

XM-UI4-UO2 Universal Input and Output Expansion Module

Data sheet applicable for:

- XM-UI4-UO2, 4 channel universal Inputs and 2 channel universal outputs expansion module

Introduction

XM-UI4-UO2 is an expansion module that adds 4 universal inputs (UIs) and 2 universal outputs (UOs) to the XM14-DT, XM17-ADT, or XM14-DT-HIO Programmable Logic Controllers (PLCs).

Front view

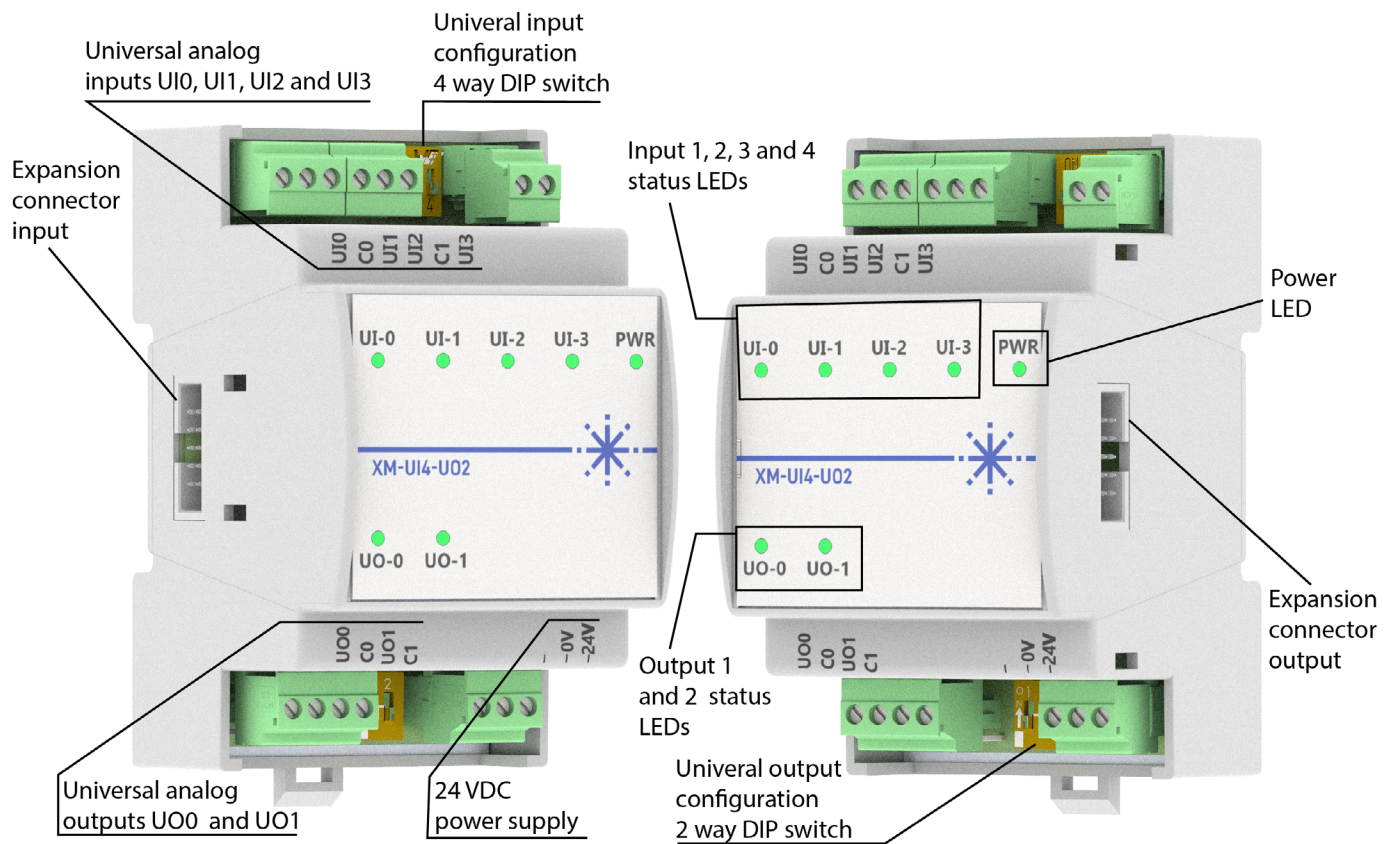


Figure 1. XM-UI4-UO2 universal input and output expansion module

Features of XM-UI4-UO2 universal expansion module

- Easy expansion by using a plug-in bus connection between the PLC and XM-UI4-UO2 module.
- Easy fitment next to the PLC on the 35 mm DIN rail.
- Bus connection routed through an expansion module connector that also offers protection for cable.
- 4 universal inputs that can be set to accept any of the following voltage, current, or sensors:
 - 0-10 VDC
 - 0-20 mA
 - 4-20 mA
 - Resistance Temperature Detector (RTD) type PT100 or PT1000
 - Resistance 0 to 350 k Ω

- Negative Temperature Coefficient (NTC) thermistor type 10k or 20k
- 2 universal outputs that can deliver any of the following voltage or currents:
 - 0-10 VDC
 - 0-20 mA
 - 4-20 mA
- Powered by an external power supply of 24 VDC.
- Convenient stacking of multiple expansion modules with connectors available on both sides of the XM-UI4-UO2 unit.

Local expansion with XM-UI4-UO2 unit

The following figure shows two Expansion Modules (such as the XM-UI4-UO2) attached to the XM14-DT PLC. Each Expansion Module connector contains a Flat Ribbon Cable (FRC) that connects the PLC with the expansion modules.

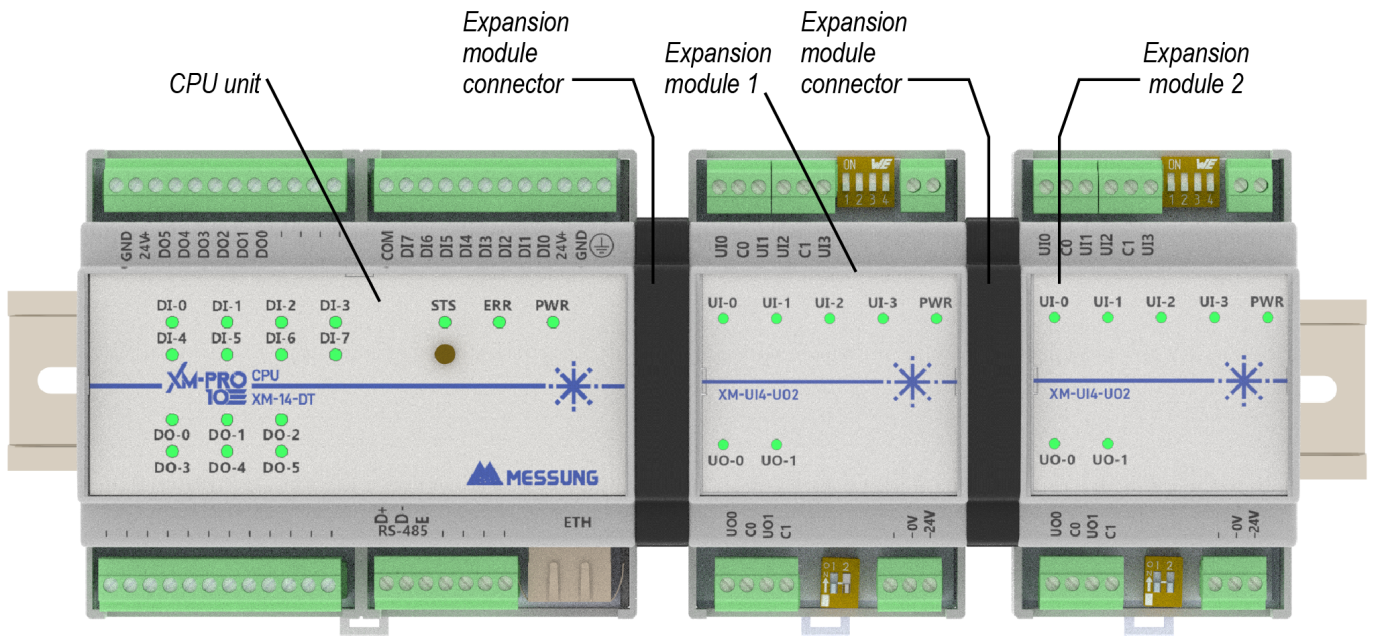


Figure 2. PLC CPU unit with 2 typical expansion modules
General specifications

Number of inputs	4
Number of outputs	2
Universal input types	Individually configurable: <ul style="list-style-type: none"> • Voltage • Current • Resistance 0 to 350 kΩ • RTD PT100 • RTD PT1000 • NTC thermistor 10k • NTC thermistor 20k • Digital inputs

Universal output types	Individually configurable: <ul style="list-style-type: none"> • 0-10 VDC • 0-20 mA • 4-20 mA
Protection	Available, against voltage surges
Resolution	Count range: 0 to 10,000
Scanning time	5 milliseconds with all channels enabled
Indication lamps	Input State LEDs (green) and output State LEDs (green)
Maximum input power	720 mW
Protection	Against voltage surges
Channel to channel isolation	No
IP level	IP20
Operating temperature	0°C to 55°C
Storage temperature	-5°C to +55°C
Operating and storage relative humidity	5 to 95% RH (no condensation)
Certifications	CE, RoHS
Dimensions	54 mm (width) x 91 mm (height) x 62mm (depth)
Weight	125 grams
Maximum wire size	0.5 mm ² with lugs
	1.5 mm ² without lugs

Univeral inputs

Input type	Individually configurable: <ul style="list-style-type: none"> • Voltage • Current • Resistance 0 to 350 kΩ • PT100 / PT1000 • 10k NTC or 20 KNTC • Digital inputs 	
Input range	<ul style="list-style-type: none"> • 0-10VDC • 0-5VDC • 0-20mA • 4-20mA • 0-350KΩ • PT100 • PT1000 • NTC-10K • NTC-20K 	
Engineering scale	0 to 10,000	
Resolution	Count range: 0 to 10,000	
Conversion time	18 microseconds	
Data rate	70 samples per second	
Analog to digital conversion resolution	Voltage	2.5 mV
	Current	5.12 μA

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Input impedance	Voltage	40 K Ω
	Current	250 Ω
Maximum permissible input	Voltage	12 V
	Current	22 mA
Accuracy	$\pm 1\%$ of full scale rating @ 25°C	
Indication lamps	Mode state LEDs (green)	

Universal outputs

Output type	Individually configurable: <ul style="list-style-type: none"> • Voltage • Current • Digital 	
Output range	<ul style="list-style-type: none"> • 0-10 VDC • 0-20 mA • 4-20 mA • Digital (0 or 12 volts) 	
Engineering scale	<ul style="list-style-type: none"> • 0 to 10,000 • 1/0 for digital 	
Resolution	Count range: 0 to 10,000	
Settling time	5 milliseconds	
Digital to analog conversion resolution	Voltage	2.5 mV
	Current	5.12 μ A
Load impedance	Voltage	Minimum 600 Ω
	Current	< 500 Ω
Maximum analog output	Voltage	10.5 V
	Current	21 mA
Digital output	0 or 12 Volts: <ul style="list-style-type: none"> • Source current: 100mA maximum at 12VDC • Minimum resistance: 120 Ω 	
Accuracy	$\pm 1\%$ of full scale rating @ 25°C	
Indication lamps	Mode state LEDs (green)	

DIP switch settings

- You can set the type of inputs and outputs on the XM-UI4-UO2 via Dual In-line Package (DIP) switches on the top and bottom terminal strips.
- The top terminal strip has a 4 way DIP switch to select the type of universal inputs.
- The bottom terminal strip has a 2 way DIP switch for select the type of universal outputs.

Universal input settings


Mode	Channel	DIP Switch 1			
		1	2	3	4
Voltage mode (0 to 10 Volts)	(UI-O) 1	OFF			-
	(UI-I) 2	-	OFF	-	-
	(UI-2) 3	-	-	OFF	-
	(UI-3) 4	-	-		OFF
Voltage mode (0 to 5 Volts)	(UI-O) 1	OFF			-
	(UI-I) 2	-	OFF	-	-
	(UI-2) 3	-	-	OFF	-
	(UI-3) 4	-	-		OFF
Current mode (0-20 mA)	(UI-O) 1	ON		-	-
	(UI-I) 2	-	ON	-	-
	(UI-2) 3	-	-	ON	-
	(UI-3) 4	-	-	-	ON
Current mode (4-20 mA)	(UI-O) 1	ON		-	-
	(UI-I) 2	-	ON	-	-
	(UI-2) 3	-	-	ON	-
	(UI-3) 4	-	-	-	ON
Resistance (0-350 K Ω)	(UI-O) 1	OFF			-
	(UI-I) 2	-	OFF	-	-
	(UI-2) 3	-	-	OFF	-
	(UI-3) 4	-	-		OFF
Temperature RTD mode (PT100)	(UI-O) 1	OFF			-
	(UI-I) 2	-	OFF	-	-
	(UI-2) 3	-	-	OFF	-
	(UI-3) 4	-	-		OFF
Temperature RTD mode (PT1000)	(UI-O) 1	OFF			-
	(UI-I) 2	-	OFF	-	-
	(UI-2) 3	-	-	OFF	-
	(UI-3) 4	-	-		OFF
Temperature NTC mode (10 K)	(UI-O) 1	OFF			-
	(UI-I) 2	-	OFF	-	-
	(UI-2) 3	-	-	OFF	-
	(UI-3) 4	-	-		OFF
Temperature NTC mode (20 K)	(UI-O) 1	OFF			-
	(UI-I) 2	-	OFF	-	-
	(UI-2) 3	-	-	OFF	-
	(UI-3) 4	-	-		OFF

Universal output settings

Mode	Channel	DIP Switch 2	
		1	2
Digital Mode (0/1)	(UO-0) 1	OFF	-
	(UO-1) 2	-	OFF
Voltage Mode (0-10V)	(UO-0) 1	OFF	-
	(UO-1) 2	-	OFF
Current Mode (0-20 mA)	(UO-0) 1	ON	-
	(UO-1) 2	-	ON
Current Mode (4-20 mA)	(UO-0) 1	ON	-
	(UO-1) 2	-	ON

Engineering scales

Universal inputs		
Type	Range	Scale
Digital	0 to 1	0 or 12 Volts
Voltage	0 to 10 Volts	0 to 10000
Voltage	0 to 5 Volts	0 to 10000
Current	0 to 20 mA	0 to 10000
Current	4 to 20 mA	0 to 10000
Resistance	0 to 350 KΩ	0 to 10000
RTD PT100	- 40 to 150 °C	- 4000 to 15000
RTD PT1000	- 60 to 300°C	- 6000 to 30000
NTC 10K	- 40 to 150°C	- 4000 to 15000
NTC 20K	- 40 to 150°C	- 4000 to 15000

 For RTDs and NTCs: Scaled value /100 = the actual value in °C.

Universal outputs		
Type	Range	Scale
Digital	0 to 1	0 or 12 Volts
Voltage	0 to 10 Volts	0 to 10000
Current	0 to 20 mA	0 to 10000
Current	4 to 20 mA	0 to 10000

Wiring diagram

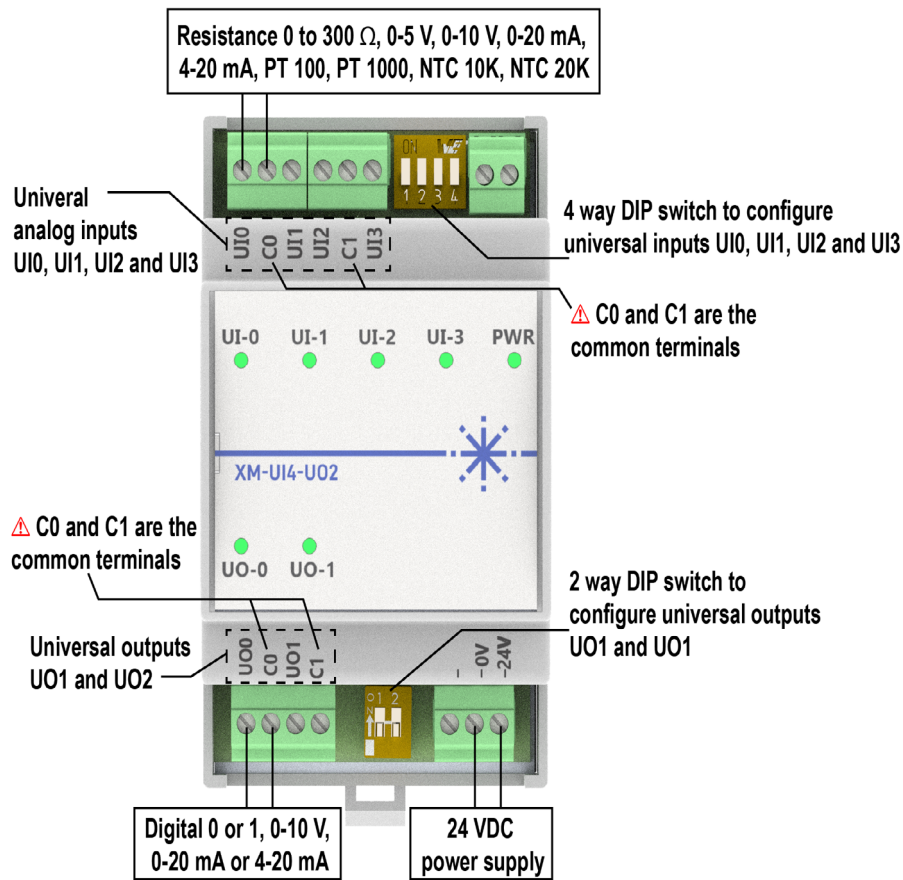


Figure 3. Typical wiring diagram of XM-UI4-UO2 expansion module

Connecting the Expansion Module

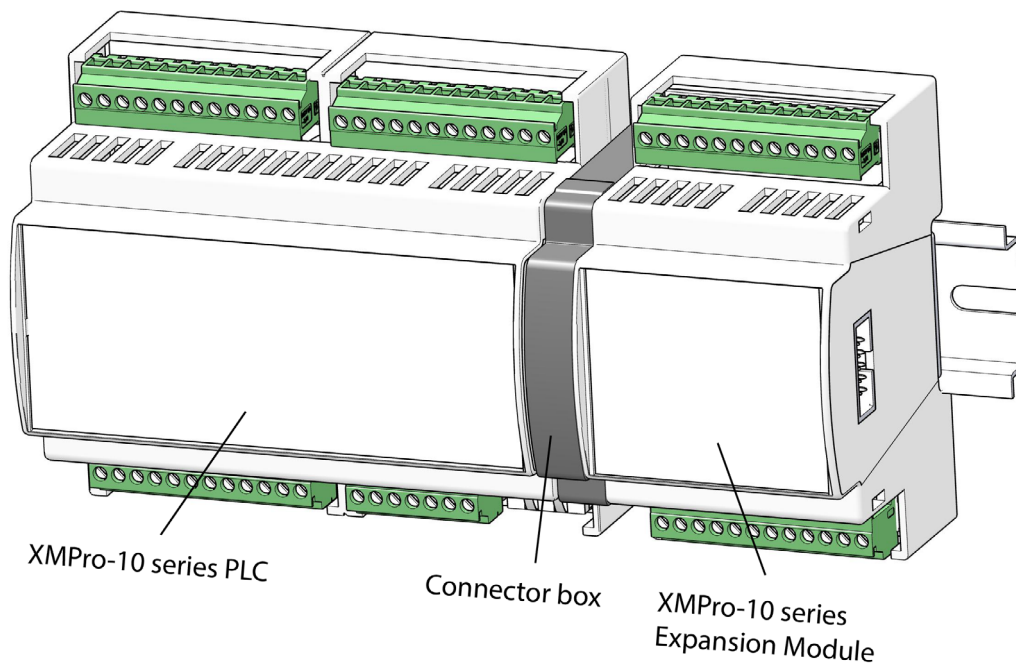


Figure 4. XMPro-10 series PLC and expansion module on a 35 mm DIN rail

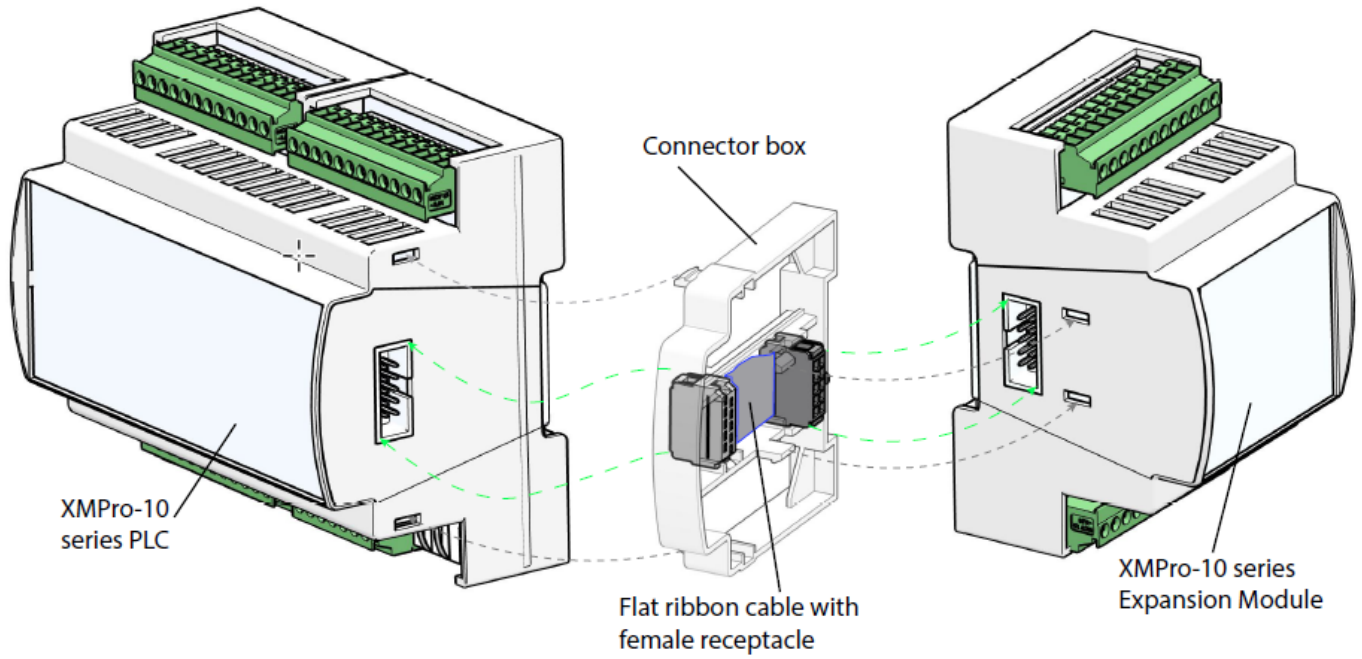


Figure 5. Connecting the XMPro-10 series PLC and expansion module
Fitting and removal

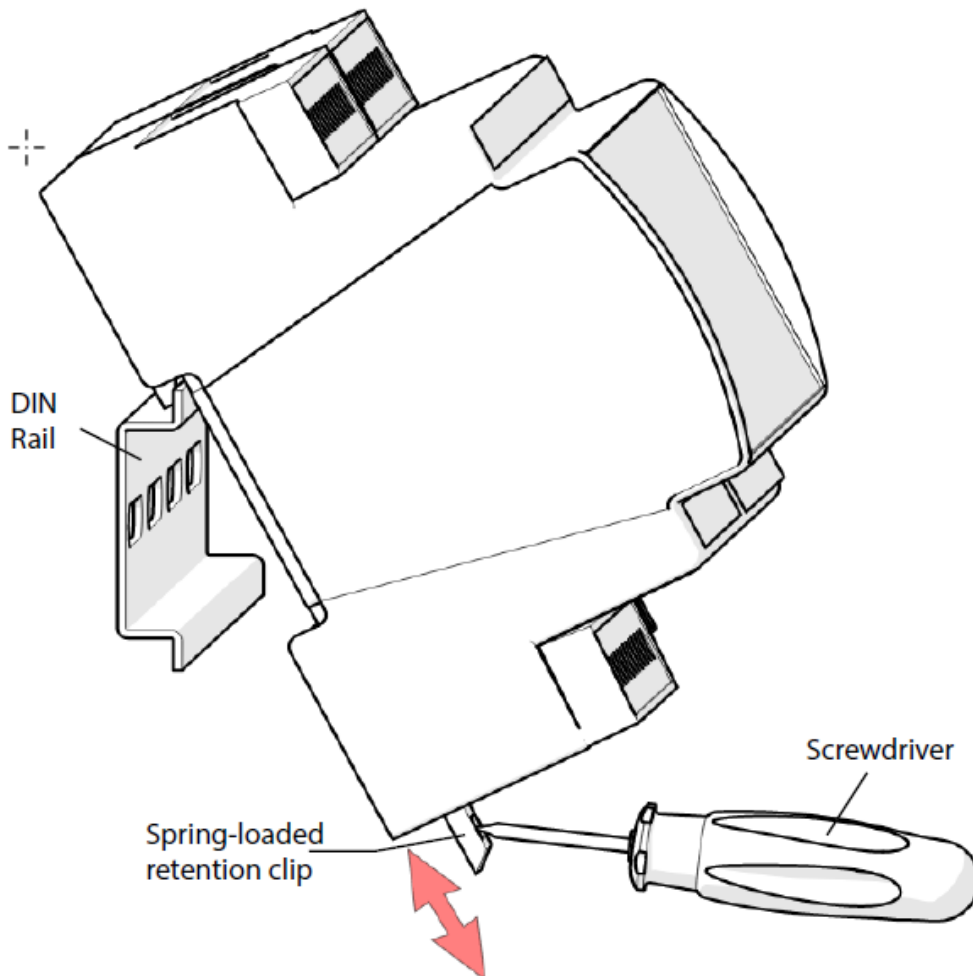


Figure 6. Engage the DIN rail and pull the retention clip

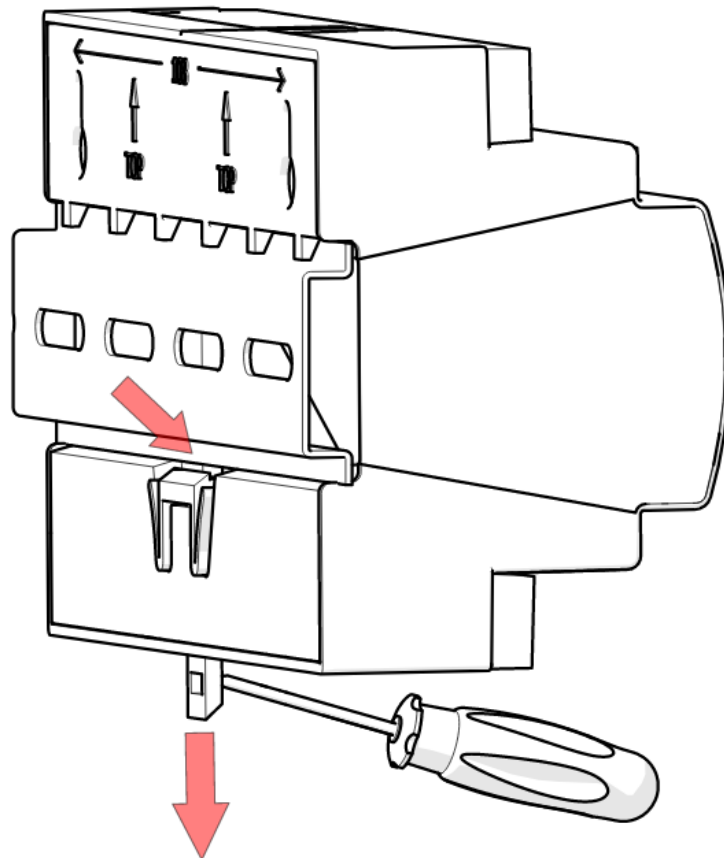


Figure 7. Pull down the spring-loaded retention clip using a flat-blade screwdriver

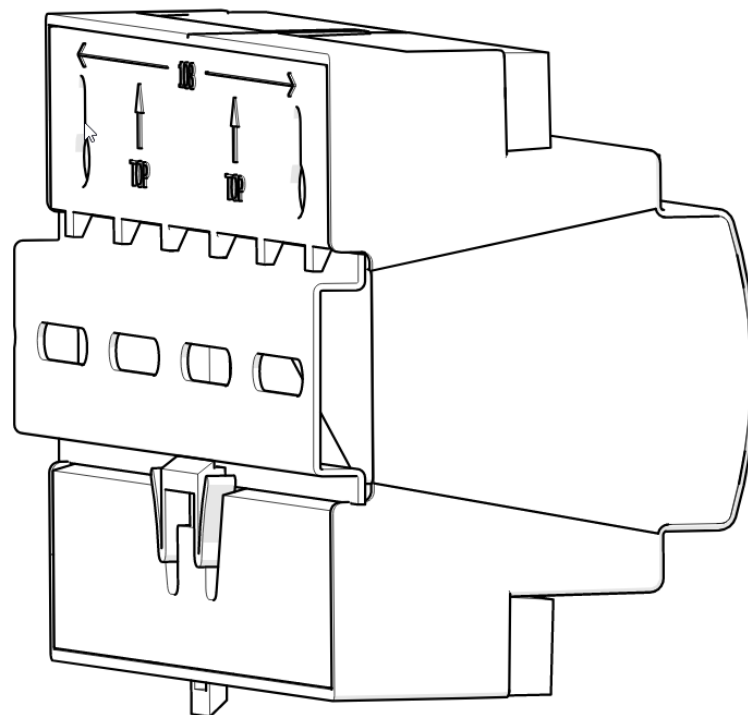








Figure 8. Lock the unit on the DIN rail

Procedure for fitting

-  XM-UI4-UO2 unit fits on a 35 mm DIN rail channel.
- 1. Engage the slot at rear of unit to the upper edge of DIN rail. Refer Figure 6.
- 2. Pull down the spring-loaded retention clip using a flat-blade screwdriver.
- 3. Push the unit onto the DIN rail. Refer Figure 7.
- 4. Release the retention clip to lock the unit on the DIN rail. Refer Figure 8.
- 5. Reverse the procedure for removing the XM-UI4-UO2 unit from the DIN rail.

Safety instructions

-  Do install the unit only by qualified professionals, following all applicable laws and regulations.
 -  Do not connect mains supply or any other external voltage to any terminal of the XmPro10 series units.
 -  Do ensure that the panel or box with the device is locked to prevent unauthorized access.
 -  Do protect all electrical loads against overloads and short-circuits.
 -  Do ensure adequate ventilation and protection from dripping water.
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