



PreView[®] Side Object Detection (SOD) Manual

SOD5010R/SOD5010L

PRECO[™]
ELECTRONICS

www.PreViewRadar.com

FCC STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference.

PATENTS

Patented under one or more of the following U.S. Patents:

5345471, 5523760, 5457394, 5465094, 5512834, 5521600, 5682164, 5630216, 5510800, 5661490, 5609059, 5774091, 5757320, 5581256, 5832772, 5519400, 5767953, 5767627, 5589838, 5563605, 5661385, 5517198, 5610611, 5883591, 5805110, 5754144, 7088284, and 7215278.

Other patents have been applied for.

TRADEMARKS

The names of actual companies and products mentioned herein may be the trademarks of their respective owners. Any rights not expressly granted herein are reserved.

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Product Description

The PreView[®] SOD is a solid-state, pulsed radar object detection system designed to alert vehicle operators to the presence of obstacles. The system detects both moving and stationary objects in a pre-defined coverage area and reports the detected object via a visual indicator and an audible signal to a vehicle operator.



The sensor includes a 9 inch pigtail terminating with a Deutsch connector.

The PreView SOD Models SOD5010R and SOD5010L consist of three major components: an environmentally sealed sensor, an operator display mounted in the cab of the vehicle, and an interconnect cable.

Sensor/Antenna Description

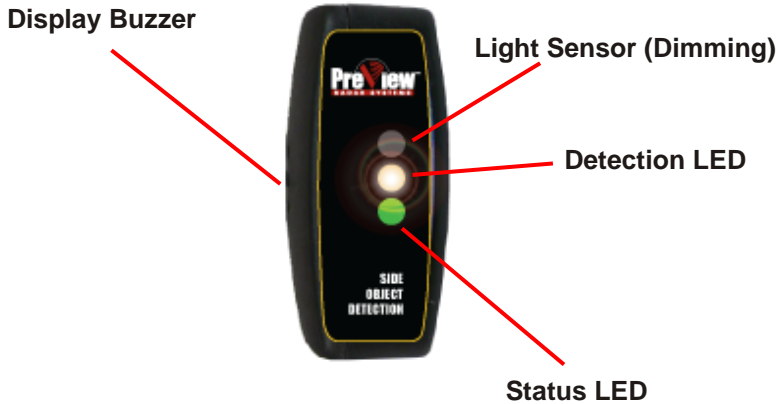
The antenna assembly transmits and receives low power 5.8GHz radar signals. It then processes the returned signals to determine if an object has reflected any energy back to the sensor and reports this to the operator display. The sensor is designed to process and report detections within ½ of a second allowing the vehicle operator to quickly respond to any object within the detection zone. System power is obtained from the vehicle's ignition, allowing the system to always be operational. The connection to the display unit is through a watertight connector eliminating any potential problems with pin corrosion.

The PreView SOD sensor has a continuous Built In Self Test which notifies the operator of sensor failure within a fraction of a second.

Operator Display Description

The operator display provides the vehicle operator with a visual indication of a detected object anytime the vehicle is operating. The display unit also contains a buzzer that provides an audible alert that only activates when the turn signal is energized providing the operator with another cue that an object is being detected. The audible alert will only announce upon **the first detection** of an object while the turn signal is energized. The audible alert will not sound again until the turn signal is cycled.

The operator display continuously monitors communication from the PreView SOD sensor and in the event of a system failure or malfunction, will notify the operator with a fault indication (reference troubleshooting section).



Item	Description
Status LED*	Illuminates green after power is applied to the system. Turns off anytime the detection LED is illuminated.
Detection LED*	Illuminates to alert operator to the presence of an object
Light Sensor*	Measures ambient light conditions allowing for Status and Detection LEDs brightness to automatically adjust
Display Buzzer*	Sounds an audible tone to alert operator of obstacles.

Table 1. Operator Display Description

*Locations of LEDs and buzzer are different for SOD5010L

Object Detection Capability

The PreView[®] SOD system is a blind spot collision warning system designed to supplement other safety practices and/or devices. The machine operator is always the first line of defense when safely operating a vehicle.

The PreView SOD system can detect most objects within the detection zone. However, there are some instances where objects can go undetected. Obstacle size, shape, relative location, and composition are all factors determining if, when and where an object is detected. The PreView system operates by transmitting a pulse of very low power electromagnetic energy. Any energy that strikes an object reflects a certain amount of this energy back to the PreView sensor. If the returned energy is of sufficient magnitude, it is used to indicate object presence and determine the object's distance. While the PreView system can resolve multiple objects, only the object closest to the vehicle is reported to the operator display since it represents the most significant collision threat.

The amount of energy returned is based on a few factors:

Size – a larger object usually reflects more energy than a smaller object.

Composition – a metal object typically reflects more energy than a non-metallic object. A metallic object at the edge of the maximum detection zone might be detected, whereas a wood object may not.

Scattering – a solid object reflects more energy than a non-solid object such as tree branches, gravel, bushes, etc.

Shape – complex shapes cause energy to be returned in a very non-uniform way. Very small variations or movement can change detection status.

Angle – an object flat side perpendicular to the sensor will reflect more energy than an object at an angle. See below for an example of how angle can affect return energy.

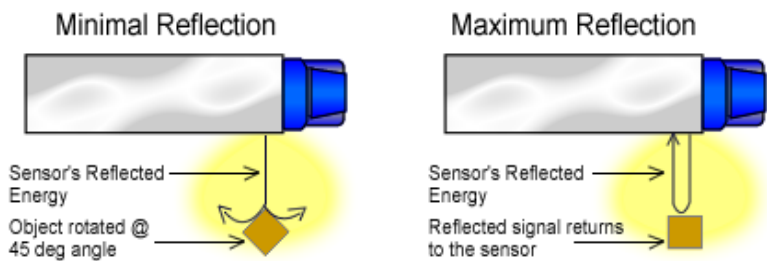


Figure 1. Object Reflection

Installation Instructions

Before You Start

Prior to installing the PreView SOD take time to familiarize yourself with the installation instructions, theory of operation, and system components. Check the contents of the shipping package and verify the following items are included:

- Antenna Sensor (1)
- Display Unit (1)
- Interconnect Cable (1)
- User Manual/Operating Instructions and drill template
- Sensor Stainless Steel Mounting Hardware
 - 1-1/4" x 10-24 Bolts, Hex Locking Nuts, and Washers (4)
- Display Hardware Kit
 - Mounting Bracket (1)
 - Mounting Hardware (1)

Sensor/Antenna Location

The PreView SOD sensor mounting location is integral to proper system operation. The sensor should be mounted in the middle of the largest blind spot area and roughly 36" (1M) +/- 12" (0.3M) above the ground. To determine the blind spot area for your particular vehicle, have somebody sit in the driver's seat in the normal driving position and have another person walk the side of the truck noting where the driver loses sight of the person walking around. The sensor face should be mounted perpendicular to the ground with the "PreView" graphic in readable position. Select a location that will provide an unobstructed view of the target hazard area.

Important!

Before the PreView SOD system is permanently installed to the vehicle, verify that the selected sensor mounting location provides a clear detection zone. Temporarily attach the sensor in the proposed mounting location, apply power to the system, and verify that nothing is being detected.

Sensor/Antenna Mounting

1. Select the appropriate sensor mounting location.
2. The correct mounting configuration is with the sensor's text in normal reading position.
3. Using the drill template, scribe position marks through the holes. Drill 1/4" (6mm) holes centered at the marks.
4. A 1 1/2" diameter clearance hole is required for the sensor connector and mating cable connector.
5. Secure the sensor to the vehicle with the four supplied 10-24 UNC button head screws, washers and nuts or equivalent. Apply a maximum torque of 22 inch pounds when securing the sensor.

Cable Installation

The interconnect cable between the sensor and display is 25 feet (7.6M) in length. If the distance between the sensor and display is greater than 25 feet, contact Preco Electronics, Inc. for additional cable extensions.

Routing of the cable should start at the sensor. Allow for a small service loop in the cable at the sensor and secure the cable every few feet (~1M) with tie wraps. When ready to enter the cab, drill a 1" (24mm) hole or locate an existing grommet and feed the display connector through. The remaining length of cable is then routed to the display unit and the connectors are latched together. Care should be taken to route the cable away from heat sources such as the engine and exhausts and areas that may see abrasion or rock damage.

System Connections

Locate the vehicle's ignition power wire and connect to the red wire on the sensor harness. If it is necessary to extend the power wire on the supplied harness, use 20AWG wire minimum. Locate the vehicle's turn signal wire associated with the turn signal on the side the sensor is being installed on, and connect the blue wire. **(Be sure that the turn signal wire selected activates ONLY when the turn signal is active. On some trucks the daytime running lights and/or air brakes will activate the certain wires connected to the turn signal lamp).** Connect the black wire of the sensor harness to vehicle ground.



Display Unit Installation

The display unit should be mounted where the vehicle operator can easily view it while driving. The ideal location for this is on the windshield pillar on the side of the truck that the sensor is installed on. This will allow the operator to view the display while looking at the side mirror.

The PreView SOD display unit comes equipped with a mounting bracket and hardware. If desired, the display unit can be mounted to the display bracket with the supplied hardware. This bracket can then be mounted in the vehicle cab as desired.

Initial System Power Up and Test

Once the sensor and display are installed, wired, and connected, power should be applied to test correct system operation. When the system is operating correctly in an open field with no obstructions, the status LED indicating green will be the only light illuminated. If the detection LED (yellow) is lit, check for any vehicle obstruction which may be detected by the sensor. If possible move the sensor so it is not detecting the object(s). If it is not possible to relocate the sensor, consult Preco.

If for some reason the system is malfunctioning, the status LED and detection LED will flash in unison and the buzzer will emit a short stutter sound. Refer to the Troubleshooting section to determine the error and potential causes.

Once the system has been installed, the detection zone should be tested. This test should be performed with two people, one who remains in the cab (the operator), and one who walks through the sensor field to the side of the vehicle (the assistant). The operator engages the parking brake, depresses the vehicle brake, and turns on the ignition. The assistant then walks through the detection zone while the operator notes where the detection LED illuminates. By moving about the side of the vehicle and noting when the detection LED illuminates, an accurate detection zone can be mapped.

Once the detection zone is determined, the display buzzer operation should be tested. With nothing in the sensor detection area (green LED on), activate the appropriate turn signal. Have the assistant walk into the detection zone and verify that the display detection LED illuminates and the display buzzer emits a short tone. With the turn signal still activated, have the assistant walk out of the detection zone. Once the detection LED turns off, have the assistant walk back into the zone again. At this point, only the detection LED will illuminate. The display buzzer should not sound.

PreView[®] Daily Maintenance

Detach this page and place with daily operator maintenance procedures.

Safety Message to Operators of Vehicles with PreView Systems

1. The PreView system is intended as an Object Detection System and should not be relied upon as your first line of defense for the safe operation of the vehicle. It should be used in conjunction with established safety programs and procedures to augment the safe operation of the vehicle, ground personnel, and adjacent property. Should the system become inoperative, it could jeopardize the safety or lives of those who depend on the system for safety.
2. Testing and inspection of the system in accordance with these instructions and record of the results should be listed on the daily maintenance report. The units on operating vehicles must be tested each day prior to the vehicle's operation. Results of this test must be recorded in the maintenance log.
3. People operating this equipment **MUST** check for proper operation at the beginning of every shift or safety inspection period.
4. People's lives depend on the proper installation of this product in conformance with these instructions. It is necessary to read, understand and follow all instructions shipped with the product.
5. Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death.
6. The PreView object detection system is intended for commercial use. Proper installation of a blind-spot aid requires a good understanding of truck electrical systems and procedures, along with proficiency in the installation.
7. Store these instructions in a safe place and refer to them when maintaining and/or reinstalling the product.

Testing and Maintenance

NOTE: A walk around test shall be performed every day to verify proper function of the system and to familiarize the operator with the zone of detection. More frequent inspections should be performed when:

The vehicle is operating in a particularly dirty or harsh environment.

The operator has reason to suspect the system has been damaged.

This test should be performed with two people, one who remains in the cab (the operator), and one who walks through the sensor field to the side of the vehicle (the assistant).

1. Clean the sensor face of any accumulation of dirt, mud, snow, ice, or debris.
2. Visually inspect the attached wiring and cable and verify that they are properly secured, not chafing or dangling free where they could become snagged and damaged. Inspect the Radar Sensor and Operator Display Module and verify that they are securely attached to the vehicle.
3. Set the park brakes, start the vehicle, depress and hold the vehicle brake.
4. Verify the green "POWER" light is illuminated on the in-cab display.
5. The area to the side of the vehicle should be clear of obstacles for a distance of 3 meters. If the display shows any indicator other than the green

light then there are objects to the side of the vehicle that will interfere with the test. Move the vehicle to a clear area and proceed.

6. The assistant should move to approx 6ft to the rear of the sensor in sight of the operator's mirrors. He should then walk toward the centerline of the sensor parallel to the vehicle, while the operator notes when the display detection LED illuminates, signifying the sensor has detected the object.
7. The assistant should continue walking through the area at the side of the vehicle while the operator notes the area that detection occurs.
8. Now face the sensor and walk from the center of the sensor straight back, away from the vehicle. When the display detection LED quits illuminating the detection limit has been reached.
9. Move halfway back towards the sensor and remain still for a few seconds, the display detection LED should stay lit, demonstrating the system's ability to detect a still object.
10. The assistant should walk the complete side of the vehicle noting the detection edges of the entire coverage area.
11. After the test the assistant needs to communicate to the operator the details on the detection zone.

**For Questions call 1-844-787-2327 between 8:00 AM and 5:00 PM
Mountain Standard Time**

Troubleshooting

Display Status LED is not illuminated:

- Verify that DC power (9-33V) is applied to the sensor.
- Verify that the cable between the sensor and display is connected.

Display Status LED and Detection LED are flashing:

- Check connection between display and sensor.

Detection LED is always illuminated when sensor is mounted:

- Verify the sensor is pointing outward from the vehicle in an open area with no obstructions. This may require removing the mounting screws and lifting the sensor out away from the side of the vehicle. If the detection LED is not active when moved away from the vehicle, but is active when mounted, then the sensors' mounting position will have to be moved.

Detection LED is on frequently when driving around and there is nothing in the detection zone:

- The sensor may be detecting a curb. Aim the sensor up about 5 degrees and check again. Do not aim the sensor up more than 10 degrees from perpendicular to ground.

Detection buzzer sounds when turn signal is not active:

- The harness turn signal wire is being set by other electronics, i.e., daytime running lights, air brakes, etc. Check turn signal wire connection.

Specifications

SENSOR SPECIFICATIONS (Typical)

Transmitter:	Pulsed RF transmitter at 5.8GHz operating under FCC Part 15.249
Electronics:	Solid state
Connector:	Deutsch DT06-08SA-E008
Sealing:	Encapsulated to protect from dust and moisture to IP67.
Housing Material:	Polycarbonate radome
Dimensions:	4.38"H x 9.24"W x 1.75"D (11.1cm x 23.5cm x 4.4cm)
Weight:	1.6 lb. (0.70 kg)
Operating Temperature:	-40°F to +185°F (-40°C to +85°C)
Vibration:	25G RMS all three axes
Shock:	25G all three axes
Mounting:	Four 0.25" (6.4mm) diameter holes on 8.54" horizontal centers and 2.00" vertical centers. Unit is supplied with #10 SS screws for mounting purposes. Recommended torque is 22 inch-lbs.

DISPLAY SPECIFICATIONS (Typical)

Housing Material:	Polycarbonate/ABS alloy
Dimensions:	1.00"H x 2.25"W x 2.00"D (2.5cm x 5.7cm x 5.1cm)
Weight:	0.25 lb. (0.11 kg)
Mounting:	User dependent

ELECTRICAL SPECIFICATIONS

Input Voltage:	9-33VDC, over voltage protected to 150V
Input current:	0.2 amp maximum, inrush current limited to 1A
Polarity:	Negative ground, Polarity protected to 150V
Power Connection:	Two 20 AWG wires, connect to ignition circuit
Turn Signal Input:	Single 20 AWG wire, +150V tolerant

OPERATING CHARACTERISTICS

Detection Range:	10 feet (3m)
Warning Range:	1 zone

COMMUNICATION

Physical Layer:	CAN 2.0B, 250 KB/s
Protocol Layer:	SAE J1939 Extended
Data Update Rate:	70 ms

MAINTENANCE

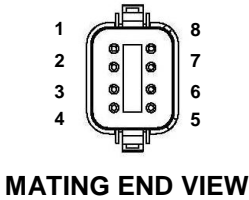
Daily: Follow test and maintenance procedure.

REGULATORY COMPLIANCE

Compliant with FCC Part 15.249 (5725-5875MHz).	
FCC ID:	OXZWZPV2009
'CE' 'E' Mark	E11 10R-045212

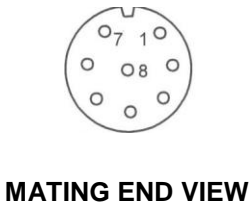
PRODUCT MANUFACTURED IN THE USA

Sensor Pin-out Information. The sensor includes a 9 inch terminating with a Deutsch connector.



CONNECTOR PIN OUT	
PIN	SIGNAL NAME
1	BATTERY PWR (+)
2	GROUND
3	CAN HIGH
4	CAN LOW
5	DISPLAY PWR (+)
6	DISPLAY GROUND
7	ALARM OUT
8	TURN SIGNAL

Display Pin-out Information



CONNECTOR PIN OUT	
PIN	SIGNAL NAME
1	CAN HIGH
2	CAN LOW
3	-
4	-
5	POWER
6	GROUND
7	-
8	-

Warranty Information

MANUFACTURER STANDARD LIMITED WARRANTY AND LIMITATION OF LIABILITY

Manufacturer warrants that on the Date of Purchase this Product will conform to Manufacturer's published specifications for the product, which are available from Manufacturer on request, and Manufacturer warrants that the product is free from defects in materials and workmanship. This Limited Warranty for sensor and in-cab display extends for sixty (60) months from the date of shipment. Manufacturer will, at its option, repair or replace any product found by Manufacturer to be defective and subject to this Limited Warranty.

This Limited Warranty does not apply to parts or products that are misused; abused; modified; damaged by accident, fire or other hazard; improperly installed or operated; or not maintained in accordance with the maintenance procedures set forth in Manufacturer's Installation and Operating Instructions.

To obtain warranty service, you must ship the product(s) to the specified Manufacturer location within thirty (30) days from expiration of the warranty period. To obtain warranty service, call Preco Customer Service at 866-977-7236 or 208-323-1000, or fax your request to 208-323-1034. Customer Service will issue warranty authorization and further instructions. You must prepay shipping charges and use the original shipping container or equivalent.

EXCLUSION OF OTHER WARRANTIES: MANUFACTURER MAKES NO OTHER WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY. THE IMPLIED WARRANTIES FOR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY EXCLUDED AND SHALL NOT APPLY TO THE PRODUCT. BUYER'S SOLE AND EXCLUSIVE REMEDY IN CONTRACT, TORT OR UNDER ANY OTHER THEORY AGAINST MANUFACTURER RESPECTING THE PRODUCT AND ITS USE SHALL BE THE REPLACEMENT OR REPAIR OF THE PRODUCT AS DESCRIBED ABOVE.

LIMITATION OF LIABILITY: IN THE EVENT OF LIABILITY FOR DAMAGES ARISING OUT OF THIS LIMITED WARRANTY OR ANY OTHER CLAIM RELATED TO MANUFACTURER'S PRODUCTS, MANUFACTURER'S LIABILITY FOR DAMAGES SHALL BE LIMITED TO THE AMOUNT PAID FOR THE PRODUCT AT THE TIME OF ORIGINAL PURCHASE. IN NO EVENT SHALL MANUFACTURER BE LIABLE FOR LOST PROFITS, THE COST OF SUBSTITUTE EQUIPMENT OR LABOR, PROPERTY DAMAGE, OR OTHER SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES BASED UPON ANY CLAIM FOR BREACH OF CONTRACT, NEGLIGENCE OR OTHER CLAIM, EVEN IF MANUFACTURER OR A MANUFACTURER'S REPRESENTATIVE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Manufacturer shall have no further obligation or liability with respect to the product or its sale, operation and use, and Manufacturer neither assumes nor authorizes the assumption of any other obligation or liability in connection with such product.

This Limited Warranty gives you specific legal rights, and you may also have other legal rights, which vary, from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you.

Any oral statements or representations about the product, which may have been made by salesmen or Manufacturer representatives, do not constitute warranties. This Limited Warranty may not be amended, modified or enlarged, except by a written agreement signed by an authorized official of Manufacturer that expressly refers to this Limited Warranty.



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