

PREHOSPITAL TELEMEDICINE

Ambulance of the future – a mobile prehospital telemedical platform with Point-of-Care-diagnostic-systems for the use in emergency cases



VIMED® TELEAMBULANCE

The VIMED® TELEAMBULANCE is able to be deployed in a prehospital emergency scenario for a variety of different diseases aiming the improvement of patient management. Through efficient Point-of-Care diagnostics and the use of telemedical communication the diagnosis can already be made in the VIMED® TELEAMBULANCE. The wireless transmission of all diagnostic data into the VIMED® TELEMEDICINE FILE and their prior transmission to a hospital, offers

the capability of a useful patient management within the prehospital area already, e.g. including the patient admission into an adequate target hospital. Therefore deployment of a VIMED® TELEAMBULANCE can significantly contribute to an improvement of the patient outcome. Furthermore it has great potential for savings of unnecessary inter-hospital transfers, waiting times and further costs.

The special equipment of the VIMED® TELEAMBULANCE can be divided into three groups:

- › VIMED® TELEMEDICINE SYSTEM
- › Point-of-Care systems (suitable for mobile and telemedicine applications)
- › VIMED® TELEMEDICINE FILE

VIMED® TELEMEDICINE SYSTEM

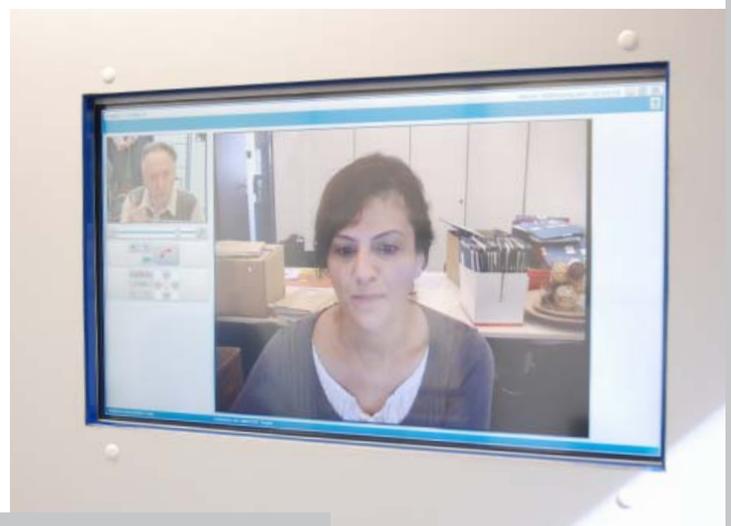
VIMED® TELEMEDICINE SYSTEM allows real-time video-, audio-, laboratory data and vital signs transmission:

- ▶ An intelligent communications network provides a broadband connection via bundled mobile channels. The data transmission can be carried out via the 3G / 4G mobile network to specialists within the targeted hospitals.
- ▶ In the drivers cab an integrated monitoring device provides additional information on an optimal positioning of the ambulance relative to the mobile network.
- ▶ The special video communication technology allows an additional audio-visual diagnosis in emergency care.
- ▶ Via integrated (wireless) interfaces more devices are connected to the telemedicine system inside the ambulance, e.g.:
 - ▶ ECG devices
 - ▶ Defibrillators
- ▶ Patient monitoring systems (e.g. arterial oxygen saturation, temperature, blood pressure and further more)
- ▶ Point-of-Care diagnostic systems for hematology, hemostaseology, parameters of clinical diagnostics (e.g. biomarkers, electrolytes, ...)
- ▶ Mobile ultrasound devices.
- ▶ The communication, diagnostic and laboratory data are recorded and transmitted automatically into the integrated patient file (VIMED® TELEMEDICINE FILE) and forwarded towards the target hospital.



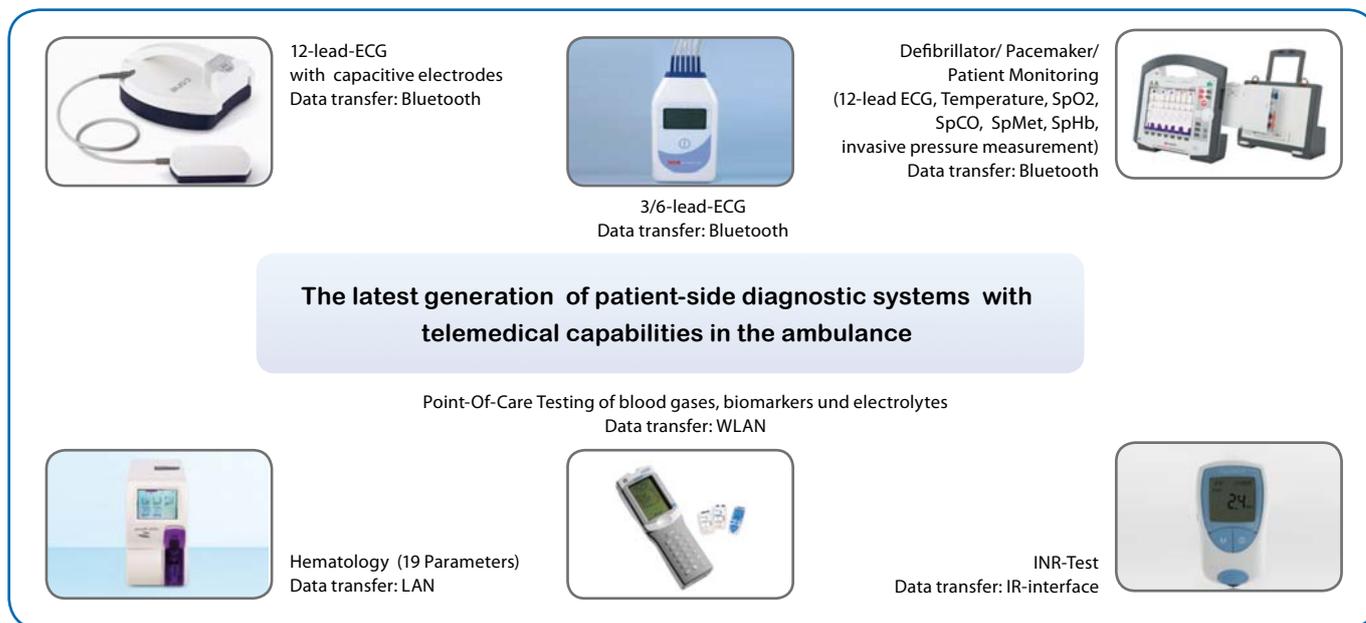
Advantages of the VIMED® TELEMEDICINE SYSTEM

- ▶ Implementation of a near-patient analytics with Point-of-Care systems
- ▶ Diagnostics with telemedical expertise via real-time transmission
- ▶ Initiation of special therapeutic measures (e.g. lysis therapy) already within the ambulance by the paramedic (requirement: special training of the paramedic and considering the specifications of law)
- ▶ Targeting on medical specialized hospitals can be triggered (more effective patient management)
- ▶ Reduction of unnecessary transports and costs



The recent generation of Point-of-Care, laboratory and monitoring systems in the VIMED® TELEAMBULANCE and their advantages:

The following scheme contains the latest available diagnostic systems of the VIMED® TELEAMBULANCE.



Latest trends: An upgrade of the product portfolio of the VIMED® TELEAMBULANCE is in preparation (VIMED® TELEDYAS, VIMED® TELEVERTIGO).

ECG systems

Currently two modern ECG devices with mobile and telemedical applications are available for the VIMED® TELEAMBULANCE. Both devices allow measurement and transmission of ECG data in real-time via Bluetooth to the VIMED® TELEMEDICINE SYSTEM. Therefore the diagnosis of myocardial infarction or cardiac arrhythmia can be realized in a very short time.

The compact and handy 3/6-lead-ECG provides by only 4 adhesive electrodes a 3-or 6-lead ECG by means of additional software configurations. The 3/6-lead-ECG also offers the capability of long-term monitoring of patients.

One step further goes the capacitive 12-lead-ECG, which consists of 2 components with a total of 29 capacitive electrodes. According to the correct placement on the patient the measurement of the ECG can be started immediately by a single touch of a button, without any time delays caused by attaching adhesive electrodes.

Optionally, the individual capacitive electrodes of the ECG can be used for diagnosis in addition to the 12-lead-ECG. So the user receives a visual feedback of the proper functioning of the electrodes and additional information, e.g. regarding the localization of a myocardial infarction.

Hematology-Analyzer

The compact hematology analyzer processes blood samples automatically on insertion of a sealed EDTA tube without further pretreatment. The paramedic receives a blood count of the patient within 3 minutes. The total of 19 parameters offers information about the number of erythrocytes, leukocytes and platelets as well as the hematocrit and the hemoglobin (cyanide-free measurement). Thus the medical staff is opened up the possibility to receive statements on inflammatory processes or anemias, to transmit the results via telemedicine and to coordinate further treatment steps with specialists already at the point of care.

Hand-held units for Electrolytes, Biomarkers, Coagulation parameters and Blood gases

The additional determination of electrolytes, biomarkers, blood gases or clotting values by small, portable and telemedicine enabled handheld systems extends the diagnostic spectrum at the point of care. Thus, inter alia, heart attack specific biomarkers such as cardiac troponin (cT) or creatine kinase (CK-MB), blood glucose or electrolytes etc.

can be determined within a few minutes. All mentioned parameters can contribute to a secure diagnosis or exclusion of certain clinical pictures, such as the stroke at a hypoglycemia (Mimics). Another emergency scenario is represented by ischemic stroke and the initiation of a lysis therapy. For accurate dosing of the lysis therapy substance, tissue plasminogen activator (tPA), information about the coagulation factors are essential (e.g. prothrombin time, INR).

The detection of numerous parameters and their wireless transmission over the VIMED® TELEMEDICINE SYSTEM into the VIMED® TELEMEDICINE FILE and further towards specialists expands the capabilities of patient-side emergency diagnosis and for a number of prehospital initiated therapies, especially focused on time-sensitive diseases such as myocardial infarction, multiple trauma or sepsis. This could contribute to a significant improvement of the patient's outcome.

Defibrillator, Pacemaker, Patient Monitoring

The VIMED® TELEAMBULANCE includes the latest generation of a modular patient monitoring system with defibrillator and pacemaker unit. The patient monitoring system together with the patient box take over the display and recording of vital signs such as temperature, ECG, SpO₂, SpCO, SpMet, SpHb (non-invasive) and invasive pressure measurement (e.g. intracranial pressure). The defibrillation and pacing unit can be used, inter alia, at ventricular fibrillation or as a ventricular pacemaker stimulating the heart muscle location-independent and separated from the patient monitor. With this modular patient monitoring system with defibrillator and pacemaker unit, vital signs of the patient can be monitored or rehabilitated.

The recorded data can be transmitted to the VIMED® TELEMEDICINE SYSTEM and the VIMED® TELEMEDICINE FILE via Bluetooth, and thus also to the telemedicine specialist or the target hospital. This system therefore also supports telemedical diagnosis and enables the optimization of treatment workflows.

VIMED® TELEMEDICINE FILE

The 3rd component of the VIMED® TELEAMBULANCE, the VIMED® TELEMEDICINE FILE combines all laboratory, vital signs, diagnostics and telemedical consultation data of the patient. Therefore the VIMED® TELEMEDICINE FILE constitutes the optimal solution for a prompt, flexible and coordinated diagnosis and treatment. The recorded data in the VIMED® TELEMEDICINE FILE can be transmitted either to an expert in a special hospital during the telemedical consultation or as preliminary information to the targeted clinic. The pre-arrival data transmission enables a better patient management in advance.

Content of the VIMED® TELEMEDICINE FILE

- ▶ Patient data
- ▶ ECG data
- ▶ Data of Point-of-Care analytics / hematology (laboratory)
- ▶ Patient monitoring / vital data

Options for an upgrade of the VIMED® TELEMEDICINE FILE

- ▶ Medication data
- ▶ Radiographs / CT images
- ▶ Therapy data
- ▶ Discharge summaries / release reports from the hospital

Advantages of the VIMED® TELEMEDICINE FILE

- ▶ Preliminary information for the targeted hospital
- ▶ Fast, comfortable and safe data exchange
- ▶ Thus facilitates a faster and better patient management (more efficient treatment)
- ▶ Outcome for the patient is improved
- ▶ With appropriate technical equipment on each site a connection of all the members of the treatment chain becomes possible, including:
 - ▶ Start on location / ambulance staff
 - ▶ Telemedical consultation of a specialist
 - ▶ Admission to a special hospital (emergency room / ward)
 - ▶ General practitioner
 - ▶ Therapist
 - ▶ Nursing service

Competence for telemedicine and eHealth

MEYTEC GmbH
Informationssysteme

Akazienstr. 13
16356 Werneuchen OT Seefeld

Phone +49 (0) 33398 – 78 200
Fax +49 (0) 33398 – 78 299

info@meytec.com
www.meytec.com

