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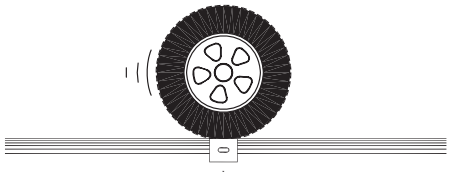
1005974-1 Rev 3

BL Roadtrax® Traffic Sensor Installation Instructions



Roadtrax® BL
Piezoelectric Axle Sensor

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These installation instructions for the Measurement Specialties Roadtrax® BL traffic sensor are intended to guide you in the correct installation procedures and should be followed closely.

Please note there may occasionally be local conditions and regulations that require modification, and that additional equipment may be needed for the installation of the inductive loops and any necessary off-road work. In these instances, please contact our technical assistance department at 757-766-4474

Prior to installation, please read the instructions completely and ensure that all required tools and equipment are available.

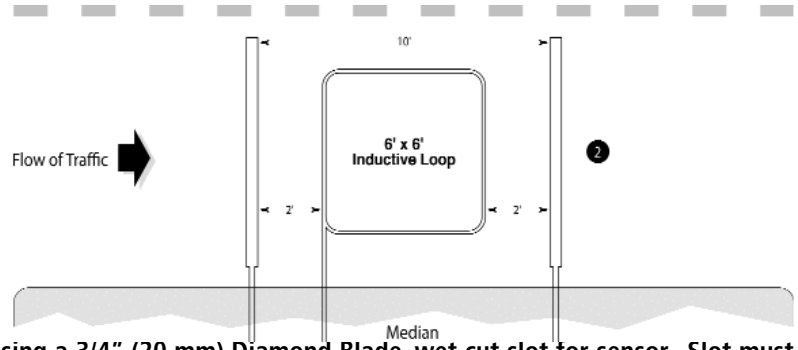
Required Tools and Equipment

- Safety Equipment (as per local regulations)
- BL Sensors with Installation Brackets (Note: Normal and wide installation brackets are included in the box)
- Encapsulation Material (IRD AS475, ECM P6G, or Global Resin PU200)
- Loop Sealant (NO hot tar)
- PVC or Polyethylene Tubing (home run cables)
- Materials for Inductive Loops (if installed)
- Straight Edge (8' [2.5 m] minimum)
- 20' (6 m) Tape Measure
- Pavement Crayons & Pavement Paint
- 1/8" (3 mm) Diameter Cord approximately 20' (6m) in length
- 35hp Wet-Cutting Pavement Saw (self-propelled)
- Diamond Blade (3/4" [20 mm] wide or equivalent)
- Diamond blade (1/4" [7 mm] minimum, for Cutting Home Run Slots.
- Hammer & Masonry Chisels
- Power Washer
- > 500 gal. Water
- Large Capacity Air Compressor (min 150 CFM)
- Street Broom
- Wire Brush
- LCR Meter (BK 875A)
- Steel Wool/Emery Pad
- Alcohol with Lint-Free Cloth
- 2" (50 mm) Duct Tape
- Foam Backer Rod
- Latex Gloves
- Electrical Power or Generator
- Low Speed Mixing Drill
- 2 each mixing paddles
- 3" (80 mm) or 4" (100 mm) wide PuttyKnife or Small Masonry Trowel
- Angle Grinder with Masonry Wheel or Belt Sander
- Wire Strippers
- Needle Nose Pliers
- Oscilloscope (recommended)

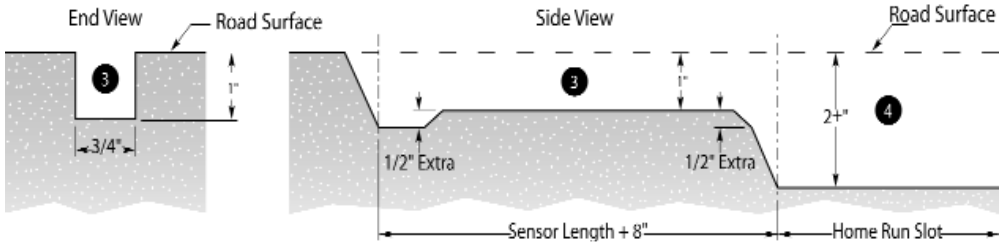
Installation Instructions

1) Ensure that the road is safely closed, as per local regulations.

2) Using pavement crayons, paint, tape measure and cord, carefully mark the layout of the sensor installation. Ensure sensors are emplaced exactly perpendicular to the flow of traffic and that all lines are straight. Verify that the passive cable length is enough to reach the cabinet. DO NOT SPLICE CABLE IF IT IS TOO SHORT. Typical WIM/Classification site layout with 11' (3.5 m) sensors is shown below.



3) Using a 3/4" (20 mm) Diamond Blade, wet cut slot for sensor. Slot must be 3/4"(20 mm) wide (±1/16" or ±2 mm) by 1" (25 mm) minimum deep. Cut slot 8" (200 mm) longer than sensor length (including lead attachment). Drop blade an extra 1/2" (12 mm) down on both ends. Repeat for all sensors.



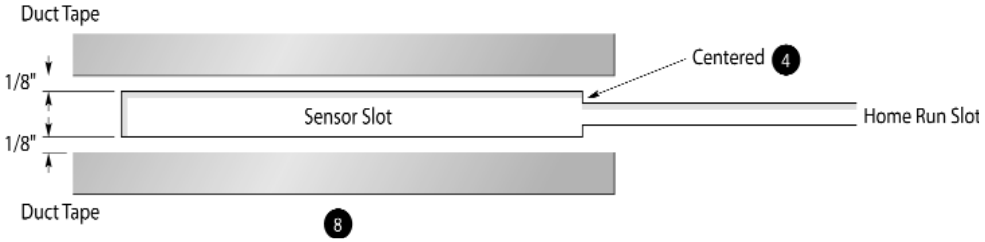
4) Cut home run slots for BL sensors. Center the home run slot on the sensor slot. Home run slots are typically cut the depth of the loop home run slots. The minimum width of the slot needs to be 1/4" (6 mm). Cut it wider if you are using conduit or tubing.

5) Cut all inductive loops sets (if applicable) Note: If inductive loops and home run slots are being dry cut, dry cut these slots and clean the area before wet cutting the BL sensor slots.

6) Power wash and sweep all slots. All slots must be very clean.

7) Dry all slots with compressed air. All slots and the pavement 1' (300 mm) on either side must be completely dry.

8) Place duct tape along length of both sides of the sensor slot. Tape must be 1/8"(3 mm) away from the slot. Repeat for all sensors.



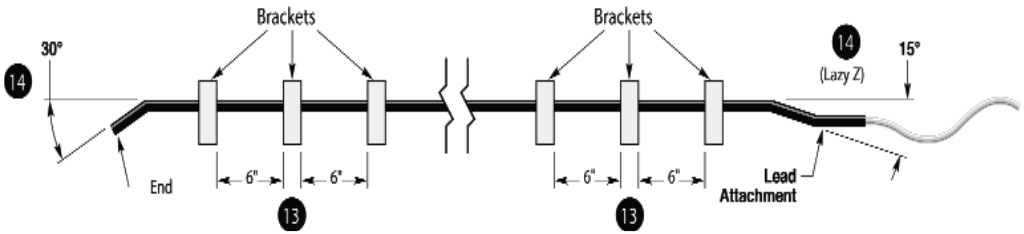
9) Remove BL sensor from box. Visually inspect sensor to ensure it is straight without any twists or curls. Check passive cable for bare wire. Check lead attachment for cracks or gaps. Look at data sheet to ensure the correct sensor is being installed, Class I versus Class II. Again, verify that there is sufficient passive cable to reach the cabinet.

10) Connect sensor up to LCR Meter. Test capacitance and dissipation factor. Test the resistance on the 20mΩ setting. Capacitance should be within ±20% of the enclosed data sheet. Resistance should be >20mΩ. Dissipation factor should be <0.04. Record all results on the data sheet.

11) Place sensor on tape next to the slot. From this point forward, handle the sensor with latex (or equivalent) gloves.

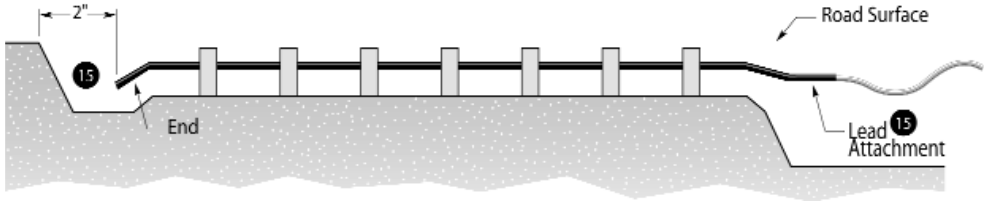
12) Clean sensor with steel wool or emery pad (Scotch Brite™). Wipe down with alcohol and clean lint-free cloth.

13) Place installation brackets on sensor every 6" (150 mm) for the length of the sensor, use the 3/4" (20 mm) (small) brackets.

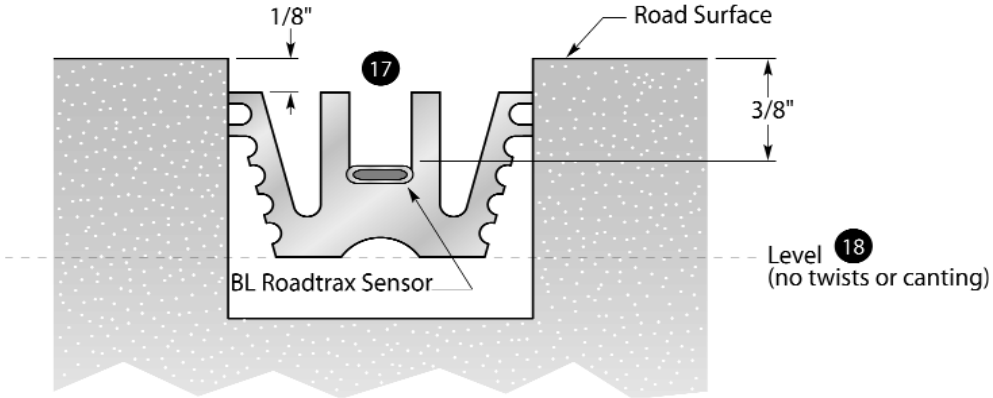


14) Bend the end of the sensor downward at a 30° angle. Bend the lead attachment end down at a 15° angle and then 15° back up until level (forming a lazy Z).

15) Emplace sensor in the slot in the road. The end of the sensor should be at least 2" (50 mm) from the end of the slot, and the tip should not touch the bottom of the slot. The lead attachment should also not touch the bottom or the sides of the slot.

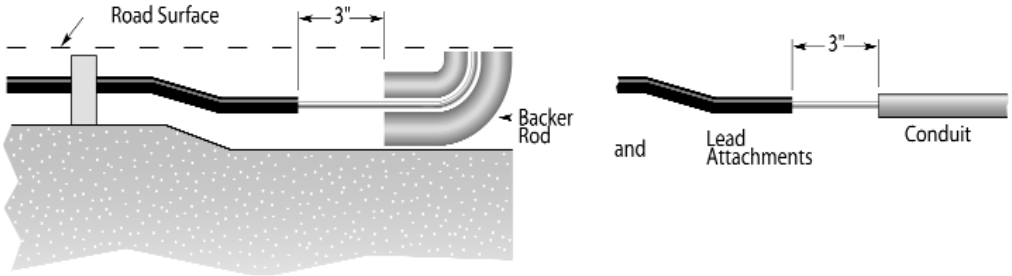


16) If any of the 3/4" (20 mm) (small) brackets do not fit snugly against the sides of the slot or are loose, replace with a 1" (25 mm) (large) bracket and repeat step 15.



17) Starting at the lead attachment end, position the sensor so that it is 3/8" (9 mm) below the surface of the road using the depth gage enclosed in the box. At this point, the installation bracket is 1/8" (3 mm) below the surface of the road.

18) Visually inspect the length of the sensor to ensure it is at uniform depth along its length and it is level (not twisted, canted or bent).



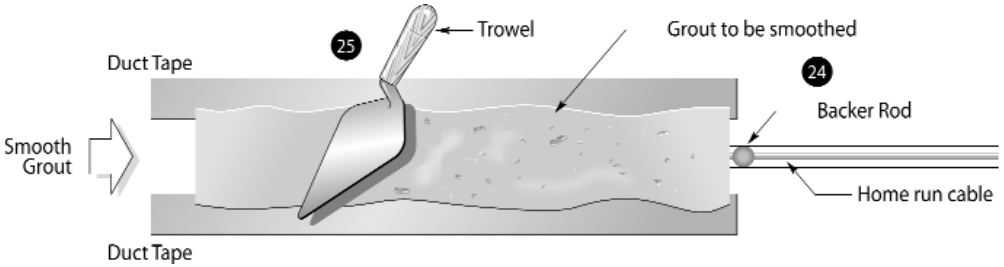
19) Run the passive wire the length of the home run slot. 3" (75 mm) from the lead attachment, place foam backer rod under and over passive cable (inside the slot). This will keep the grout from running out into the deeper home run slot. If the passive cable is put in a conduit, also allow 3" (75 mm) between the lead attachment and the beginning of the conduit.

20) Repeat steps 9-18 for all BL sensors to be installed.

21) Emplace all inductive loops to site specifications (if applicable).

22) Using low speed mixing drill (450 rpm) and a mixing paddle, premix the grout for 2 minutes or until smooth.

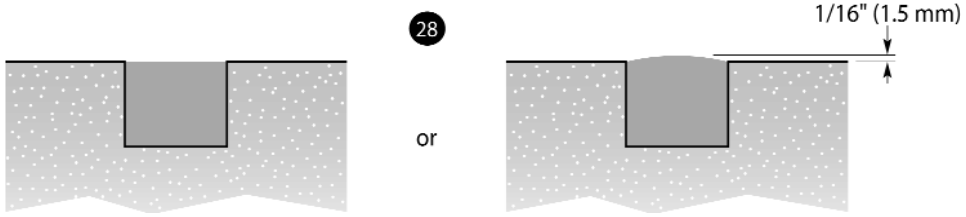
23) Add hardener to grout and mix according to manufacturer's instructions.



24) Immediately pour grout into slot using a small bead. Using a small bead allows the installer to watch the grout flow under the sensor, eliminating air pockets. Start at the end and pour towards the lead attachment. Repeat until slot is completely full of grout. DO NOT FILL SLOT IN ONE PASS.

25) Using putty knife or trowel, lightly spread (feather) the grout smooth along the length of the slot. Resin should be slightly higher than tape as it will shrink while curing.

26) Remove tape as soon as grout begins to set (2-5 minutes, depending on grout type and ambient temperature).



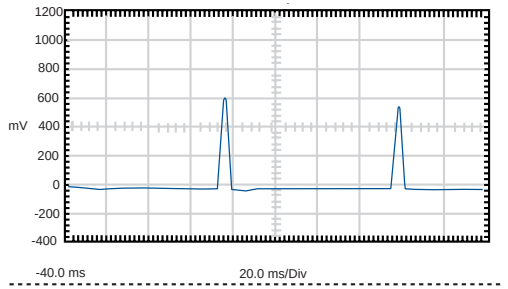
27) Remove backer rod from the slot. Fill in home run cable and inductive loops with loop sealant.

28) Once grout is cured, use an angle grinder or a belt sander to grind/sand the top of the grout flush with the surface.

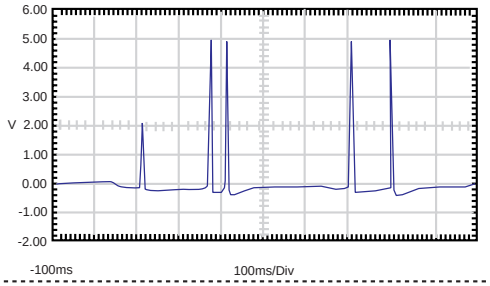
29) Wait allotted period to allow loop sealant and grout to fully cure (45 - 60 minutes) and then open the lane to traffic.

30) Hook up occilliscope to sensors and view wave forms as vehicles pass. Ensure signal is clear without noise.

Example Waveforms



Car



5 Axle Truck