



iMIS-V2X

Intelligent Multipurpose
Informationssystem V2X

YUNEX
TRAFFIC

Intelligent Multipurpose Information System (IMIS) - V2X

Future orientated focus is intelligent use of road information

Nowadays, a traffic warning trailer fulfills a wide range of tasks on the road. An IMIS is used for driver information via flashlights, variable message signs (VMS) and V2X (Vehicle to Infrastructure) technology as well as gathering information from the road with smart sensors such as BLE (Bluetooth Low Energy)/WiFi/V2X scanning for estimated travel time, video camera and others. The focus is on, gathering pertinent information from the road, for the road user i.e.: the VMS or sensors, equipped on the trailer act as the driver's eyes displaying potential hazards or deviations to the planned travel.

The respective collected data contributes to increasing traffic safety and optimizing the flow of vehicles - which is advantageous to road-user's during road works. Furthermore, IMIS can also be used for capturing long-term information or at special events as guidance system.

The IMIS trailer is either managed by a central management system or can work autonomously. Its field of use is both inside and outside urban areas, including highways.

Key facts

IMIS trailer and central management system have the following features:

- Yunex RSU is used for realtime and bidirectional communication of C-ITS messages (V2X)
- display traffic signs and text information on the full matrix RGB display
- generate traffic data i.e.: volume, average speed
- gather BLE / Wifi / V2X data from passing vehicles for travel time estimation
- transmit live image of the road via an integrated camera
- monitor and manage via central management system, such as current location and status information
- sensors and components can be switched on/off remotely maximizing runtime, when in battery mode.

Components - future proof and secure

Key component is the V2X unit - Yunex Traffic RSU. It integrates on part of the C-ITS communication channel,



where messages are exchanged bidirectionally in real-time via DSRC or C-V2X between vehicles and infrastructure.

As such, the Yunex RSU must be connected to a trusted environment, a so-called PKI infrastructure, i.e.: EU provided Certificate Authority. All C-ITS messages need a digital signature of the originator for acceptance by the receiver. Special security measures are taken to protect the unit for unauthorized access or control. Approval of a certified body is needed and is currently pending (all information collected into central system)

A main control unit manages the components and collects all information and data from the sensors. This data is transferred to the central system for further processing. In offline mode the data is stored on the unit itself and can be evaluated afterwards.

Connection to the central system is done by a mobile router, which is equipped with a standard SIM card. The communication channel to the central system is also secured to ensure privacy, security, and safety.

Flexible, modular and retro fit

A package with V2X unit, control unit and mobile router can be retro fitted on legacy trailers such as standard warning trailers.

A standard interface is used to communicate with the trailer and monitor the charging state of the battery.

With that, a full integration into the central system is possible. Beside that, additional sensors can be added on customer request.

Remote operation, monitoring, and service

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For remote operation, monitoring and service, the central management system is used. It enables remote updates, vehicle management to reduce maintenance effort and reaction times.



Technical Specification

Summary	
Main Control - embedded Single Board Computer	
V2X Unit - Yunex RSU2X	
Full matrix, RGB Variable Message Sign	
Bluetooth / Wifi Sensor	
Mobile Router - Dual band LTE/4G	
GNSS / GPS / Heading	
Wireless Control panel	

Trailer Chassis / Mechanics	
Nissen, VarioSign LED Trailer	
Length	4300 - 5800 mm (Drawbar)
Total height:	ca. 4000 mm (VMS up position) ca. 1655 mm (VMS down position)
Track width:	ca. 1600mm
Weight	ca. 900 kg, max. total 1000 kg
Max. speed	80 km/h
Equipmentbox	Two Aluminium IK08, IP55
Locking system	padlocking, unified
Support	Manual, electrical, hydraulic

VMS characteristics	
Total size	2605 x 1365 mm
LED area	2580 x 1340 mm
Pixel size/pitch	RGB, 68 x 130, 20 mm
Brightness	min. 4 Lux autodim. max. 10000 Lux
Class	EN 12966

Flashlights	
Class	L8H, dual synchronized
Dimension	Ø220 mm
Light	Yellow, intensity 1500 cd

Battery Power	
Pack	Lead gel battery, 24V, 230Ah
Charger	230V/24 20A, incl. Battery protect
Mode	Separate for control and trailer

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