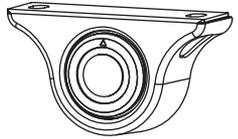
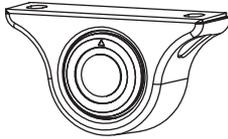
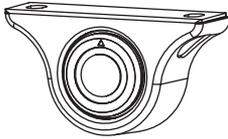
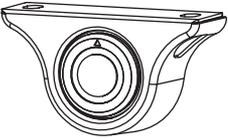
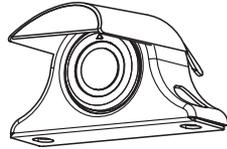
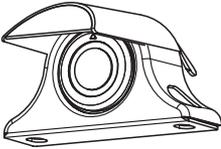




**rosco**  
VISION



**BSSK4000**  
COMMERCIAL GRADE  
BACKUP SENSOR SYSTEM  
INSTALLATION/USER MANUAL

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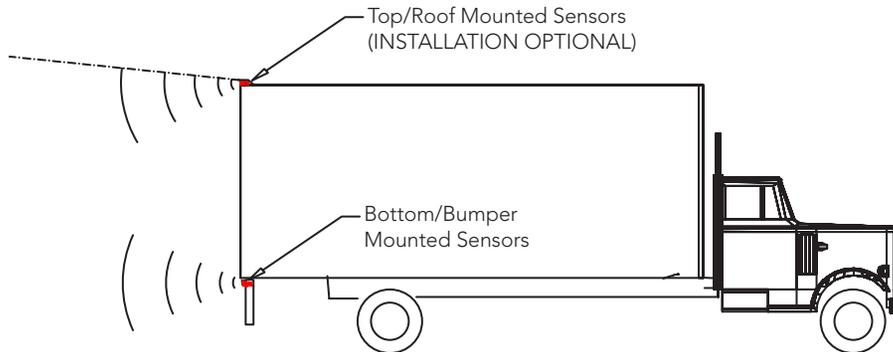
## BSSK4000 COMMERCIAL GRADE BACKUP SENSOR SYSTEM

Rosco Vision System's premium backup sensor system is specifically designed for commercial vehicles. The high-accuracy system can detect obstructions up to 13 ft away with a resolution as accurate as 1 inch. A concise and high-fidelity display shows both the location and distance of the obstruction(s) and alerts the driver with audible "beeps". The beep will vary in frequency to indicate the distance to the nearest obstruction, and the volume is fully controllable.

Installation options: The system is supplied with 4 bumper-mounted sensors. The installer has the option of using undermount brackets for the sensors, or flush-mounting the sensors into small holes drilled into the rear vehicle bumper.

BSSK4000 is unique and revolutionary in that it also features 2 roof mounted brackets to house an additional 2 sensors. The roof sensors will detect obstructions above and behind the vehicle to ensure enough roof clearance when backing up into garages, loading docks, etc.

- Please read the entirety of this manual before beginning installation. Double check all measurements before drilling any holes or making any other modifications.
- This system is intended as an aid to safe reverse operation.
- Drivers must always use extreme caution when operating a vehicle.
- Specifications subject to change without prior notice.



# COMPONENTS LIST AND DESCRIPTION

PART NO.		DESCRIPTION
BSSKT500		Weather-Proof ECU (Electronic Control Unit)
BSSKD400		Electronic Distance Display with Audible Alerts
BSSKS300		Water and Submersion-Proof Backup Sensors (Pack of 6) Top Mount Sensor Installation is Optional. All sensors interchangeable.
BSSKB301		Under-mount Sensor Brackets (Pack of 4) (Installation Optional)
BSSKB302		Top/Roof-mount Sensor Brackets (Pack of 2) (Installation Optional) (May not be included in all related kits)
BSSKH425		Harness for 4 Rear Bumper Sensors
BSSKH625		Harness for 2 Rear Roof-Mount Sensors (Installation Optional)
BSSKH210		Power and Display Data Harness (65 ft)
Hole Saw		1 inch (25mm) Hole Saw For Flush-Mounting Sensors

## SENSOR AND ECU INSTALLATION

### BUMPER SENSOR LOCATION

- See Figure 1 & 2. Mount 4 backup sensors on the vehicle rear bumper facing rearward. **All provided sensors are interchangeable.**
- The left and right most sensors should be installed first at about 6 inches from the left and right edge of the vehicle.
- The remaining 2 sensors must be mounted so that there is equal separation distance between all 4 sensors.
- The sensors can be mounted either with the provided under-mount brackets **OR** they can be flush-mounted through 1-inch (25mm) holes drilled with the provided hole saw.
- **Ensure the arrow on the sensor is pointed up.**

### ROOF SENSOR LOCATION

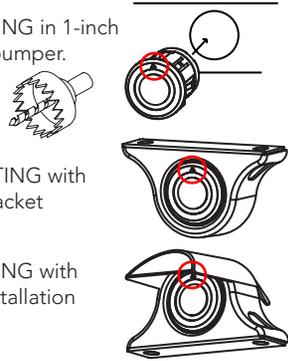
- Roof sensor installation is optional.
- The roof sensors must be installed with the custom roof-mount brackets provided. The 2 sensors should be mounted about 1-2 feet from the left and right edge of the vehicle.
- Ensure that the roof sensor cable interface into the vehicle is fully water-proofed. Use the provided cable grommets and silicone (not included) to weather-proof the cable interface.

### POWER SOURCE AND ECU INSTALLATION

- The ECU must be powered from the vehicle reverse circuit. See Figure 3 on page 5.
- The best way to find the reverse circuit is by locating the backup alarm on the vehicle, which is usually located at the rear underneath the body. If there is no backup alarm, the reverse light power source can be used instead.
- Install the ECU on the right or left side of the vehicle; preferably the side closer to the reverse power source. The ECU is weather proof and thus can be installed on the underside of the vehicle, on the inside of the rear bumper, or any other similar hidden location at the rear of the vehicle. See Figure 2.

FIGURE 1: SENSOR INSTALLATION (ENSURE ARROW ON SENSOR ALWAYS POINTS UP)

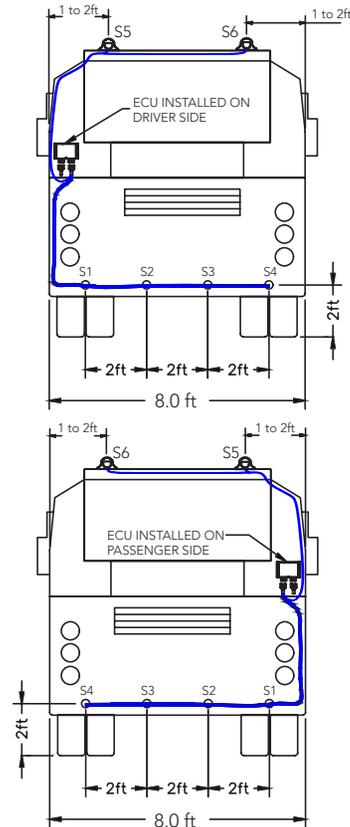
FLUSH-MOUNTING in 1-inch (25mm) hole in bumper. Use provided hole saw.



UNDER-MOUNTING with under-mount bracket

ROOF-MOUNTING with roof bracket (Installation Optional)

FIGURE 2: EXAMPLE INSTALLATIONS



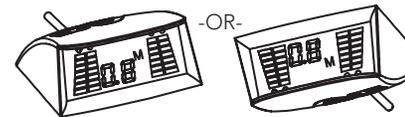
## HARNESS AND DISPLAY INSTALLATION

### SENSOR HARNESS INSTALLATION

- See the Figures 2 and 4 on pages 4, 6 & 7. Connect the BSSKH425 sensor harness to the ECU. Connect the sensors to the same sensor harness, noting that the numbers on the connectors should count sequentially 1 through 4.
- If the roof sensors were installed, connect the roof sensor harness BSSKH625 to the small white connector on the main sensor harness. Connect the 2 roof sensors to the harness. See Figure 4 on pages 6 & 7.
- Use the provided cable tie mounts and cable ties as needed to route the harnesses for a neat installation.

### DISPLAY INSTALLATION

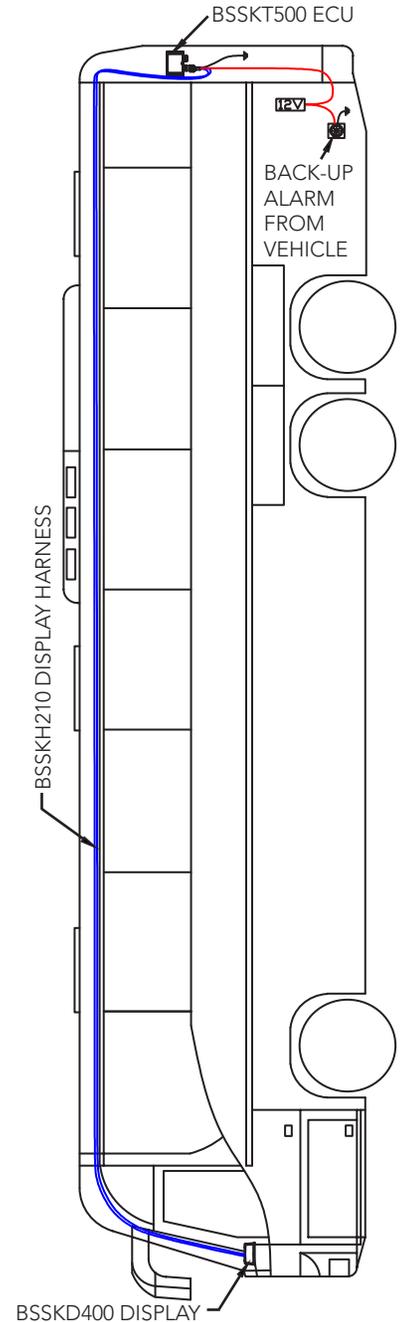
- Find a flat surface for the display at the front of the cabin, such as on top of the dash board or instrument cluster. The display can also be mounted up-side down on the headliner or ceiling. The display must be clearly seen and heard by the driver. Thoroughly clean the location, let dry, and install the display using the provided double-sided adhesive.
- Connect the display power and data harness, BSSKH210, to the ECU at the rear of the vehicle. Route the display cable into the body of the vehicle.
- Find a raceway that contains most of the wiring that runs the length of the vehicle and run the display harness along the same raceway. Connect the harness to the display. See Figure 3.



### POWER CONNECTION AND TEST

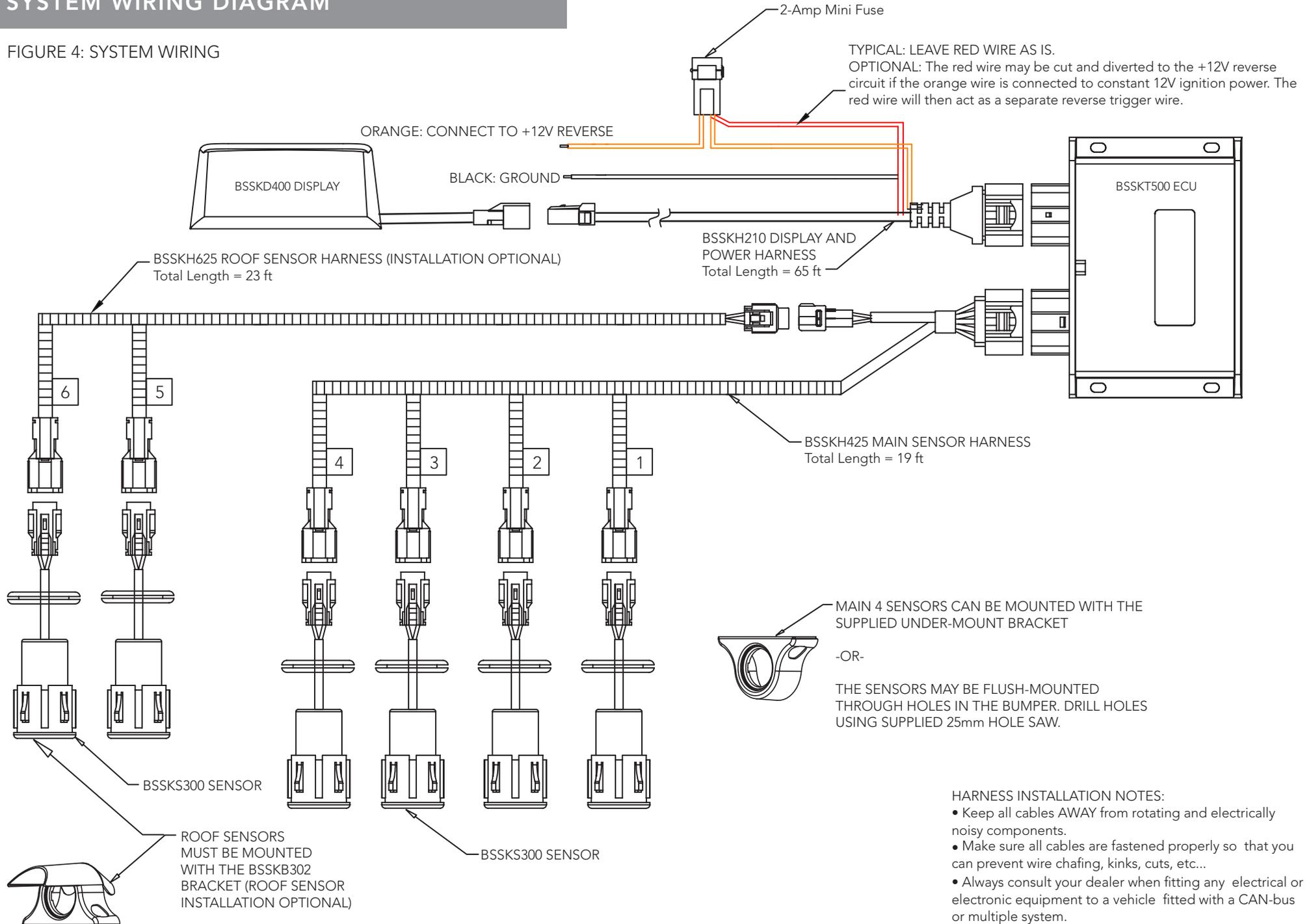
- Return to the back of the vehicle where the ECU is mounted. Connect the red wire from the display to the reverse power source (the wire powering the backup alarm or reverse light). Connect the black wire vehicle ground.
- Power on the vehicle and shift into reverse. The display should beep and show some activity. This confirms the installation has power and that all the components are communicating.

FIGURE 3: EXAMPLE HARNESS ROUTING



# SYSTEM WIRING DIAGRAM

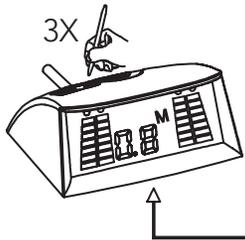
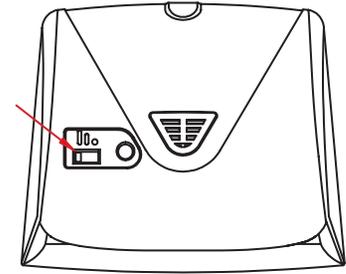
FIGURE 4: SYSTEM WIRING



## DISPLAY SETUP (VOLUME, UP/DOWN MODE, DISTANCE UNITS, DISTANCE OFFSET)

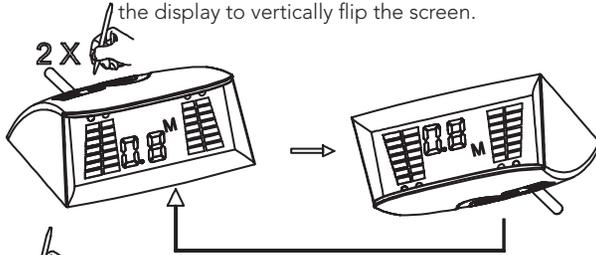
### ADJUST DISPLAY VOLUME

- The BSSKD400 display has 3 volume settings: Loud, Soft, and Off



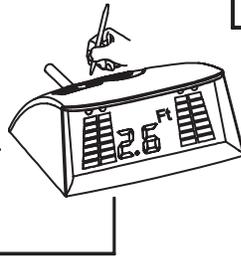
### RIGHT SIDE UP vs. UP SIDE DOWN MODE

- The BSSKD400 display can be mounted on the dash board or ceiling. The display can be vertically flipped to accommodate this.
- Shift into reverse if necessary to turn on the display. Double-press the small button on the top of the display to vertically flip the screen.



### UNITS (FEET OR METERS)

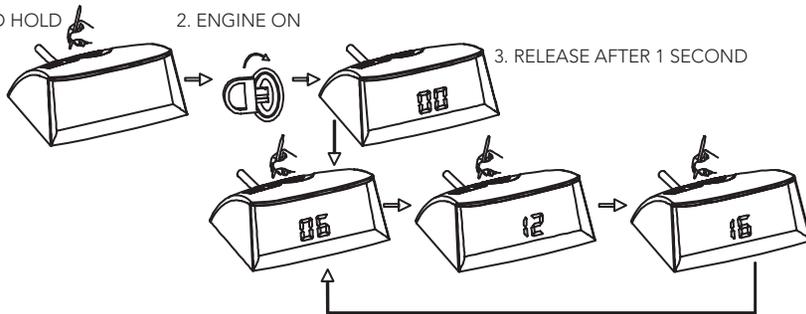
- Triple-press the button on top of the display to change the units from Feet to Meters and vice-versa.



### ADJUST DETECTION DISTANCE OFFSET (FOR PROTRUDING VEHICLE FEATURES):

- Press and hold the display button.
- Ensure the emergency brake on the vehicle is engaged. Apply the brake pedal. Power on the vehicle and shift into reverse to power on the display.
- Allow the display to power on and release the button after 1 second.
- The display button may now be used to adjust the offset distance. 0, 6, 12, or 16 inches may be selected.
- Example: If 12 is selected, then 12 inches will be subtracted off the detection distances. That is an obstacle 6 ft away from the sensor will be displayed as 5 ft away instead. This would be used if a vehicle feature, such as a lift gate, sticks out 12 inches beyond the sensors.

- PRESS AND HOLD
- ENGINE ON
- RELEASE AFTER 1 SECOND

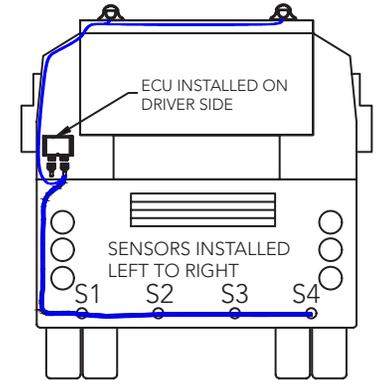
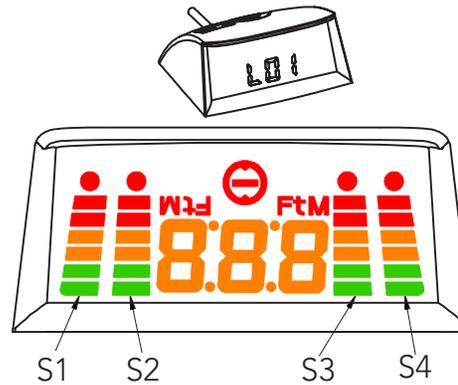
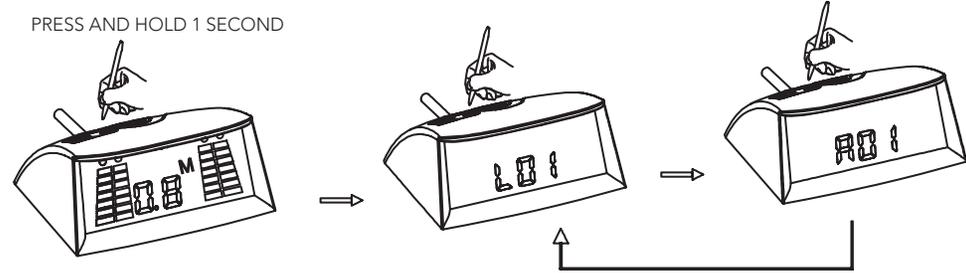


## DISPLAY SETUP (LEFT/RIGHT MODE)

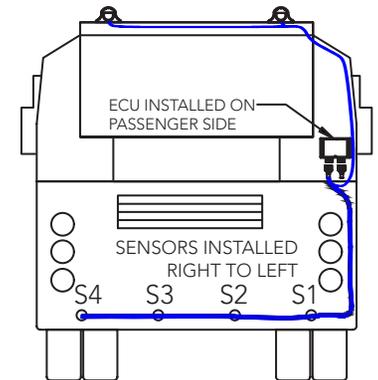
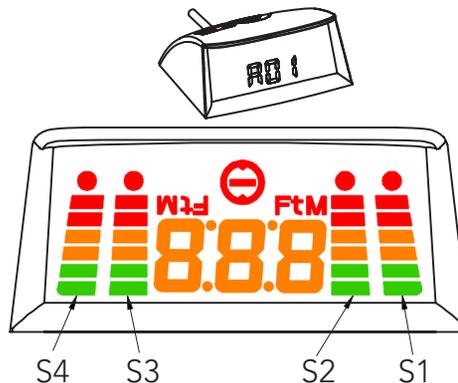
### DISPLAY "L01" vs "R01" MODE

- The ECU can be installed on either side of the bus.
- Shift into reverse if necessary to turn on the display. In order to change between L01 and R01 mode, press and hold the small button on top of the display for 1 second. Then normally press the button to change between modes.
- If the ECU is installed on the driver side (Left), the default display setting "L01" should be used to portray sensor 1 on the driver (left) side and sensor 4 on the passenger (right) side of the display.

### PRESS AND HOLD 1 SECOND



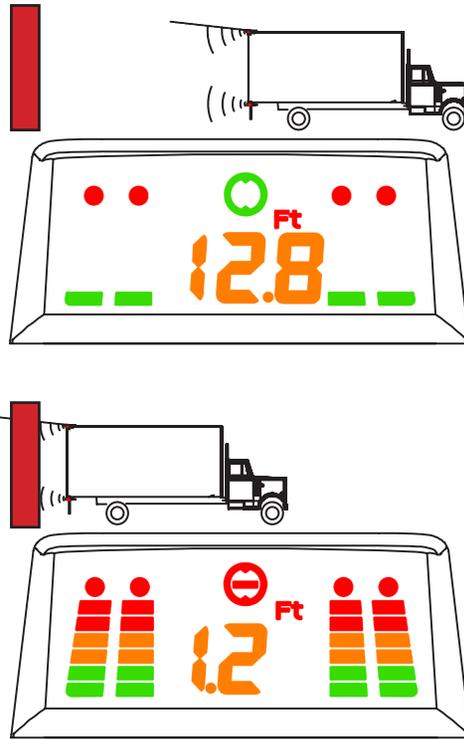
- If the ECU is installed on the right side, the display must be changed "R01" in order to portray sensor 1 on the passenger (right) side, etc.



## SYSTEM TEST

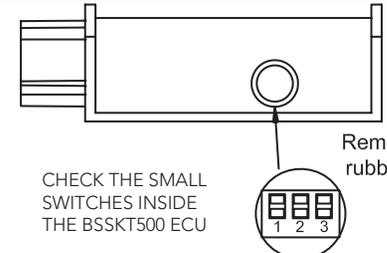
### CONDUCT A FINAL TEST OF THE BACKUP SENSOR SYSTEM

- Shift the vehicle into reverse and back-up towards a large wall or other large flat obstacle such as the side of a truck or bus.
- When the vehicle is far away from the obstacle, the display should not beep and display something similar to the top right graphic. If the roof sensors are mounted, a green circle will be present at the top of the display indicating that there are no obstacles near the roof of the vehicle (such as garage entrances, loading dock entrances, arches, signs, etc)
- When the vehicle is very close to the obstacle, the display should beep continuously and display something similar to the bottom right graphic. The circle at the top should turn red and blink to indicate the roof sensors see an obstacle.
- Ensure all 4 bumper-level sensors feature a red dot to show that they are communicating with the system. NOTE: Upon startup, the display will denote damaged or disconnected sensors by displaying E1, for sensor 1, E2 for sensor 2, etc.
- Always restart the system after a sensor has been added or reconnected to the harness. Failure to do so will result in the sensor providing inaccurate measurements or continuously displaying a proximity alert "-P-".



## ADJUST SENSOR SENSITIVITY (OPTIONAL)

- If the back-up sensor system is over-alerting or under-alerting, the sensitivity of the sensors may be adjusted to compensate for this.
- If the sensors are over-alerting, change the sensitivity to a lower value (see chart).
- If the sensors are under-alerting, change the sensitivity to a higher value.
- Note that the chart to the right recommends certain sensitivity settings according to sensor mounting height. Note that the settings are only suggestions and should not be changed unless the sensor system is under or over-alerting.

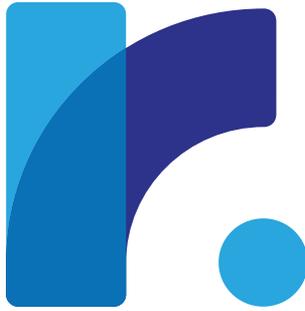


CHECK THE SMALL SWITCHES INSIDE THE BSSK500 ECU

Mounting Height	SW1	SW2	SW3	Sensitivity
2~2.3ft	ON	OFF	OFF	Normal
1.6~2ft	ON	ON	OFF	Low
1.3~1.6ft	ON	ON	ON	Lowest
2~2.3ft	OFF	OFF	OFF	High

## SYSTEM TECHNICAL SPECIFICATIONS

RATED VOLTAGE	DC 12V	
INPUT VOLTAGE RANGE	DC 10.5V ~ 32V	
CURRENT CONSUMPTION	<300mA	
BUZZER FREQUENCY	2400 ± 100 Hz	
SENSOR DETECTION RANGE	S1, S2 S3, S4	6.0 ± 0.5ft (75mm by 1m PVC pipe) 13.0 ± 0.1ft (1m by 1m flat board)
	S5, S6	4.0 ± 0.5ft (75mm by 1m PVC pipe)
ENVIRONMENTAL RATING	Submersion-Proof Sensors: IP67	
	Weather-Proof ECU: IP65	
OPERATING TEMPERATURE	-30° ~ +80°C (-22° ~ +176°F)	
STORAGE TEMPERATURE	-40° ~ +85°C (-40° ~ +185°F)	
SENSOR OPERATING FREQUENCY	58 ± 1kHz (Ultrasonic)	



# rosco VISION

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