



Excel Technology Co Pty Ltd

Installation Guide for In-pavement PIEZOS

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Publication Date 2010:05:18/130.3 Rev A ENGNOTE_INSTALLATION_IN-PAVEMENT_PIEZOS

INTRODUCTION

This information is provided for the benefit of XL clients installing XL-1000 vehicle classification and WEIGH in Motion products.

XL manufactures products which interface to in-pavement sensors produced by third party manufacturers. The Roadtrax MSI Linqini Piezo based sensor is such a product and translates the force applied by a vehicle tyre passing over the sensor located in the road into an electrical signal which can be measured by XL detector technology. MSI RoadTrax provide comprehensive descriptive and installation material on their web site as detailed below.

For further information regarding the ROADTRAX sensor product please refer to:

Sensor Products Division
950 Forge Avenue
Norristown, Pennsylvania 19403
Tel: (610) 650-1508/1580
Fax: (610) 650-1509
e-mail: roadtrax@msiusa.com
Web Site: www.msiusa.com/sensors.htm

Piezo Installation

Piezos must be installed according to the Piezo manufacturers recommendations – please refer to the appropriate manufacturers document. If installed correctly ETG equipment is certified to record vehicle weights within an error range of 10% when temperature compensation is applied.

The critical factors in PIEZO installation for WIM purposes:

- * The PIEZO co-axial feeder cable must not be joined however it may be shortened
- * Use only the epoxy materials recommended by the PIEZO manufacturer
- * The PIEZO must be installed such that the top surface is a constant distance from the road surface height for the length of the PIEZO – this is achieved using the tool supplied by MSI.
- * It is recommended that masking tape be run up each edge of the saw cut to contain the epoxy used to secure the PIEZO into the road surface.
- * Any irregularities in the epoxy surface should be ground down to or ‘built up’ to the road surface level
- * The road surface surrounding the sensor should be level to reduce suspension oscillations which may adversely effect the measurement.
- * PIEZOs may be tested with the ETG PTM-1000 Piezo Tester suitable for monitoring MSI Roadtrax piezos. The PTM-1000 provides a graphical representation and signal measurement indication of the piezo activity when pressure is applied to the piezo by vehicles or the ‘piezo calibration impactor’.

Temperature Probe Installation (optional)

When the PIEZO is used for measuring the weight of a vehicle then a temperature probe is located in the road surface to compensate for signal variation as a consequence of changing road temperature. This is not required when providing the vehicle classification function.

It is recommended that the Temperature Probe be located in the feeder slot for Loop ONE (1) however the adjacent PIEZO slot may be used providing the probe is not located under or above the brass strip of the sensor. The probe should be located such that the loop / piezo feeder wires and the probe are completely covered by the compound used for sealing the wires into the saw cut – preferred minimum clearance 2cms.

During installation the exposed end of the feeder cable **MUST** be secured in the roadside cabinet if possible, or in a manner in a ground pit to prevent the ingress of water. The termination cable end should not be left submerged in pit water but secured in a manner to keep it clean and dry until terminated on the Field Termination Panel in the roadside cabinet.

Ground Connection

To avoid input voltage surge damage to the Primary Piezo interface circuitry (Operational Amplifiers) the Piezo common associated with Connectors CON3, CON4, CON5 and CON 6 must **not** ‘float’ relative to chassis common and must be connected to Battery Common (-VDC) and Cabinet Earth via TB19 and TB20.

ETG-TEMP-PROBE-CABLE (optional)

Installing Cable

Install the cable probe end (Photograph A) in the slot cavity in the road surface. The probe may be located in the slot for the PIEZO strip providing it has adequate depth such that its position does not cause the PIEZOs position to be altered. It is recommended to install the probe in the LOOP ONE Slot.



Photograph A

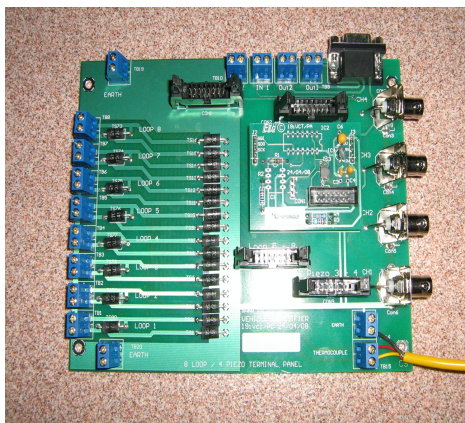
The cable must be installed by pulling the open end through ducts and conduits into the cabinet to avoid damage to the temperature sensor located within the black end socket.

The 'open' cable end which has been drawn into the cabinet should have at least 12 inches (30 cms) of cable cut off to remove any cable which may have water ingress as a result of drawing through ducts/conduits. Excess cable may be bundled in the pit adjacent to the cabinet.

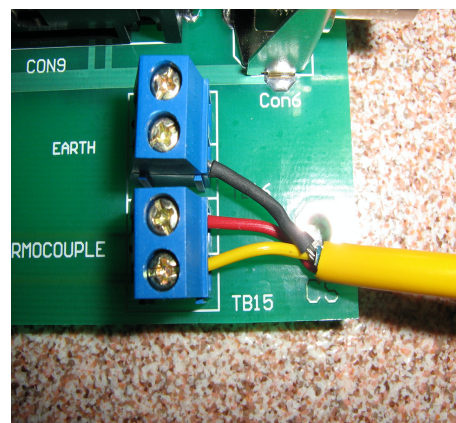
Connecting the Cable

The Field Termination Panel facilitates connection of the temperature probe cable – see Photograph B. The cable outer sheath is a tough robust material. The cable should be stripped without damaging the inner cables – a co-axial cable stripper is recommended. Approximately 3 cms of outer sheath should be removed.

Approximately 1 cm of cable insulation should be removed. The wire should be twisted firmly, soldered and inserted into TB15. The 'earth drain wire' should be twisted, soldered and sheathed with the heatshrink provided in the kit.



Photograph B



Photograph C

The Termination Panel has the colour code recorded adjacent to TB15. An additional piece of heatshrink for sheathing the earth drain has been adhered to the Termination Panel.