



ADVANCED TRAFFIC TECHNOLOGY
COUNTS, SEPARATES & CLASSIFIES IN **ALL** CONDITIONS

Technical Sheet No. 10

Idris®

LOOP INSTALLATION

LOOP INSTALLATION

Several factors will influence the accuracy of loop data. First, the loop site needs to be chosen with care to avoid interference from external objects or signals. Then the loops themselves need to be correctly installed and properly positioned. Most detector problems are caused by improper loop installations. Care and high professional standards at the loop installation stage are paramount and will pay enormous dividends when the technology is set to work.

LOOP GEOMETRY

Loops should be installed according to the following guidelines:

- One pair of matching main loops per lane.
- For 3 and 4 loop systems in a tolling environment then the appropriate extra loops should be added. All main loop dimensions in a lane must match.
- Main loops should have 4 turns of loop wire per loop.
- Nominal main loop length (in direction of travel is 2 metres). The nominal gap between loops should be 2 metres (i.e. 4 metres leading edge to leading edge). Loop length can be modified from these dimensions to suit site and system design needs according to the limits indicated below. Any sizes outside the given limits should be discussed with DCS prior to installation.
- Loop width is variable, depending on the lane width, with 0.8 - 0.9 metre gap between each edge of the loop and the edges of the lane. It is important that the loops are positioned to cover the vehicle path.

On some roads the edges of the carriageway are marked with a solid white line which may be some distance in from the physical edge of the road surface. Providing that the traffic in that lane is seen to drive between this solid white line and the lane dividing markings, then the loop position should be measured from the solid white line. In single lanes however the road width should be taken from kerb to kerb, taking into consideration any gutters or change in surface layout.

- All loop pairs must be positioned adjacent to each other right across the site. (See diagram overleaf).

If there is any doubt regarding the loop geometry, consult DCS for clarification before commencing any installation.

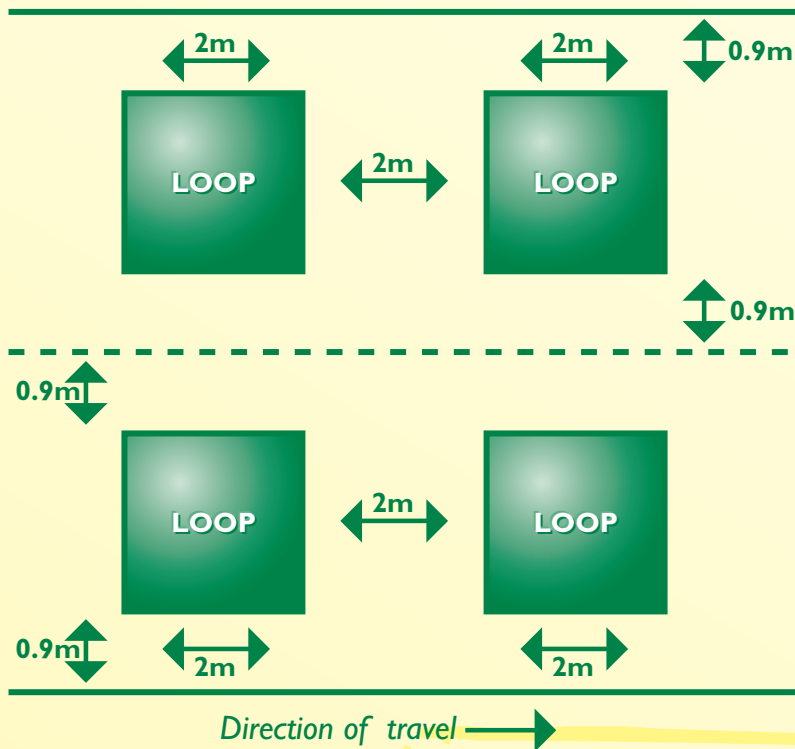
Diamond Consulting Services Ltd

Chestnut Farm, Dinton, Aylesbury, Bucks. HP17 8UG Tel: +44 (0)1296 747667 Fax: +44 (0)1296 747557

Email: idris@diamond.demon.co.uk www.idris-technology.com



MAIN LOOP ARRAY LAYOUT AND DIMENSIONS



LOOP INSTALLATION

- Loop dimensions in the direction of travel can vary from 1.5m to 2.3m.
- Loop gaps in the direction of travel can vary from 1.5m to 2.4m.
- In a 4 loop system the gap between loops 2 and 3 can be up to 3m.
- Loop dimensions/gaps outside these guidelines should be discussed with DCS before any commitment is made.
- All main loops in a lane MUST be the same dimensions and number of turns.
- Loops are normally installed in slots cut 0.5cm wide and 3.3cm deep.
- On the smaller axle loops the corners should be drilled.
- Lead-in wires must be twisted at least 18 twists per metre (five twists per foot) to prevent unwanted interference between detectors. It is essential the twists be tight and even. The quality of the twist can be improved by applying electrical tape every 2-3 metres after twisting before releasing tension.

Cutting depth of the loops is very important. If the axle loops are cut too deep they will not work correctly.

INSTALLATION QUALITY

Correct loop installation practices should be followed. The following notes are to emphasise the issues which may adversely affect the quality of an Idris System.

Due to the nature of the high accuracy detection algorithms in an Idris System, it is imperative that the loop installation is of the highest possible quality.

An Idris System is a precision recording instrument, and the quality of the data it produces is wholly dependent of the quality of the loops connected to it.

SPECIAL ATTENTION SHOULD BE GIVEN TO THE FOLLOWING:

ACCURATE MARKING AND CUTTING OF LOOPS:

The loop slots must be cut to match the dimensions on the installation drawing as closely as possible.

RECORDING OF THE 'AS CUT' SLOT DIMENSIONS:

Due to the practicalities of the loop installation process, it is inevitable that the loop slots which are cut will not match the site drawings exactly. To allow for this difference in dimensions, the Idris System can be configured at a later date with the actual loop/slot dimensions measured from the road. This will allow the Idris System to produce accurate data by matching its configuration as closely as possible to the actual loop dimensions. Once the loop slots have been cut, carefully measure and record the 'as-cut' loop dimensions from the road surface (to the nearest centimetre). The most important measurements to take are the dimensions of each loop in the direction of travel and the spacing between them. These measurements must be kept safe, as they will need to be entered into the Idris System when it is configured. It is important to make these measurements before the slots are filled. The filling compound may run and spread across the road surface making it virtually impossible to accurately determine the dimensions of the slot.

LOOP WIRE:

Inductive loops typically use # 14 wire with low AC and DC resistance. Most critical is the quality, thickness and type of wire insulation. Cross-link polyethylene insulation is strongly recommended. The insulation must withstand wear and abrasion from shifting roads, moisture and attack by solvents and oils, as well as withstand heat and high temperature sealant. Stranded loop wire should be used.

LOOP LEAD-INS AND FEEDERS:

Ensure that ALL loop tails and feeder cables are twisted. Loop tails should be jointed to shielded loop feeder cable at the closest convenient roadside location to the loop site. While unshielded loop tails from two or more loops connected to a single detector can share lead-in slots, loops connected to different detectors must never share a run without being individually shielded. The total length of loop feeder and loop tail runs should not exceed 150 metres without consultation with DCS. Longer loop feeders are possible, but this may entail additional loop turns being installed. Joints between unshielded loop tails and shielded feeder cable must be made using sealed jointing kits approved for the purpose.

LOOP SEALANT:

Most loop sealants require dry and dust free conditions for best adhesion and consequently care should be taken to thoroughly dry slots before applying sealant. Ensure that the loop sealant completely covers the loop and feeder cables. When pouring the sealant, make sure that there are no trapped air pockets or unfilled gaps in the slot, as these may allow loop movement or water ingress. Loops which are not properly anchored by the loop sealant may vibrate when vehicles pass overhead, causing excessive noise.

Recommended sealants are:

Bondo P606 polyurethane loop sealant,

VersaFLEX SL / 75 polyurethane loop sealant or locally approved equivalent.

Others as found appropriate to local temperature and road surface conditions.

In all cases a free flowing two part curing sealant should be used.

LOOP TESTING:

Each loop should be tested after installation and prior to the sealant being applied so that any problems may be rectified straightaway.

Standard loop testing should be carried out including:

1. Impedance to ground
2. Series resistance
3. Inductance

The Idris Technology is protected by one or more of the following patents:

EP0879457, USA 6345228, 6337640 and 6483443

Patent Applications Pending in other Countries

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