



# Ultra II DTEK™

INCLUDES ULTRA II D-TEK-E with PULSE ON EXIT

## Vehicle Loop Detector



## Operating Instructions

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## CAUTIONS AND WARNINGS

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**CE REQUIREMENT:** Use EMX Pre-formed loops with built-in surge suppression for CE compliance. Connect shield on lead in wire to earth ground.

**CE REQUIREMENT:** Use CE rated power supply for CE compliance providing suppression as specified by EN61000-4-5.

*Not to be used in safety applications.*

*When more than one loop detector is used, set each one to a different frequency.*

*Refer to DIP switch diagram for frequency settings.*

### IMPORTANT:

This product is an accessory or part of a system. Always read and follow the manufacturer's instructions for the equipment before connecting this product. Comply with all applicable codes and safety regulations. Failure to do so may result in damage, injury or death.

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## PRODUCT OVERVIEW

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The UltraIIDTEK™ vehicle loop detector is compatible with most gate operators. The UltraIIDTEK™ may be used in Center, Safety and Exit loop positions. The UltraMETER™ display feature makes set-up easy by displaying the optimum sensitivity setting required to detect a vehicle positioned on the loop. Ten sensitivity settings allow for fine adjustment of detection level. A PULSE/PRESENSE switch allows configuration of output relay for presence or one second pulse on entry operation (ULTRA II D-TEK-E pulse on exit). Four frequency settings provide flexibility in preventing crosstalk in multi-loop applications.

### Specifications

|                                    |  |
|------------------------------------|--|
| Sensitivity                        | 10 levels, 0-9   |
| UltraMETER™ Display                | Indicates optimum sensitivity level, 0-9<br>Diagnostic aid                                     |
| Loop frequency                     | 4 settings (low, med-low, med-hi, high)  |
| Loop inductance                    | 20...2000µH (Q factor $\geq$ 5)  |
| Grounded loop                      | Isolation transformer allows operation with poor quality loops                                 |
| Automatic tuning                   | Detector tunes to loop on power-up and following frequency count function                      |
| Environmental tracking             | Automatic compensation   |
| Surge protection                   | Loop circuitry protected by surge suppressors  |
| Detect output                      | COM, NO and NC contacts  |
| Power / loop fault indicator       | Green LED  |
| Detect / frequency count indicator | Red LED  |
| ASB (Automatic Sensitivity Boost)  | Increases sensitivity after initial detection to prevent dropout due to high-bed vehicles      |
| Relay operation                    | Presence or one-second pulse on entry (ULTRA II D-TEK-E, Presence or one-second pulse on exit) |
| Power                              | 12VDC...24VDC, 24VAC (see Cautions and Warnings)   |
| Operating Current                  | 18 mA  |
| Operating temperature              | -40° C...82° C (-40° F...180° F)<br>0...95% relative humidity                                  |
| Dimensions (L x W x H)             | 3.0”(76mm) x 0.9”(22mm) x 2.75”(70mm)  |
| Weight                             | 0.15 lbs. (68 g)   |
| Connector                          | 7 position male, 5mm ctrs.   |

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## OPERATION

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### Power up

Upon power up the detector initializes by automatically tuning to the loop. The green LED indicates that the detector is powered and operational.

### Frequency setting

The operating frequency of the loop is a function of the specific loop inductance and DIP switch settings 3-4. The primary purpose of the frequency setting is to allow the installer the ability to set different operating frequencies for multi-loop installations, recommended to prevent crosstalk/interference from adjacent loops. After changing the frequency setting, press the Frequency Count switch to re-initialize the detector. To check the operating frequency of a loop refer to the Frequency Count section. To determine whether crosstalk between adjacent loops is occurring, refer to the UltraMETER Sensitivity Display section.

### UltraMETER™ Sensitivity Display

The UltraMETER™ sensitivity display simplifies the installation process by displaying the sensitivity setting required to detect a vehicle on the loop. To use this feature, observe the display while a vehicle is moving into position on the loop, note the number displayed, then adjust the sensitivity setting (rotary switch) to the displayed position.

During normal operation, when a vehicle is not on the loop, the display is blank. The effects of crosstalk or other interference can be observed on the display when the loop is vacant. Interference or crosstalk will cause the display to indicate a level, typically 8 or 9. It may be necessary to observe the display for a minute or so to see this effect. Change the frequency setting to prevent crosstalk.

### Sensitivity setting

The 10-position rotary switch allows for precise adjustment of detection level. The sensitivity level increases from position 0 thru 9 with position 0 being the lowest sensitivity. Typical applications require a setting of 3 or 4. The UltraMETER™ sensitivity display simplifies the installation process by displaying the sensitivity setting required to detect a vehicle on the loop. To use this feature, observe the display while a vehicle is moving into position on the loop, note the number displayed, then adjust the sensitivity setting (rotary switch) to the displayed position.

### Frequency Count / Reset

Press the Frequency Count switch and count the number of flashes on the red LED. Each flash represents 10kHz. To help to prevent crosstalk when multiple detectors are used for adjacent loops, perform a frequency count on each detector to confirm the operation frequencies are different. Following a frequency count cycle, the detector re-initializes

### Automatic Sensitivity Boost

The Automatic Sensitivity boost causes the sensitivity to increase following initial detection. This feature is useful to prevent dropout when detecting high-bed vehicles. The sensitivity returns to its normal setting after the vehicle exits the loop. Decimal point on the display indicates ASB on.

### Output Relay

The pulse/presence switch allows the output relay to be configured for presence or one-second pulse on entry operation (model ULTRA II D-TEK-E one-second pulse on exit). When set to pulse operation, the display cycles through “P...U...L...S...E” repeatedly to indicate that the detector is set for pulse operation. When set to presence, the output relay remains activated while the vehicle is present on the loop.

# Controls and Indicators

## FREQUENCY SETTINGS

| FREQUENCY   | DIP switch position |     |
|-------------|---------------------|-----|
|             | 4                   | 3   |
| Low         | on                  | on  |
| Medium low  | off                 | on  |
| Medium high | on                  | off |
| High        | off                 | off |

## AUTOMATIC SENSITIVITY BOOST

|             | DIP switch position 2 |
|-------------|-----------------------|
| ASB enabled | on                    |
| ASB off     | off                   |

## OUTPUT RELAY

|   | DIP switch position 1 |
|---|-----------------------|
| Pulse one entry<br>(ULTRA II D-TEK-E,<br>pulse on exit) | on                    |
| Presence  | off                   |

## SENSITIVITY SETTING

|             | Position 0.....9 |
|-------------|------------------|
| Sensitivity | Low.....high     |

## DETECT / FREQUENCY COUNT

|                   | Red LED  |
|-------------------|----------|
| Presence detected | on       |
| No presence       | off      |
| Frequency count   | flashing |

## ULTRAMETER™ DISPLAY

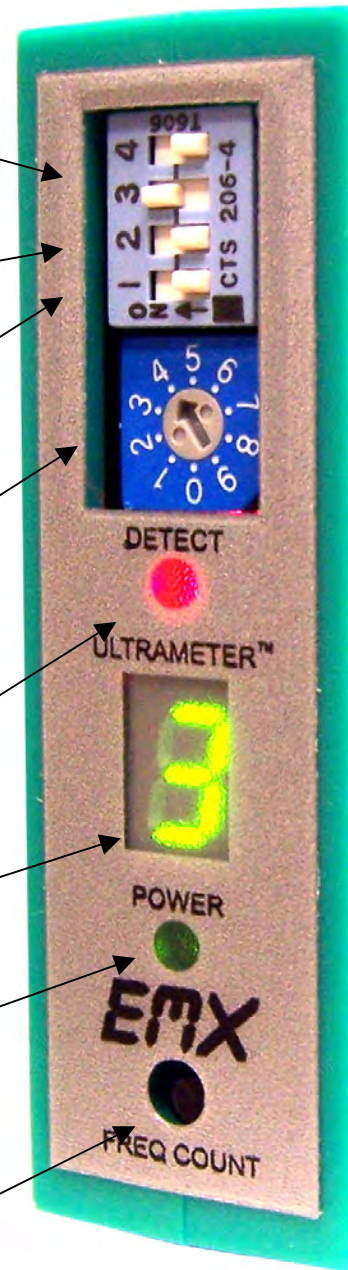
Indicates sensitivity setting required to detect vehicle

## POWER / LOOP FAULT INDICATOR

|                      | Green LED      |
|----------------------|----------------|
| Normal operation     | on             |
| Shorted loop         | 1 fast flash   |
| Open loop            | 2 fast flashes |
| Abrupt change (>20%) | 3 fast flashes |
| Previous loop fault  | 2 slow flashes |

## FREQUENCY COUNT / RESET

Press to start frequency count, re-initializes after count



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## Connections

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| Connector pin | Description                               |
|---------------|---|
| 1             | Loop                                      |
| 2             | Loop                                      |
| 3             | Power + (12VDC...24VDC, 24VAC)            |
| 4             | Power - (12VDC...24VDC, 24VAC)            |
| 5             | Pulse/Presence relay Normally Open (NO)   |
| 6             | Pulse/Presence relay Common (COM)         |
| 7             | Pulse/Presence relay Normally Closed (NC) |

Note: Relay states (NO, NC) are shown in standby (i.e. not in detect)

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## Troubleshooting

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| Symptom  | Possible cause   | Solution   |
|--|--|--|
| Green LED flashes                                      | Loop wire shorted or open  | Check loop resistance on the appropriate loop pins on the control board connector, between .5 ohms and 5 ohms.   |
| Green LED flashes, 2 fast                              | Loop was previously shorted or open  | Check loop resistance on the appropriate loop pins on the control board connector.   |
| Detector remains in detect after vehicle has left loop | <ol style="list-style-type: none"><li>1. Faulty loop</li><li>2. Poorly crimped terminals</li><li>3. Loose connections</li></ol>  | <ol style="list-style-type: none"><li>1. Perform megger test from loop lead to ground, should be &gt;100 megohms</li><li>2. Check loop connections to terminals</li><li>3. Check splices are properly soldered and sealed against moisture</li><li>4. Observe ULTRAMETER display, level indicated on display indicates residual frequency shift from vacant loop to vehicle presence, press Frequency Count switch to re-initialize the detector</li></ol> |
| Intermittent detection                                 | <ol style="list-style-type: none"><li>1. Faulty loop</li><li>2. Poorly crimped terminals</li><li>3. Loose connections</li><li>4. Cross-talk between adjacent loops</li></ol> | <ol style="list-style-type: none"><li>1. Perform megger test from loop lead to ground, should be &gt;100 megohms</li><li>2. Check loop connections to terminals</li><li>3. Check splices are properly soldered and sealed against moisture</li><li>4. Set adjacent loops to different frequencies (see Frequency Setting)</li></ol>  |
| No detection   | <ol style="list-style-type: none"><li>1. Loop wire shorted or open</li><li>2. Loop sensitivity set too low</li></ol>   | <ol style="list-style-type: none"><li>1. Check loop resistance on the appropriate loop pins on the control board connector, between .5 ohms and 5 ohms.</li><li>2. With vehicle on loop, observe ULTRAMETER display, set sensitivity to the level indicated on the display</li></ol>   |

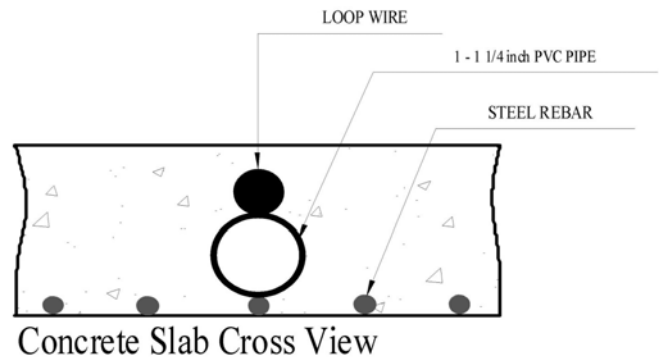
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## Loop Installation

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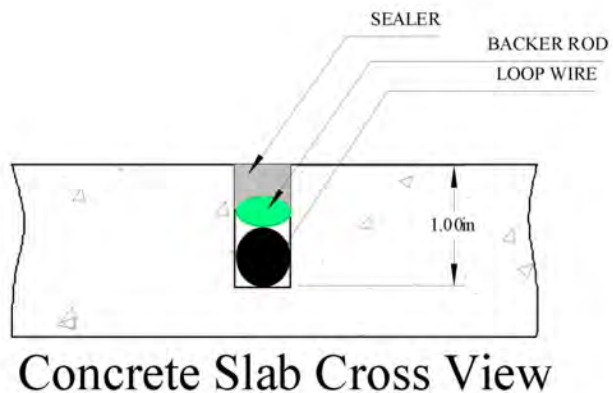
### NEW SLAB POUR

Ty-wrap 1-1/4" PVC pipe to the top of the rebar in the size and configuration of the loop (ex. 4' x 8'). Then ty-wrap the loop to the top of the PVC frame. This stabilizes the loop during the pour and separates it from the rebar.



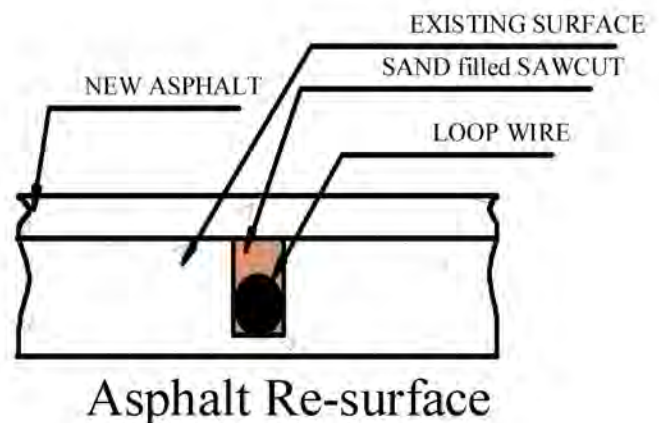
### SAW CUT EXISTING SURFACE

Cut 1" deep into the existing surface, place a 45° cut at the corners to prevent sharp edges from damaging the loop wire. Notch out for the "T" connection where the lead wire connects to the loop. Remove all debris from the finished cut with compressed air. Place the loop into the saw cut. Place backer material into the saw cut over the loop wire and pack tightly. Place a high-quality sealer over the saw cut to seal the surface.



### RESURFACE ASPHALT

Saw cut the existing surface 3/4" deep and place a 45° cut at the corners to prevent sharp edges from damaging the loop wire. Remove all debris from the finished cut with compressed air. Place sand over the loop wire to the surface and pack tightly. Lay new asphalt.



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## General Installation Guidelines

- Use EMX Lite Preformed loops for quick, reliable installations and for CE compliance.
- Lead-in wire (wire from loop to detector) must be twisted a minimum of 6 turns/ foot to avoid the effects of noise or other interference.
- Detection height is approximately 70% of the shortest side of the loop. Example: detection height for an 4' x 8' loop = 48" x .7 = 33.6"

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## Ordering information

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Ultrall DTEK Vehicle Loop Detector (Presence or Pulse on entry)  
Ultrall DTEK-E Vehicle Loop Detector (Presence or Pulse on exit)

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## Accessories

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PR-XX EMX Lite Preformed Loops™  
LD-7P 7 pin terminal connector

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## Warranty

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### **WARRANTY**

EMX Industries Incorporated warrants all products to be free of defects in materials and workmanship for a period of two years under normal use and service from the date of sale to our customer. This warranty does not cover normal wear and tear, abuse, misuse, overloading, altered products, damage caused by incorrect connections, lightning damage, or use other than intended design.

There is no warranty of merchantability. There are no warranties expressed or implied or any affirmation of fact or representation except as set forth herein.

EMX Industries Inc. sole responsibility and liability, and the purchaser's exclusive remedy shall be limited to the repair or replacement at EMX Industries option of a part or parts found not conforming to the warranty. In no event shall EMX Industries Inc. be liable for damages of any nature, including incidental or consequential damages, including but not limited to damages resulting from non-conformity, defect in material or workmanship.

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