



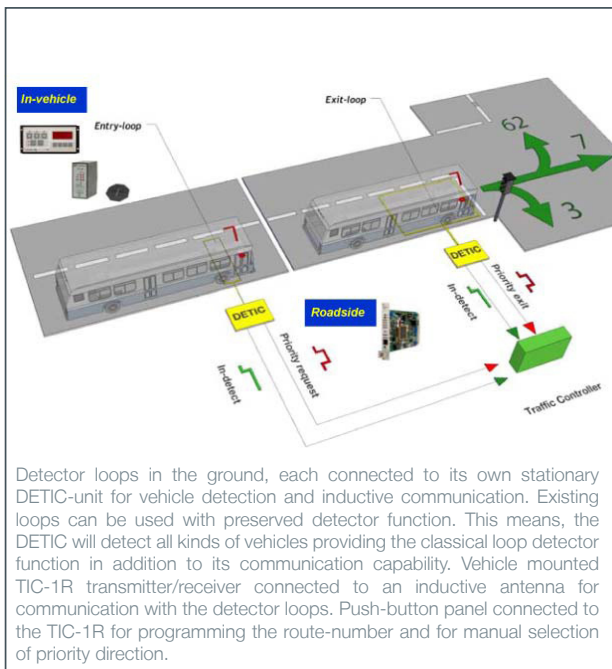
TicPrio

SIGNAL PRIORITY FOR PUBLIC TRANSPORT

SWARCO TECHNOLOGY is one of the leading companies worldwide in the development, production and sales of traffic and motorway controllers and communication equipment for traffic management systems. The TicPrio-system provides buses, trams, and emergency vehicles priority over other traffic at signalised intersections.

PRIORITY FOR PUBLIC TRANSPORT

There is a large number of detector loops in urban environments for monitoring traffic at signalised intersections. In addition to performing the classical detector function towards the Traffic Controller, the TicPrio system also provides two-way communication over detector loops through its in-vehicle and roadside components. Since the location of each loop is known, the position of the vehicle can readily be determined. The communication infrastructure is given through the loops.



Detector loops in the ground, each connected to its own stationary DETIC-unit for vehicle detection and inductive communication. Existing loops can be used with preserved detector function. This means, the DETIC will detect all kinds of vehicles providing the classical loop detector function in addition to its communication capability. Vehicle mounted TIC-1R transmitter/receiver connected to an inductive antenna for communication with the detector loops. Push-button panel connected to the TIC-1R for programming the route-number and for manual selection of priority direction.

In-vehicle and Roadside Components of the TicPrio-system.

KEY BENEFITS

TicPrio is a reliable solution made by SWARCO.

- Gain in commercial speed; Priority contributes to the reduction of PT-vehicle journey times producing greater transport capacity
- Service regularity; alignment with nominal timetables.
- Reduction of pollution
- A more rational use of energy
- Detection & Two-way Communication on the same loop
- Existing detector loops can be used without any modification for easy and cost-effective installation

TicPrio – SIGNAL PRIORITY FOR PUBLIC TRANSPORT

HOW TicPrio WORKS IN STAND-ALONE APPLICATIONS

A fundamental requirement for a stand-alone system is that the priority direction corresponding to the bus route number is stored in the memory of the system's roadside (DETIC) unit. As the bus arrives on the entry-loop, this sends, to the in-vehicle TIC-1R unit, the loop-ID including the information that the loop is an entry-loop. The TIC-1R returns the route number to the roadside unit, which then finds the corresponding priority direction and generates a priority request pulse for the Traffic Controller. There is an output assigned for each priority direction on the DETIC roadside unit. The bus driver can see the selected priority direction on a display panel. The manual option, incorporated to allow route diversions and detours, allows the driver to select the desired direction using a push-button before the vehicle reaches the entry-loop. The system ignores the automatic priority selection if a manual direction is selected. Priority is terminated when the bus sends an exit pulse upon leaving the exit-loop at the junction.

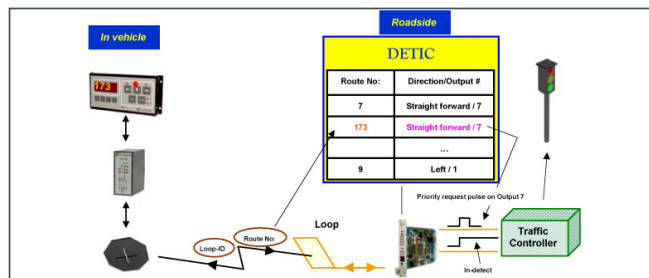
INTEGRATING TicPrio WITH INTELLIGENT TRANSPORT SYSTEMS

If the bus or tram is fitted with a Vehicle Computer, this can be connected to the TIC-1R through a serial channel. The stationary system is the same as in TicPrio stand-alone systems. That means, each loop is connected to its own DETIC-board. On approaching an entry-loop, as identified by the DETIC roadside detector, the vehicle computer selects the appropriate priority direction and sends this via the TicPrio in-vehicle equipment through the loop to the roadside DETIC-unit. The DETIC then generates the priority request pulse to the Traffic Controller. Again, the loops provide the communication infrastructure, making additional (e.g. radio or infra-red) links unnecessary.

OVERLAPPING SYSTEMS

In urban areas buses/trams serving the main routes are likely to be equipped with Vehicle Computers, using for example GPS for position updates to provide stop-info, arrival announcements, etc. The PT-vehicles serving the minor city routes or regional ones usually lack this equipment. Signal priority at all intersections for all PT-vehicles might still be desirable. Integrated and stand-alone TicPrio systems can be operated in parallel to solve this problem. Thus, the hardware is the same and the difference between the stand-alone (route 173 in our example) and the integrated (route 7) system is in the way of storing and transmitting the priority directions corresponding to the route number of the vehicle and to the ID of the loop it encounters.

YOUR LOCAL CONTACT



TicPrio stand-alone applications are in operation in smaller cities. The system does not need to keep track of the buses' positions and can operate without being connected to an automatic vehicle location.

A typical example of a stand-alone implementation is in the city of Borås, Sweden. Its public transport fleet consists of 80 buses with an established detector system based on 60 loops.

TicPrio can be integrated in real-time passenger information systems. The in-vehicle TicPrio equipment is connected to the vehicle computer through a serial channel, allowing downloading of priority directions from an AVL-system.

An example of an integrated TicPrio system is the implementation in Gothenburg with its 200+ trams serving 13 lines and 350 buses plying about 50 fixed routes.

BENEFITS OF USING LOOPS TO PROVIDE SIGNAL PRIORITY

- Existing loops can be used with preserved detector function
- No communication costs
- No matter how many vehicles and loops are in the system, communication capacity is unlimited
- Once the vehicle is over a loop, communication is always guaranteed
- Negligible communication delays (from vehicle to Traffic Controller < 50 ms.).
- Exact vehicle positioning

SWARCO TECHNOLOGY APS

SWARCO TECHNOLOGY develops and markets traffic and motorway controllers as well as communication equipment for traffic management systems. Thousands of our products have been installed and are now in use in different applications in many countries. As a company of the SWARCO Group we can deliver complete solutions for traffic management systems.

SWARCO TECHNOLOGY APS

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