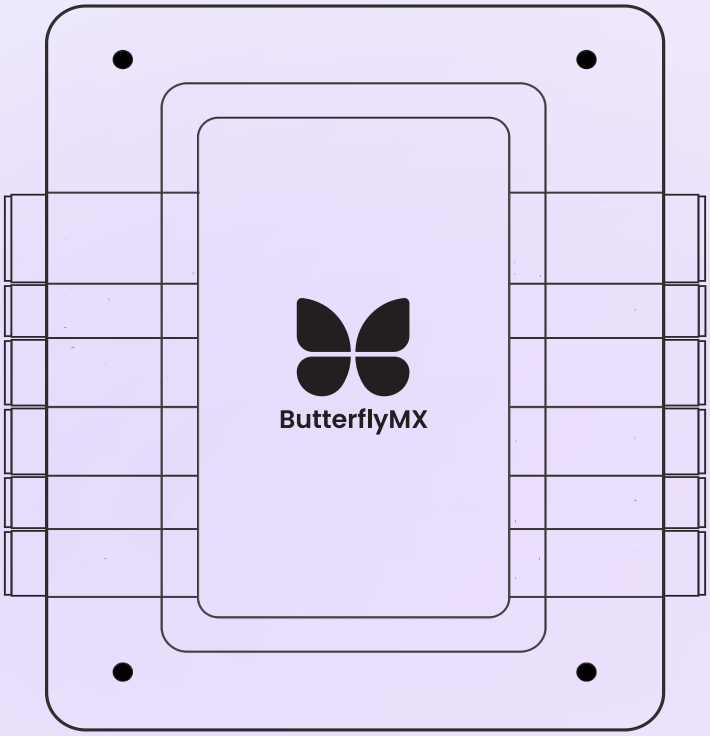
ButterflyMX

2-Door Access Controller & Readers

Installation Guide



Version: **v2 (updated 1/20/24)**

Software: **v2.1**

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Table of contents

02 **Package contents**
What is NOT Included

03 **Before you start**
Important Information
How to become a certified ButterflyMX installer

05 **System overview**

06 **Controller overview**

07 **Requirements**
Network requirements
Battery backup requirements

08 **ButterflyMX readers**
Third-party readers

09 **Wiring information**

10 **Installation steps**
Mount the controller
Connect the reader
Mount the reader
Connect the controller to internet
Electric locking hardware: Electric strike
Electric locking hardware: Magnetic lock
Electric locking hardware: Automatic door or externally controlled door
Connecting a request to exit (REX) device

20 **Troubleshooting**
Controller lights diagnostics
Ethernet port light diagnostics
Power cycling the 2-Door Access Controller
Further troubleshooting

Package contents

ButterflyMX 2-Door Access Controller

12V 5A Power Supply

DIN Rail and Screws

ButterflyMX Readers (optional)

What is **NOT** included

Items listed below are not included with the ButterflyMX 2-Door Access Controller and must be sourced by the installer prior to installation. This is not an exhaustive list.

Electric Locking Hardware
The ButterflyMX controller can only operate doors with electric locking hardware installed (e.g. electric strike, magnetic lock, automatic door, electrified panic bar, etc.).

Please see the installation manual of your electric locking hardware for the wiring requirements and best installation practices.

Low Voltage Cables
To connect the electric locking hardware, REX devices, and any other accessories. These cables should be rated to handle the voltage and amperage necessary for their particular use case.

Request to Exit (REX) Device
Your exit hardware should allow for mechanical free-egress. If your exit hardware does not have mechanical free-egress, refer to local codes and jurisdictions for requirements.

Reader Cables
To connect the ButterflyMX readers to the controller. View **'Wiring Information'** for recommended cables.

Ethernet Cord
To connect the controller to the internet. View **'Wiring Information'** for more details.

Battery Backup
A 12VDC standard lead acid battery can be connected to the controller's battery backup input to provide backup power in the event of a power outage. If primary power to the controller is lost, connected devices will not work without a battery backup attached due to a loss of output voltage.

Enclosure
We recommend the Vevor ST6620, an IP65 NEMA 4 rated enclosure for housing the ButterflyMX 2-Door Access Controller. There are various sizes available to fit many configurations.

Before you start

This ButterflyMX 2-Door Access Controller installation guide walks certified installers through the process of installing the ButterflyMX 2-Door Access Controller and readers.

⚠ ATTENTION

- Access control systems **must** meet all relevant local, state, and federal codes. It is the responsibility of the installer to make sure all electric locking hardware, REX devices, and physical exit devices are configured in a manner that is safe, effective, and meets all relevant codes.
- ButterflyMX supplies controllers and readers. We **do not** supply any additional peripheral devices (e.g. motion sensors, electric locking hardware, etc.). The ButterflyMX controller is required to operate all ButterflyMX readers.
- The ButterflyMX controller is meant for indoor use only. Please ensure that it is installed in a secure, weatherproof location. See previous page for more information.
- Before beginning the ButterflyMX 2-Door Access Controller installation, we recommend performing a site-visit to determine which ButterflyMX hardware and additional third party hardware is required for the installation.
- If installed in accordance with the installation guidelines provided in this document, the ButterflyMX Access Controller does not prevent the functionality of the emergency exit (i.e., fire emergency) functions. Consult with your installer and relevant local authorities to ensure your ButterflyMX Access Control System complies with all local, state, and federal codes.
- The controller has been tested under UL294 for temperatures between 0° and 49°C and 85% (±5%) of relative humidity.

All systems must be activated once installation is complete and while the installer is on-site.

Activation will verify all systems are operational, document installed hardware, and activate the system. Activation is done using the ButterflyMX Installer App (find by searching "ButterflyMX Installer App" in the Apple App or Google Play stores). If you are unable to download and use the ButterflyMX Installer App, call ButterflyMX Support while the installer is on-site at (800) 398-4416, ext 2.

If intending to call ButterflyMX Support for activation, please schedule installations with this requirement in mind.

This guide details installation for the ButterflyMX Keypad, Single-Gang, and Mullions Reader only.

- If installing a ButterflyMX Vehicle Reader, please see the Vehicle Reader Installation Guide on the ButterflyMX website.
- If installing a ButterflyMX Elevator Control System, please see the Elevator Control System Installation Guide on the ButterflyMX website.

How to become a ButterflyMX certified installer

To qualify for dealer pricing and to ensure you do not void our two-year hardware warranty, we require anyone installing our products to be certified.

The certification process is a free online course and shouldn't take more than 30 minutes to complete. Once you are certified, we may also provide you with free installation referrals.

Click here to get certified

ButterflyMX Support

(800) 398-4416, ext. 2
Mon—Fri 6am-10pm, Sat—Sun 8am-8pm ET
support@butterflymx.com

Find more resources on the ButterflyMX Access Control System by scanning the QR code to the left.

System overview

Keypad, Single-Gang,
or Mullion Reader

OSDP Compatible
Cabling

Keypad, Single-Gang,
or Mullion Reader

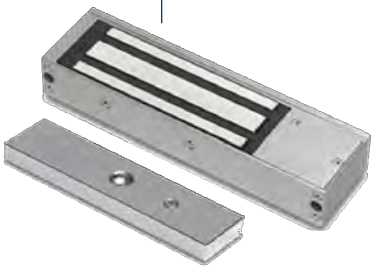
Low Voltage Cabling

Low Voltage Cabling

Electric Locking
Hardware

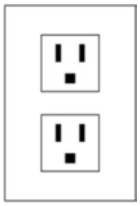
Ethernet Cable
(RJ45)

Included 7' 12VDC / 5A
Power Supply



Mag lock

Internet Router

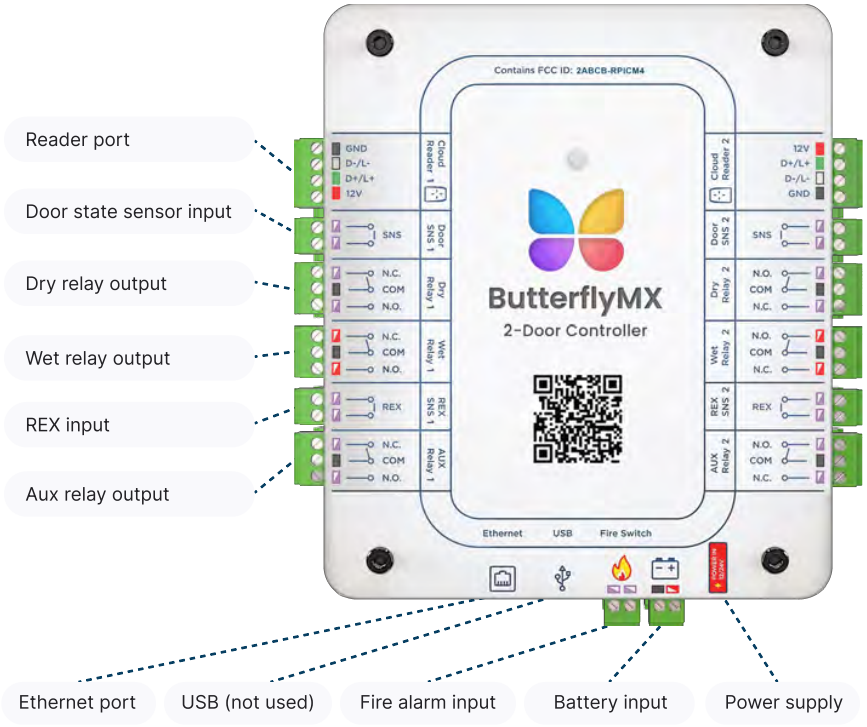


120V Wall Outlet

ATTENTION!

This is a system overview, NOT a wiring diagram. For 3rd party hardware, please refer to the manufacturer's documentation.

Controller overview



Reader Port
Reader port for ButterflyMX Keypad Reader, Mullion Reader, Single-Gang Reader, or Vehicle Reader. OSDP, RS485 protocol required (12VDC). See wiring diagram in section **'Connect the Reader'**.

Door State Sensor Input
Input for two-state door sensor.

Dry Relay Output
Output for electric locking hardware powered by an external power supply. Rated up to 48VDC, 48W, max 4A at 12VDC.

Wet Relay Output
Output for the electric locking hardware powered by the controller. Provides up to 1A at 12VDC.

REX Input (aka REX SNS)
Input for request-to-exit (REX) devices, e.g. push-to-exit button, motion sensor, etc. 3rd party REX hardware should be configured to N.O.

Aux Relay Output
Dry relay output used in various custom configurations, e.g. support ADA door functions, trigger third-party alarm systems, and schedule automatic doors. Rated up to 48VDC, 18W max 1.5A at 12VDC.

Ethernet Port
Connects with RJ45 using a CAT5e rated cable or higher. WiFi is supported if ethernet is not available.

Battery Backup
Connects to 12VDC battery backup. Battery backup is not included, but required for UL 294 compliance.

Fire Alarm Input
Fire alarm requires FACP relay (N.O. position). Please consult with your certified fire alarm contractor for information about your fire alarm system.

Power Supply
Must use provided 12VDC 5A power supply or another UL 294 approved power supply for compliance with UL 294. Power supply is compatible with a 120V AC wall outlet.

ATTENTION!

Wiring connections on the left side of the controller are reversed with respect to the right side. Please pay close attention when connecting the wires to the terminal blocks. For example, N.C. is above COM on 'Dry Relay 1' while N.O. is above COM on 'Dry Relay 2'.

Network requirements

Internet

A ButterflyMX controller needs a reliable internet connection to provide optimal service. The client is responsible for acquiring and maintaining this service.

When possible, a wired ethernet connection is preferred over wireless (WiFi).

WiFi is compatible with both 2.4GHz and 5GHz networks, and is available only in secure networks (no open WiFi networks). While the controller is compatible with 2.4 GHz, we recommend the use of 5GHz.

Bandwidth

All ButterflyMX devices require a minimum bandwidth of 2 Mb/s for uploading and downloading.

If sharing an internet connection with other devices, please configure QoS to ensure minimum bandwidth requirements are met.

DSL connections cannot support the ButterflyMX controller.

IP/DHCP

By default, ButterflyMX devices use DHCP to obtain an IP address. Static IP assignments can be arranged by contacting ButterflyMX support at **support@butterflymx.com**.

Firewall

ButterflyMX controllers maintain permanent connections (outbound) on 443, 8080, and 8927 ports. No inbound connections are expected.

If there is a firewall at the property, you may need to whitelist the controller's MAC address. MAC addresses for controllers can be provided by ButterflyMX support at **support@butterflymx.com**.

Battery backup requirements

Battery

ButterflyMX controllers can be connected to a standard lead acid 12VDC battery in the battery backup input. Battery backup is not included, but is required for UL 294 compliance.

Consumption

Controller consumption with no accessories attached is 250mA. Each ButterflyMX keypad, single-gang, or mullion reader adds an additional 200mA. Each ButterflyMX vehicle reader adds an additional 950mA.

Battery backup life is dependent on the number of devices, type of devices, and usage of those devices. Results may vary.

ButterflyMX readers

ButterflyMX Keypad Reader

- Swipe-to-open (mobile app)
- Key fobs and key cards
- PIN codes
- Virtual Key and Delivery Pass
- Delivery authorization

Cutsheet
ButterflyMX Keypad Reader

ButterflyMX Mullion Reader

- Swipe-to-open (mobile app)
- Key fobs and key cards

Cutsheet
ButterflyMX Mullion Reader

ButterflyMX Vehicle Reader

- Swipe-to-open (mobile app)
- ButterflyMX Windshield Tags

Cutsheet
ButterflyMX Vehicle Reader

This guide only details installation for the ButterflyMX keypad, mullion, and single-gang readers. For installation instructions on the ButterflyMX Vehicle reader, see here.

ButterflyMX Single-Gang Reader

- Swipe-to-open (mobile app)
- Key fobs and key cards

Third-party readers

- ButterflyMX 2-Door Access Controller may support third-party OSDP readers depending on specific criteria. Before connecting a third-party OSDP reader, please reach out to your ButterflyMX representative.

- ButterflyMX 2-Door Access Controller does not support Wiegand.

- ButterflyMX 2-Door Access Controller does not support any third-party vehicle readers or third-party windshield tags.

Wiring information

Connection path	Popular compatible cables	Max run length
Controller to keypad, single-gang, or mullion reader	1. Shielded CAT6A 2. Shielded CAT6 3. Shielded RS485 w/ 22-24 AWG (thicker wire is preferred) 4. Shielded CAT5e 5. Unshielded CAT6 6. Unshielded CAT5e 7. Shielded 22 AWG, 4 conductors (22/4) cable	800 ft See diagram below for visual representation.
Controller to vehicle reader	1. Shielded CAT6A 2. Shielded CAT6 3. Shielded RS485 w/ 22-24 AWG (thicker wire is preferred) 4. Shielded CAT5e 5. Unshielded CAT6 6. Unshielded CAT5e 7. Shielded 22 AWG, 4 conductors (22/4) cable	800 ft* *Included external power supply is required for any vehicle reader installation.
Controller to electric locking hardware	18 AWG, 2 conductors (18/2) cable	–
Controller to third-party garage door controller	18 AWG, 2 conductors (18/2) cable	–
Controller to third-party REX device	18 AWG, 2 conductors (18/4) cable	–
Controller to internet router	Ethernet: CAT6A, CAT6, CAT5e (RJ45 terminations)	300 ft Note: Never splice Ethernet cables. Do not use couplers, extenders, or data jacks.
Controller to power outlet	7’ 12VDC / 5A Power Supply	7 ft

⚠ ATTENTION

- The ButterflyMX Access Controller is required to operate all ButterflyMX readers.
- While it’s possible to reuse existing Wiegand wiring for ButterflyMX readers using a simple stranded cable typical of Wiegand readers, it generally does not meet the RS-485 twisted pair recommendations.
- To remain fully RS-485 compliant, the cabling must adhere to the OSDP wire specification (minimum four-conductor, twisted pair, shielded cable).

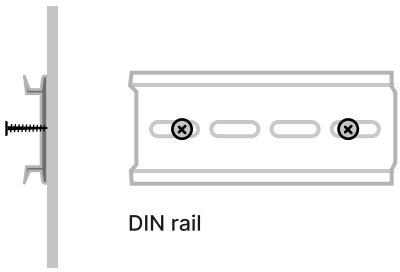
OSDP *(Open Supervised Device Protocol) is an access control communications standard that has improved security and functionality relative to Wiegand. It supports AES-128 encryption.*

Installation steps

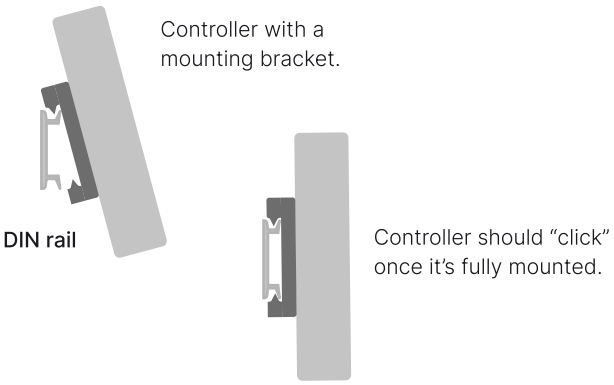
Always disconnect power from the 2-Door Access Controller and locking hardware when wiring readers and other devices. Failure to do so can damage the controller and any connected accessories.

Mount the controller

1. Secure the DIN rail using screws provided.



2. Mount the controller onto the DIN rail using the included mounting bracket.



Prep the reader

1. **Secure the unused wires.**
Secure the brown, yellow, blue, and orange wires on the reader pigtail using electrical tape, making sure none of the exposed wires are touching.

2. **Run the cable.**
Run the reader cable through the hole in the mounting plate.

Installation steps

Connect the reader

Please confirm the colors on the reader pigtail correspond to the correct colors on the reader port.

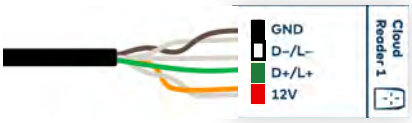
1. **Connect the reader to the controller.**
Splice the black, white, green, and red wires on the reader pigtail to the reader cable.

CAT Cables (double up wires for GND and 12V)

Splice one twisted pair (two wires) to GND and another twisted pair to 12V

Splice a singular wire to D-/L- and the other singular wire (of that same pair) to D+/L+

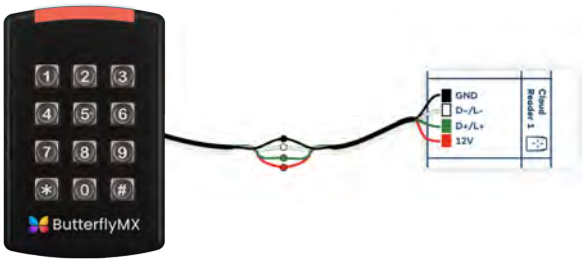
One pair is left unused



All other cables (non CAT cables)
Splice singular wires to GND, D-/L-, D+/L+, and 12V

2. **Connect the reader to the controller.**
Connect the reader cable to the controller, making sure the reader pigtails are connected to the correct termination.

Reader pigtail color	Reader port value
Black	GND
White	D- / L-
Green	D+ / L+
Red	12V



3. **Test reader connection.**
To test the connection from the reader to controller, enter the zip code of the building where the reader is being installed, followed by the pound sign (e.g. 10001#). If the connection is functional, both the reader and the controller will display a green light.

Installation steps

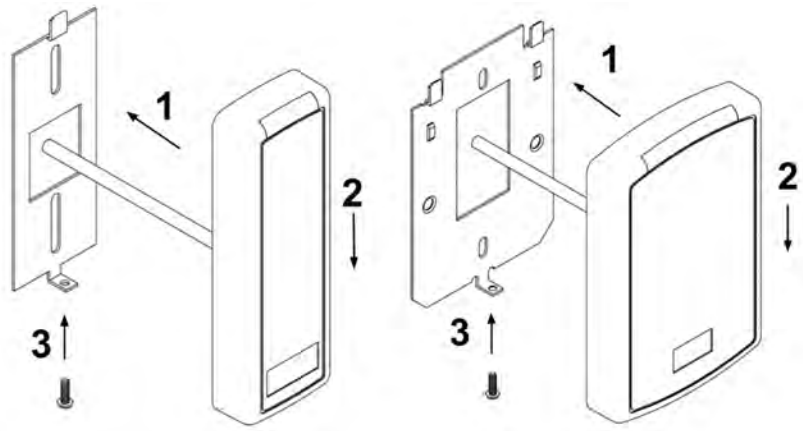
Mount the reader

Please refer to the **'Wiring Information'** section of this installation guide for details on the reader to 2-Door Access Controller max run length and cable type.

1. **Install the reader's wall plate.**
Install the metal wall plate to gang box using the provided #6 screws.

2. **Attach the reader to the wall plate.**
Align the reader so that the tabs of the base plate slide into the slots on the wall plate.

Move the reader into position.



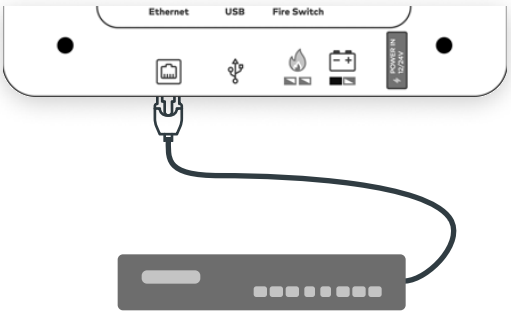
3. **Install the reader screw.**
Install the #4-40 screw or pin-in-torx at the bottom of the reader.

Installation steps

Connect the controller to the Internet

Connect the controller using Ethernet or WiFi; Ethernet is preferred when possible. See the **'Network Requirements'** section on page 5 for more information.

1. **Connect via Ethernet cable.**
Plug the Ethernet cable into the controller's Ethernet port.

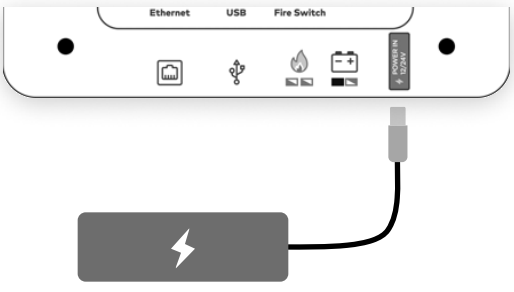


2. **Connect via WiFi.**
Download and register for the ButterflyMX Installer App and follow the prompts to connect the controller to WiFi. If you are unable to download the app, please contact ButterflyMX Support.

Connect the controller to power

1. **Connect the power supply.**
Wait for 45-60 seconds and observe white LED.

Verify the power connection by the LED on the front center of the controller. If the light does not turn on, the controller is not receiving power.



Power Supply

2. **Verify the panel is online.**
The controller light should be white if the panel is successfully connected to the internet. You can also verify the panel is online and connected through the installer app. If the controller light is red, it is not connected to the internet.

Electronic locking hardware

Important information on fail safe and fail secure modes

Electric locking hardware

When using electric locking hardware, make sure you understand the implications of choosing the mode of operation (Fail Safe or Fail Secure). Magnetic locks will always operate in a Fail Safe mode.

Fail safe

Electric locking hardware in a fail safe mode will default to an **unlocked** state when the system loses power.

This means the locking hardware will remain unlocked until power is restored. Fail Safe locks may be required to comply with certain codes and Life Safety requirements.

Fail secure

Electric locking hardware in a fail secure mode will default to a **locked** state when the system loses power.

Fail secure electric locking hardware may require an additional physical method of exit (e.g. crash bar) or mechanical free-egress.

Magnetic lock

Make sure you understand the implications of installing a magnetic lock. Magnetic locks will always operate in a fail safe mode. Connect the magnetic lock to N.C. and COM (Normally Closed and Common).

Automatic door or externally controlled door

If you're using an automatic door or an externally controlled door, make sure to configure the external controller and door hardware to operate correctly and to accept the request-to-exit from the ButterflyMX controller. It is recommended to contact the door manufacturer or their representatives before installing the ButterflyMX controller for compatibility and operational guidance.

Connect the externally controlled door to N.O. and COM (Normally Open and Common).

Industry recommended wire gauge based on power rating:

TOTAL LENGTH OF WIRE RUN	CURRENT at 12V			CURRENT at 24V		
	0.5A	1A	2A	0.5A	1A	2A
0 - 100 ft	18 AWG	14 AWG	12 AWG	18 AWG	18 AWG	14 AWG
100 - 150 ft	16 AWG	12 AWG	10 AWG	18 AWG	16 AWG	12 AWG
150 - 200 ft	16 AWG	12 AWG	—	18 AWG	16 AWG	12 AWG

Installation steps

Connect the controller to electronic locking hardware (option 1 of 3)

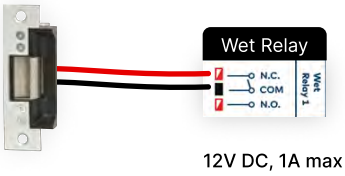
Before you install the electric locking hardware, check the manufacturer's documentation to set the mode of operation.

1. **Connect via electric locking hardware.**

Note which side of the controller you are connecting the electric locking hardware to. Single door installations should always use **Side 1** for all connections. Be sure to connect the wires to the correct terminals (N.O. and COM). N.O. will be oriented below COM on **Side 1** and above COM on **Side 2**.

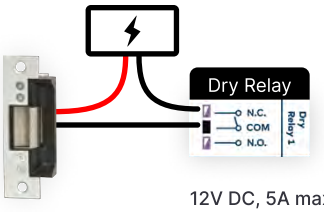
Fail safe

Electric locking hardware (fail safe) powered by the controller.



12V DC, 1A max

Electric locking hardware (fail safe) powered by external power supply.

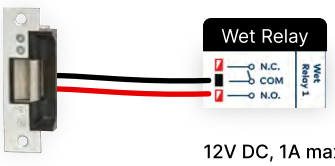


12V DC, 5A max

*If external power supply is required

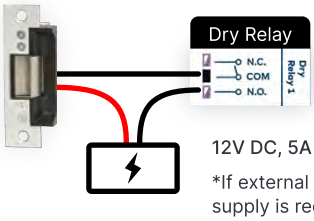
Fail secure

Electric locking hardware (fail secure) powered by the controller.



12V DC, 1A max

Electric locking hardware (fail secure) powered by external power supply. The external power supply must be 12VDC, 5A max.



12V DC, 5A max

*If external power supply is required

Use complimentary power from the Wet Relay only if the locking mechanism is 12VDC and current is less than 1A.

Installation steps

Connect the controller to electronic locking hardware (option 2 of 3)

1. **Connect magnetic lock.**

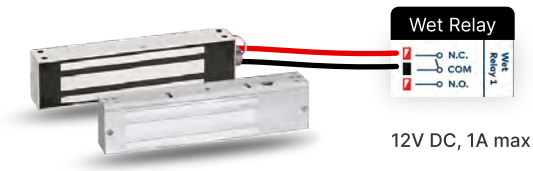
Note which side of the controller you are connecting the magnetic lock to. Single door installations should always use **Side 1** for all connections. Be sure to connect the wires to the correct terminals (N.C. and COM).

N.C. will be oriented above COM on **Side 1** and below COM on **Side 2**.

Connect the magnetic lock in fail safe mode to N.C. and COM (Normally Closed and Common. Before you install the magnetic lock, check the manufacturer's documentation to set the mode of operation.

Fail safe

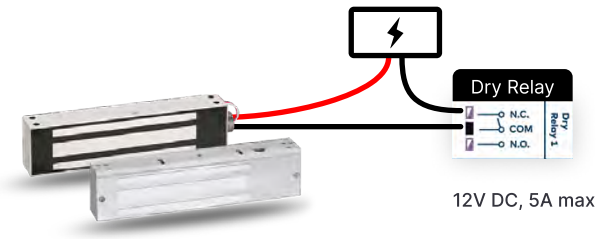
Magnetic lock (fail safe) powered by the controller



12V DC, 1A max

Fail safe

Magnetic lock (fail safe) powered by external power supply, if required.



12V DC, 5A max

Use complimentary power from the Wet Relay only if the locking mechanism is 12VDC and current is less than 1A.

Installation steps

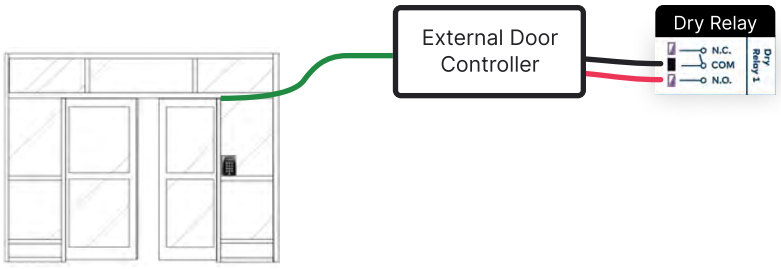
Connect the controller to electronic locking hardware (option 3 of 3)

1. **Connect automatic door or externally controlled door.**

Note which side of the controller you are connecting the external door controller to. Single door installations should always use **Side 1** for all connections. Be sure to connect the wires to the correct terminals (N.O. and COM) on the dry relay output. N.O. will be oriented below COM on **Side 1** and above COM on **Side 2**.

Connect the external door controller according to the manufacturer's documentation for desired operation.

External Door Connection



Connecting a request to exit (REX) device

Attach the low-voltage cables from the REX device to the REX input on the controller.

ButterflyMX does not supply REX devices. Your local installer is responsible for selecting and installing a REX device that meets all local codes and considerations.

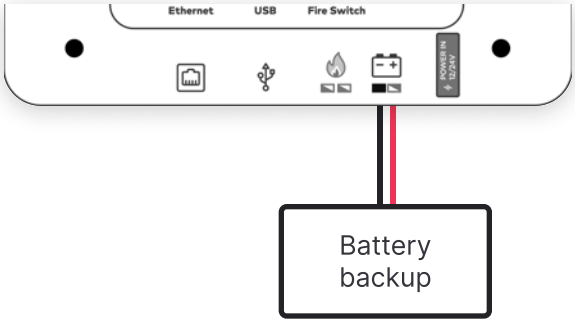
Installation steps

Connecting a battery backup

A battery backup is strongly recommended to prevent loss of function in the event of a power outage. When a battery backup is not used, a loss of power will cause the controller to stop functioning due to a loss of input voltage.

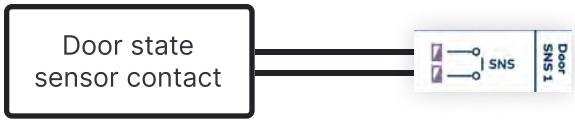
Connect the battery.
Attach the low voltage wires from the battery to the battery backup input on the bottom of the controller.

A battery backup must be installed in order to comply with UL 294. ButterflyMX does not supply battery backup devices.



Connecting a door SNS

There are two NC inputs for 3rd party door state sensors. Installation varies depending on the sensor.



Connecting to the AUX relay output

Connection depends on the third-party device being connected to the AUX relay output. The controller supports both N.O. and N.C. in the AUX relay, rated up to 48VDC, 18W, 1.5A max. Please consult the third-party hardware manual for your specific device.

Examples:
1A at 12VDC = 12W
0.5A at 24VDC = 12W

Activation is required.

All systems must be activated once installation is complete and while the installer is on-site.

Activation will verify all systems are operational, document installed hardware, and activate the system. Activation is done using the ButterflyMX Installer App (find by searching "ButterflyMX Installer App" in the Apple App or Google Play stores). If you are unable to download and use the ButterflyMX Installer App, call ButterflyMX Support while the installer is on-site at (800) 398-4416, ext 2.

If intending to call ButterflyMX Support for activation, please schedule installations with this requirement in mind.

ButterflyMX will onboard the client.
All documentation can be found on https://butterflymx.com/resources/installers/documentation.

Troubleshooting

Always disconnect power from the 2-Door Access Controller and locking hardware when wiring readers and other devices. Failure to do so can damage the controller and any connected accessories.

Controller light diagnostics

The LED light located on the center face of the ButterflyMX 2-Door Access Controller indicates information about the controller's current status. Please see the information below.

Power Supply

No light
Indicates the controller is not receiving power.

Solid white light
Controller successfully booted and is connected to internet.

Solid red light
Controller successfully booted, but is not connected to internet.

Temporary green flash
Indicates a door release in real-time.

Blue light
Indicates that the controller is in a booting state. The light will flash blue when the device is pinged during testing and maintenance. If the light remains blue, this indicates an issue with booting—please contact ButterflyMX Support.

Ethernet port light diagnostics

The ethernet port will communicate the status of the internet connection using two LED lights on the left and right of the port:

Normal operation
Left ethernet light = Solid green
Right ethernet light = Blinking amber

If the controller is not connecting to the Internet and shows a light pattern other than the above, please contact ButterflyMX Support.

Power cycling

To power cycle the ButterflyMX 2-Door Access Controller, disconnect the power supply's barrel connector for 15 seconds, then plug the barrel connector back in. Verify the controller is receiving power by checking that its LED is illuminated.

Additional troubleshooting

ButterflyMX Support

(800) 398-4416, ext. 2
Mon—Fri 6am-10pm, Sat—Sun 8am-8pm ET
support@butterflymx.com

Compliance

FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Radio Frequency (RF) Exposure

The controller has been designed, tested for, and passed FCC RF Susceptibility. It must be installed and operated in accordance with the instructions as detailed by ButterflyMX in this installation guide.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

UL 294

UL 294 Performance Levels

Endurance	Line Security	Destructive Attack	Standby Power*
Level IV	Level I	Level I	Level III

* A battery backup MUST be installed to comply with UL 294. In order to provide at least 2 hours of backup power in the event of an AC power loss, install a battery backup that is:

- Recommended battery type: 12VDC 9 Ah lead-acid battery
- Recommended dimension: 5" x 3.7" x 3"

This product is grade 2.

In order to adhere with UL 294 standards, the following conditions must be met:

- The ButterflyMX 2-Door Access Controller must be installed within a secured area.
- The ButterflyMX 2-Door Access Controller must be attached to a battery backup.

Warranty

ButterflyMX has a 2 year limited warranty to end customers. For full details, please see https://butterflymx.com/warranty.