TOPO

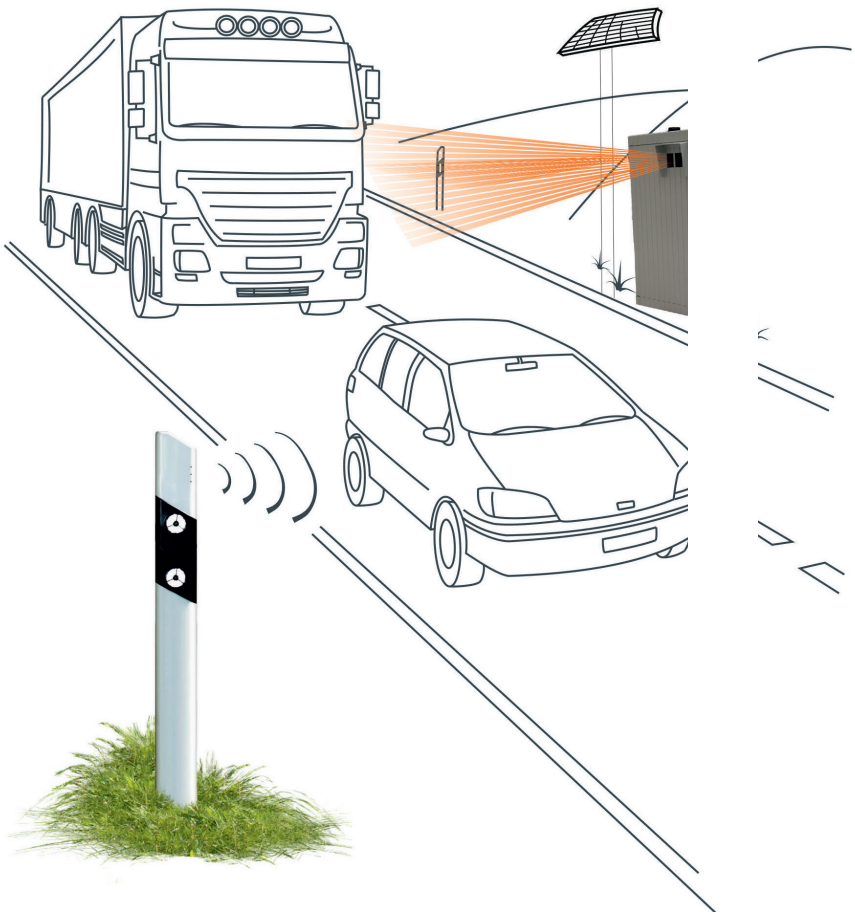
Vehicle classification systems

RTB

Unique selling points of RTB radar systems

- Only radar system that offers axle detection along with length and speed measurement
- Additional microphone for pinpointing the position of the engine block in long vehicles
- Capture of the maximum sound pressure level in dB as a vehicle drives by in the closet lane
- Analysis of noise levels in dB usind the DD.web 4.0 analysis program

Hybrid detector systems



Precise traffic data acquisition

Optimum control of traffic flows at all levels is becoming more and more important for a variety of reasons. Avoiding traffic jams, determining emissions and immissions, increasing general road safety and capturing data in the context of recurring traffic counts are all becoming increasingly important.

The devices of the TOPO product family, which are certified by the Federal Highway Research Institute (BASt), recognize and classify respective vehicles in different classes based on the technical delivery conditions for routing stations (TLS).

Award-winning technology

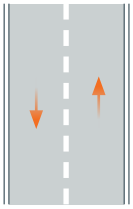
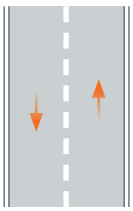
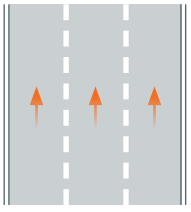
TOPO is creating a sensation in the transportation sector. Its ability to capture and classify vehicles according to TLS 2012 open up a new dimension for collecting data in the course of dealing with daily traffic.

That's why TOPO was honored with

- The Innovation Award of OWL Marketing GmbH
- BASt certification.

- vehicle drives by the detector
- Classification of 8+2 vehicle types in conformity with TLS 2002 of the German Highway Research Institute (BASt)
- Only radar system with certification from the BASt
- Only radar system with authorization from the BASt for automatic counting

Variants

Klassifizierungssystem	Systemintegration		
TOPO.slp FSK	Integration of the system in a standard guide-post (SLP) For installation on roads outside of built-up areas Can be integrated discreetly in the streetscape		
TOPO.box FSK TOPO.bigbox FSK	Easy installation on various pole systems For installation on city and rural roads		
TOPO.lx	TOPO.lx classifies vehicles and motorcycles by means of two multi-beam LIDAR sensors A variety of vehicle parameters (including length, number of axles and speed) are recorded Classification of up to three lanes in one direction		

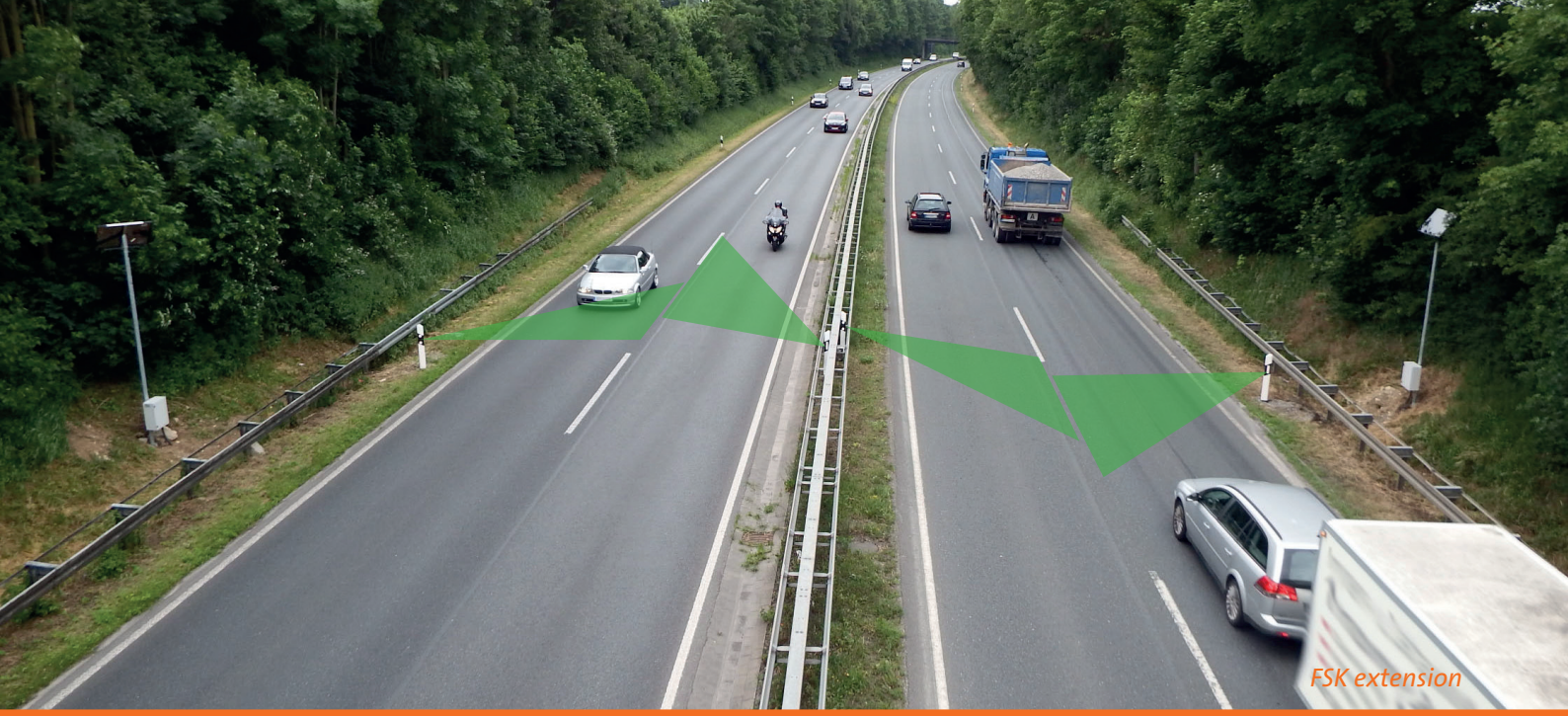
Technology & Usage

Hybrid detector systems

TOPO.slp fsk and TOPO.box fks/TOPO.bigbox fsk are based on hybrid technology and are used to survey traffic for a variety of purposes. The exact classification of 8+1 vehicle classes according to TLS 2012 (technical terms of delivery for roadside data collection facilities) uses a variety of measurement characteristics:

- Length of the vehicles
- Number of vehicle axles
- Vehicle axle configuration
- Axle spacings
- Position of the motor block
- Measurement of sound levels

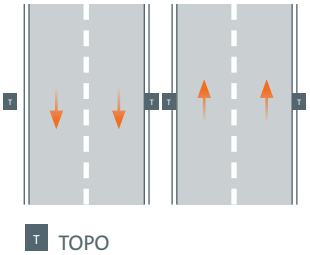
In order to meet the increasing demands of noise reduction, the TOPO systems are capable of directly measuring noise via the device so that noise emissions can also be determined in addition to traffic data.



FSK extension

Expanded measurement options

Thanks to the FSK extension, it is possible to use four devices to measure four separate lanes. This means that one device is required per lane. A complete system thus consists of four devices. The following TOPO systems can be equipped with this FSK extension: TOPO.slp FSK, TOPO.box FSK and TOPO.bigbox FSK.



T TOPO

Frequency shift keying (FSK)

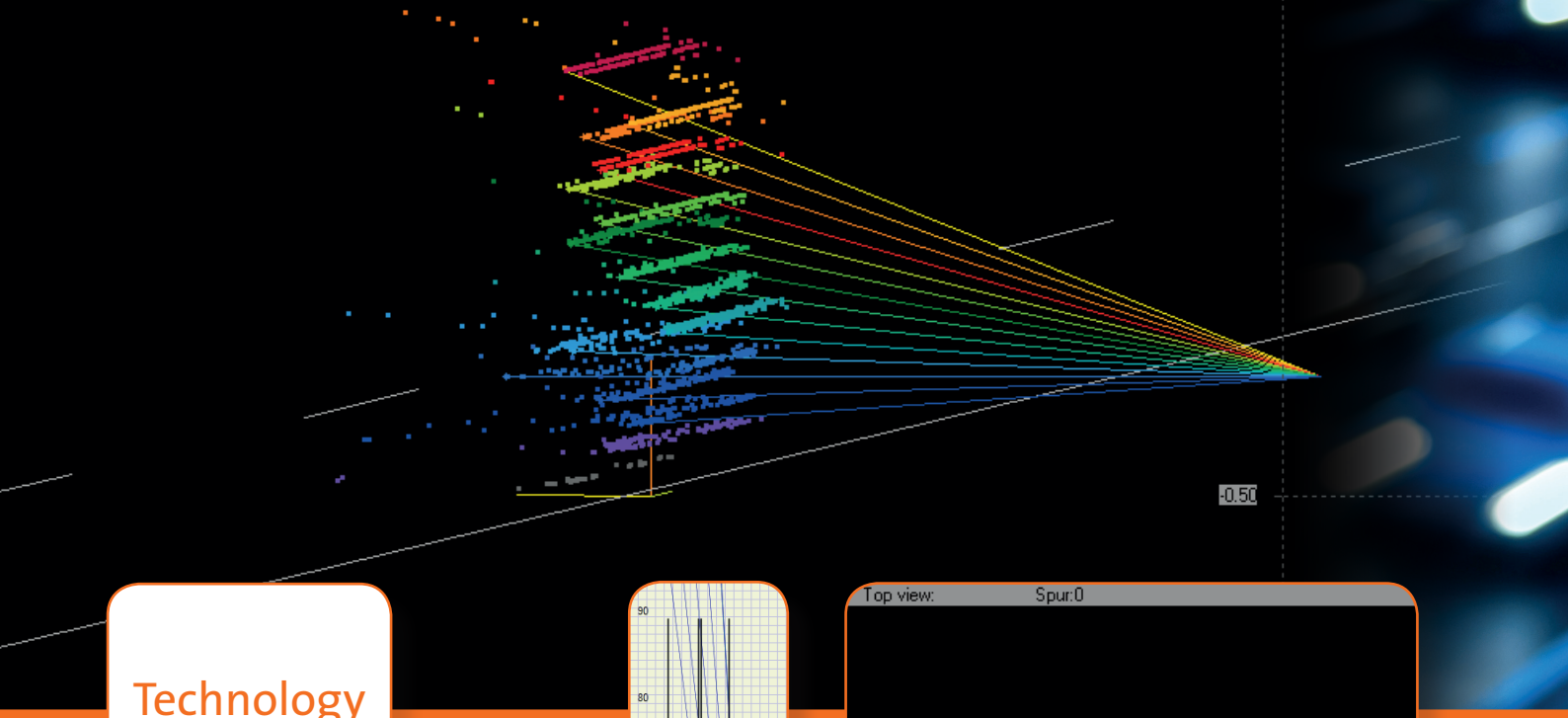
Without FSK technology

The FSK method measures the distance of moving objects and thus produces information about the distance between the device and the vehicles to be classified.

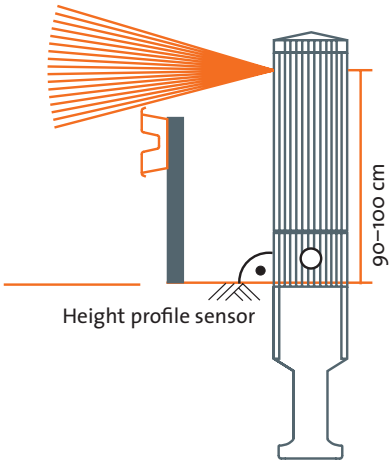
The main advantage of FSK is that disruptive reflections can be blocked out, which significantly expands application possibilities.

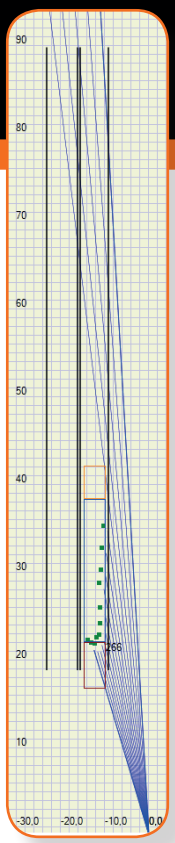
With FSK technology

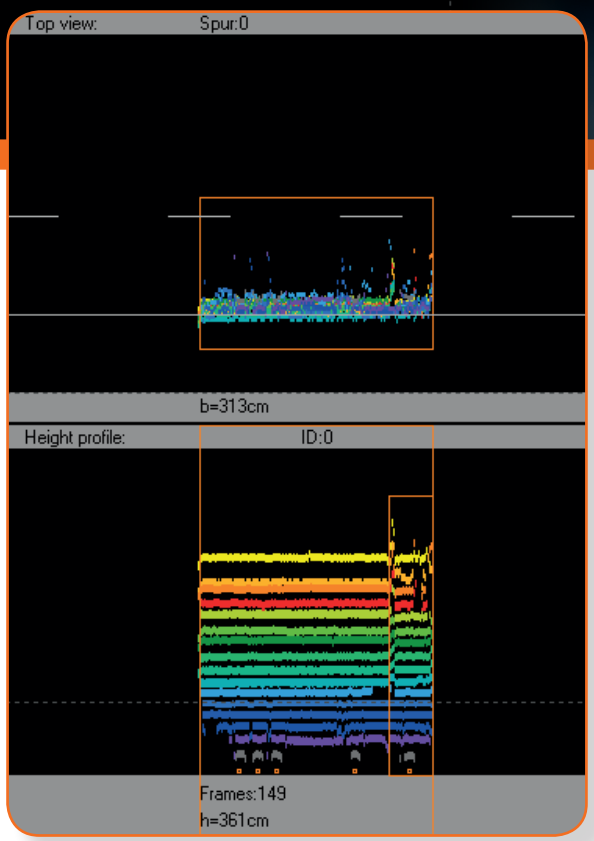
This makes it possible to select locations that were previously not serviced or serviced only to a limited extent – for instance, across from protective devices (guard rails) or in inner city areas with numerous reflective objects (e.g., parked cars).
The TOPO systems TOPO.slp FSK, TOPO.box FSK and TOPO.bigbox FSK are standardly equipped with FSK technology.



Technology & Usage

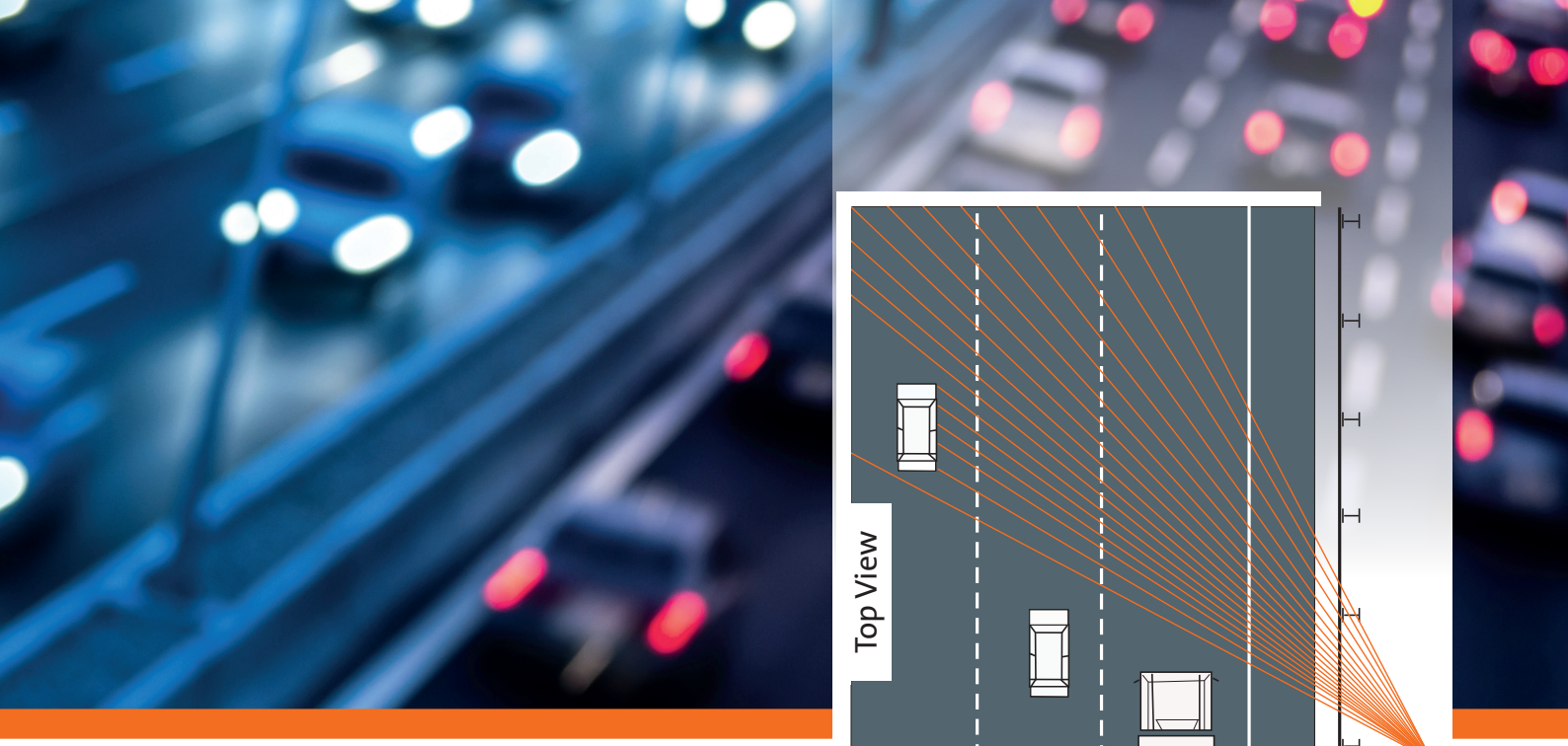






Laser-based vehicle classification

TOPO.lx, which is based on state-of-the-art laser technology, enables exact classification – especially on multi-lane roads, such as motorways. With the help of two multi-beam LIDAR sensors, a wide range of vehicle parameters and properties from the right-hand edge of the road are acquired. In this process, even partially or completely hidden vehicles are detected by the system.



Method of operation

Of the two multi-beam LIDAR sensors, one sensor is mounted at a 90° angle to the road surface so that it can, with the help of 16 channels, record the lateral height profile of the vehicles and assign them to the respective driving lane. The second sensor is oriented in a way that allows it to record vehicles driving by from the rear and the right-hand side. It thus observes the continued travel of the vehicles and determines their speed by means of a tracking algorithm. The measurement data of both sensors are then merged by the system, which makes it possible to exactly detect and categorize vehicles into individual vehicle classes, following the technical delivery conditions for the route stations (TLS) of the BASt. And it can do this even when vehicles are moving at a speed of up to 250 km/h.
As standard, all TOPO.lx systems are equipped with a mobile network interface that simplifies the readout of measured data and maintenance.

Motorcycle noise

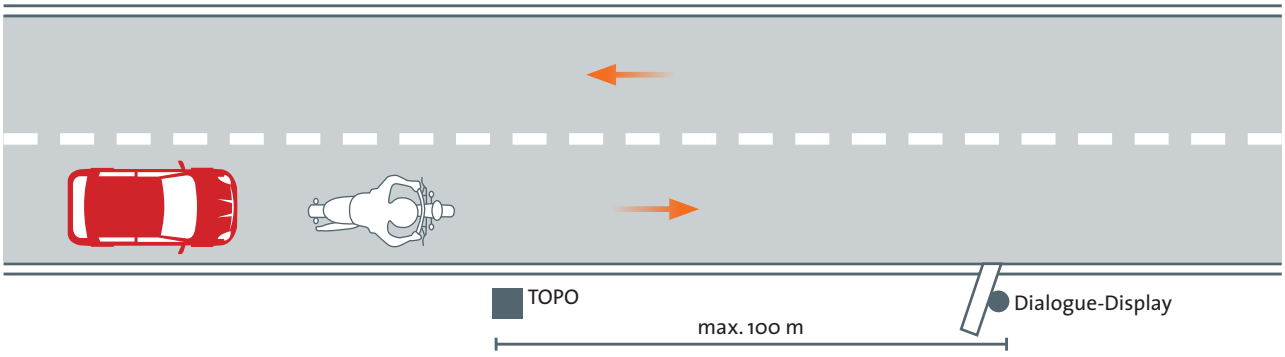
Noise can make you sick. This finding is supported by numerous scientific studies. In adults, noise mainly affects the cardiovascular system, while in children it affects the mental functioning of the brain. Noise can make you ill even at sound pressure levels well under 85 decibels – even if the sound is not perceived as disturbing.

It is estimated that in Germany alone 4,000 heart attacks occur each year due to road traffic noise.

Particularly affected are places that lie along popular motorcycle routes, because here the weekend travel of bikers and their motorcycles create additional noise pollution beyond that of the usual traffic. This is exactly where the TOPO system is designed to intervene. Guide-post counting devices with acoustic sensors quickly recognize whether the passing vehicle is a motorcycle and simultaneously measure speed and volume. If the unit determines that volume limits have been exceeded (threshold in dba is configured individually), the rider receives feedback just a few meters further down the road through a downstream Dialogue-Display requesting a speed reduction (Slow down/Thank you/Quiet).

The use of this device combination has already proven its worth and has been scientifically verified in many places. Consistently positive results confirm the effectiveness in reducing motorcycle noise.

Installation of motorcycle noise system (TOPO / Dialogue-Display)



Bicycle detection

Bicycles are “in” again! Roughly 80 percent of all households in Germany have at least one bicycle, and 30 percent or more have three bicycles, which means that about 78 million bicycles are being used with increasing frequency. In order to motivate even more people to switch over to riding bicycles, the German federal government promotes cycling (Source: BMVI).

For transportation planners, this means taking this group of road users into account and adapting the infrastructure in cities accordingly. Ultimately, it comes down to the safety of all participants on public roads.

Reliable data are the key here! The TOPO bicycle detection makes it possible to exactly identify and capture this data. It is even possible to perfectly resolve groups through the combination of radar and the hybridcamera. TOPO.box is mounted at a height of one meter along the bike path or at the edge of the road and detects the speed and direction of travel. From a mounted height of three meters, the LIDAR sensor detects cyclists and transmits the distance values to the TOPO.box. The combination of the two sensors with their different technologies enables reliable detection,with a recognition rate of up to 96 percent.

This makes reliable data available, which can serve as the basis for optimum transportation/bike path planning.

Technology

- TOPO.box contains radar sensors and a complete signal processing and communication unit for data transmission via GSM
- TOPO.box detects the speed and direction of travel
- The infrared sensor detects cyclists from above and transmits distance values to the TOPO.box
- A combination of both sensors with their different technologies enables reliable detection including the resolution of groups
- Detection rate of up to 96 percent
- All devices are equipped with a GPS unit to determine their position

Usage & Efficiency

Simple installation and set-up for operation

TOPO systems can be quickly and easily installed. The system can be installed and set up for operation and adjusted directly on-site via the associated remote control or the TOPO App. A check is performed to ensure that all installation steps have been completed and that quality of the captured traffic data is high.

The remote control unit makes it possible to check whether the data have been correctly recorded, as the unit immediately shows the detected vehicle on its display.

In addition, the remote control / TOPO App activates or deactivates the theft warning function.

Quantity Classes/ Groups		Designation of the vehicle classes/groups (with code)										
TZ2		Car (64) nk Car						SV (40)				
TZ4		LVm (37) nk Car						SGV (34)			Bus (5)	Motorcycle (10)
TZ5		LVm (37) nk Car						Truck (3)	Truckk (4)		Bus (5)	Motorcycle (10)
Basic classifi-cation	Bicycle (230)	nk Car (6)	Partially covered Car (250)	Car (7)	CarA (2)	Truck (11)		Truck (3)	TruckA (8)	Tractor-trailer truck (9)	Bus (5)	Motorcycle (10)

Very high detection rates

The German Federal Highway Research Institute (BASt) has confirmed it! The TOPO systems TOPO.slp, with and without frequency shift keying technology, as well as the TOPO.box and the TOPO.bigbox consistently achieve very high detection rates.
The detection is based on the TLS 2012 with regard to the vehicle classification 8+1, 5+1 and 2 classes, but also according to AFDS 2015 (instruction for the road traffic census 2015) with 7+1=TZ5 and 4+1=TZ4 classes having been tested.

This means that certified systems for different requirements are available for automatically counting traffic.

Quantity Classes / Groups		Designation of the vehicle classes/groups (with code)										
1		Car (64) unclassifiable motor vehicle & vehicle partially hidden										
2		Car-like (32) nk Car					Truck-like (33)					
5+1		nk Car (6)		CarG (1)			CarA (2)	Truck (3)	Truckk (4)		Bus (5)	
8+1		nk Car (6)		Motorcycle (10)	Car (7)	Truck (11)	CarA (2)	Truck (3)	TruckA (8)	Tractor-trailer truck (9)	Bus (5)	
8+1+F	Bicycle (230)	nk Car (6)		Motorcycle (10)	Car (7)	Truck (11)	CarA (2)	Truck (3)	TruckA (8)	Tractor-trailer truck (9)	Bus (5)	
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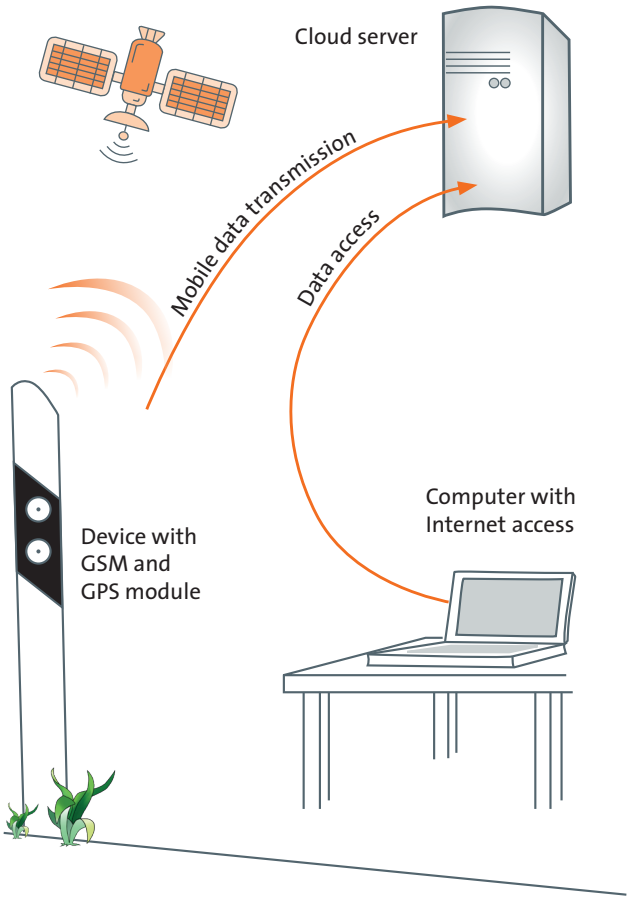
Data transmission

Automatic data transmission

The traffic data collected by these systems are sent to a cloud server. This requires the integration of a GSM module and the availability of a SIM card from a mobile telephone provider.

In addition to captured traffic data, the device's location coordinates are saved in each dataset. The current position of the device can be pinpointed via GPS.

Of course, all data are secured by means of an https protocol.



TOPO Hotline

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topo-hotline@rtb-bl.de

Manual data transmission

Of course, it is also possible to manually collect the collected traffic data. Data transmission can be initiated via a Bluetooth connection to the netbook/ laptop or via remote control. The required DD.local software must be installed in advance.

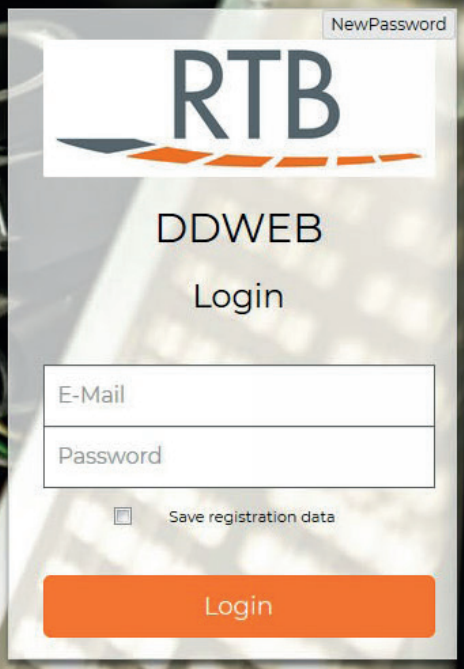
An extensive evaluation is possible based on the Internet platform DD.web 4.0. There are various export versions available for use in other programs. There are further transmission possibilities via RS232 and RS485 interfaces.

RTB DDWEB

DIFFERENT than others!

That's the premise, our work is based on.

We want to make a good impression on you by ultimate innovational power and an outstanding service level. Usability of our products and customer focus is the measure of all things for us.



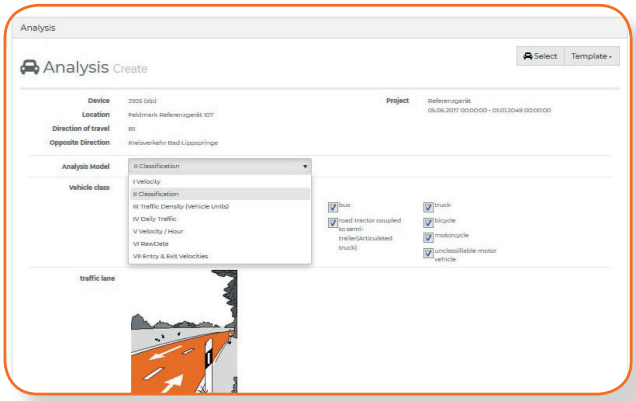
Evalu-ations

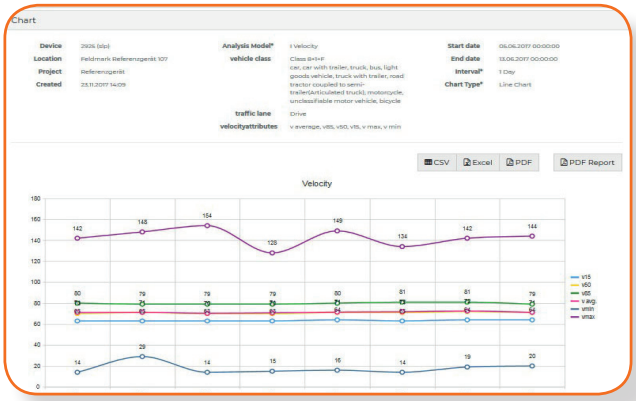
DD.web 4.0: Convenient evaluation

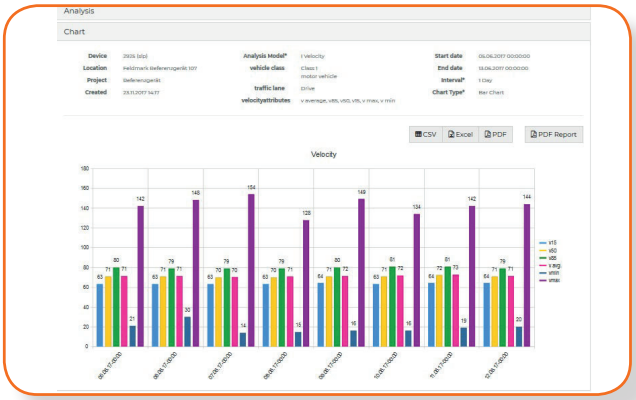
DD.web 4.0 is an Internet platform that offers customers a variety of services:

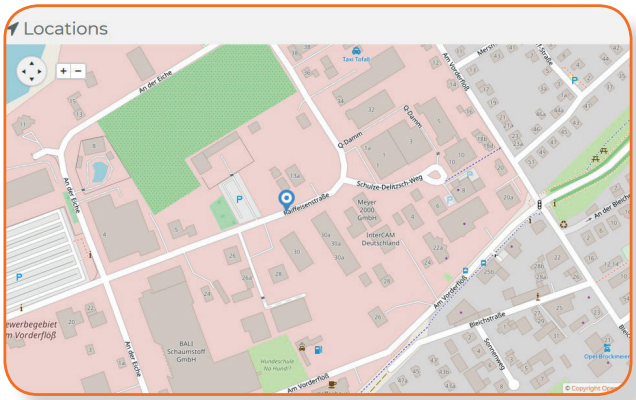
- High standard of safety through encrypted https connection
- Legal distribution is the responsibility of the customer: As an administrator, you can decide what rights should be given to which user
- Improved communication between the users through group news
- Establish contact with support directly in DD.web 4.0 Hotline
- Free language selection
- Comprehensive analytics (speed, traffic volume, classification results)
- Dynamic speed and time intervals configurable for evaluation models
- Individual retrieval of vehicle data (Raw data)
- Location and order management
- Operational control of the device
- Detailed setup of the locations, with photos, descriptions and card usage
- PDF document creation
- Export function

DD.web







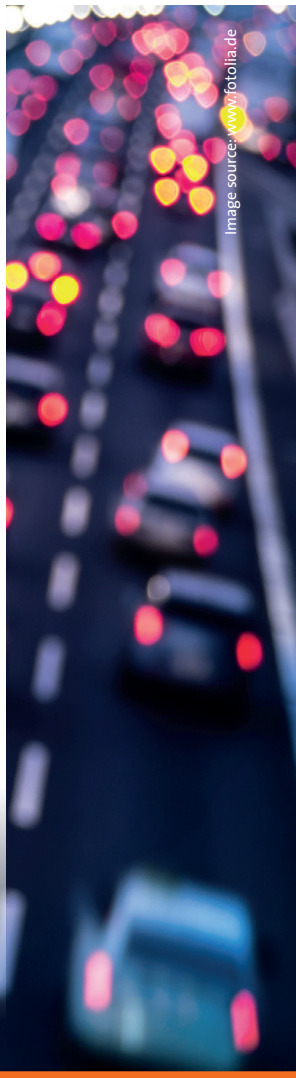


Test access
can be requested at:
DD.web4.0@rtb-bl.de
+49-52-52/97-06-265

DIFFERENT than the OTHERS!

This is the premise we work on. We want to attract your attention with innovative strength, the highest quality and an excellent service. User-friendliness of our products and customer orientation are most important for us. We are doing everything for a reliable, partner-like cooperation.

Drawing on many years of experience, RTB develops, produces and sells innovative solutions for road traffic. In addition to supplemental equipment for traffic light signal systems, radar and laser systems for speed reduction and certified traffic data recording systems, our product range also includes parking ticket machines, innovative systems for electromobility and effective parking lot management.



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Status 09/2019