

User's Manual

Backup Parking Sensor System

Wireless Digital Display with Built-in Audible Alert
4 Rear Heavy-Duty Under-Bumper Type Sensors
Waterproof Main Control Box

For Buses, RV's, Commercial Trucks, and Long Vehicles

MODEL C-2682-04

CE ISO9001

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Included in the Box

- **4x Black Sensors** with bracket, attached cable and BNC type connector. Cable Length: 26ft (8m)
- **1x Main Control Box** with double-sided self-adhesive and Velcro attachment. Two screw holes on each side of the box
- **1x Wireless Digital Distance Display** with adjustable and removable bracket with double-sided self-adhesive on bottom of the bracket base
- **1x Power Cable for Wireless Digital Distance Display** with 3-pin mini plug. 5ft (1.5m) long
- **1x Power Cable for Main Control Box** with BNC type connector. 5ft (1.5m) long
- **10x 1-1/4" screws with nuts** for mounting the sensors and Main Control Box
- **1x User's Manual**

Features

- Wide Working Voltage Range (DC 12-24V)
- System works when vehicle is in reverse.
- 4 Under-Bumper Heavy Duty Sensors with bracket for easy under-bumper installation
- Waterproof Main Control Box for easy under-vehicle installation
- Wireless Digital Distance Display with built-in audible alert, volume control (Off/Low/High), and adjustable/removable bracket
- All Connectors - Waterproof BNC type
- Distance Display in feet or meters
- 3 LED Lights (Green/Yellow/Red) on each side of distance display indicating orientation of obstacles and Safe/Warning/Stop zone.
- Specially designed for long vehicles such as Buses, Recreational Vehicles, and Commercial Trucks.
- 12 Month Warranty

Specifications

- CE and ISO9001 Approved
- Wireless Display RF Range: 65ft (20m)
- Operating Voltage: DC 12V ~ 24V
- Detecting Range: 1.0 ~ 8.2ft (0.3m ~ 2.5m)
Displayed as 0.0 when less than 1ft (0.3m)
- Measuring Error: ± 0.3 ft (0.1m)
- Sensor Detection Angle: 90°
- Detection Response Time: 300ms
- Audible Alert when obstacle within: 1.0~8.2ft (0.3m ~ 2.5m)
- Distance Display: in feet or meters
- Ultrasonic Frequency: 40Khz
- RF Frequency: 433KHz
- Audible Alert Volume: 60 db
- Maximum Power Consumption: 4W
- Current Consumption: 100~300mA
- Operating Temperature Range: -30 ~ +70°C
- Sensor Cable Length: 26ft (8m)
- Power Cable for Wireless Display: 5ft (1.5m)
- Power Cable for Main Control Box: 5ft (1.5m)
- Dimensions of the Wireless Display without Bracket:
Width x Depth x Height = 3" x 3.1" x 1.2" (7.6cm x 7.9cm x 3.0cm)
- Height of Display Bracket: 0.75" (1.9cm) Bracket adjustable/removable from the display
- Dimensions of the Main Control Box: Width x Depth x Height = 4.0" x 4.3" x 1.1" (10.2cm x 10.9cm x 2.7cm)

Note: The specifications are for reference only. They may be changed without prior notice.

Tools Needed

1/8" drill bit, drill, tape measure, chalk or marker, wire stripper, vinyl electrical tape, cable/wire ties, voltage meter, screw driver set, pliers

How the System Works

The Backup Parking Sensor System determines obstacle distance by measuring the time needed for the ultrasonic wave emitted by a sensor to reach an obstacle and for the sensor to receive the ultrasonic wave reflected from the obstacle. Given the speed of the ultrasonic wave, the system can then calculate and display the distance between the sensor and the obstacle.

The main control box and the wireless display get their power by tapping into the back up light wires so that the system will work only when vehicle is put in reverse. ❖ It is supplied with a wireless digital distance display which shows the exact distance from an obstacle and eliminates the wiring between the display and main control box. This is especially convenient for installation on long vehicles. ❖ Three (3) LED Lights (Green/Yellow/Red) on each side of the wireless distance display indicate both orientation of obstacles and Safe/Warning/Stop zone. ❖ The audible alert (beeper) is built in the wireless display with volume control (Off/Low/High). It beeps faster as vehicle gets closer to obstacle and sounds continuously when vehicle is within 1ft (0.3m) from the obstacle.

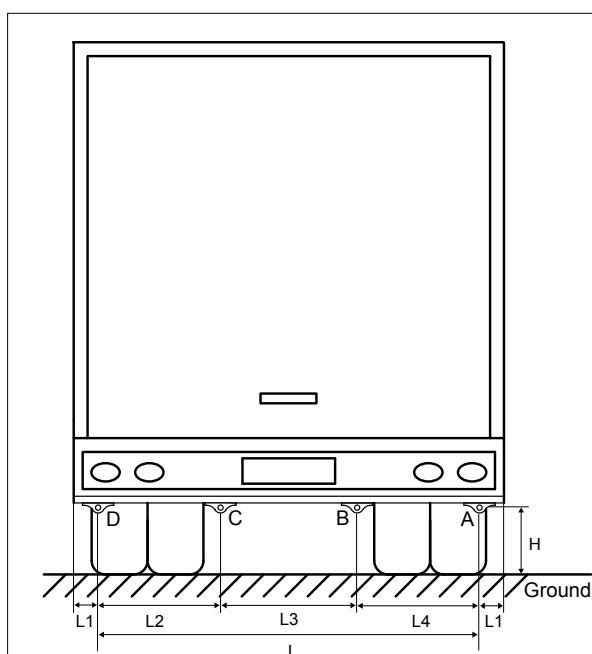


Fig.1 Mounting Height and Position of Sensors

$H = 20'' \sim 32''$ (50 ~ 80cm)

$L1 = 2'' \sim 6''$ (6 ~ 15cm)

$L2 = L3 = L4$ or $L2 = L4 = 0.3L$, $L3 = 0.4L$

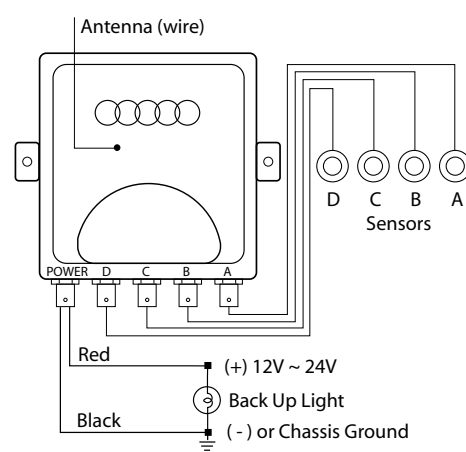


Fig.2 Main Control Box and Wiring

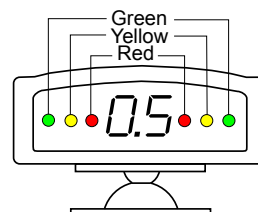


Fig.3 Wireless Display (Front View)

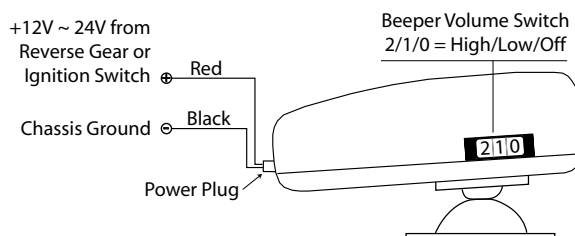


Fig.4 Wireless Display (Side View)

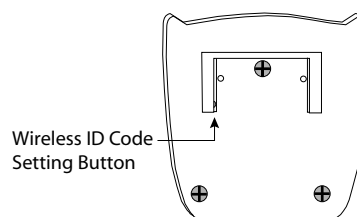


Fig.5 Wireless Display (Bottom View)

Installation and Wiring

IMPORTANT: (a) Read this manual thoroughly before proceeding to installation. You can also have the system installed by a professional installer such as your local auto mechanic/auto electrician/car stereo store. (b) Turn off the engine and ACC during installation. (c) Double check that the wiring is correct before power on the system. (d) During installation, avoid flattening, perforating, cutting, and extending the wires of sensors to reduce unnecessary signal loss.

1. Installation of the Main Control Box

- a) Find a flat and clean surface inside the vehicle or underneath the vehicle close to the driver's side taillight assembly as the waterproof main control box gets its power from the back up light and has all the rear sensors plugged into it. Keep it away from areas of high heat, high humidity, direct water contact, direct sunlight, and electromagnetic devices.
- b) Place the main control box in place temporarily without securing it to the vehicle as you may need to adjust the location of the main control box slightly while wiring.
- c) After completing all wiring, use the 2 screws included to secure the main control box to the vehicle. You will need to drill two 1/8" holes through the mounting surface corresponding to the two screw holes on each side of the main control box.

2. Installation of the Wireless Digital Distance Display

- a) Find a place for the wireless digital distance display on top of the dashboard where the driver can see it easily. Place the wireless display in place temporarily without securing it to the top of the dashboard.
- b) After completing all wiring, secure it with the included self-adhesive on bottom of the display bracket.

3. Wiring - Power Supply to the Wireless Digital Distance Display

- a) Insert the 3-pin mini plug of the power cable of the Wireless Display into its socket on back of the display.
- b) Locate the +12V (or +24V) and the (-) negative wires from the reverse gear for the back up lights under the dashboard or near the reverse gear.
- c) Strip 1/2" of the wires found.
- d) Connect the red wire of the power cable to the +12V (or +24V) wire (Fig. 4).
- e) Connect the black wire of the power cable to the (-) negative or chassis ground (Fig. 4).
- f) Wrap the connections with vinyl electrical tape.

Note: You can also connect the red wire to the ignition switch or ACC. But connecting it to the reverse gear or back up light is better as the display only needs to work when the vehicle is put in reverse.

4. Wiring - Power Supply to the Main Control Box

- a) Plug the BNC type connector of the power cable of the Main Control Box into its socket on the left side of the main control box labeled POWER.
- b) Locate the +12V (or +24V) and the (-) negative wires from the back up light near the taillight assembly. If necessary, remove the taillight assembly to locate them.
- c) Strip 1/2" of the wires found.
- d) Connect the red wire of the power cable to the +12V (or +24V) wire (Fig. 2).
- e) Connect the black wire of the power cable to the (-) negative or chassis ground (Fig. 2).
- f) Wrap the connections with vinyl electrical tape.

5. Installation of the Sensors

IMPORTANT: (a) To avoid false alert from the system detecting the ground, the sensors should be mounted between 20" to 32" (50cm to 80cm) above the ground and the face of the sensors need to be vertical or slightly upward angled. (b) Horizontally, the sensors should be equally spaced if possible or symmetric to the center of the bumper. (c) The outer two sensors should be mounted about 5.9" (15cm) from the corner of the bumper for better corner coverage.

- a) Refer to Fig. 1 for mounting height and position of the sensors.
- b) The four (4) sensors supplied with this system are under bumper type (each sensor is pre-fitted in a sensor bracket with two screw holes for easy under bumper installation). Under the bumper, with chalk or marker, mark the position of sensors, then the two screw holes corresponding to the two screw holes on each sensor

bracket. Use a 1/8" drill bit to drill the holes at the marks.

- c) Secure the sensor brackets underneath the bumper with the screws included.
- d) Run the sensor wires to the main control box. Do not cut the sensors wires. Attach sensor wires to the vehicle body with cable/wire ties so that they will not get in the way of any moving parts and there are no loose wires hanging down.
- e) Plug one sensor at a time into its corresponding socket at the main control box, start the engine and put the vehicle in reverse, put a flat board as an obstacle in front of the sensor, the display should show the correct obstacle distance, repeat the procedure for the remaining sensors. **Note:** When you shift into reverse, the system may beep once indicating it is activated.

Note: For some vehicles, you may find it is easier to install the sensors to a metal bar first, and then secure the metal bar underneath the bumper.

Testing Your New Backup Parking Sensor System

Back your vehicle slowly (about 3 mile/hour) to approximately 8.2 feet (2.5m) from a flat vertical surface such as a wall. Continue to back up slowly and check the performance against Chart 1.

Using the Wireless Digital Distance Display

A. Understanding the Display

(a) There are three (3) LED Lights (Green/Yellow/Red) on each side of the two-digit distance display (Fig. 3). The color LED lights have two functions: indicating the orientation of obstacle and showing if you are in Safe/Warning/Stop zone. See Chart. 1 below for details.

Chart 1. Orientation of Obstacle, Digital Distance Display, and Beeping (Audible Alert)

Obstacle Distance	Viewing from the Front of the Display			
	LEDs on the Left Side of the Display Responding to Sensor D or C	Beeping	Digital Distance Display	LEDs on the Right Side of the Display Responding to Sensor B or A
Safe Zone (> 8ft or 2.5m)	No LEDs on	No	-.-	No LEDs on
Safe Zone (8~3ft or 2.5~0.9m)	Green on	Starting to beep at 8ft or 2.5m	Actual distance	Green on
Warning Zone (3~2ft or 0.9~0.6m)	Yellow/Green on	Faster	Actual distance	Yellow/Green on
Warning Zone (2~1ft or 0.6~0.3m)	Yellow/Green on	Fastest	Actual distance	Yellow/Green on
Stop Zone (1~0ft or 0.3~0m)	Red/Yellow/Green on & flashing	Continuous	0.0	Red/Yellow/Green on & flashing

(b) The display has a built-in beeper (audible alert) with volume switch (High/Low/off) on the left side of the display (Fig. 4) and an ID code setting button on the bottom of the display (Fig. 5).

B. Setting the ID code of the Display

Note: The ID code of the display has already been set in the factory. You only need to reset it if you find the display can not work properly or communicate with the main control box.

Each main control box of the wireless system has its own ID code, and the display is set to only recognize the ID code from its own main control box. If the display doesn't work properly with the main control box, the ID code

needs to be reset as follow:

- ⇒ Power on the main control box. Make sure no other main control boxes are working nearby.
- ⇒ Power on the display, press the wireless ID code setting button on the bottom of the display with a small flat head screw driver until you hear one beep followed by two beeps indicating the display is set successfully.

Warning

- To avoid collision with obstacle because of the inertia of vehicle while backing up/parking, keep your vehicle speed at **about 3 miles per hour** and stop the vehicle immediately once you hear the continuous beeping. This is because even if the brake is applied, your vehicle will still go for some distance (inertia) before it comes to a complete stop.
- Because the back up parking system detects obstacle by emitting ultrasonic wave and receiving reflected ultrasonic wave from obstacle, the system may fail to give both visual and audible alert if an obstacle has smooth ball-shaped or sloped surfaces as such surfaces may not reflect ultrasonic wave back to the sensors. Obstacle surfaces absorbing ultrasonic wave such as human body and clothes will reduce the detection distance of the system. Drivers in these situations should pay more attention while parking their vehicles.
- In heavy falling rain or snow, the system may give alert as falling rain or snow may be detected as obstacles. Keep surface of sensors clean of snow, mud, dirt, and other debris.

Troubleshooting

Problem	Cause	Solution
Display doesn't light up when reversing	No power to the display. No power to the main control box. Incorrect wireless ID code of the display. Faulty display.	Check display power connection. Check main control box power connection. Reset the wireless ID code of the display. Replace the display.
Display light up but system is not detecting any obstacle	Sensors not connected. Faulty display. Faulty main control box.	Check sensor connection. Replace the display. Replace the main control box.
System showing distance but no beeping or beeping but no distance display	Beeper switched off. Faulty display. Faulty main control box.	Switch on the beeper. Replace the display. Replace the main control box.
Wrong LEDs light up	Sensors are plugged into the wrong sockets at the main control box	Install the sensors under the bumper as labeled in Fig. 1 and plug sensors as labeled on the sensor wires into their corresponding sockets at the main control box
Display constantly shows 0.0 or beeps continuously	Object within 1ft (0.30m) is detected. Faulty sensors.	Unplug all sensors, and then plug back in one sensor at a time to find out which sensor is causing the problem. Adjust position or angle of the sensor. Refer to 5. Installation of the Sensors for details.
Display shows a distance and beeps even there is no obstacle behind	Ground is detected. Sensor is angled too low. Sensors are installed too low (mounting height below 1.6ft or 0.5m)	Unplug all sensors, and then plug back in one sensor at a time to find out which sensor is causing the problem. Adjust position or angle of the sensor. Refer to 5. Installation of the Sensors for details.

For more installation related questions and Frequently Asked Questions (FAQs) with answers, and product photos, visit our Web site at <http://parkingsensors.net> or <http://parking-sensors.hyt.com>

IMPORTANT

The Parking Sensor Systems sold and distributed by HY Technologies are only a device used to assist a driver while parking. They should not be considered as a substitute for driver responsibility when operating a vehicle. No warranty as to operational efficiency is granted. We don't guarantee or assume liability for collisions or damages that take place when parking your vehicle with the use of the Parking Sensor System. We will not be liable for any claims, actions, suit proceedings, costs, expenses, damages or liabilities arising out of the use of this product. By purchasing, installing and using such a Parking Sensor System, customers agree to take full responsibility of use of such System.