to the conductor
Contact-circuit CSA	≥ 0.75 mm² per O _x · ≥ 2.5 mm² for COM. Do not use the lower clamp range on COM or O _x
Strip length	6 mm
Tightening torque	0.5 N·m (M2.5 screw)
Outline	35 × 89.6 × 31.25 mm (W × H × D)



MX-EXT5 shown. Same outline for MX-EXT3.

Modbus parameters

Set slave address, motor interlock and group mask over Modbus. Devices ship in application Mode 1 (motor interlock on). The complete register map is in this datasheet. Addresses are 0-based PDU addresses; some hosts offset them by one.

Parameter	Options	As shipped
Baud rate	115200, fixed in current firmware	115200
Framing	RTU	RTU
Format	8 data bits, no parity, 1 stop bit	8N1
Address	1–247. EEPROM. Applied after the write is acknowledged	8
Motor interlock	Off = independent contacts (Mode 2). On = contacts in the group are mutually exclusive, break-before-make	On
Motor group	Bit mask of contacts in the interlock group. Default O1–O3, matching Mode 1 fan-speed contacts on both variants	O1–O3
Termination	Selectable via Modbus: none or 120 Ω	None
LED	AUTO (breathing glow and activity), FORCE_ON, FORCE_OFF. FORCE states are not stored; AUTO power-up returns AUTO	

Commissioning. Factory-fresh devices share address 8. Do not write the address register while several devices still share 8. Commission one device by factory serial (holding registers 9–26). Pull-in, hold duty and motor dead-time are holding registers 4–6. Use twisted pair with drain wire and foil wrap, or equivalent, for RS485. Removing VIN opens the contacts. Contact state on Modbus timeout is not a safety function.

Modbus register map

RS-485 Modbus RTU, 115200, 8N1. Default slave address 8, configurable 1–247 and stored in EEPROM. Addresses below are 0-based PDU addresses. Current firmware is 1.0.0. Coils 3–4 and holding bits 3–4 (O4–O5) apply to MX-EXT5 only. Factory serial is 32 bytes in input registers 3–18 and is not writable over Modbus.

Encoding

Type	Encoding	Notes
Bitfield	uint16, low bits	Relay and motor-group masks. Bit 0 = RELAY_1 (O1)
Enum	uint16	0/1 or enumerated ordinal
Time	uint16, milliseconds	Pull-in 10–1000 ms. Motor dead-time 5–1000 ms
Percent	uint16	Hold duty 1–100 %
Serial / ASCII	2 bytes per register	Big-endian: high byte = even index, low byte = odd index
Commit magic	uint16	Write 0xA55A to holding register 26 to apply a commission

Function codes

Code	Name
01	Read Coils
02	Read Discrete Inputs
03	Read Holding Registers
04	Read Input Registers
05	Write Single Coil
06	Write Single Register
15	Write Multiple Coils
16	Write Multiple Registers

Exception codes

Code	Meaning
01	ILLEGAL_FUNCTION — unsupported function
02	ILLEGAL_DATA_ADDRESS — out of range, or write to a read-only holding
03	ILLEGAL_DATA_VALUE — out of range, incomplete commission, or motor-mode interlock
04	SLAVE_DEVICE_FAILURE — EEPROM write failed

Coils · read/write · functions 01, 05, 15

Address	Access	Description	Unit
0 (0x0000)	R/W	RELAY_1 · O1. 1 = closed (pull-in or hold), 0 = open	—
1 (0x0001)	R/W	RELAY_2 · O2. 1 = closed (pull-in or hold), 0 = open	—
2 (0x0002)	R/W	RELAY_3 · O3. 1 = closed (pull-in or hold), 0 = open	—
3 (0x0003)	R/W	RELAY_4 · O4. MX-EXT5 only. 1 = closed, 0 = open	—
4 (0x0004)	R/W	RELAY_5 · O5. MX-EXT5 only. 1 = closed, 0 = open	—

Motor interlock. When motor mode is on (holding 3 = 1), one function-15 write must not close more than one coil from the motor group (holding 8; default coils 0–2). That request is rejected as a whole with ILLEGAL_DATA_VALUE. Per-coil function 05 writes remain legal — the driver does break-before-make.

Input and holding registers

Discrete input 0 is the status LED (function 02). Input registers 0–2 are the firmware version (1.0.0); 3–18 are the factory serial (function 04). Holding registers 0–8 are relays, status and configuration (functions 03, 06 and 16). Register 1 is read-only — writes return ILLEGAL_DATA_ADDRESS. LED_MODE is not stored; power-up returns AUTO.

Discrete inputs · read-only · function 02

Address	Access	Description	Unit
0 (0x0000)	R	LED_STAT — 1 = status LED lit after override. Also mirrored in holding register 1, bit 1	—

Input registers · read-only · function 04

Address	Access	Description	Unit
0 (0x0000)	R	VERSION_MAJOR	—
1 (0x0001)	R	VERSION_MINOR	—
2 (0x0002)	R	VERSION_PATCH	—
3–18 (0x0003–0x0012)	R	SERIAL_NUMBER — factory-programmed unique 32-byte serial, 2 per register, big-endian. Read-only; not writable over Modbus	ASCII

Holding registers · relays, status and configuration · 0–8

Address	Access	Description	Unit
0 (0x0000)	R/W	RELAY_BITFIELD — bits 0–4 = RELAY_1..RELAY_5 (O1–O5)	Bitfield
1 (0x0001)	R	STATUS_BITFIELD — bit 1 = LED_STAT lit (bit 0 reserved 0)	Bitfield
2 (0x0002)	R/W	MODBUS_SLAVE_ADDR (1–247). Applied after the write is acknowledged. EEPROM	—
3 (0x0003)	R/W	MOTOR_MODE (0 = off, 1 = on). EEPROM. Default 1	Enum
4 (0x0004)	R/W	PULL_IN_MS (10–1000). EEPROM. Default 100	ms
5 (0x0005)	R/W	HOLD_PERCENT (1–100). EEPROM. Default 60	%
6 (0x0006)	R/W	MOTOR_DEADTIME_MS (5–1000). EEPROM. Default 30	ms
7 (0x0007)	R/W	LED_MODE (0 = AUTO, 1 = FORCE_OFF, 2 = FORCE_ON). Not stored	Enum
8 (0x0008)	R/W	MOTOR_GROUP_MASK — bits 0–4; bits 5–15 must be 0. EEPROM. Default 0x0007 (O1–O3)	Bitfield

In motor mode a write to register 0 must not set more than one bit from the group in register 8. Do not use register 2 while several devices still share address 8 — use the commission block.

Address commission

Holding registers 9–26 change one device by factory serial. Staging is RAM-only and expires 30 s after the last write to 9–26. Prefer one broadcast (slave address 0) function-16 write covering registers 9–26.

Address	Access	Description	Unit
9–24 (0x0009–0x0018)	R/W	COMMISSION_SERIAL — target factory serial, 32 bytes	ASCII
25 (0x0019)	R/W	COMMISSION_ADDR — desired new slave address 1–247	—
26 (0x001A)	R/W	COMMISSION_COMMIT — write 0xA55A to apply; reads 0	—

All 16 serial registers and register 25 must have been written since the last commit or timeout. Serial mismatch: the write is accepted but ignored, with no reply, so devices still at address 8 do not collide. Serial match: the new address is stored and applied after the reply (after a broadcast, poll the new address).

LED mode · holding 7

Value	Mode
0	AUTO — breathing glow and activity
1	FORCE_OFF
2	FORCE_ON

Motor mode · holding 3

Value	Mode
0	Disabled — independent contacts
1	Enabled — interlock on the group in register 8

Relay bits · holding 0 and 8

Bit	Contact
0	RELAY_1 · O1
1	RELAY_2 · O2
2	RELAY_3 · O3
3	RELAY_4 · O4
4	RELAY_5 · O5

Register summary

Block	Type	Range	Count	Description
Relays	Coil	0–4	5	RELAY_1..RELAY_5 (O1–O5)
LED state	Discrete	0	1	LED_STAT after override
Firmware version	Input	0–2	3	Major / minor / patch
Factory serial	Input	3–18	16	32-byte serial
Relays and config	Holding	0–8	9	Bitfield, address, motor, PWM, LED
Commission	Holding	9–26	18	Serial-targeted address change

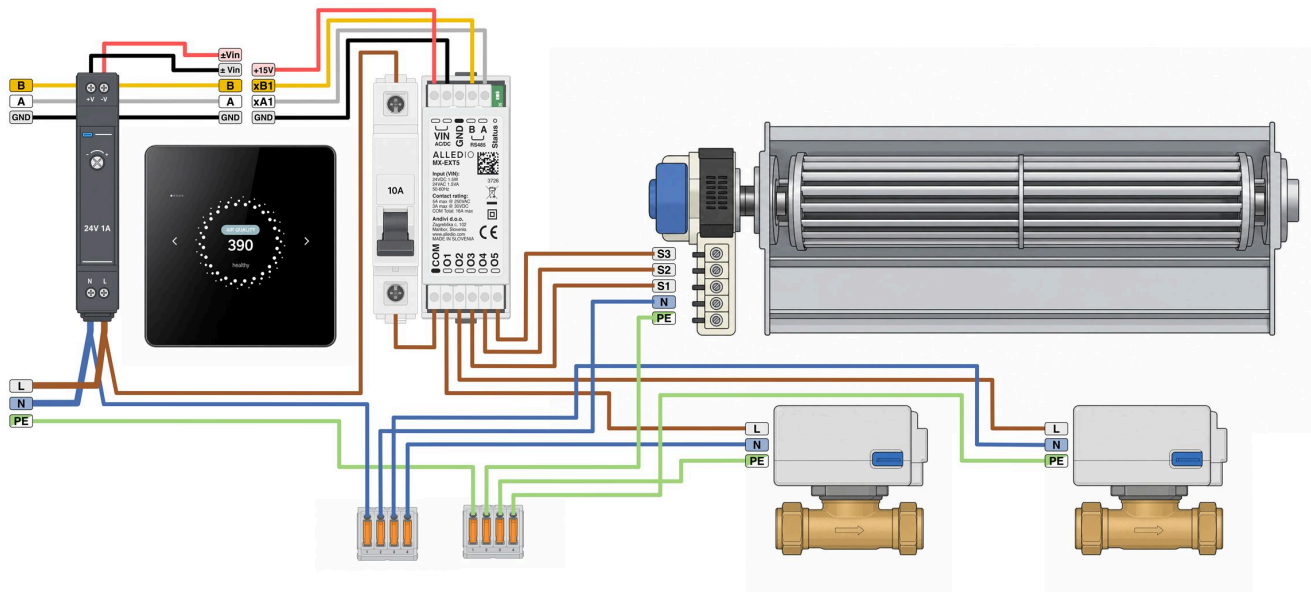
Total: 5 coils, 1 discrete input, 19 input registers (0–18), 27 holding registers (0–26).

Notes

- Addresses are 0-based PDU addresses. Factory-fresh devices share slave address 8.
- Slave address (holding 2) is applied only after the write is acknowledged. The next request must use the new address. Do not use this register while several devices still share address 8.
- Commission (holding 9–26) changes one device by factory serial. Prefer one broadcast function-16 write of the whole block, then poll the new address. Staging expires after 30 s.
- Motor mode treats the group in holding 8 as mutually exclusive, with break-before-make (dead-time in holding 6). Default group is O1–O3 (mask 0x0007).
- LED_MODE is not stored — a reset always returns AUTO.

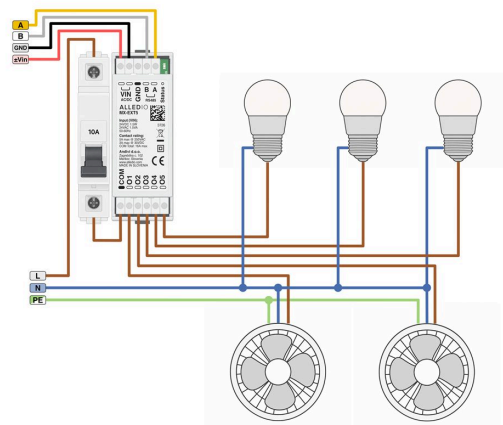
Applications

Mode 1 · default · 3-speed AC fan + 2 × valve · remapped example



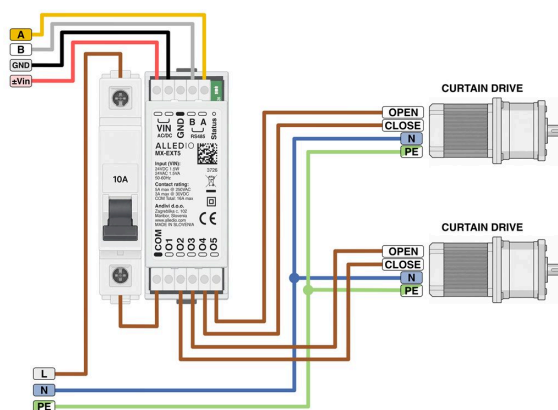
Mode 1 is intended for fan-coil applications with a 3-speed AC fan. It connects over Modbus to the Alledio Room Unit / Room Controller or to other controllers. As shipped, O1–O3 drive the three fan speeds on both variants; on MX-EXT5, O4 and O5 control two on/off valves, and the motor group is O1–O3. The figure is an example of remapping that group on MX-EXT5: valves on O1 and O2, fan speeds on O3–O5, motor group O3–O5. Change the motor group mask (holding register 8) to match the fan contacts in use. Firmware interlocking prevents simultaneous activation of the contacts in that group. That interlocking is an application function, not a safety function.

Mode 2 · standalone relay · 5 or 3 channels



Mode 2 provides independent NO contacts, still limited to 5 A per O_x (resistive) and 16 A through COM. Turn the motor interlock off over Modbus. MX-EXT5 has five channels; MX-EXT3 has three. The figure is an example (lighting and fan loads on MX-EXT5), not a factory wiring.

Mode 3 · curtain control · 2 drives or 1 + free relay



Mode 3 is intended for curtain-drive operation. MX-EXT5 connects up to two drives on pairs O1/O2 and O4/O5; O3 remains unused. MX-EXT3 connects one drive on O1/O2; O3 remains a free general-purpose relay. Open and Close are never asserted together. That interlocking is an application function, not a safety function. Set the motor group mask (holding register 8) to the open/close pair in use.

Secure installation

Install the device in a closed electrical cabinet, lockable control panel or fan-coil enclosure, on a DIN rail EN 60715 TH35. When used as intended, wiring terminals are not accessible to untrained persons. The enclosure must keep the module non-condensing.

Route cables through protected conduits where practical. Place associated controllers, gateways and network equipment in access-controlled technical areas. Optional wall clips, purchased separately, are only for mounting inside the same enclosure, not on an open wall.

Wiring	Protect wiring, terminals and service interfaces from unauthorised access.
Modbus	Connect Modbus only to trusted, building-internal networks. Do not expose it to the public internet.
Commissioning	Set Modbus parameters over the bus and confirm the motor interlock and group mask. Devices ship in Mode 1. Factory-fresh devices share address 8 — commission by serial (holding registers 9–26).

Installation checklist

Before completing installation, verify that:

- the device is inside a closed electrical cabinet, lockable control panel or fan-coil enclosure, and terminals are not accessible to untrained persons;
- an MCB or fuse matched to the load is fitted, not exceeding 5 A per Ox; combined current through COM max. 16 A and any device on COM must not exceed 16 A;
- wiring terminals and service interfaces are not exposed, and cables and Modbus connections are appropriately protected;
- Modbus is not exposed to the public internet;
- commissioning is complete, Modbus parameters are set over the bus, and temporary commissioning access has ended.

Safety

Intended use. Use only as specified. Intended for fan-coil motors, on/off valves, curtain drives and lighting, within 5 A per contact and 16 A through COM. Unauthorised modification voids the warranty.

Critical systems. Do not use where failure could endanger people or animals.

⚠ WARNING — Live terminals. Terminals COM and O1–O5 (MX-EXT5) or COM and O1–O3 (MX-EXT3) may carry 230 V AC. Contact with live terminals can cause electric shock. Install only in a closed electrical cabinet, lockable control panel or fan-coil enclosure. Installation and service by a qualified person. Isolate all supplies before installation or service. Do not work on live equipment. The contacts are not a disconnecting safety device (micro-disconnection only). Construction is Class II: no protective-earth terminal. Do not connect GND as PE.

Circuit protection. Ox contacts and COM are not fused. Fit an MCB or fuse matched to the load, not exceeding 5 A per Ox. Combined current through COM max. 16 A; any device on COM must not exceed 16 A. Do not mix 230 V AC and extra-low voltage on the same COM.

Regulations. Observe local law, health and safety rules, technical standards and this datasheet.

Modbus interface

⚠ WARNING — Unauthenticated Modbus. Modbus does not provide authentication or encryption by itself. Connect this interface only to a trusted, building-internal network or physically protected bus. Do not connect Modbus over the public internet or an untrusted network. Protect Modbus wiring and use network segmentation, firewall rules and a secure gateway where remote access is required.

Standards and declarations

Intended for residential and commercial use. Conforms to the essential requirements of the EMC Directive 2014/30/EU, Low Voltage Directive 2014/35/EU and RoHS Directive 2011/65/EU as amended by (EU) 2015/863. WEEE Directive 2012/19/EU: do not dispose of with unsorted municipal waste; use the take-back and collection systems available.

Assessed to EN IEC 60730-1:2024/A11:2024; EN IEC 61000-6-2:2019; EN IEC 61000-6-3:2021; EN IEC 60664-1 (reinforced-insulation barrier, OVC III, PD2, up to 2,000 m); EN 60068-2-1, EN 60068-2-2, EN 60068-2-14, EN 60068-2-78; EN IEC 63000:2018. EMC: industrial immunity with residential emission. Ingress protection IP30 (EN 60529) as installed in a closed cabinet or fan-coil enclosure that keeps the module dry. Terminals are not accessible in intended use.

EU Declaration of Conformity: www.alledio.com/documents or www.andivi.com/documents.

Type of action	Type 1 (operating control). Not a protective control
Software class	Class A. Software is not relied upon for safety. Fan-speed and curtain interlocking is application firmware
Construction	Class II. Double insulated. No protective-earth terminal
Insulation	Reinforced-insulation barrier between the contact circuit and the 24 V / RS485 side
Design Uimp	6 kV (IEC 60664-1, OVC III, PD2, 230 V)
Disconnection	Micro-disconnection. Control contacts only. Not a disconnecting safety device. Contacts open when de-energized

Related documents and products

CE EU Declaration of Conformity	Pending
RoHS & REACH Certificate of Conformity	Pending
Related products	Alledio Room Unit / Room Controller, Alledio_Room-Unit_Room-Controller_Datasheet

Commercial notes

Ordering	MX-EXT5 · MX-EXT3. Article numbers and EAN pending
Package	MX module. Wall clips not included. Packing list pending
Warranty	1 year
Country of origin	Slovenia, EU

Manufacturer

Company	Andivi d.o.o.
Address	Zagrebška cesta 102, 2000 Maribor, Slovenia
VAT ID	SI12053961
Web	www.andivi.com · www.alledio.com
E-mail	info@andivi.com
Support	support@andivi.com
Telephone	+386 (0) 51 630 770

CE marking



The CE marking is affixed in accordance with Directive 2014/30/EU, Directive 2014/35/EU and Directive 2011/65/EU. Conformity assessment: Module A (internal production control), no Notified Body involved.

The full text of the EU declaration of conformity is available at www.alledio.com/documents or www.andivi.com/documents.