

OWNER'S GUIDE & INSTALLATION INSTRUCTIONS

Switchbox with Remote Switch

Model: SB646

Patent <http://www.airmar.com/patent.html>

07/24/18

17-565-01 rev.03

Follow the precautions below for optimal product performance and to reduce the risk of property damage, personal injury, and/or death.

WARNING: Always wear safety glasses, a dust mask, and ear protection when installing.

WARNING: The power must be 'OFF' before proceeding with the installation.

WARNING: The power supply voltage must be 10 - 32 VDC.

WARNING: A safe installation requires a 0.5 amp fast-blow fuse or circuit breaker.

CAUTION: To reduce electrical interference from other electrical wiring and any on-board equipment with strong magnetic fields such as radar equipment, radio transmitters, boat engines, generators, etc., separate the cables by at least 1 m (3').

CAUTION: Be careful not to tear the cable jackets when passing them through bulkheads and other parts of the boat. Use grommets to prevent chaffing. Use deck glands to prevent water seeping into the boat.

CAUTION: Use a multimeter to check the polarity and the connections to the power supply before applying power to the transducer(s).

IMPORTANT: Please read the instructions completely before proceeding with the installation. These instructions supersede any other instructions in your instrument manual if they differ.

Applications

- Single transmission line transducers and echosounders only
- Echosounders with power rating of 1 kW or less. Do not use with 2kW echosounders.
- One echosounder can be connected to two transducers. The transducers must have C32 or C332 cable.
- One transducer can be connected to two echosounders. The echosounder must be dual-frequency with a single transmission-line. The transducer must have C32 or C332 cable.
- One echosounder can switch between a wide-beam and a narrow-beam transducer. Pair a wide-beam SS264W with one of the narrow-beam models such as: B258, B260, or M260. Both transducers must have C32 or C332 cable.



Figure 1. SB646 Switchbox with remote switch

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Tools & Materials

- Safety glasses
- Dust mask
- Ear protection
- Grommets (some installations)
- Deck glands (some installations)
- Cutting pliers
- Phillips screwdrivers
- Pencil
- Electric drill
- Drill bits:
 - Switchbox 3 mm or 1/8"
 - Remote switch 11 mm or 1/2" spade bit
- Sandpaper
- Weak solvent (such as alcohol)
- Wire strippers
- Heat shrink tubing
- Small blade screwdriver
- Alcohol
- Slip-joint pliers (some installations)
- Adjustable wrench
- Petroleum jelly (such as Vaseline® brand)
- Cable ties (some installations)

Locating Switchbox, Remote Switch & Cables

IMPORTANT: Be sure to allow an extra 25 cm (10") of cable to make the connections within the switchbox.

Switchbox—Select a convenient *dry* mounting location for the water-resistant switchbox about 1–2 m (3' – 5') from the echosounder(s).

- Retrofit—If the transducer(s) and echosounder(s) are already installed, select a location with easy access to the cable(s). Be sure the cable(s) will be long enough to make the necessary connections. *Allow an extra 25 cm (10") for wiring ease.*
- New installation—Install the transducer(s) and echosounder(s) before connecting the switchbox. Plan the cable runs.

Remote Switch—Locate the remote switch on the dash panel or other convenient location near the echosounder. Check the backside for any obstructions such as cables and wires.

- Minimum clearance on backside 36 mm (1-1/2")
- Maximum panel thickness 6 mm (1/4")

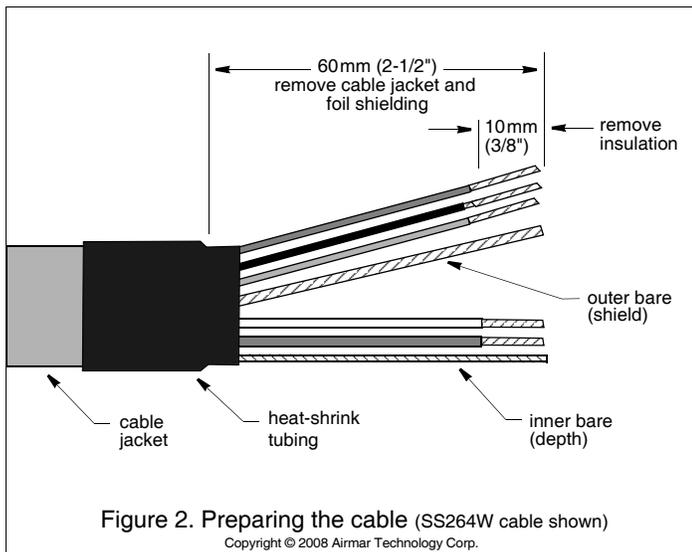


Figure 2. Preparing the cable (SS264W cable shown)

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Running the Cables

If new equipment is being installed, route the transducer cable(s), the echosounder cable(s), the power cable, and the remote switch cable to the proposed location of the switchbox before beginning the installation.

- To reduce electrical interference from other electrical wiring and any on-board equipment with strong magnetic fields such as radar equipment, radio transmitters, boat engines, generators, etc., separate the cables by at least 1m (3').
- Use grommets when passing cables through bulkheads and other parts of the boat to prevent chafing.
- Use deck glands where necessary to prevent water seepage into the boat.
- Allow an extra 25 cm (10") of cable for wiring ease.
- *Do not fasten the cables in place at this time.*

Hole Drilling

1. Hold the switchbox at the selected location and mark the position of the four screw holes.

NOTE: *If the switchbox will be mounted on a vertical surface, face the compression fittings to the side to avoid any possibility of water seeping into the box (Figure 1).*

2. At the marked locations, drill 3mm or 1/8" holes to a depth of 10mm (3/8"). *Do not fasten the switchbox in place at this time.*
3. At the planned location for the *switch*, use the label as a template to mark the hole.
4. Drill a 3mm or 1/8" pilot hole. Using a 11mm or 1/2" drill bit, drill the hole for the switch.
5. Sand the area around the hole, inside and out. Clean the surface with a weak solvent such as alcohol to ensure the label will adhere properly.
6. Apply the switch label by removing the backing from the adhesive and pressing the label firmly into place.

Installing the Remote Switch

IMPORTANT: It may be easier to wire the remote switch before installing it in the mounting surface.

1. Strip 60mm (2-1/2") of the cable jacket and foil shielding from one end of the C2 cable (Figure 2).
2. Strip 10mm (3/8") of conductor insulation from the end of each insulated wire in each cable.
3. Protect the cable's foil shielding from causing a short by using heat shrink tubing around the jacket where the wires emerge from the cable. The tubing must overlap the wires a minimum of 6mm (1/4").
4. On the switch, unscrew the plastic ring and discard. It will not be used. Unscrew the hexagonal nut and set aside.
5. Connect the blue wire to one of the screw terminals on the back of the remote switch and the black wire to the other terminal (Figure 3). Either wire can be connected to either screw terminal. It will not affect the performance of the switch.

Connect each wire by loosening a screw. Wrap the striped end of the wire around the threads of the screw and tighten it again.

6. From the backside of the mounting surface, push the toggle through the mounting hole. With the *notch* on the threaded stem facing the word 'Wide-Beam' or 'A' on the label, screw the nut against the surface. Tighten it with an adjustable wrench.
7. Screw the water-resistant boot onto the toggle switch.

Preparing the Cables

1. Allowing an extra 25 cm (10") for wiring ease, cut each cable to length. *Do not fasten the cables in place at this time.*
2. Push approximately 200mm (8") of each cable through the appropriate fitting. Use alcohol to ease sliding. Follow the diagram on the switchbox cover (Figure 1). *Be careful not to damage the circuit board.*
3. Strip 60mm (2-1/2") of the cable jacket and foil shielding from the cut end of each cable (Figure 2).
4. Strip 10mm (3/8") of conductor insulation from the end of each colored wire in each cable.
5. Protect each cable's foil shielding from causing a short inside the switchbox by using heat shrink tubing around the jacket where the wires emerge from the cable. The tubing must overlap the wires a minimum of 6mm (1/4").

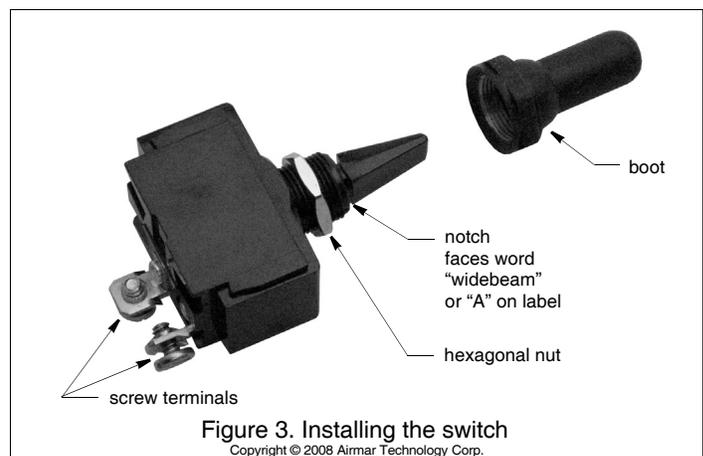
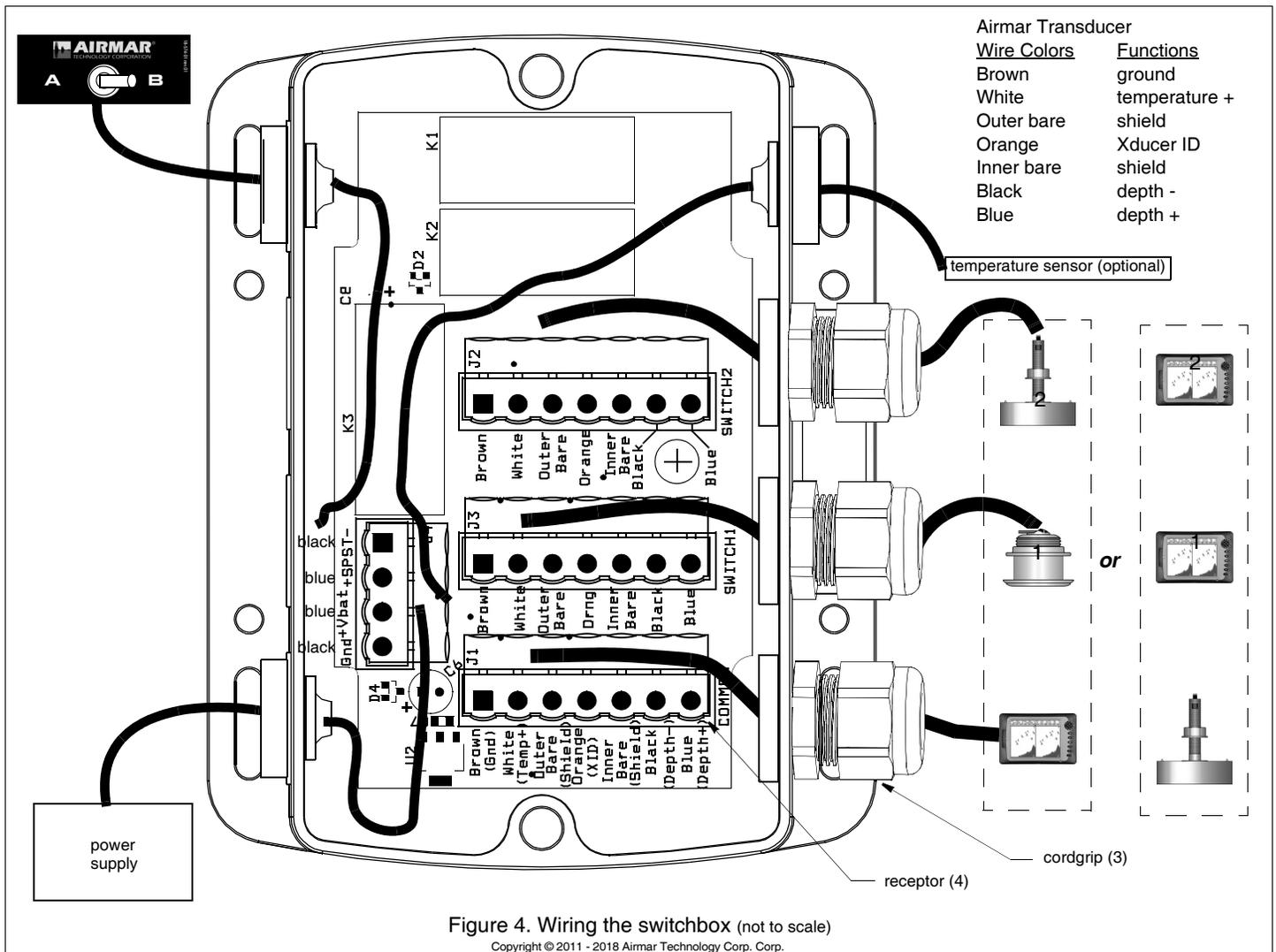


Figure 3. Installing the switch

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Connecting to the Switchbox

CAUTION: Be sure to orient the terminal block correctly before beginning, so the colored wires are connected to the appropriate terminals and not in reverse order.

NOTE: For wiring ease, make connections to the terminals outside of the switchbox.

NOTE: For Echosounder wire colors, see page 4.

NOTE: To wire an optional temperature sensor, see page 4 "Connecting an Optional Temperature Sensor" before proceeding.

Wire each cable to its *designated* terminal block (Table below and Figure 4).

Echosounder and 2 Transducers	Terminal Block	Transducer and 2 Echosounders
Echosounder	Common (J1)	Transducer
Transducer A	Switch 1 (J3)	Echosounder A
Transducer B	Switch 2 (J2)	Echosounder B
Temperature (optional)	Common (J1)	Temperature (optional)
Power	J4	Power
Remote switch	J4	Remote switch

1. Begin by wiring the single echosounder/transducer. Select a seven-terminal block. Be sure to orient it correctly as it fits on the receptor one way only (Figure 5). Follow the color code on the printed circuit board labeled Common (J1). Insert the stripped

end of a colored wire into the appropriate square hole in the terminal.

2. Using a small blade screwdriver, tighten the terminal screw to lock the wire into place. Be sure the stripped end of the wire is inserted up to the insulation only. *Do not include any insulation inside the terminal.* Gently tug on the wire to ensure it is firmly held in place.
3. Repeat this process until all the colored wires are connected to the terminal block.
4. Join the terminal block to the appropriate receptor on the PC board. The block fits one way only. Push the side with the round holes onto the pins until you hear a snap.
5. Select another terminal block and repeat steps 2 through 5. When all the cables are connected to their designated terminal blocks, go to "Closing & Mounting" on page 4.

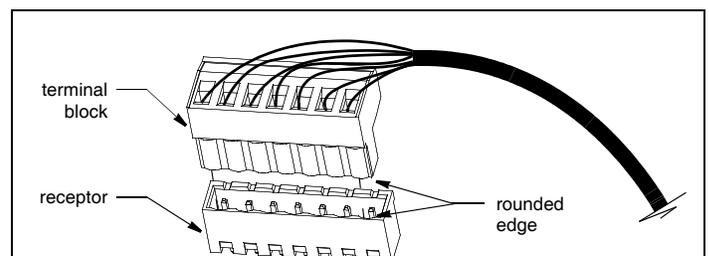


Figure 5. Wiring & joining terminal block to receptor on PC board

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Echosounder Wire Colors by Brand

Some echosounder cables contain wire colors that differ from those listed on the PC board. And some cables do not contain all the wire colors listed. If a wire color differs, match the wire's function to the function listed on the PC board. Check the table below.

Echosounder Brand	Echosounder Wire Color	Terminal Label Color	Wire Function
Furuno	brown	white	T-
	white	brown	T+
Lowrance	no orange wire	orange: not used	
Navman, Northstar	no orange wire	orange: not used	
Raymarine	green	follow instructions below	rsense

Raymarine Echosounder Only

If you are connecting a Raymarine echosounder(s), the cable contains a green wire. Since there is no terminal on the PC board labelled green, you will need to use the supplies in the plastic bag marked Raymarine to connect the green wire. If you are connecting two echosounders, follow the steps below with both cables.

1. Strip an additional 10mm (3/8") of insulation from the brown wire.
2. Connect the green wire and one resistor by inserting the end of each into separate holes in the butt connector (Figure 6). With the wires pushed tightly against the far inside wall of the connector, lightly squeeze the button with slip-joint pliers until it depresses. Gently tug on the wire and the resistor to ensure that they are securely connected.
3. Cover the resistor with a sleeve. While holding the sleeve tightly against the butt connector, twist the free end of the resistor together with the brown wire. *Be sure the resistor is completely covered by the sleeve to prevent a short circuit inside the switch.*
4. The twisted pair will be connected to the terminal labeled 'brown'. Follow the instructions "Connecting the Switchbox" on page 3.

Connecting an Optional Temperature Sensor

If you install an optional temperature sensor, it will substitute for the temperature function in both transducers/echosounders 1 and 2.

- Connect the brown wire from the temperature sensor to the terminal labeled brown on the Common (J1) terminal block.
 - Connect the white wire from the temperature sensor to the terminal labeled white on the Common (J1) terminal block.
- NOTE:** *There will be two wires within both the brown and white terminals.*
- Do not connect the white wires from the transducers/echosounders 1 and 2.

Closing & Mounting

1. From outside the switchbox, carefully pull each of the cables in turn until about 3mm (1/8") of the *cable jacket* remains inside the box (Figure 4).
2. Hand tighten the cordgrips. To make a water-resistant seal, use an adjustable wrench to tighten the cordgrips an additional 1/4 to 1/2 turn.
3. Arrange the wires neatly inside the switchbox. *Be sure that no bare wires are touching.*
4. Lubricate the gasket in the cover with petroleum jelly.
5. Attach the switchbox cover with the screws provided to make a water-resistant seal.
6. Attach the switchbox to the selected mounting surface at the previously-drilled holes, using the screws supplied.
7. If they are not connected already, connect the power cable to the power source and the echosounder(s) cable(s) to the instrument(s).
8. Fasten all the cables in place. Coil any excess cables and secure them using cable ties to prevent damage.

Parts

Lost, broken, or worn parts should be replaced immediately. Obtain parts from your instrument manufacturer or marine dealer.

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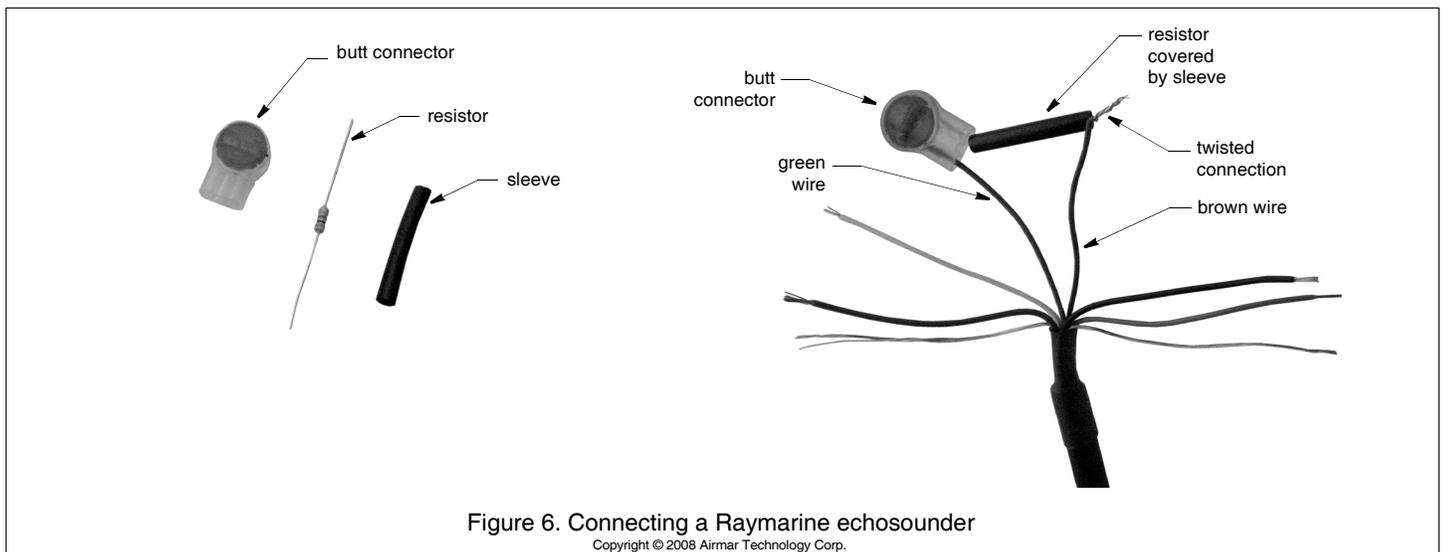


Figure 6. Connecting a Raymarine echosounder

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