MX-232-IO-Box: Quick Install

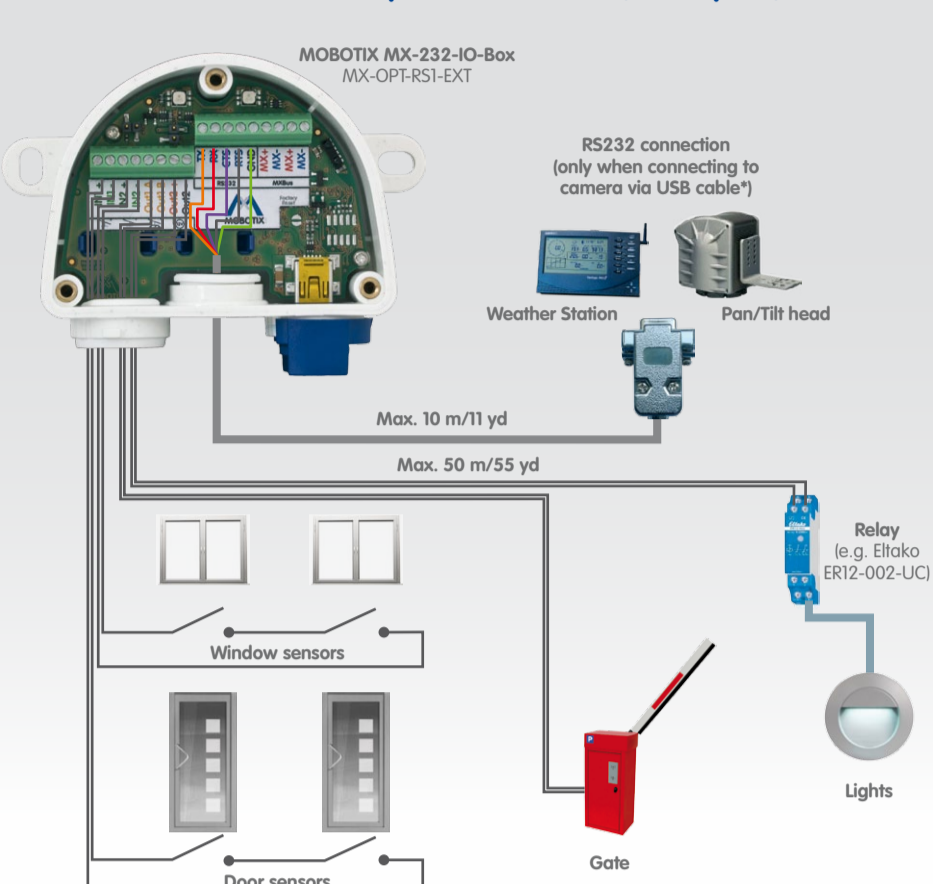**MOBOTIX**
The HiRes Video Company

MX-OPT-RS1-EXT

Weatherproof Signal Input/Output and RS232

Protection class IP65
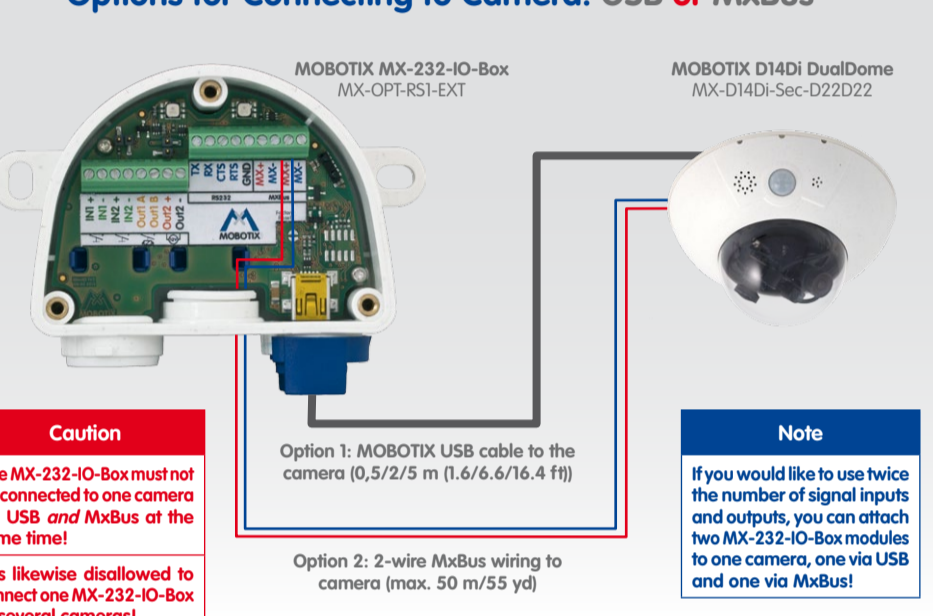**–30 to 60°C/–22 to 140°F**

- 2 self-powered inputs for connecting sensors
- 2 outputs: 1 powered output, 1 isolated relay output (can be switched to second powered output)
- RS232 interface when using USB cable to connect to camera*

Connection of external sensors and switching of external devices via MOBOTIX cameras; RS232 interface, connection to camera using USB or MxBus

---

Connection of Peripheral Devices (Examples)

MOBOTIX MX-232-IO-Box
MX-OPT-RS1-EXT

RS232 connection
(only when connecting to camera via USB cable*)

Weather Station

Pan/Tilt head

Max. 10 m/11 yd

Max. 50 m/55 yd

Relay (e.g. Eltako ER12-002-UC)

Window sensors

Door sensors

Gate

Lights

Options for Connecting to Camera: USB or MxBus

MOBOTIX MX-232-IO-Box
MX-OPT-RS1-EXT

MOBOTIX D14Di DualDome
MX-D14Di-Sec-D22D22

Caution

One MX-232-IO-Box must not be connected to one camera via USB *and* MxBus at the same time!

It is likewise disallowed to connect one MX-232-IO-Box to several cameras!

Option 1: MOBOTIX USB cable to the camera (0,5/2/5 m (1.6/6.6/16.4 ft))

Option 2: 2-wire MxBus wiring to camera (max. 50 m/55 yd)

Note

If you would like to use twice the number of signal inputs and outputs, you can attach two MX-232-IO-Box modules to one camera, one via USB and one via MxBus!

*Only use MOBOTIX USB cables! USB cables are not part of the delivery and are to be ordered separately!

Options for Connecting to Cameras

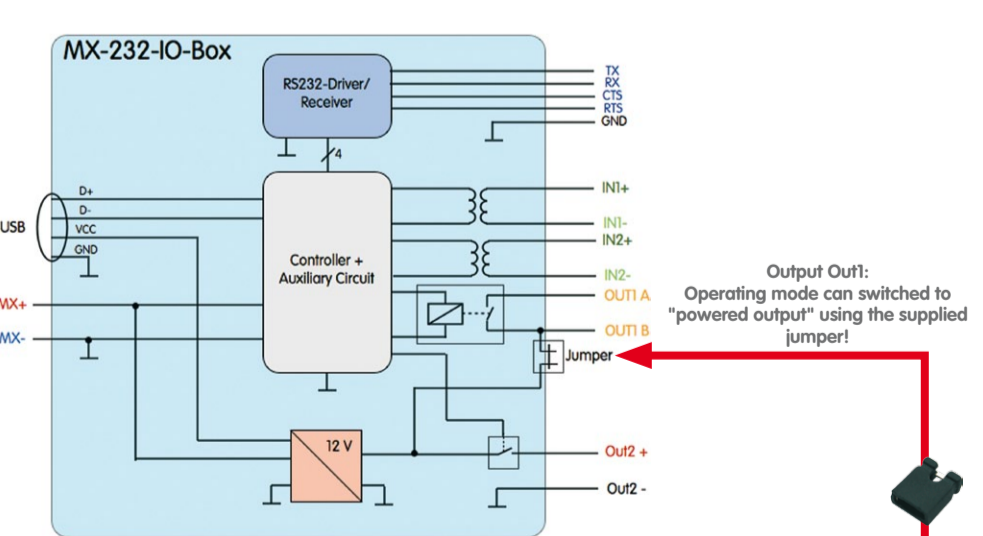| Function	Option 1 – USB	Option 2 – MxBus
2 signal inputs, self-powered	✓	✓
1 powered output 12 V	✓	✓
1 isolated relay output (can be switched to powered output 12 V)	✓	✓
RS232 interface	✓	—
Connecting additional MxBus devices to MX-232-IO-Box	—	✓
Length of the connection to the camera	0,5/2/5 m (1.6/6.6/16.4 ft)*	Max. 50 m/55 yd

---

USB Cables for Connection to Camera*

	MX-CBL-MU-STR-05/2/5 (straight/straight)	MX-CBL-MU-EN-STR-05/2/5 (straight/angled)
MOBOTIX USB cable 0.5/2/5 m (1.6/6.6/16.4 ft) (order separately)		
MOBOTIX S14	✓	—
MOBOTIX D14, D24, M24, Q24, T24	—	✓

*Only use MOBOTIX USB cables! USB cables are not part of the delivery and are to be ordered separately!
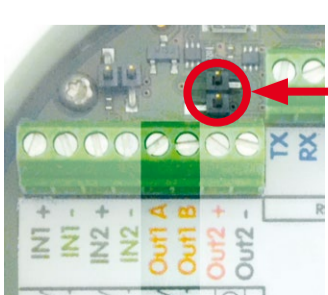

Technical Specifications

	Option 1 – USB	Option 2 – MxBus
Interface to camera	USB	MxBus
Inputs	2 galvanically separated inputs (AC/DC, self-powered, up to 50 V)	
Output Out1	Isolated relay output (AC/DC, up to 50 V/60 W/2 A) **With jumper:** Powered output 12 V, max. cable length 50 m (55 yd) (see «Changing the Mode of Output Out1»)	
Output Out2	Powered output 12 V, max. cable length 50 m/55 yd	
Total output rating	400 mW	500 mW
RS232 interface	Rx, Tx, RTS, CTS, GND, max. 115 kbaud	—
Cross-sectional diameters of wires at the terminals	Minimum: 0.14 mm² (AWG 26) Maximum: 0.5 mm² (AWG 20)	
Protection class	IP65 (DIN EN 60529)	
Operating temperature	-30 to +60°C/-22 to 140°F (DIN EN 50125)	
Power supply	USB	MxBus
Power consumption	Typically 1 W	

Block Diagram of the MX-232-IO-Box

MX-232-IO-Box

RS232-Driver/Receiver

TX
RX
RTS
CTS
GND

USB
D+
D-
VCC
GND

IN1+
IN1-
IN2+
IN2-

Controller + Auxiliary Circuit

OUT1 A
OUT1 B

MX+
MX-

Jumper

12 V

Out2 +
Out2 -

Output Out1: Operating mode can switched to "powered output" using the supplied jumper!

Changing the Mode of Output Out1

In order to use output **Out1** as powered output, you need to stick the jumper on the jumper pins at the right as shown in the figure. The other jumper will be used in the future and must **not** be used at present. When connecting, use the terminals **Out1 A** and **Out2 –**. Please note that the total output rating of the MX-232-IO-Box is split between the two powered outputs in this mode (see «Technical Specifications»). In this mode, the max. cable length for **Out1** is also 50 m (55 yd).

LED Signaling

		Connection to Camera	
LED		**USB**	**MxBus**
Operation (left)	○	Not connected	
	●	Regular operation	
	●	—	Unencrypted communication
	◐	Communication error	
I/O Status* (right)	◑	1x: Input 1 closed 2x: Input 2 closed	
	◐	1x: Output 1 closed 2x: Output 2 closed	
	◑	1x: RS232 communication	

*Displays status of inputs/outputs and RS232 alternately (pauses, if there is no RS232 communication)

○ LED off
● LED permanently on
◐ LED flashes at regular intervals

Installation Instructions

1. Attach the box

Attach the MX-232-IO-Box at the mounting position with the cable ports pointing downwards (torque 0.4 Nm). Next, remove the box cover (three screws).

2. Establish connection to the camera

You need to follow different procedures depending on the connection option:

- **Option 1 – USB**
  - Remove the slim sealing ring of the straight plug of the USB cable*.
  - Pull the delivered blue sealing ring over the plug, so that the smaller opening points into the same direction as the plug's contacts.
  - Remove blue bayonet catch of the MX-232-IO-Box and pull out the blue plug.
  - Plug the USB cable with attached sealing ring into the MX-232-IO-Box and secure the cable using the blue bayonet catch.
  - Connect the USB cable to the camera (→ *Camera Manual*).

- **Option 2 – MxBus**
  - **Before proceeding, make sure there is no voltage on the MxBus wires!**
  - Cut the MxBus wires to size (2-wire, 0.6 to 0.8 mm diameter). When using **wires without jacket**, strip the insulation of the wires for 5 mm and push the wires through the eight-wire plug (right).
    When using a **cable with jacket**, remove the pre-installed eight-wire plug and insert the appropriate cable plug (3 to 5 mm or 5 to 7 mm). Press the rubber plug into the casing in such a way that the rims stick out equally on both sides. Push the cable through the plug, remove the jacket on a length of 15 mm and strip the insulation of the wires for about 5 mm.
  - Connect the MxBus wires to the terminals of the MX-232-IO-Box using the screwdriver. Make sure to maintain the polarity (see sticker in front of the terminal).
  - Connect the MxBus wires as described in the corresponding manual to the MOBOTIX camera or to another MxBus module connected to a camera (e.g. KeypadRFID, DoorMaster). Make sure not to exceed the overall length of the MxBus wiring of 50 m (55 yd).

3. Connect the peripheral devices

Connect the other wires/cables as required and by using the corresponding cable plugs (inputs, outputs, RS232, MxBus).

4. Lock the cable in place

Insert one or two cable ties depending on the attached cables as shown. Pull the cable ties tightly around the cables in order to provide strain relief.

5. Mount the cover

Mount the cover back onto the MX-232-IO-Box and affix it using the cover screws (torque 0.4 Nm).

MxBus plug of MOBOTIX D14

Initializing the MX-232-IO-Box

1. Open the MOBOTIX camera's user interface in the browser
- Enter the IP address of the camera that is connected to the MX-232-IO-Box in the browser (admin access rights required):
  `http://<camera IP address>`

2. Make sure that the camera uses PoE class 3
- Open the **Admin Menu > Ethernet Interface** dialog.
- If **Power Supply** has not been set to **Power over Ethernet (Class 3)**, click on the **Change** link, follow the steps of the wizard and activate **Power over Ethernet (Class 3)**.

3. Activate MX-232-IO-Box
- Open the **Admin Menu > Manage Hardware Expansions** dialog.
- **Option 1 – USB:** In the line **MX-232-IO-Box USB**, click on **Connect**.
- **Option 2 – MxBus:**
  - If the LED icon in the line **MxBus Interface** is not green, click on **Connect**.
  - In the **Admin Menu > Manage MxBus Modules** dialog, **Devices** section, **MX-232-IO-Box** line, click on the **Activate** button.
  - If the **Update SW** button appears in this line, click on it to update the software of the module.

4. Configure events (when using the signal inputs/outputs)
- Open the **Setup Menu > Event Overview** dialog.
- In the **Signal Events** section, click on **Edit** and set the parameters as required (open the help page for this dialog by clicking on [?]).
- You can now use the new events in the **Setup Menu > Action Group Overview** dialog (see the help page for this dialog by clicking on [?]).

5. Configure RS232 interface (only when using Option 2 – USB)
- Open **Admin Menu > Serial Interface > Setup** and configure the parameters in the **Serial Interface and Modem** as required (see the help page for this dialog by clicking on [?]).

6. Store the camera configuration
- In the Live screen of the camera, click on **Admin Menu > Configuration > Store**, permanently store the camera configuration and reboot the camera.
- Save the camera configuration to the local computer (**Admin Menu > Configuration > Save**).

Resetting the MX-232-IO-Box

If the MX-232-IO-Box had been connected to a different camera before and not deactivated or reset before detaching, the left LED (MxBus status) may blink red after establishing the MxBus connection. In this case, you need to reset the connected and activated MX-232-IO-Box to **factory defaults**:
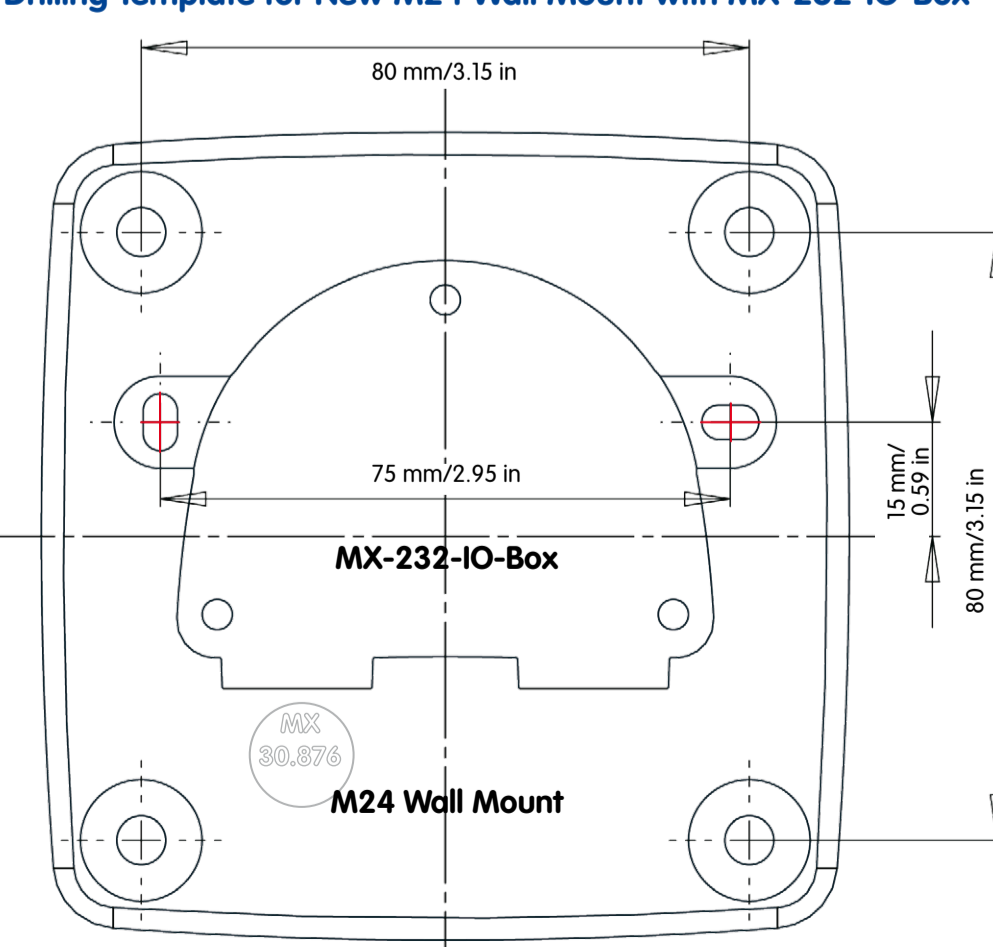
- Remove the box cover (three screws).
- Bridge the contact surfaces below the **Factory Reset** label (red circle in figure) using a screw driver, for example (both LEDs are flashing red/blue with increasing frequency).
- Only remove the bridge if both LEDs of the MX-232-IO-Box are flashing green on/off 3 times to indicate that the process has finished successfully.
- Mount the cover back onto the box (torque 0.4 Nm).
- Set up the MX-232-IO-Box in the camera (see *«Initializing the MX-232-IO-Box»*).

Notes

- The MOBOTIX MX-232-IO-Box is to be used only for providing signal inputs/outputs and an RS232 interface (only when connecting to a camera using USB) for MOBOTIX cameras in IP65 environments.
- For MOBOTIX cameras with MxBus connector and software version MX-V4.1.4.11 or higher.
- Make sure that you adhere to all relevant laws, regulations and that you fulfill all certification requirements for the intended use.
- Torque for all screws: 0.4 Nm.
- Press the white cable plug (eight-wire plug or cable plug 3 to 5 mm or 5 to 7 mm) into the casing in such a way that the rims stick out equally on both sides.
- The max. baud rate of the RS232 cable depends on the cable length and on the cross-sectional area of the wires.
- The length of the entire MxBus wiring must not exceed 50 m/55 yd.
- Cross-sectional area of the MxBus wires: 0.6 to 0.8 mm (0.8 mm recommended to reduce line losses).

Drilling Template for New M24 Wall Mount with MX-232-IO-Box

80 mm/3.15 in

75 mm/2.95 in

15 mm/0.59 in

80 mm/3.15 in

MX-232-IO-Box

MX 30,076

M24 Wall Mount