MetroCount®
Traffic Data Specialists

MC5720 Cycle Site Installation

MC5700 Series RSUs

November 2008

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Introducing the MC5720

The MetroCount 5720 Roadside Unit is a vehicle classifier, optimized for use on dedicated cycle paths. The MC5720 uses two Measurement Specialties *Roadtrax BL* piezoelectric axle sensors, permanently embedded in the pavement, to provide bidirectional volume and speed of cycles.

MetroCount 5720 RSU for Cycle Sites

Advantages of the MetroCount 5720 system include:

- Excellent signal-to-noise ratio - high-sensitivity, with tuned noise-rejection.
- Broad speed response - detects the slowest of cycles.
- Low profile - sensors are mounted flush with the pavement.
- Cluster separation - optimized analysis algorithms to separate clusters of cycles.
- Ultra-low power - 290 days standalone operation, or optional external power supply, such as solar.
- Synchronous second channel - time-stamp other sensors, such as people counters.

Embedded piezo sensors for the MetroCount 5720

Site Selection and Preparation

Site selection for the MC5720 is crucial to providing quality data, like any permanent installation. The pavement at a site should be:

- Sealed - either asphalt or concrete.
- Thick enough to support a 15-20mm deep slot.
- Free of joints, cracks and other inconsistencies.
- Straight and level - avoid bends, intersections and steep inclines to ensure constant speed.

Installation of all supporting infrastructure prior to piezo installation is highly recommended. This includes any footings, cabinets, poles, cable conduits, solar panels, and so on. This ensures that cables can be routed, terminated and tested, once the piezos are installed.

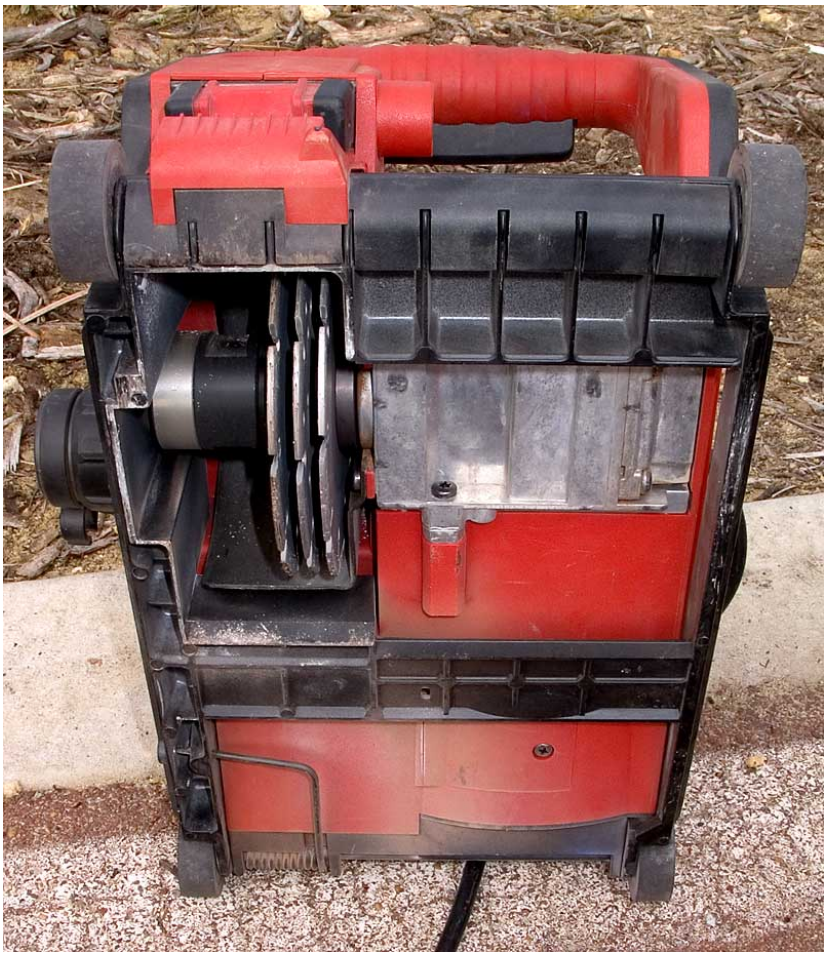
Slot Cutting

The piezo sensors should be installed at a spacing of 350 - 500mm, which is optimum for detecting cycles. Chalk snap lines provide a quick, and easy method for marking the slots.

Each slot should be cut to a depth of 15 - 20mm. The piezo sensors can be installed shallower than a normal road installation, since they are not subjected to the same forces and wear. A shallower slot is also preferable for thin pavements.

Slots should span the full width of the cycle pavement, to ensure maximum sensor coverage.

Slots should be cut 20mm wide. Given the nature of cycle sites, a heavy-duty, multi-blade wall chaser may be preferable to a wet-cutting pavement saw. A wall chaser is easier to handle, providing a more controlled finish.



Multi-blade Wall Chaser

Cutting the slots using a wall chaser

Slots cut with multiple blades will need to be chiselled out to remove remaining pavement material. A rotary hammer drill is recommended for this step.

Chiselling out the slots

Slot cleanliness is paramount, to ensure proper adhesion of the encapsulating resin. All debris and dust should be removed from in and around the slots. If the slots were wet-cut, they should be dried using compressed air. A wire brush may be required to remove any caked-on residue.

Cleaning the slots

Piezo Insertion

Piezo sensors slightly longer than the width of the cycle pavement should be used, to ensure maximum sensor coverage. Sensors should be tested and cleaned prior to insertion.

Piezos should be inserted into the slots using the normal width "W" brackets, evenly spaced along the sensor. The standard BL Installation Kit depth guide installs sensors to a depth of approximately 10mm. This guide can be shortened a few millimetres for shallow slots.

Inserting the piezo sensors

The far end of each piezo sensor should be bent down approximately 30°, and placed just short of the pavement edge. If slots were cut right to the edge, they should be blocked using debris from the slots, or a fast-curing sealant, to prevent encapsulant escaping during pouring.

End detail

The cable-end of the sensor should be routed downwards as soon as possible, to avoid future damage by mowing equipment and maintenance vehicles. The piezo sensors may be bent by up to 90°, but ensure a radius greater than 100mm to avoid damaging the sensor. If raised kerbing is present, it may be preferable to drill through at an angle, and feed the cable and sensor through.

The cable joint should be placed inside a length of flexible conduit, positioned to allow encapsulant to flow from the slot into the conduit, sealing the joint. The cable end of the conduit can be blocked with an end-cap, or simply sealed with tape.

Cable routing detail

Encapsulation and Finishing

Each slot should be lined with cloth tape, set back 3 - 5mm from the slot edge.

Slots should be filled using an approved encapsulant, such as PU200 polyurethane, manufactured by Global Resins. Some general guidelines for working with PU200:

- Do not over-mix. Aggressive mixing will heat the resin, reducing pot-life and flowability.
- Ensure slots are completely dry. Moisture will cause the polyurethane to foam.
- Work quickly, but carefully, one slot at a time. Start by half-filling a slot to ensure resin flows under the sensor, and no voids are formed, then fill the slot on a second pass.

Pouring the PU200

While the resin is still workable, level the surface using a plastic scraper, allowing for some shrinkage during curing.

Levelling the resin

Remove the tape as soon as the resin begins to set, which is usually less than five minutes, subject to temperature.

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