



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

Technical Sheet No. 3

Idris® & **TOLLING**

FIELD-PROVEN TECHNOLOGY FOR TOLLING

Almost every country in the developed world suffers from a common problem – an ever increasing number of vehicles leading to high levels of congestion. This is widely predicted to lead to gridlock on more and more occasions. Road pricing is widely accepted as one solution with the result that the number of toll roads, bridges and tunnels is growing around the world. This in turn increases the need for accurate toll collection and enforcement. Idris® addresses both these requirements in a single technology. Idris combined with the stability of loops provides accuracies previously only closely approached with multiple detection technologies. Now, with a suitable loop array in each lane, accurate vehicle separation, axle-based automatic vehicle classification (AVC), tag correlation and enforcement triggers can be achieved from a single integrated system.

Installations on live toll plazas and on test sites have demonstrated Idris' ability to separate and count vehicles accurately, distinguish between towing and tailgating, allocate vehicles to a toll class and pinpoint the location of front and rear license plates to initiate a photograph. Idris' unique straddling algorithm ensures very accurate separation is achieved, even with poor lane discipline in multi-lane express toll installations. All these functions are provided at all speeds from stop-go to high speed free flow traffic. In consequence the system is suitable for all tolling environments:- open road tolling (ORT) using Automatic Vehicle Identification (AVI) tags, electronic toll collection (ETC) in single lanes, manual toll lanes or any combination of these.

Idris is a loop based technology, using the data from loop signatures to generate the information required by toll operators to meet their charging criteria. Analogue loop data generated by a detector is passed to the processor as a serial output and is known as the loop signature. This signature contains a wealth of information which is analysed by Idris to determine the events occurring on all loops simultaneously. By analysing all loops simultaneously and comparing the signatures, the algorithms can then determine exactly what has transpired on each loop in the array, calculating the relational effects of each to provide precise and consistent outputs regardless of traffic flow and environmental conditions. Using information gathered from the raw loop data, Idris is able to provide records on each vehicle that transits the loop site. These records are known as "per vehicle records" (PVR). The PVR provides an important source of information not only on the vehicle's speed but also its length, class and number of axles.

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

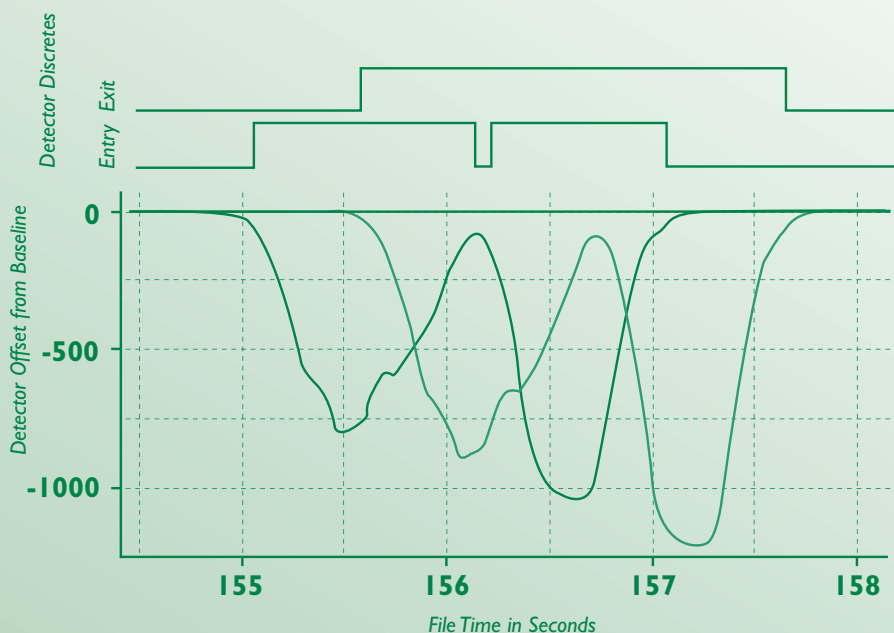


Idris[®]

FIELD-PROVEN TECHNOLOGY FOR TOLLING CONT...

Vehicle class is determined during system configuration and can be easily altered to suit a tolling authority's requirements. The PVR's can also be compared with payment data provided by the ETC, toll collection staff or AVI tag reader for enforcement purposes, though the trigger for the camera is generated directly by Idris. Idris uses detailed digitised analogue information from the loops, avoiding difficulties experienced with threshold setting in standard detectors. For example, trailer hitches will often drop out when using standard detectors, and Idris avoids this by careful examination of the detailed signal.

Idris VERSUS DISCRETE



Idris TRIGGER

Providing a consistent and reliable trigger for VES systems in any weather conditions is an important requirement in many toll lanes today. The trigger is used to activate a VES system to capture toll violators and is required for speeds ranging from 0 to 100mph, which Idris achieves consistently to $\pm 30\text{cm}$ regardless of the vehicle speed or environment conditions. The system is also capable of differentiating between two vehicles tailgating (which gets two triggers) and a vehicle in tow (which gets a single trigger). Idris is able to track vehicles in single lane plaza configurations, multi-lane express or open road applications, triggering VES for the appropriate lane. Idris also has the ability to cope with recurrent output congestion with the addition of an optional third loop at the trigger point.

Idris and the detector enhancement technology may be deployed in either an industry standard package or integrated onto a compliant lane controller. This technology enables lane straddling and overtaking vehicles (in multi-lane situations) to be properly dealt with, along with the ability to distinguish between tailgating vehicles and vehicles towing trailers. In AVC applications, the system can detect the number of axles per vehicle including distinguishing dual tyres.

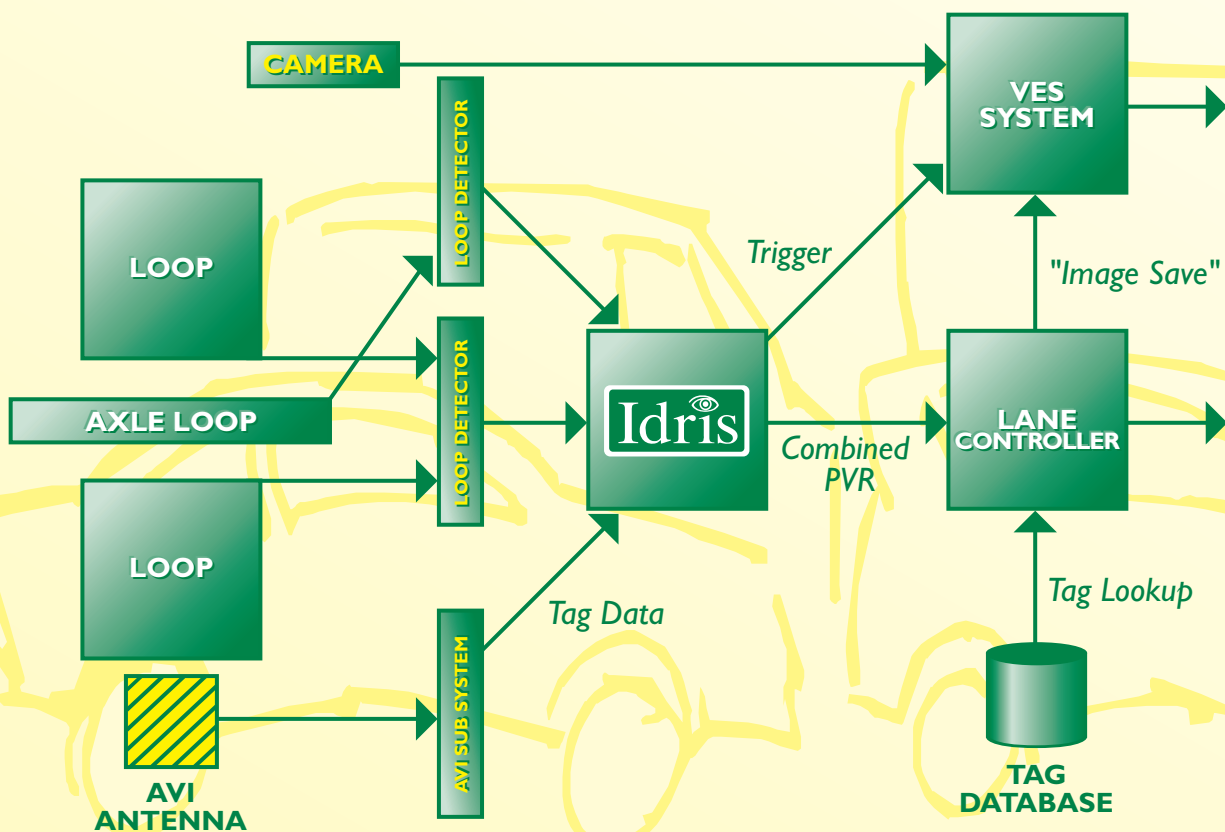
THE BENEFITS OF LOOP BASED SYSTEMS

Idris uses a special loop array per lane, 2m square and 2m apart with two optional axle loops in-between to reliably separate, profile and track each vehicle as it transits the toll facility. When installed correctly loops have proven to be very reliable, requiring little maintenance. The mean time between failures of a properly installed loop system is typically 25,000 hours with many loop systems lasting 10+ years. Being below the road surface loops are not susceptible to vandalism, tampering by passers-by or damage from passing vehicles. The system is not affected by adverse environmental conditions which significantly improves the reliability and performance in adverse weather conditions. Loops do not have to be cleaned or adjusted after installation keeping maintenance costs to a minimum and providing the lowest cost of ownership of all the technologies currently available on the market.

Idris INTEGRATION ON A LANE CONTROLLER

The Idris Technology currently runs on Linux, Lynx and QNX and can be made to operate on any POSIX compliant system. Idris can therefore be implemented to run hosted on any suitable lane controller simplifying the functions of the lane controller. This has the benefit of significantly reducing hardware requirements and maintenance costs, whilst improving overall system reliability.

Idris BASED LANE CONTROLLER



Idris®

FEATURES OF AN Idris TOLLING SYSTEM

- **Intelligent Profiling & Wide Area Tracking for Tolling Applications**
- **Loop based Intelligent Detection**
- **Simple to setup and operate**
- **Separation accuracy**
- **Complete Automatic Vehicle Classification (AVC) solution**
- **Axle class accuracy**
- **Optional axle detection**
- **Pre or Post class applications**
- **Optional VES trigger output**
- **Can support reversible lanes**
- **Supports multi-lane express configurations**
- **Optional suite of audit tools available**
- **Low life-cycle cost**
- **Can be ported to POSIX compliant platforms**

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

Idris® is a registered trademark of Diamond Consulting Services Ltd.

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

