autobimini

Installation and User's Manual

Version 3.2

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About This Manual

Version 1.0 was created May 31, 2021
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This manual was created for use by FFI Automation end users and OEM customers. OEM customers are encouraged to use material they deem appropriate for incorporation into their own end-user manual. Contact FFI Automation directly if you have questions, suggestions, or corrections to the manual.

Safety

FFI Automation considers the safety of its customers and end users of prime importance. Please read and follow the warnings and recommendations below to ensure correct and safe operation of the system.

Operate Safely

Before operating autobimini, thoroughly inspect the area around autobimini to verify that all passengers are in a safe position. Verify that no person is in an area that will interfere with the motion of the autobimini as serious injury could result.

Pinch Points

Moving parts, including autobimini arms can pinch, cut, or crush. Keep passengers clear and use caution when operating the unit.

Operation Limitations

The autobimini actuators are designed to overcome wind loads to operate in adverse weather conditions. However, do not operate autobimini in excessive high winds or boat speeds. High winds and boat speeds could result in product damage and/or personal injury. Do not attempt disassembly or repair while the boat is in motion.

Maximum Speeds

Observe the autobimini maximum operating speed limits. The maximum speeds are relative values inclusive of wind and boat speeds combined.

autobimini Position	Maximum Speed
Full UP Position (no front support arms)	25MPH
Full UP Position (Front support arms secured 1/3 up front arch)	45MPH
Full UP Position (Front support arms secured 2/3 up front arch)	55MPH
RADAR Position	50MPH (boot installed)
Full DOWN Position	70MPH (boot/straps installed, highway speed)

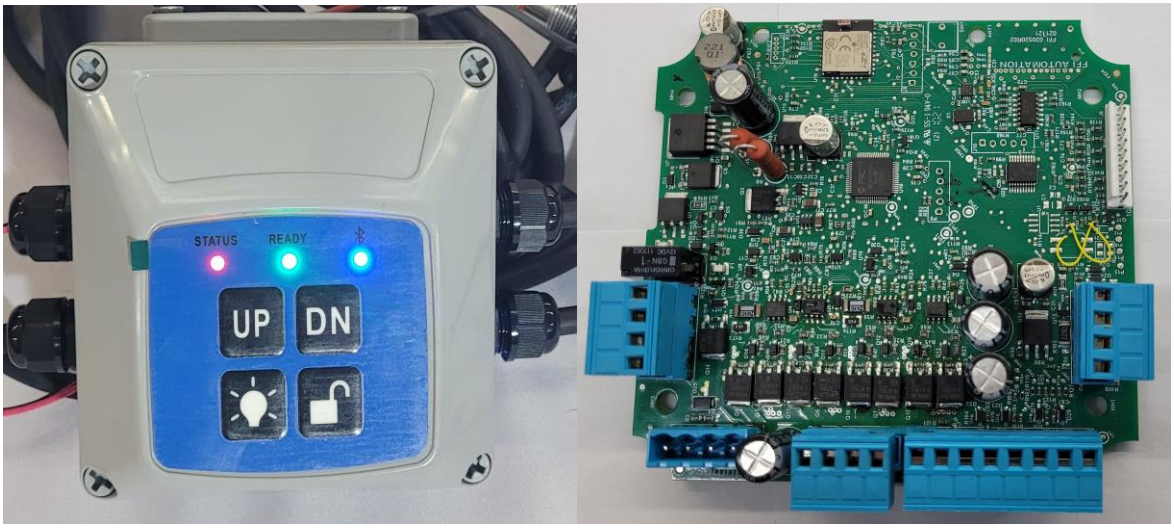
Caution: Do not operate autobimini in excessive high winds

Electrical hazards

There are no end-user serviceable components on the autobimini controller or within the actuators. Users should consult their dealer for repairs or replacements if autobimini is damaged in any way, including water immersion.

System Components

autobimini Controller



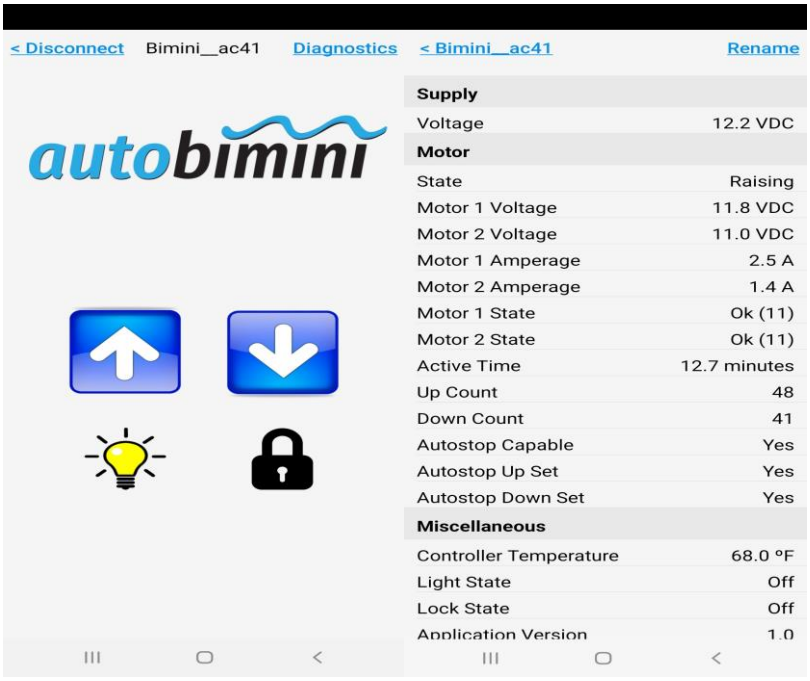
autobimini Controller – Keypad (left) and internal PCB (right)

autobimini intelligent controller key features:

- Electronic Synchronization: The intelligent controller uses feedback from both actuators to ensure the actuators maintain synchronized speed and position control.
- FOB Remote Control: The controller has an on-board microprocessor capable of operating the autobimini with a frequency operated button (FOB). Up to 5 FOB's can be paired to the controller at one time.

autobimini FOB (Frequency Operated Button)

- Bluetooth Control: The controller has a separate on-board Bluetooth wireless communications microprocessor. The Bluetooth processor allows Smartphone operation including wireless system diagnostics with the provided APP (iOS or Android).



autobimini Smartphone APP (iOS or Android)

- Keypad Control with Status LEDs: The autobimini controller is housed in an IP65 waterproof enclosure. The controller can be operated with a keypad on the enclosure. The keypad is equipped with status LEDs indicating operating Status, Ready, and Bluetooth communications.
- Auto Stop: The controller can be programmed to automatically stop at user programmable UP and DOWN positions. The controller operates at 66% speed until the auto stop positions are set, then will operate at full speed with the auto stop positions set. The green READY LED on the keypad will be full ON indicating the auto stop positions are set. Smartphone diagnostics will also indicate when the auto stop positions are set.
- Soft Stop: Once the auto stop positions are set, the controller will automatically incorporate soft stop at the UP and DOWN positions. The autobimini will softly settle into the programmed UP or DOWN positions. This maintains good position control and safely and gently operates the mechanics.
- Sleep Mode: If the autobimini controller is not being operated, it will automatically go into sleep mode for energy efficiency and conserve power. The autobimini controller will automatically wake up when any FOB, Bluetooth, Keypad or Console switch is pressed.
- Manual Override Mode: Built-in terminals to lower the bimini frame bypassing the controller in case of malfunction.
- REGEN Mode: The controller will automatically regenerate loads from canopy winds safely.

Heavy Duty Marine Grade Construction

- Dual intelligent actuators with stainless steel yoke and electronic synchronized operation.

autobimini intelligent actuators (powder coat black or silver)

- Significantly heavier and more durable than competing brands.
- 4-bow light sand blasted aluminum frame or black powder coat frame with stainless steel fasteners.
- Worm Gear Technology: The built in worm gear inside the smart actuators protects the system from back-driving to ensure safe and reliable operation.
- UHMW: Ultra High Molecular Weight film provides frictionless aluminum frame sliding for years of maintenance free operation.
- UV protected and 600D solution dye canvas with double PTFE Teflon sewing and marine grade zippers.

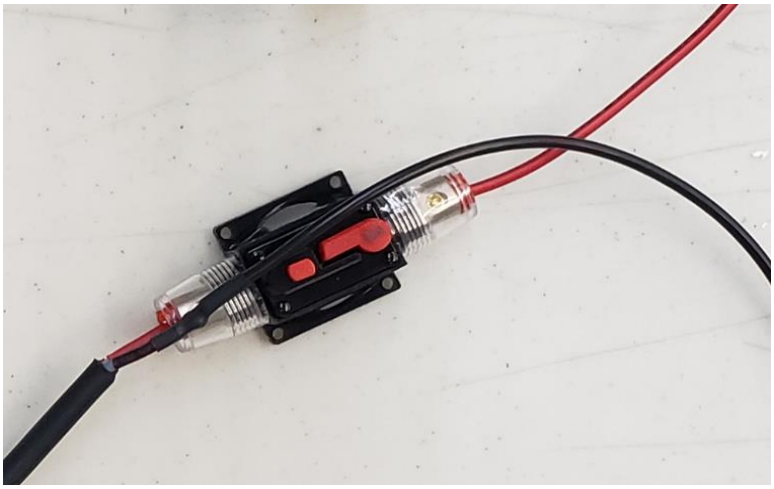
autobimini canvas colors (Beige, Black Burgundy, Forest Green, Navy Blue, Pacific Blue and Silver). Supplied with matching zippered boot.

- Matching storage boot with marine grade zippers.

- Marine grade wiring with tinned copper wire.

Battery Powered: The autobimini operates on 12VDC battery power.

Resettable Circuit Breaker: The autobimini has built-in manually resettable circuit breaker protection. The controller will protect the smart motorized actuators while the circuit breaker protects the controller.



autobimini resettable circuit breaker

Adjustable Width: Telescoping frame adjusts to fit 92" to 102" wide pontoon or deck boats.

Premium Coverage: UV protected autobimini canvas top with generous 10 foot coverage.

Front support Arms: Front supports arms provide stability to the bimini frame when traveling at higher boat or wind speeds. Front support arms are cut-to-length for each unique installation.

Front support arm base and arm with mounting bracket

Typical location for mounting front support arms. Front support arms are cut-to-length.

Optional Canopy LED Light: autobimini can be provided with an optional canopy LED light. The LED can be operated with the FOB, Bluetooth, or Keypad and is complete with marine grade wiring.

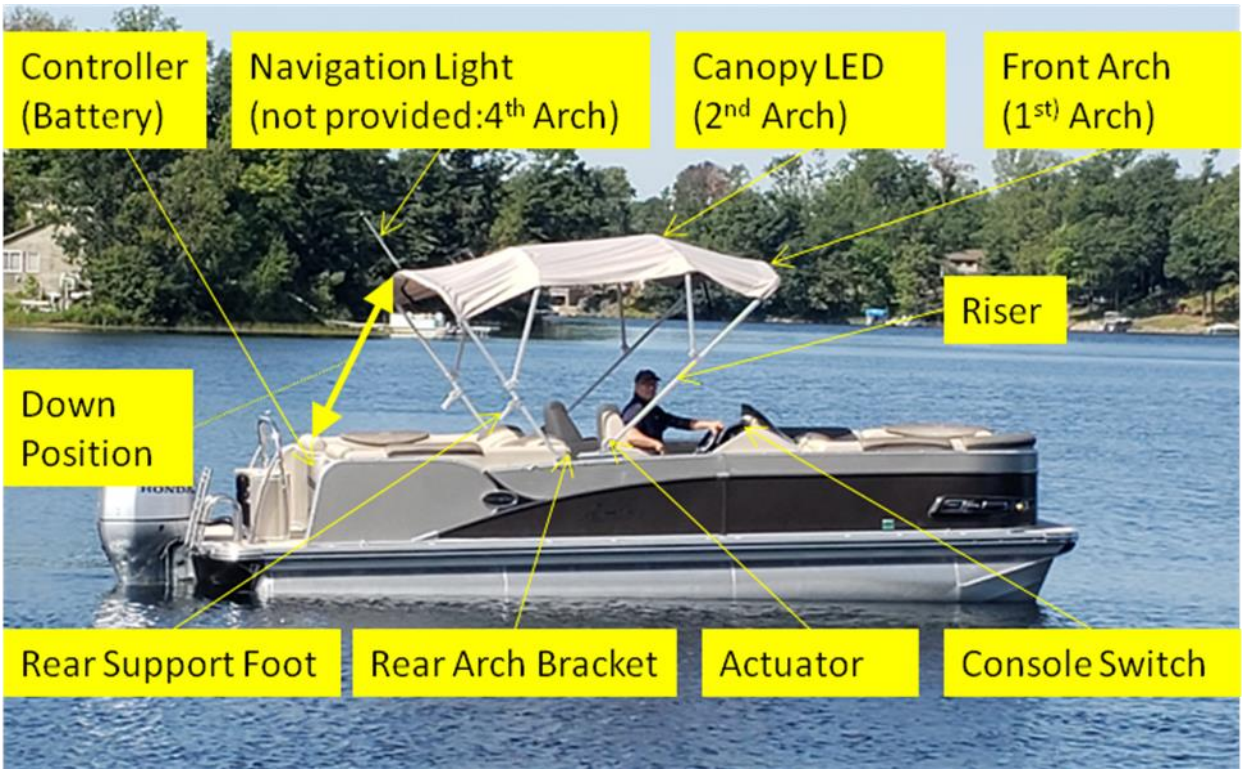
autobimini LED Light installed on 2nd arch (optional; shown powered)

Optional Console Switch: The controller can be wired with an optional console switch mounted in the helm control panel. UP, DOWN, and operating LED indication provided. Momentary on and off with LED (new production units have blue LED).

autobimini console switch (left) and console switch installed in helm control panel (right)

Installation Planning

This section describes what the end installation looks like and preparation knowledge.



autobimini completed installation with component names and relative locations

Planning for installation:

1. The 1st, 2nd, 3rd and 4th **ARCHES** and **RISERS** are assembled into sub-assemblies based on the **playpen width**. The risers connect to the arches using the supplied connector tubes.	

2. The **DOWN POSITION** is where the 4th arch would rest with the rear support foot installed. Pick a location that is clear from passengers and similar to the bimini being replaced as typical.

3. The **NAVIGATION LIGHT** is not provided. The existing navigation light is used and wires routed through the 4th arch and riser. The autobimini canvas and boot has provisions (sewn holes) to support the navigation light installation. Cable grommets for wire routing are provided in the aluminum frame.

Navigation light installed on 4th arch. Access holes are built into canvas and boot

4. The autobimini **CONTROLLER** can be mounted near the battery or under the helm. Regardless of desired mounting location, the circuit breaker needs to be within 7 inches of the battery positive (+) post based on marine electrical codes. Enough marine grade wire is provided for either installation location.

5. The **REAR ARCH BRACKET** mounting location determines how far the front(1st arch) travels down. The **closer** the rear arch bracket is to the actuator, the **further down** the bimini front or 1st arch will travel. Pontoon boats do not travel "flat". Thus, the user can select the desired position.

6. The **ACTUATOR** is an intelligent actuator. The marine grade actuator cable provided has:
    a. Two (2) motor power wires of sufficient gauge to reduce voltage drop.
    b. Four (4) feedback wires for closed loop operation to the controller.
    c. Enough marine grade cable to run inside the playpen and underneath the pontoon to the controller location. Attention to routing the actuator cable is suggested prior to installation. The cable is marine grade so it does not have to route inside the playpen and depends on the exact installation.

7. The **CONSOLE SWITCH** is an optional purchase. If purchased, the console switch allows for pushbutton operation at the control console located in the helm.

8. The **CANOPY LED** is an optional purchase. If purchased, the typical location for the canopy LED is in the 2nd arch. However, the user can mount the LED in any desired arch. There are built-in cable grommets to rout the LED wires through the aluminum frame.

9. The most difficult installation tasks are:
    a. Locating the actuators in the correct position. Clamps can be used to ensure the mounting location is correct before drilling any holes. Wiring and operating the actuators before a final installation is suggested to ensure correct and proper operation before routing all the wires through the pontoon.

    Expert Tip: Protective cloth can be used to prevent scratches when mounting the actuators or brackets until the final mounting locations are determined.

    b. Routing the wiring for the actuators, navigation light, canopy LED and console switch should be reviewed in advance. Typically, the pontoon will have existing wire path ways on both sides of the pontoon from existing electrical wiring and cabling. Investigate the best path to run the wires underneath the pontoon and secure wires near aluminum supports with cable ties (or other wire securing devices). Cable ties or other wire securing devices are not provided.

autobimini in full up position

Expert Tip: autobimini videos available on our YouTube channel at: www.youtube.com/channel/UCpATtpEzl15J6B5WQWU-PgA

Expert Tip: Additional pictures located at: www.autobimini.com/gallery

System Installation

This section describes how to install the system including mechanical assembly, electrical assembly and suggested order of assembly.

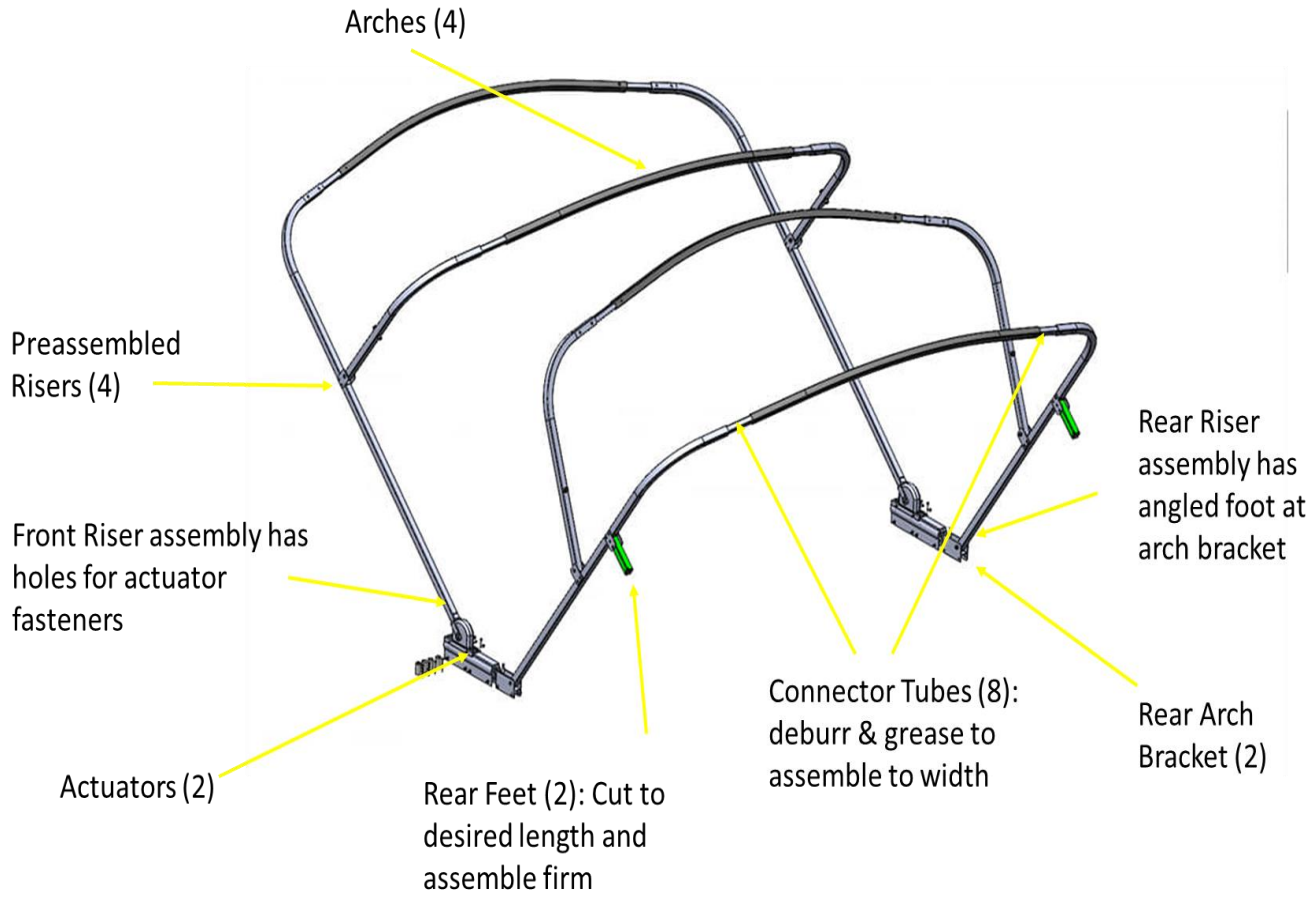
The general assembly process is as follows:

1. Gather and identify the components to be installed.
2. Remove any existing bimini.
3. Assemble the autobimini aluminum frame.
4. Mount the stern navigation light.
5. Mount the actuators.
6. Mount the rear arch support brackets and aluminum frame assemblies.
7. Locate and wire the autobimini controller.
8. Install arches.
9. Attach the canopy.
10. Set the rear arch support brackets' final locations.
11. Install the rear support feet.
12. Program the auto stop positions.
13. Hold-down snap installation.
14. Front support arm installation.
15. Install console switch (optional).
16. Wire navigation light
17. Install the LED light (optional).
18. Install Canvas Boot Straps during high-speed travel.

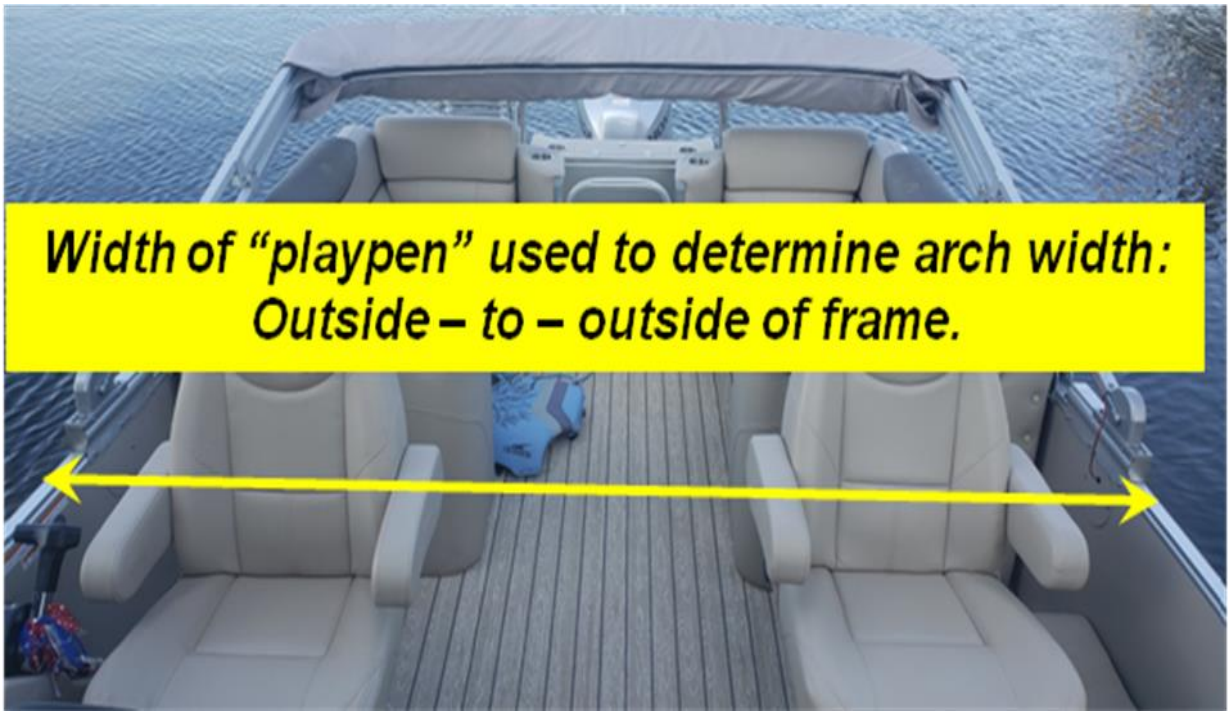
autobimini installed and in radar position

Installation

1. **Gather and identify the components to be installed.** At a minimum this will include:
    - Two motor actuators with their mounting brackets and wiring
    - Two rear arch mounting brackets
    - Four riser arms
    - Four bimini arches
    - Eight arch connector tubes
    - One autobimini controller enclosure with keypad
    - Manual reset circuit breaker and cabling
    - One "fob" controller
    - Console switch with marine grade cable (optional)
    - LED light with marine grade cable (optional)
    - Assembly hardware
    - Tools (tape measure, rubber hammer, portable drill, file, lube, socket set, screwdrivers, hacksaw, cloth, wire strippers, pencil and rivit tool)

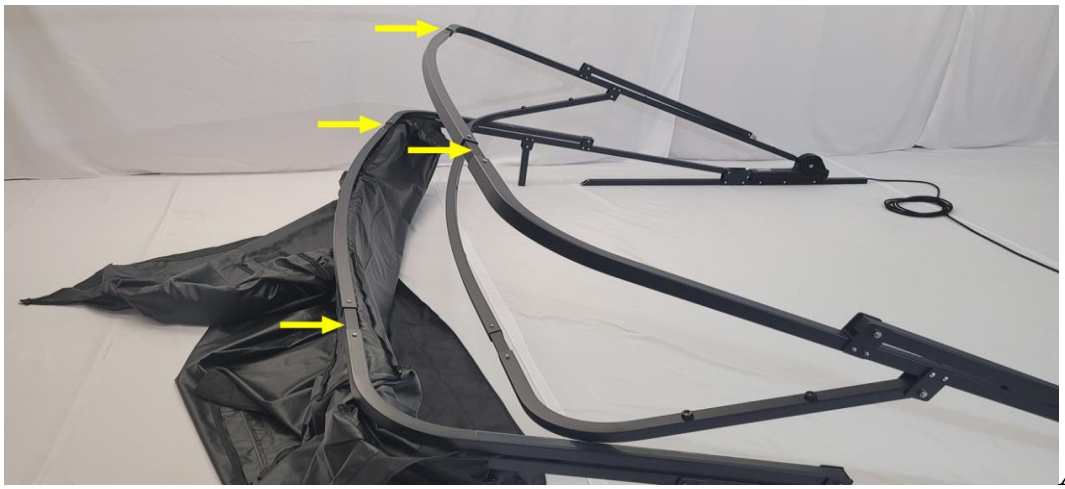


2. **Remove any existing bimini.**. Note the location of the bimini mounting points. This may aid in locating the placement of the new autobimini. Measure the width of the "playpen" – outside frame to outside frame – at the points where the new autobimini will be attached. See image below.



Measure the width of the pontoon playpen. This determines the aluminum frame arch width for assembly. autobimini shown in down position with arches layered

3. **Assemble the autobimini aluminum frame.**
    a. The frame assembly is provided with pre-drilled holes for a 99.5-inch-wide pontoon boat installation. New holes can be drilled using the 99.5-inch-wide existing holes as a guide. The pontoon installation may be different from 99.5 inches wide. Pontoon playpens will range from 98 inches wide to 101 inches wide, typically. Adjust the connector tube holes according to the measured width.
    b. Deburr the outside ends of the insert tubes as well as the inside edges of the riser arm tubes and the inside edges of the arches – this will greatly ease assembly.
    c. Install the predrilled portion of the connector tube into the riser arm and bolt this connection with one of the 10-24 x 1-1/2" bolts with nylon locknut.
    d. Create the arch assembly by inserting each side of the riser/insert into an arch (lightly greasing the insert first may aid in smooth insertion). Adjust the insertion depth such that the overall width of the assembly equals the width measured in step 2. The exposed insert tube will usually be approximately 4 inches – see the image below.
    e. Drill and bolt this connection together using a 3/16" drill bit and the corresponding hardware. There should be four bolted connections per arch.
    f. Repeat this assembly for each of the four arches, **except for the 4th arch (stern) which will have the navigation light**.



Arches – connector tube - riser arm assembly shown bolted together (make sure all the connector tubes are same width for a square frame assembly)

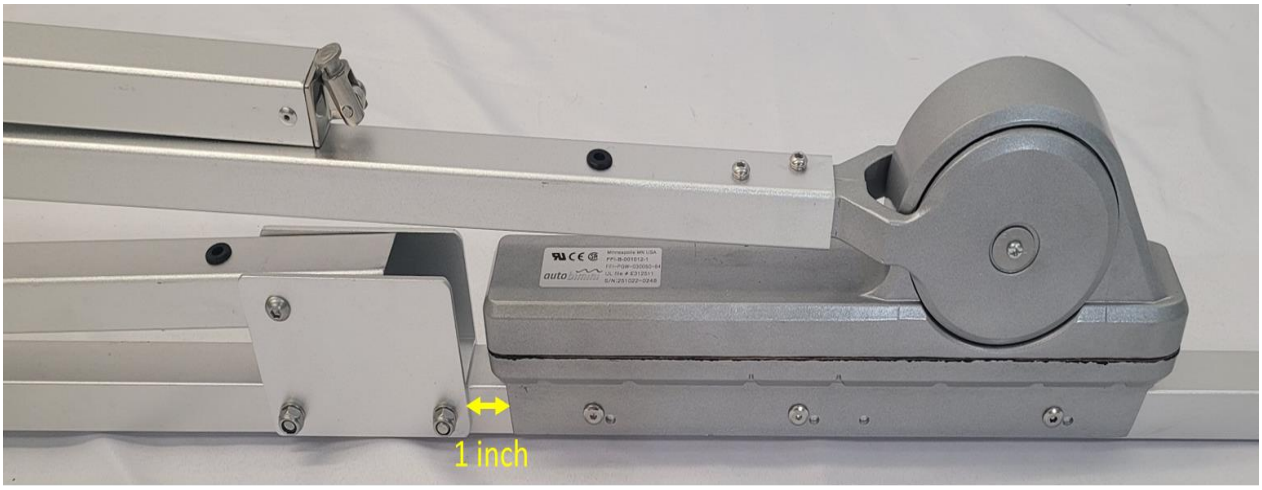
Expert Tip: Ensure all the connector tubes are the same width. This will ensure a square frame when mounted on the pontoon.

4. **Mount the stern navigation light.**
    a. Using the navigation light hardware from previous bimini, attach the navigation light to the rearmost frame arch (4th arch).
    b. Route the wire through the arch, then through the riser frame after drilling the bolt holes but before assembling the arch. This will be the easiest way to route the wire through the frame.
    c. Use a "fishing wire" as necessary to properly route the wire to the bottom of the riser.

Expert Tip: Drill holes in the aluminum tubing before routing navigation wire.

autobimini with navigation light installed in 4th arch

5. **Mount the actuators.**
    a. Place the front arch where it will sit when folded down. Make sure the folded bimini will rest at the desired stern location.
    b. Note the location at the base of the riser where the actuator is connected and mark the boat frame. Make a similar mark on the opposite side of the boat at an equal distance from the stern.
    c. Align the actuator receiver location with the mark made in step 'b' such that the front arch will end up in the desired location.
    d. Determine where the actuator cable will route to the controller. A hole can be drilled in the frame to accommodate where the cable will be routed. The cable can be routed through or around the playpen – each installation will be different. Route the cable accordingly so the actuator mounting holes can be drilled.
    e. Make sure the actuators are tightly pressed to the top of the boat frame.
    f. Using the actuator holes as a guide, drill holes through the boat frame.
    g. Mount the actuators by bolting them to the frame using the provided hardware.



Riser arm slides onto actuator and bolts into position. The rear arch bracket will be located 1 inch from rear of actuator.

Expert Tip: When drilling holes in the playpen frame, check for existing wires before drilling.

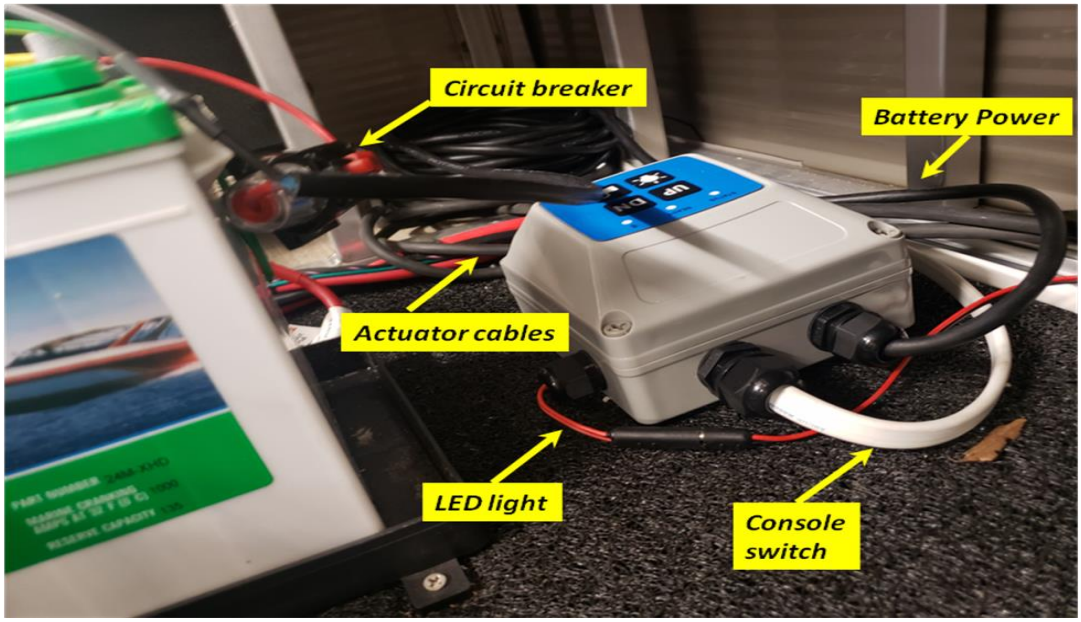
6. **Clamp the rear arch support brackets and attach 3rd and 4th arches.**
    a. Temporarily clamp the front of the rear arch support brackets to the "playpen" 1 inch from the rear (stern end) of the actuator. Protective cloth can be used to prevent scratching the surface of the playpen.
    b. Attach the 3rd and 4th aluminum frame assemblies to the rear arch support brackets using the supplied stainless steel hardware. Do not bolt the rear arch support brackets to the boat playpen at this time. They will be bolted after the final position adjustments have been made.

Important: INSTALL AND DO NOT REMOVE the UHMW frictionless tape on the 3rd risers. This prevents wear between the aluminum frame assemblies when folded down.

7. **Locate and wire the autobimini controller.**
    a. Locations near the battery or under the helm are typical for the controller.
    b. Run the battery power wires to the autobimini controller using the circuit breaker connection wire. **Leave the circuit breaker open until ready to power system**.

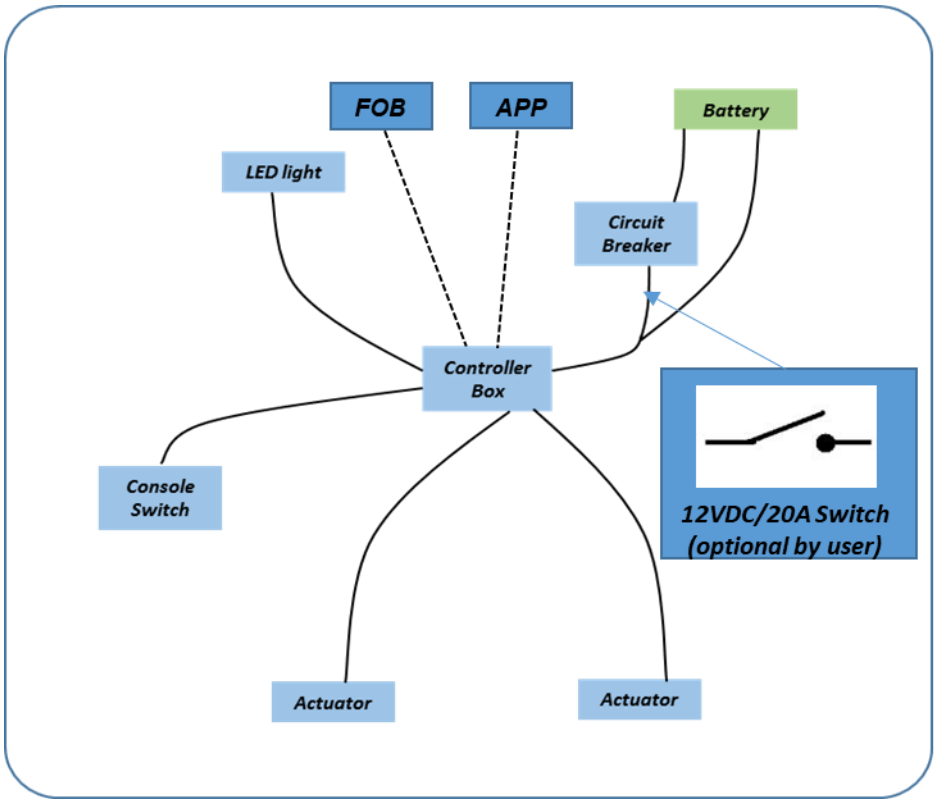
Important: The manual reset circuit breaker protection must be located within 7 inches of the battery positive (+) post to comply with marine safety guidelines and electrical codes.

Expert tip: Wire the autobimini controller and actuators without routing the wires to learn terminal connections in an easy and open environment.



autobimini controller enclosure with keypad located near the battery

    c. Route the actuator wires from the controller to the actuators. This will likely require routing across the bottom of the boat platform and through the playpen frame. Choosing how to route the wires is dependent on each individual installation as every pontoon is unique. Use common sense to obtain a safe and clean wire installation free of sharp edges. The actuator wires can be run below, through, or on top of aluminum frame members, using zip-ties as necessary for a clean installation.

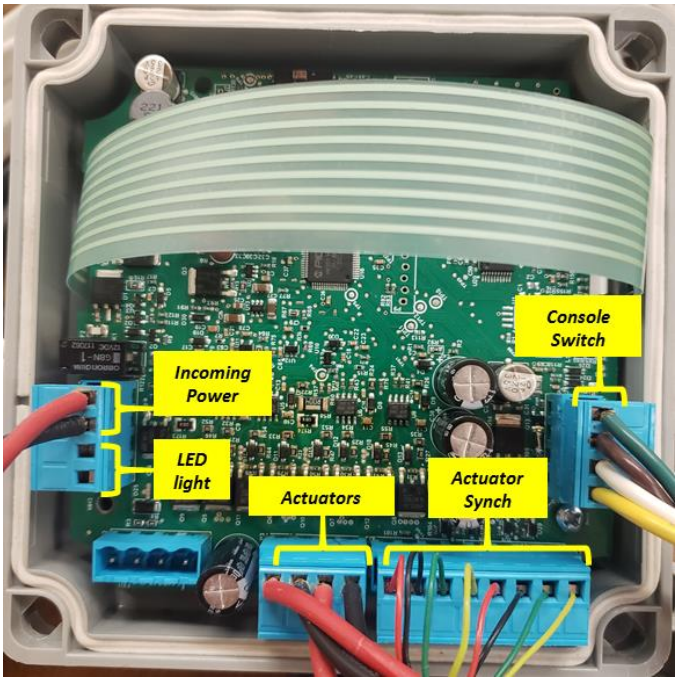


autobimini wiring and wireless block diagram

Controller and Actuator Power Wire Connection Table

Wire & Function	Wire Color	Device Connected
PCB Incoming Power +	Red	From Circuit Breaker (B+)
PCB Incoming Power -	Black	From Battery (B-)
Motor 1 Power +	Red	From actuator 1
Motor 1 Power -	Black	From actuator 1
Motor 2 Power +	Red	From actuator 2
Motor 2 Power -	Black	From actuator 2

Note: The user may choose to install an optional 12VDC/20A single pole switch (not provided) located in the helm. The provided 20A circuit breaker has a manual switch installed to disconnect power when autobimini is not in use. However, the user may desire a more convenient switch location and can add a helm switch, if desired. Power consumption is minimal when not in use, but positive disconnect of battery power may be desired.



Controller inside enclosure wiring connections

Important: Make sure the controller terminals are screwed very tight to the stripped wires. Do a pull test on the wires to ensure proper connections. Poor connections is the #1 cause of problems.

Actuator Synchronization Wire Connection Table

Wire & Function	Wire Color	Device Connected
Motor 1 Feedback Power +	Red	From Actuator 1
Motor 1 Feedback Power -	Black	From Actuator 1
Motor 1 Feedback A	Green	From Actuator 1
Motor 1 Feedback B	Yellow	From Actuator 1
Motor 2 Feedback Power +	Red	From Actuator 2
Motor 2 Feedback Power -	Black	From Actuator 2
Motor 2 Feedback A	Green	From Actuator 2
Motor 2 Feedback B	Yellow	From Actuator 2

Expert Tip: It doesn't matter which actuator is actuator 1 or actuator 2. However, actuator 1 motor power and feedback wiring must be from the same actuator. Similarly, actuator 2 motor power and feedback wiring must be from the same actuator.

8. **Install arches.**
    a. Power the controller by closing the circuit breaker. The LED's on the Keypad will blink or illuminate.
    b. The GREEN READY LED on Keypad will blink at 10% rate indicating READY for auto stop programming.
    c. Press DOWN on Keypad, 1 second at a time, until both actuator yokes are gently resting on the actuator frame.
    d. Press LOCK on Keypad; the GREEN READY LED will now blink at 50% rate indicating the auto stop DOWN position has been stored in non-volatile controller memory. The 50% blink rate indicates the controller will synchronize the actuator movements. The system will operate at 2/3 speed and 50% actuator current limits until final auto stop positions are fully programmed at a later time. This is for safety.
    e. Now use UP on keypad to move the actuator yokes to an approximately vertical position that will permit the 1st and 2nd riser arms to be installed.
    f. Install the aluminum frame assemblies onto the actuator receivers.
    g. Bolt the 1st and 2nd aluminum frame arches to the actuator receivers. Use the supplied stainless steel bolts and nuts.

Important: Program the DOWN auto stop position first. The autobimini controller synchronizes the actuators from the down position for safe controlled operation. The controller will not allow the UP auto stop position to be programmed first.

autobimini actuator installed, shown with wire routed through playpen (hidden)

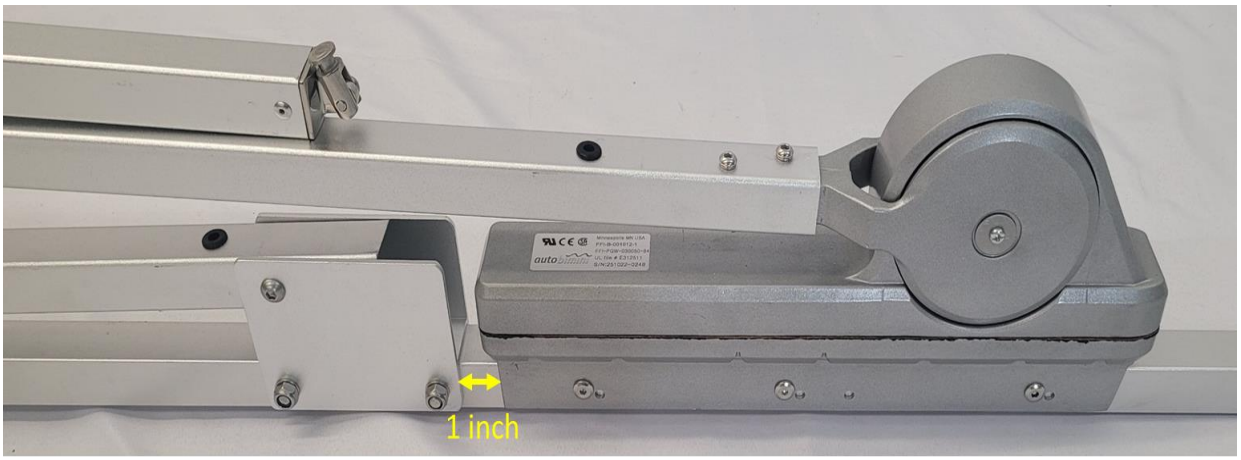
Expert tip: Rout the navigation light wires and optional LED light wires before completing the aluminum frame connections to the actuator and rear arch bracket.

Expert tip: Install and leave the UHMW tape on the 3rd risers. This allows the aluminum frame to slide frictionless for years of operation without wear.

UHMW (ultra high molecular weight) film allows frictionless sliding

Aluminum frame assembled to the pontoon (shown with canopy installed)

9. **Attach the canopy.**
    a. Use the keypad buttons to set the front arches about halfway up.
    b. Starting at the front or 1st arch. Attach the canopy by zipping it to the respective aluminum frame members. Subsequently, attach the canopy by zipping it to the 2nd, 3rd and 4th arches. Actuate the arms forward with the controller as necessary to more easily reach all arches.



Rear arch bracket location in close proximity to actuator (1 inch). This ensures the aluminum frame folds up nicely and the canopy boot can be installed over the aluminum frame.

10. **Set the rear arch support brackets' final locations.**
    a. Raise the autobimini to its fully-extended position. **Be careful to not over-extend the canopy since the auto stop limits are not programmed yet. It is possible to damage the canopy or frame if it is over-tightened.**
    b. Make sure the front 1st arch ends up at the final desired location. If it is too far forward, then lower the bimini, move the rear brackets toward the stern and retest. If too far back then lower the binimi and adjust the rear brackets to be closer to the actuators. Repeat this sequence until the front of the bimini ends up in the desired location. The **REAR ARCH BRACKET** mounting location determines how far the front or 1st arch goes down. The **closer** the rear arch bracket is to the actuator, the **further down** the bimini front or 1st arch will travel. Pontoon boats do not travel "flat". Thus, the user can select the desired position. Keep in mind the desired tightness of the canopy as well.
    c. Drill and bolt the rear brackets to the boat frame using the brackets as the drilling guide.

Expert tip: Check the angled foot on the riser where it meets the rear arch bracket. The angled foot makes contact with the bracket surface to assist in tightening the canvas.

Angled foot on 4h aluminum frame riser

11. **Install the rear support feet.**
    a. Determine an appropriate location for the support posts that won't interfere with boat operation, won't contact seat upholstery, and will minimize any pinch hazard.
    b. The typical length of the rear support feet is 6-10 inches long. Installing the appropriate length feet ensures the aluminum frame folds up well and the canopy boot fits nicely.
    c. Bolt the support post brackets in place to the aluminum frame.
    d. Determine the required length of the support post by measuring from the top of the boat frame to the bottom of the post bracket. (The default length is 10 inches.)
    e. Cut the post to length.
    f. Drill 3/16" holes through the support post using the bracket as a drill guide.
    g. Bolt the post to the bracket. The rear foot post should be secured solid so the foot does not move and can always be used in the down position. The foot creates a hard travel stop for the down position.
    h. Repeat for the other side of the autobimini.

Rear support foot mounted on autobimini aluminum 4th riser and positioned to avoid interference with boat upholstery.

Expert tip: Pontoon furniture can be moved to prevent contact wear points. Locate the furniture securing screws and move the furniture appropriately to prevent contact wear.

12. **Program the auto stop positions.** The system will operate at 2/3 speed and 50% actuator current limits until safe auto stop positions are programmed. Auto stop positions should be programmed when there is minimal wind in order to program safely.

    a. Press DOWN on the Keypad until the bimini is about 80% - 90% folded down. This is the desired programming position to clear the auto stop positions so the frame doesn't have to move a long distance without synchronized position control.
    b. Slowly and methodically press LOCK (hold for 1 second), LOCK (hold for 1 second), LIGHT (hold for 1 second) on Keypad to remove any auto stop programmed positions. The GREEN READY LED on Keypad will blink at 10% rate (10% on and 90% off) indicating READY for auto stop programming.
    c. Press DOWN on Keypad until the DOWN position is reached where both support posts are resting on the frame and the bimini is completely retracted to its DOWN position.

d. Press LOCK on Keypad; the GREEN READY LED will now blink at 50% rate indicating the auto stop DOWN position has been stored in non-volatile controller memory.
e. Press UP on Keypad until the desired UP position. **Be careful not to over-tighten the canopy. Monitor the angled foot on 4th riser at the rear arch bracket.**
f. Press LOCK on Keypad, the GREEN READY LED will be SOLID ON GREEN indicating the auto stop positions are stored in non-volatile controller memory.
g. PRESS UP/DOWN to operate autobimini. Once auto stop positions are programmed, the system will operate at full speed.

Expert tip: Once paired, auto stop positions can be programmed from the FOB or APP.

Expert tip: You can view the auto stop position settings in the APP diagnostics.

13. **Hold-down snap installation.**

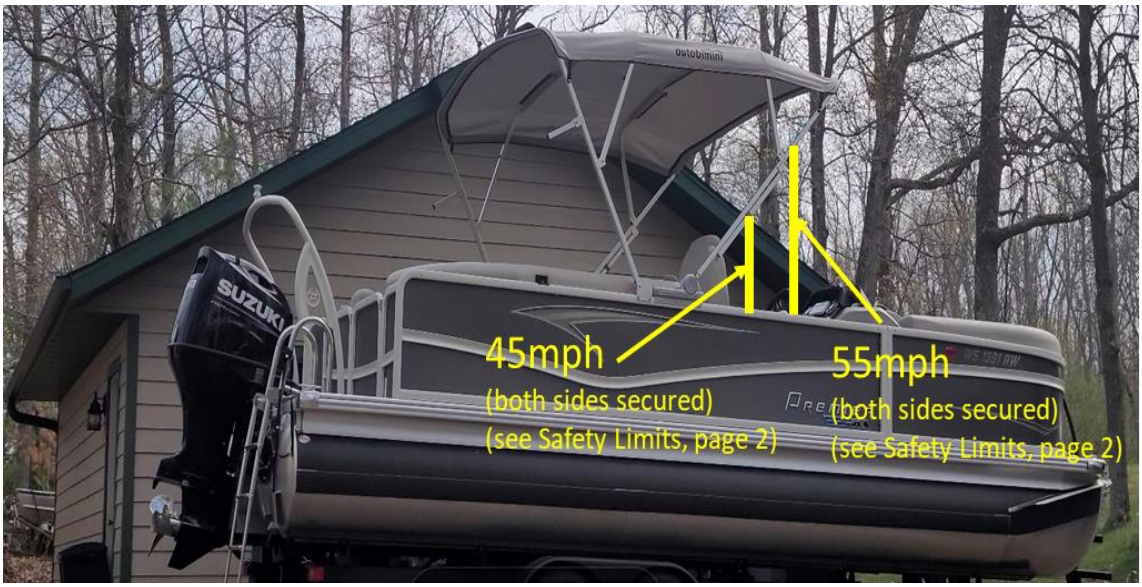
There are four snap attachments that can be used: one at each corner. To use them, first determine the appropriate locations for the snap hardware, drill pilot holes for the hardware, and screw the self-tapping snap hardware in place.

Expert tip: The canopy canvas is designed for 8.5 foot wide boats. If the pontoon or deck boat is only 8 feet wide, the hold down snaps will need to be installed to better secure the canopy.

14. **Front support arm installation.**

a. Set the autobimini top at the forward auto stop location. (Note: the auto stop positions should be programmed FIRST before mounting the front support arms)
b. Mount the arm base at the desired location on the "playpen" frame noting potential speed limits. The farther up the front arch, the more stable and faster operating speeds.
c. Temporarily attach the support arm to the arm base and determine the location for the arm bracket to be mounted on the autobimini.
d. The front support arms are designed to be cut-to-length to fit the exact installation location. The front support arms should be vertical when installed for the best support and aesthetics. They can be cut with a hack saw or circular saw.
e. Temporarily attach the stainless-steel cleat to the playpen to determine mounting location.
f. Mount the stainless-steel quick release cleat to the playpen. Drill two 3/16" diameter holes using the cleat holes as a guide. Use the aluminum rivits and rivit tool to rivet the stainless-steel cleat to the playpen. (Note: aluminum rivits are used for clearance in operating the manual release button on the stainless-steel cleat).
g. Mount the arm bracket to the autobimini at the determined location, bolting it in place.
h. Install plastic front support arm holder using the self tapping screws.

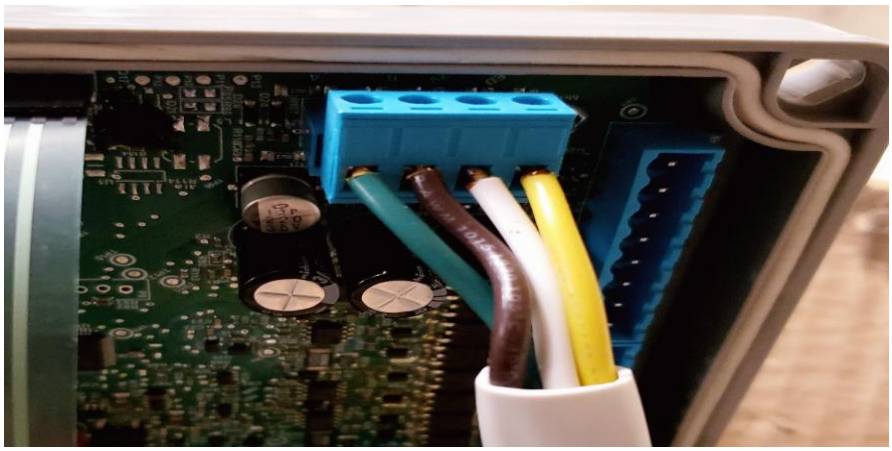
Front support arm base and arm with mounting bracket. **Cut-to-length may be required.**



Front support arms at 1/3 (45mph) or 2/3 (55mph) speed limit locations (See Safety).

15. **Install console switch (optional).**
    a. Insert the free end of the console switch wire through the console, pulling the length through, and snapping the switch in place. The indicator light on the switch should be oriented towards the top.
    b. Route the wire appropriately from the console to the controller location.
    c. Drill a 1" hole in the controller box for the cord grip.
    d. Mount the cord grip in the box and run the wire through it.
    e. Make the electrical connections to the controller.

autobimini console switch; console switch installed in helm control panel



autobimini console switch wiring

Console switch wiring table

Function	Wire Color	PCB Connection
Operate bimini Down	Green	B
Operate bimini Up	Brown	A
12VDC Common	White	12V
Operate Switch LED	Yellow	LED

f. Tighten the cable gland around the wire.
g. Close the controller box.

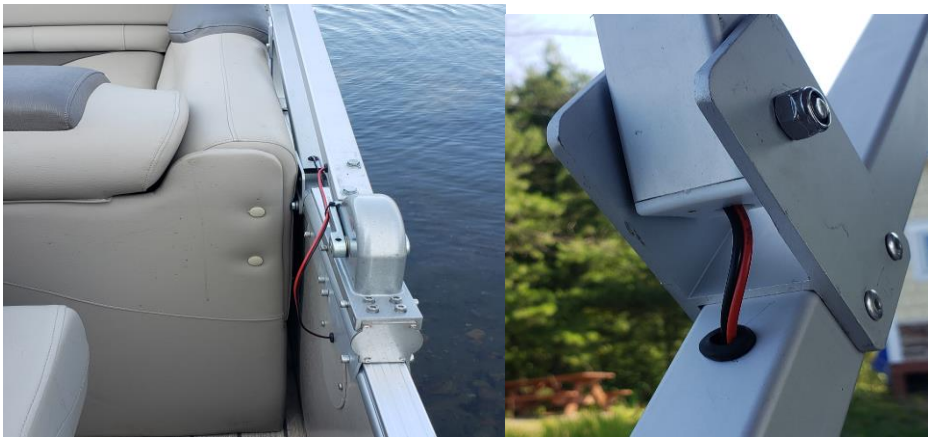
16. **Wire the navigation light**
    a. Route the navigation wires through the 4th arch and riser
    b. Route or fish the wires through the aluminum frame
    c. The wiring for navigation light is the same as provided from the pontoon manufacturer. It should be re-connected the same way as was disconnected.

Navigation wires routed in rear riser, rear arch bracket and actuator grommet

17. **Install the LED light (optional).**
    a. Mount the LED light bar in the desired location on the autobimini frame.

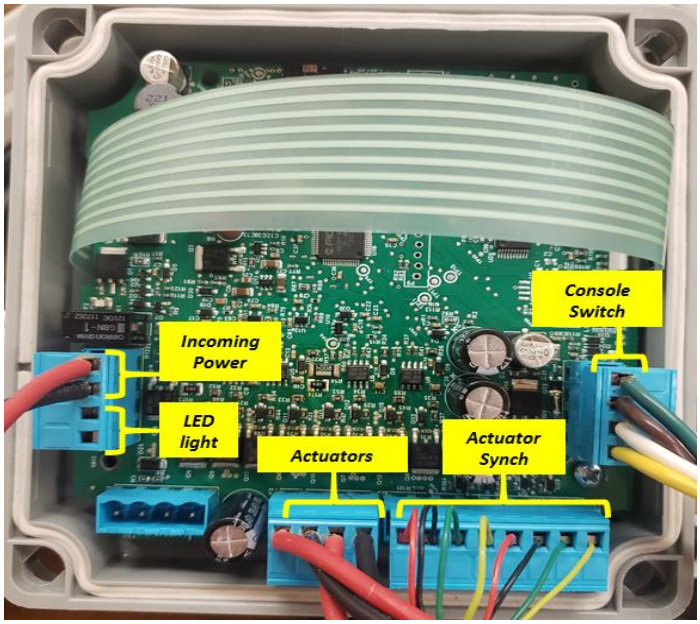
LED light wire routing in 2nd arch

    b. Clip off the 2-pin connector from the long LED wire. This will permit the wire to be routed through the grommets in the hardware.
    c. Route the wire through the frame and out the side near the actuator as shown below. This will likely require the use of a "fish wire" to properly route.



Routing of LED wire through aluminum frame

    d. Run wire to controller.
    e. Splice the 2-pin connector back onto the long LED wire.
    f. Connect the 2-pin connectors together, completing the LED circuit.



Controller box wiring connections

LED Light wiring table

Wire & Function	Wire Color	Device Connected
LED Power +	Red	LED Light
LED Power -	Black	LED Light

Expert tip: You can use the automotive 2 pin connector for the LED light connections.

18. **Install Canvas Boot Straps during travel.**

When autobimini is in the full down position with the boot secured, there are two (2) canvas boot straps that can be installed. The straps will hold the aluminum frame tighter and keep the boot secured to the aluminum frame. The 100cm boot straps are adjustable with built-in buckle.

Canvas Boot Strap installation location (secures frame/boot for high-speed travel)

General Operation

Pairing RF Remote (Frequency Operated Button - FOB)

1. To pair the key FOB:
    a. Simultaneously press and hold both the LIGHT and LOCK keys on the Keypad to initiate the pairing process.
    b. Release the LIGHT and LOCK keys when the RED status LED starts blinking indicating the FOB pairing process is initiated.
    c. To pair the FOB, press and release any key on the key FOB. The RED status LED on the Keypad will indicate successful pairing of the FOB.
    d. The FOB is now paired to controller.
2. No more than five FOB's can be paired simultaneously. Pairing more than five FOB's will result in loss of all the FOB's paired.
3. To clear the FOB pairings from controller memory, press and hold the LIGHT and LOCK keys for about ten seconds.

Pairing Smartphone APP

1. To pair a smartphone:
    a. Open the smartphone APP. The APP can be downloaded from Google Play or the Apple store (autobimini APP).
    b. Simultaneously press the UP and DOWN Keypad keys to initiate the pairing process.
    c. Release the UP and DOWN Keypad keys when the BLUE LED illuminates indicating Bluetooth Pairing Mode.
    d. On the APP, press the Scan button in the upper right corner on the main screen.
    e. Select the device by tapping on it and the APP will connect and pair to the controller. On the iPhone APP it will ask if you want to pair to the device, select yes. On the Android APP it may pair automatically or may ask you to confirm pairing – depending on your version of Android.
    f. Press UP or DOWN on the APP to verify units are paired.
2. The BLUE Bluetooth LED will illuminate when Bluetooth is communicating.

Expert tip: The Apple iOS recently allowed users to select the theme ("Light" or "Dark" theme). The iOS autobimini APP works best in "Light" theme. On your iPhone, go to Settings -> Display & Brightness -> Appearance to select the Light theme.

Clear Smartphone Pairings

1. To clear the Smartphone pairings from the autobimini controller memory, press and hold the UP and DOWN keys on the Keypad for about ten seconds.

2. On the Smartphone, go to the 'Settings -> 'Connections'-> 'Bluetooth' and select the FFI Bimini RX device and then select 'Forget this device' (iOS) or 'Unpair' (Android). Failure to do this will result in difficulty in re-pairing the phone to the controller.

Smartphone APP Screens and Operation

autobimini APP operating and diagnostics screens

The user can operate autobimini via iOS or Android APP with a smartphone. The APP is included and available from the Apple Store and Google Play. The APP operation is identical to the FOB or Keypad. See Automatic Bimini Operation in this section for details. The APP will provide real time diagnostics. The user can also customize the name using the **RENAME** function in the APP.

Bluetooth Diagnostics Table

Parameter	**Diagnostic Function**
Supply Voltage	Battery Voltage
State	Synchronization state
Motor 1 Voltage	Actuator 1 motor voltage
Motor 2 Voltage	Actuator 2 motor voltage
Motor 1 Amperage	Actuator 1 motor amperage
Motor 2 Amperage	Actuator 2 motor amperage

Motor 1 State	Stopped, Raising or Lowering states
Motor 2 State	Stopped, Raising or Lowering states
Active Time	Operation time (minutes)
Up Count	Up activation
Down Count	Down activation
Autostop Capable	Capable of accepting auto stop (Yes/No)
Autostop Up Set	Up limit set (Yes/No)
Autostop Down Set	Down limit (Yes/No)
Controller Temperature	Actual controller temperature
Light State	LED output state (On/Off)
Lock State	On/Off
Application Version	Current version of APP
Current Fault	Active fault (None or fault name)
Last Fault	Most recent fault stored in memory
Fault Code	Code of controller fault

Automatic Bimini Operation:

- Press hold the UP key (FOB/Bluetooth/Keypad, or optional Console Switch) to move the bimini UP.
- Press hold the DOWN key (FOB/Bluetooth/Keypad, or optional Console Switch) to move the bimini DOWN.
- Releasing the UP or DOWN keys will stop the bimini and maintain the current bimini position.
- The Keypad RED STATUS LED on the Keypad will go solid when the bimini is moving UP or DOWN.
- The FOB RED LED will activate when the FOB button is pressed
- The APP key will highlight when the APP button is pressed
- The Optional Console Switch LED will go solid when the bimini is moving UP or DOWN.
- **To turn the power off, turn the switch located on the 20A circuit breaker near the battery or the optional switch installed by the user.**

For safety, the operator must PRESS and HOLD the key from the desired operating button location. autobimini buttons are MOMENTARY for safe operation. autobimini requires the user to be in control of moving the system at all times. If, at any time, the operator identifies an unsafe condition, the user can cease operation.

Program auto stop positions:

1. Press DOWN on the Keypad until the bimini is about 80% - 90% folded down. This is the desired programming position to clear the auto stop positions so the frame doesn't have to move a long distance without synchronized position control.
2. Slowly and methodically press LOCK (hold for 1 second), LOCK (hold for 1 second), LIGHT (hold for 1 second) on Keypad to remove any auto stop programmed positions. The GREEN READY LED on Keypad will blink at 10% rate indicating READY for auto stop programming.
3. Press DOWN on Keypad until the DOWN position is reached where both support posts are resting on the frame and the bimini is completely retracted to its DOWN position.
4. Press LOCK on Keypad; the GREEN READY LED will now blink at 50% rate indicating the auto stop DOWN position has been stored in non-volatile controller memory.
5. Press UP on Keypad until the desired UP position. **Be careful not to over-tighten the canopy. Monitor the angled foot on 4th riser at the rear arch bracket.**
6. Press LOCK on Keypad, the GREEN READY LED will be SOLID ON GREEN indicating the auto stop positions are stored in non-volatile controller memory.

Important: Program the DOWN auto stop position first. The autobimini controller synchronizes the actuators from the down position for safe controlled operation. The controller will not allow the UP auto stop position to be programmed first.

Expert tip: Once paired, auto stop positions can be programmed from the FOB or APP.

Expert tip: You can view the auto stop position settings in the APP diagnostics.

Expert tip: Check the angled foot on the back riser where it meets the rear arch bracket. The angled foot contacts the bracket surface to assist in tightening the canvas.

Angled foot on riser attached to rear arch bracket

Expert tip: You can determine if auto stop positions are set using the APP diagnostics.

Expert tip: autobimini will operate at 2/3 speed and 50% current limit until auto stop positions are programmed. Once the safe auto stop positions are programmed, autobimini will operate at full power.

Clear auto stop positions:
Methodically and slowly use the button press sequence "LOCK (hold for 1 second), LOCK (hold for 1 second), LIGHT (hold for 1 second)". After clearing, the Keypad GREEN READY light will no longer be constantly on, but will flash intermittently at about 10% blink rate.

LOCK Keypad:
To lock the controller, press and hold the LOCK key for five seconds. All the LED's will blink for five seconds indicating the Keypad is locked. The UP/DOWN buttons will be locked for the Keypad and FOB. To unlock, press and hold the LOCK key for five seconds.

LED LIGHT operation (optional):
Pressing the LIGHT key activates the light either turning the light on or off. Pressing the LIGHT key again will toggle the light (FOB, APP or Keypad operation).

autobimini LED Light installed on 2nd arch (optional; shown powered)

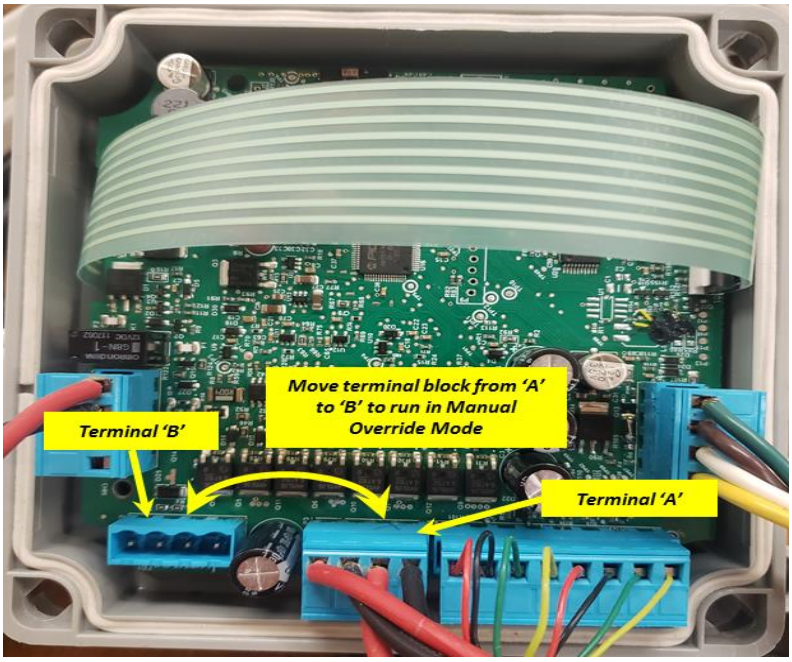
Sleep Mode Power Conservation:
The controller remains active for about five minutes. After that period the controller will automatically go into Sleep mode. Pressing any button on any device will wake up the controller.

Expert Tip: autobimini draws minimal power in Sleep mode. However, if autobimini will not be used for an extended period of time, trip the circuit breaker to save battery power.

REGEN Mode
The regeneration mode in the controller is automatic. Any regenerative loads from excess energy (i.e. high winds) are electronically regenerated. Do not operate autobimini in excessive high winds.

Manual Override Mode:

1. In the unlikely event of autobimini controller malfunction, use the Manual Override Mode to move the autobimini actuators. Manual override will allow the bimini to be driven down for storage until the controller can be repaired or replaced. **Caution: As this mode overrides the controller, there are minimal protections in place to prevent over travel. Use with caution in emergency situations.**
2. Open the controller enclosure by unscrewing the retaining screws.
3. Disconnect the actuator terminal block from Terminal 'A' by pulling firmly straight up.
4. Reconnect the actuator terminal block to the adjacent, empty Terminal 'B'. **Note that the actuators will move immediately! You must manually disconnect the terminal block to stop the motion.**
5. To reverse the actuation direction, simply swap the red and black wires in the respective red/black pairs and reconnect the terminal block. **Before returning to normal operation, make sure the wires are in their original locations and the terminal block is connected to Terminal 'A'!**
6. Close controller enclosure and screw in the retaining screws.



Controller box interior for Manual Override Mode

Keypad LED Indicators

RED 'Status' LED Indicator:

- For normal operation the LED will be solid during an UP/DOWN operation.
- If the controller encounters a fault condition, the RED Status LED will blink to indicate the fault. The blink cycle is 3 blinks every 3 seconds and the blinks will either be a short or long blink indicating a 0 or 1. The most common fault is due to a low battery.

RED 'STATUS' LED Indicator Fault Table (3 digit Code)

FAULT	LIMIT	Blink 1	Blink 2	Blink 3	Value
UNUSED		0	0	0	0
LOW_VOLTAGE	Battery Voltage < 7.5 V	0	0	1	1
OVER_TEMP	Module temp> 100C	0	1	0	2
OVER_CURRENT	Excess Motor Current	0	1	1	3
HIGH_VOLTAGE	Battery Voltage> 16 V	1	0	0	4
BACK EMF	Differential Voltage	1	0	1	5
EEMEM	Memory Error	1	1	0	6
IIRQ	Excessive over Current	1	1	1	7

Expert tip: You can see the current fault or last fault in smartphone APP diagnostics.

GREEN 'READY' LED Indicator:

- The READY light is used for auto stop indications as well as indicating the system is ready to use. When the READY light is completely on (i.e. not intermittent), the auto stop positions are set. When the READY LIGHT is "half on" (i.e. on time equal to off time) just one of the auto stop positions is set. When the READY LIGHT is 10% on, no auto stop positions are programmed.

BLUE 'Bluetooth' LED Indicator:

- The BLUE LED will illuminate when the controller is communicating via Bluetooth or when entering pairing mode.

Keypad with STATUS, READY and BLUETOOTH LED's

Care and Maintenance

Aluminum frame and actuators: The autobimini system frame components are designed to be maintenance-free. The aluminum components are light sand blasted designed to look nice and provide protection from the elements. However, the sand blasting can be damaged if cleaned incorrectly with harsh chemicals. The best way to clean the metal elements of your system is to use a neutral cleaner like dish soap in tap water along with a non-abrasive sponge. Non-neutral solutions like bleach or baking powder can damage the aluminum. It is recommended that you test your cleaning method on an inconspicuous section before proceeding to clean the entire unit. You should never use petroleum-based products or abrasive metal cleaners on any part of the autobimini.

Canvas canopy: Owners should inspect the canvas at full extension to make sure there are no deteriorating portions of the canvas (canvas rips, broken threads, etc). Additionally, there are some basic steps that should be taken that will prolong the life of your canvas:

- General, light cleaning with a hose on a monthly basis with clear water to remove debris
- A thorough cleaning every 2-3 years, which may include fabric guard and/or mildew treatments. The canopy can be removed using the zippers to permit cleaning off the boat with a soap mixture. Laying the canopy on an open surface (driveway) and spray off with a hose or light pressure with a spray washer. Do not put the canopy in a washing machine!
- Conduct an annual inspection of your canvas to ensure that all threading is intact
- Performing a pull test on the threading will determine whether that threading has become dry rotted from the elements

Electrical: While the autobimini controller is connected to the battery there is minimal current draw as the autobimini will be in SLEEP mode. However, to prevent long-term battery drainage, the circuit breaker should be tripped manually if the boat is to be unused for an extended period of time.

Troubleshooting

If you're having problems with your system, see the table below for potential solutions.

Problem	Possible Cause	Solution
Actuators don't move	Use the diagnostic page on the APP to determine potential causes.	Respond according to APP diagnostics
Actuators don't move	Wiring not connected at controller, or connected improperly.	See installation manual for proper connections.
Actuators don't move	Circuit breaker tripped.	Reset circuit breaker.
Actuators don't move	Auto stop limits set incorrectly.	Reset auto stop limits.
Actuators don't move	Dead boat battery.	Check battery voltage or use APP to check battery.
Actuators don't move	Controller may be locked.	Unlock controller by pressing LOCK button for 5 seconds.
Actuators don't move	Inoperative controller	Bypass controller using manual override mode. See dealer for controller test/repair.
Actuators don't move	One actuator inoperative	Use manual override mode to determine actuator operation. See dealer for actuator test/repair.
Actuators not synchronized	Initial position not set	Move arms to full down position and reset auto stop
Actuators move intermittently	One or more synch wires not connected to controller	Reconnect synch wires as shown in controller box wiring image.
Canopy LED doesn't work	Not correctly wired/connected.	See wiring detail in manual
Canopy won't fully extend	Obstructions prevent movement	Remove obstructing material(s).
Canopy won't fully extend	Auto stop set incorrectly.	Reset auto stop positions.