AstroMC Roll off Roof Controller Hardware Quick Start Guide

March 2018

Here are some pointers so that both your installation and initial startup are smooth.

1. The AstroMC Roof Control and Hub comes with an RS-232 serial interface, so if you need a converter to USB, you can get one from our website or from a number of computer supply sites. If you ordered your controller as a USB unit, it came with a converter that we've tested. A note on converters: Not all converters are created equal, especially with Windows 7 and Windows 10. Our converters are tested with the USB driver on our site; they work in all Windows versions, except Windows 8, from Win XP through Win10 64bit. If you prefer your own converter, separately test it for full duplex operation (send and receive simultaneously).

2. Shown below is a pictorial of the Roof Controller circuit board. Let's describe each connection terminal in a clockwise direction beginning at the upper left of the board.
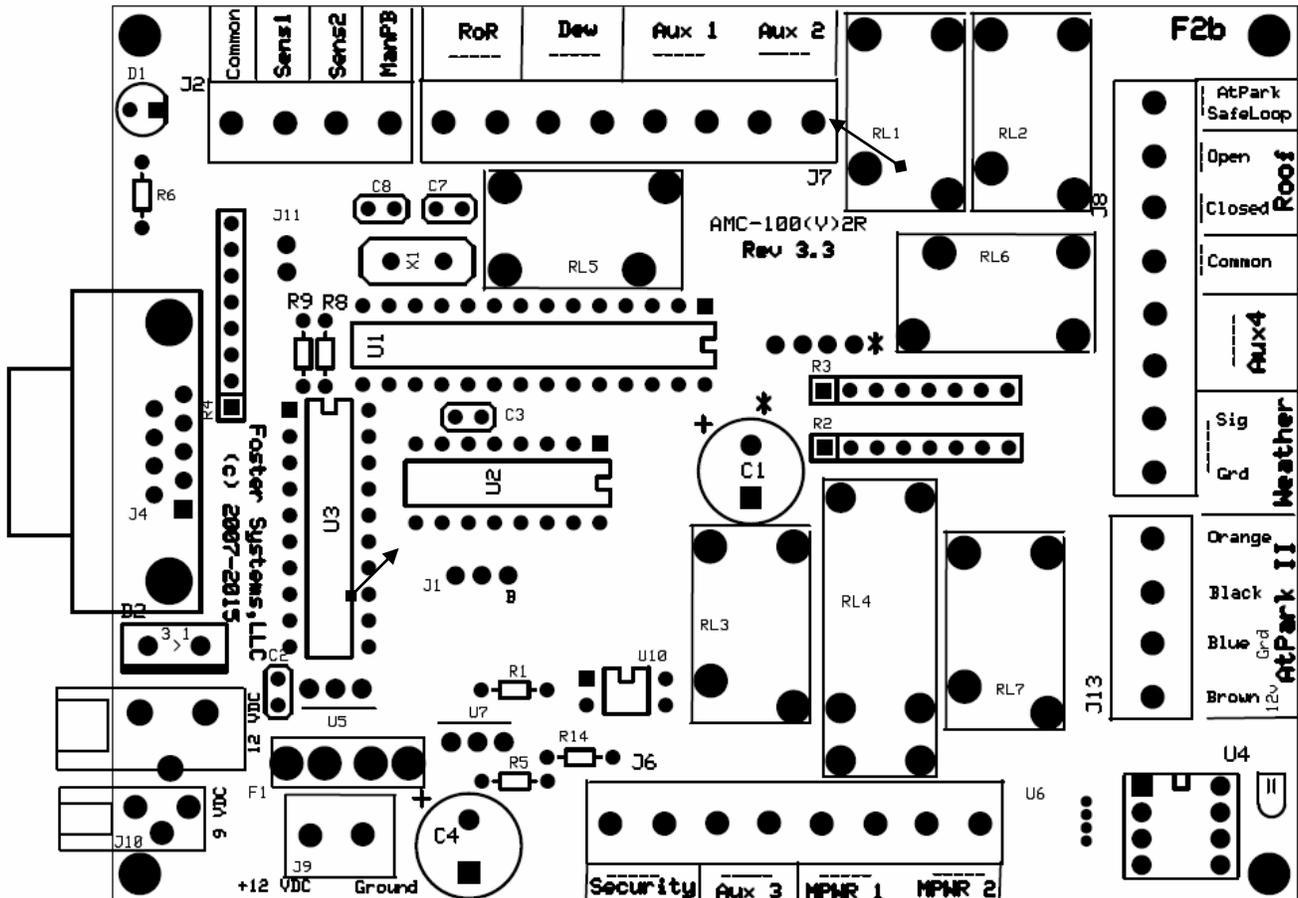
The connector marked J2 is new. It is intended for future offerings, so we'll skip over that for now.

The next, J7, has 4 sets of terminals. The first is used for common Roll off Roof garage door openers; it simulates a push button—push to open, push to close. In this configuration, the garage door opener performs its own stopping, just like a regular garage door. The next is marked Dew; it is a contact closure (no power) to cycle your OTA dew heaters; the AMC PC software (SW) allows you to set the duty cycle of the dew heaters, turn them on constantly or off. The next two sets of contact closures. These are general purpose contacts, controlled by SW, for accessories and in some instances for roof control. For example, if you have a PierTech motorized pier, Aux1 and Aux2 are used to raise and lower the pier.

Now moving to the right edge, there are a mix of single contacts, pairs, and a 4 contact set. The first of these is the AtPark Safe Loop. It is an electrical circuit that connects to Common and allows you to determine whether your OTA is in the Safely Parked position. Normally, people use magnetic switches to sense the OTA position. If this loop is not closed, the roof won't move! Next is the Open and Close sense circuits; these are Normally Open circuits, connected to Common. These sensors can be magnetic or mechanical; there are a number of choices. Next is the Common terminal, described above. Next is a contact closure for Aux4, another general purpose SW controlled pair. Next is a hardware sense Weather Unsafe pair, designed to connect to your weather monitor; exercise caution in the use of this pair as it cau cause a hardware induced roof closure. The next 4 contacts are set up to interface directly to our AtPark Sensor, an optical version of the Safe Loop. Many customers use both.

Lastly, at the bottom right corner, there is a socket for our Temperature/Humidity/Dew Point sensor which measures these weather parameters inside your roof. Take note of the small icon at the edge; it shows you the orientation of the plug-in sensor.

Now moving along the bottom edge, there is a connector with 4 pairs of contact closures. First is a set of Master Power contact closures (e.g. 12 vdc, 5 vdc). These are not powered themselves. They are just contact closures. Next is Aux3, another general purpose contact closure. Aux3 is used for large roofs that require both an open relay contact and a close relay contact. Next is the Security pair; this is a traditional security alarm type feature that can send you a text message if the observatory door is opened. The bottom edge is completed with a power supply terminal pair.

On the left edge, there is a small socket for the Prime Power Monitor adapter and a large one for a 12 vdc power adapter.

Note: Aux 1 thru Aux 4 contact pairs are contact closures only; they do not supply voltage. They are available for general use except in certain roof configurations that require contact closures for proper operation. These exceptions are as follows:
- Single Roll off Roof: uses only the RoR contact closure pair
- Dual Roll off Roof: uses RoR and Aux 3 contact closure pairs
- Large Roll off Roof: uses RoR and Aux 3 contact closure pairs
- Actuator: uses Ror and Aux 3 contact closure pairs
- PierTech Motorized pier: uses Aux 1 and Aux 2 contact closure pairs.

3. Your hub has jumper wires on the Security and Unsafe terminals. These are the Observatory Security Loop and the Unsafe Loop respectively. If these are not jumpered, you will get alert messages. Also, your shutter will not move when the Unsafe Loop is "open circuit". Customers sometimes install small magnetic switches on their OTA, Mount and/or Pier to assure that the scope is in Park Position prior to roof movement; this is for protection purposes. By placing the jumpers, you BYPASS these features.

4. Install the hub in a convenient place in your building. If you have purchased (or plan to purchase) our Temperature/Humidity/DewPoint plug-in module, keep in mind that it will read the conditions where the box is placed.

5. If you prefer using a 12 VDC power adapter, plug it into the 2.1 mm connector on the board. If you have a Power Monitor adapter, plug it into the 1.3 mm connector on the board.

6. To review, wiring to your roof motor control:
    a. Single Roll-off-Roof with pushbutton control (e.g. garage door or gate opener type) – Connect the pushbutton wires to the RoR terminals of the board.
    b. Dual pushbutton controls – Connect one pushbutton to the RoR terminals and the other to the AUX3 terminals.
    c. Large Roof control – Connect one set of control wires to RoR and the other set to Aux3. Check the setup window to identify which combination opens the roof and which closes the roof. These connectors are for low voltages and low current only. Use an intermediate relay if your roof is controlling high voltages directly. See enclosed sketch.
    d. Actuator Roof control – Connect the RoR terminals to the Direction relay and the Aux 3 contacts to the Motion relay. (this design will require transition relays which we sell. Contact us for details.)
    e. Pier Tech—Connect the RoR terminals to your roof as in a, b, c above. Connect the Up motion wire pair to Aux1 and the Down motion pair to Aux2. Adjust the time (secs) that these connections will be closed to achieve full up or down. (You may need an adapter to complete integration of your PierTech motorized pier. Contact us for assistance.)

7. To review, wiring Open and Closed sensors:
    a. Using either our magnetic switches or your own Normally Open (NO) switch, place 2 switches so that they close when the roof is stopped in the Open or Closed position. In the case of magnetic switches, the magnet would be mounted on the moving part of the roof. The switch parts are located on the fixed structure at the Open or Closed position respectively.
    b. Connect these wires to Open or Closed and Common. These switches are in addition to whatever limit or safety switches you have installed to prevent motion beyond the safety limits of your installation. We strongly recommend that you install separate limit switches to assure that your roof stops if there is an unsafe condition.

8. Once you have made all the desired connections to the controller board, apply power to your controller enclosure.
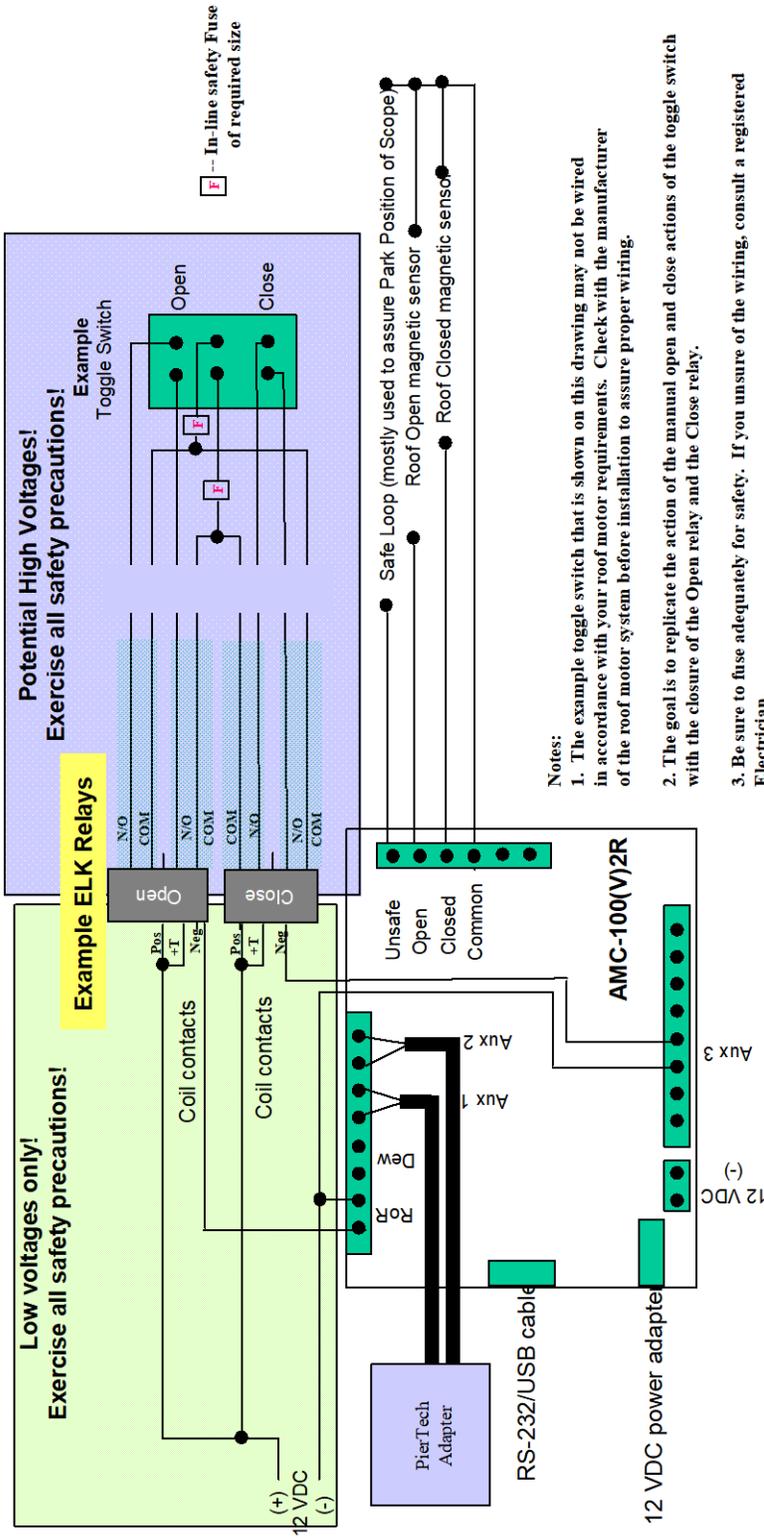
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9. Go to our Download Center at http://fostersystems.com and download the Installation Package for a Roll off Roof. Unzip it and copy the content into a separate directory. Install the software first.

    a. If you have a USB converter interface, Windows 10 will install the driver for you.
    b. Locate the AstroMC Dashboard installer and run it. The installer should guide you through the process.

10. Now connect your RS-232 cable or USB cable to your PC and observe the COM port that the PC assigns to your system.

11. Once completed installation, double click on the AstroMC icon on your Desktop.

12. On the AstroMC Dashboard, use the Communications pull down to select the assigned COM port. After a short delay, the communications activity indicator should start to flash. This means that you are communicating with the controller hardware.

If you have questions on your operation please do not hesitate to contact us at:
support@fostersystems,com

Foster Systems, LLC
www.fostersystems.com

Example Wiring for Large Roof Control With Motorized PierTech pier

F -- In-line safety Fuse of required size

Potential High Voltages!
Exercise all safety precautions!

Example Toggle Switch

Open

Close

Example ELK Relays

Open
Close

N/O
COM
N/O
COM
COM
N/O
N/O
COM

Low voltages only!
Exercise all safety precautions!

Coil contacts
Coil contacts

Pos
+T
Neg
Pos
+T
Neg

PierTech Adapter

(+)
(-)
12 VDC

RoR
Dew
Aux 1
Aux 2

RS-232/USB cable

12 VDC power adapter

12 VDC (-)

Aux 3

AMC-100(V)2R

Unsafe
Open
Closed
Common

Safe Loop (mostly used to assure Park Position of Scope)
Roof Open magnetic sensor
Roof Closed magnetic sensor

Notes:

1. The example toggle switch that is shown on this drawing may not be wired in accordance with your roof motor requirements. Check with the manufacturer of the roof motor system before installation to assure proper wiring.

2. The goal is to replicate the action of the manual open and close actions of the toggle switch with the closure of the Open relay and the Close relay.

3. Be sure to fuse adequately for safety. If you unsure of the wiring, consult a registered Electrician.

4. Virtually every installation differs in some ways from this drawing. Users should consider this drawing as an example only. You are responsible for your own wiring and use of the AMC-100. ELK model ELK-924-4 is used as example in this drawing.

Warning: Your motor controller and manual switch may be utilizing high voltages (i.e. 110 VAC or above). If in doubt, consult a Registered Electrician for wiring, packaging, hookup and test! Protect all high voltage relays and exposed wires in an enclosure that is suitable for the purpose.