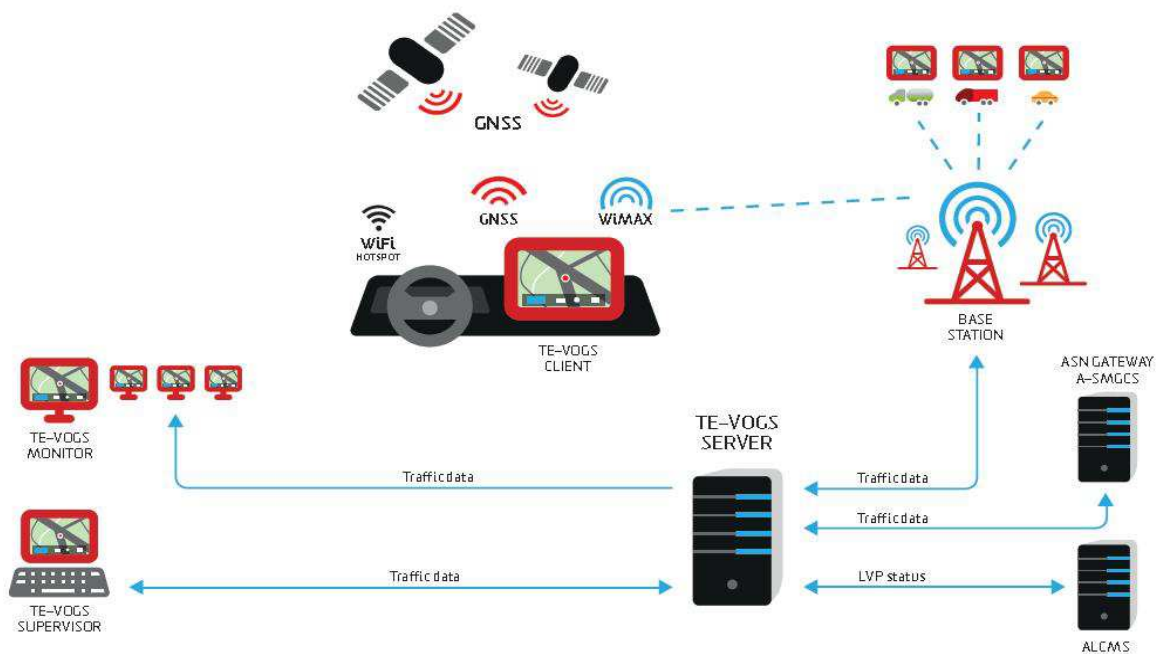# TE VOGS

VEHICLE ONBOARD GUIDANCE SYSTEM

The Solution TEVOGS is mainly utilized for Airport/Airport Operations. The key feature of the product is the precise safety application. As installed in Airport "Follow Me" cars (generally applicable on all vehicles on the airfield) once located it delivers precise real-time position based upon the GNSS System.


Based upon this application you are able to equip and enlarge the net of the application to an unlimited number of cars/receivers (for example: ARFF, SAR, Police and/or Border Guard, Maintenance and Mass transportation vehicles). The system serves a variety of different units conducted to act in parallel and/or separately. The product is compatible with the standards of AeroMACS, which warrants a bride usage.

The wireless network used by the solution can be based on WiMAX or based upon LTE technology. The WiMAX Technology is standardized for AeroMACS. Therefore it offers more flexibility and options for a solid operation with key features, such as latency, stress tests etc. The LTE technology (preferred VPN) allows the operation of the product under an already installed coverage network, which is in any case the lower investment pitch for any new user. So generally speaking, the solution is predicted to be integrated into your existing environment or could be set up separately. Worth mentioning is that the LTE solution is also defined to fulfil the AeroMACS standards in the near future.

TEVOGS Infrastructure Fit

The solution is prepared and tested in the field during live operation to interact with your A-SMGCS System, which exchanges with TEVOGS information on the targets. Furthermore the product is capable of cooperating with ALCMS and other airport relevant systems of standard use.
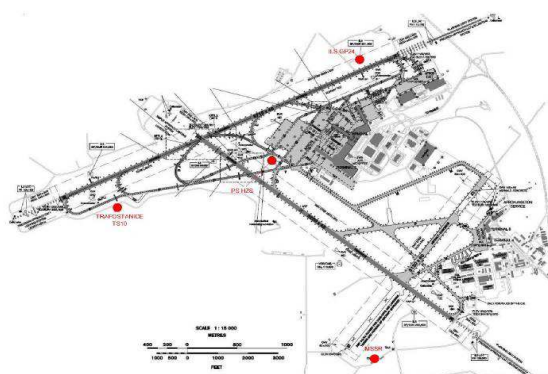
Airport Operation usage

The centralized HMI is generally operated via a dispatch person with the highest ranked access credibility (Chief Operation Dispatcher). There are also HMI of lower ranked access points, with the competence to control and organize lower professional working group activities (such as maintenance workers, security team, the fire brigade, fuel supply team and so on). The coordination is well defined in our concept in order to make the access for all airfield units available 24/7. All units are centralized within the Operation Dispatcher view. That way we ensure, that all users have real time data available. The coordination with this solution becomes all in one controlled by a predicted workplace and with sole standing usage, by all the different units. This is a key feature in AOG, SAR situations and other daily operations.

Security, Safety Warranty of Use

Generally speaking, the solution is as safe as your existing network already is, as we intend to implement it into your current network. End to end secure communication within the system is used. Nevertheless, the certification parameters, the data transfer are in line with the highest safety standards of AeroMACS parameters.

Customized Solution per Airport/Airport Ops

The available solution is customizable for each airport individually, according to the available budget of the Airport. Customization could be based upon traffic and particularly variable if we customize the solution for your needs in terms of work planning on your Airport. Each Airport has his own defined strip down of the daily operation and TEVOGS is prepared to be configured according to that based on its SW modules.

Application tested and in use

The solution increases the safety management of your vehicles on the airfield/runways. Especially where you have low visibility procedures in place, quick weather changes, it´s a perfect fit. Furthermore, it allows you real-time control of all movements, and last but not least it develops your efficiency of work of the vehicles which ends in lower consumption and more efficient use. Vehicles with the client installed on board receive and view their positions, so is the data received by the guiding workplace - the centralized HMIs visualize the position as well. The key benefit is to avoid accidents based upon the data exchange with your ground radar in relation to in bound, out bound or rolling aircrafts on ground. Allow us to summarize the key benefits described:

➢ LVP is no longer an issue
➢ RWY/TWY incursion is no longer an issue as pre warning is implemented
➢ Guidance for example maintenance staff via clearly defined target input. Work preparation, mission preparation available. Once mission completed, acknowledgeable by the staff via the portable device in the car
➢ Possibility of short term messages as needed to quickly respond in text/touch mode
➢ Cross function allows the predication of possible crossing targets
➢ Term Conflict Pre detection and warning applicable
➢ Areas of no entry restriction manageable and possible to visualize

Security Coverage

Spots with low or no fixed connectivity are bridged via camera feeds into the system of such dead angles. Even camera feeds of general use for security purposes are able to be implemented. Work in progress situations can also be monitored. Where for example the police co-works with the airport, where the airport fire fighter brigade needs to train etc. Such situations are predicted to be processed in our system.

SAR module

Restricted areas can be defined, Allows the Airport Operation Officer to real-time guide and steer, pre define the situations.

Safety Coverage

Heavy (snow, rainy) conditions, Airfield lightning information, Wildlife reporting system, Runway incursion prevention system, Weather observation system, Runway condition reporting system and others.

Data Mining Module

A clear ID, a labelling per vehicle and person allows an immediate tracking. The tool allows for the provision of Training and Lessons Learned. It combines the movement of the vehicle, the task to be solved with the view of the current situation. Increases smooth operations, well-coordinated and acknowledged.

Block Diagram
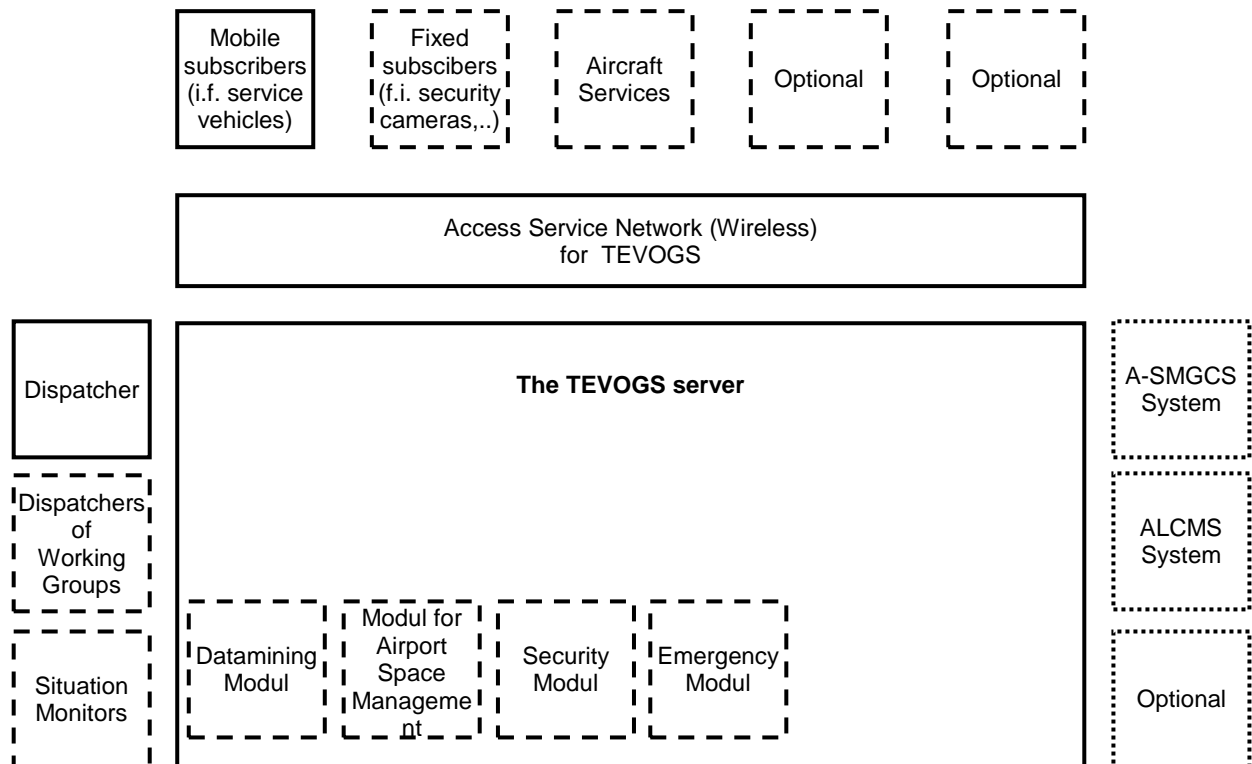
Technical Parameters

Frequency band - WiMAX*:   5091MHz - 5150MHz (international), 5000MHz - 5030MHz (national)
Frequency band - LTE: 5150MHz - 5900MHz (according to national administration)
Bandwidth (AeroMACS):   5MHz*, 7MHz, 10MHz
Data rate: Mbps - Mbps (channel 5MHz, per BS)
Coverage: 1 to 3 km
Mobility: up to 120km/hour
Encryption: AES-128
QoS: Yes

Note: Minimum Operational Performance Standards (MOPS) for AeroMACS

Abbreviations

AeroMACS	Aeronautical Mobile Airport Communication System
ALCMS	Airfield Lighting Control & Monitoring System
AOG	Aircraft on Ground
A-SMGCS	Advanced Surface Movement, Guidance and Control System
BS	Base station
GNSS	Global Navigation Satellite System
HMI	Human Machine Interface
LTE	Long Term Evolution
LVP	Low Visibility Procedure
RWY	Runway
SAR	Search and Rescue
TWY	Taxiway
VPN	Virtual Private Network
WiMAX	Worldwide Interoperability for Microwave Access