

Pioneering new technologies
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Sensor-Technik Wiedemann GmbH
Mobile Controllers and Measurement Technologies

ESX[®] - C2C



Teleservice
Professional System Solutions
for Mobile Machines



Freely programmable controllers for
vehicles and machines with CAN-Bus



Teleservice for mobile working machines

Due to economic pressures, owners and operators of mobile working machines face the on-going need to optimize the productivity of their equipment. Modern control devices help to meet this demand by managing a multitude of complex tasks in mobile machines. In particular, they offer the potential for teleservice functions that can play a crucial role in achieving this goal. Teleservice can increase vehicle availability by optimizing scheduled service, simplifying unplanned service needs, and offering the possibility of integrating the machines into a coordinated workflow. The daily use of mobile machinery, especially in the areas of construction and farm equipment, can benefit from functions such as:

- Dynamic, real-time service, also via Internet (scheduled service intervals are superfluous)
- Remote maintenance (software updates, diagnostics, calibrations, etc.)
- Transmission of data and status or error messages via GSM/GPRS
- Location and navigation with the addition of a GPS module
- Fleet management
- Theft protection
- etc.

Trough analysis of transmitted data, and in connection with geographical information, the use of vehicles and mobile machines can be optimized and downtimes minimized (e. g. intelligent fleet management, precision farming, etc.). Geographic Information Systems (GIS) are a value added feature. The use of geographic data in the planning and analysis process is an increasingly decisive factor for success and profitability in the use for mobile working machines.

Service- and Integrationtool ESX®-KEFEX

ESX®-KEFEX is a suite of software tools offering enhanced service and integration capabilities in a CAN-Bus network.

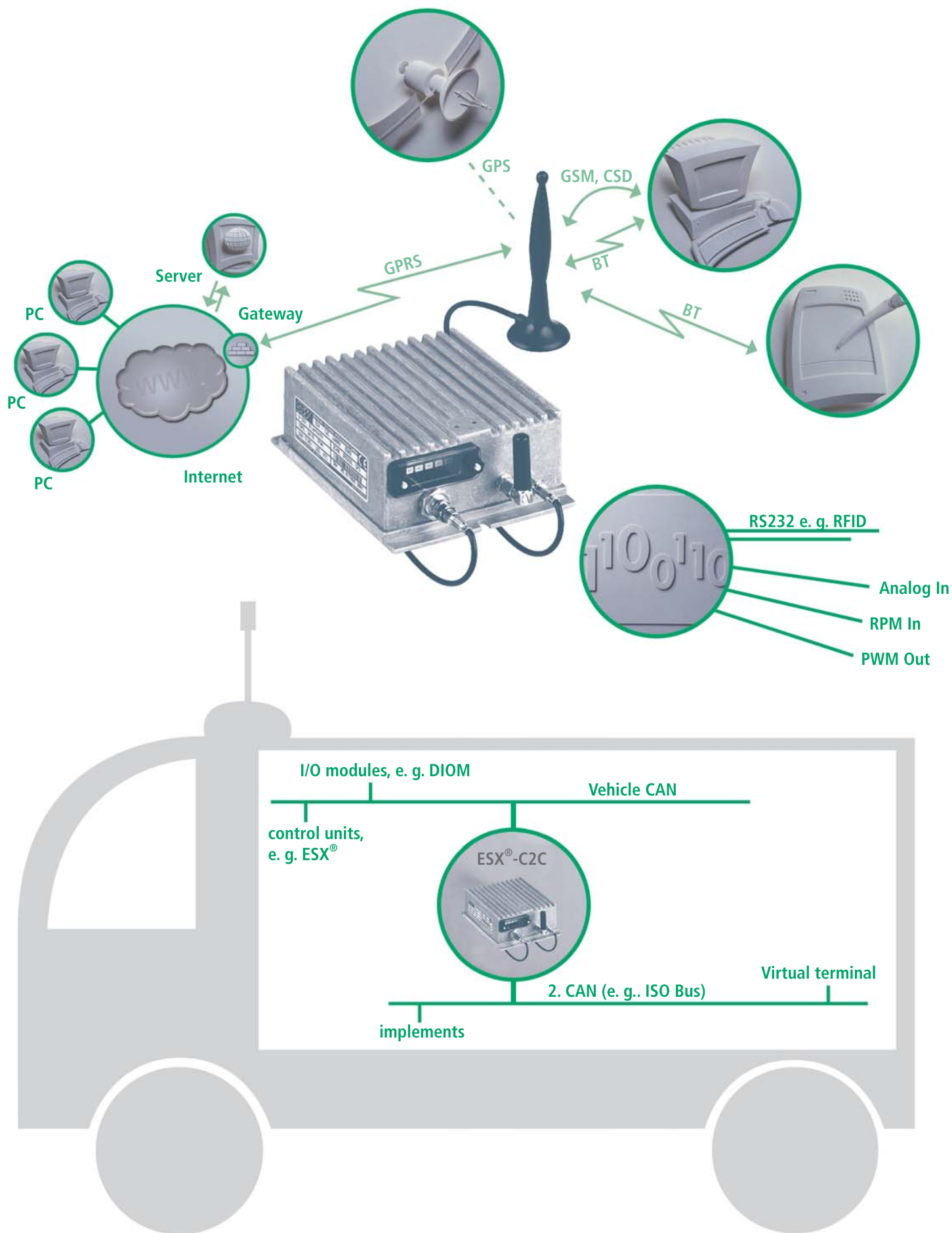
ESX®-KEFEX allows users to create comprehensive monitoring, diagnostic and integration tools. Developers can create customized graphical interfaces for their own use, or provide end-users or service personnel a clear view through the complex structure of the machine.

- System configuration, integration tool and fault diagnosis
- Monitoring of CAN-messages with time stamp
- Software download
- Extensive library of visualization components
- Use as stand-alone program or as an individual designed tool in an integrated user interface

Mobile Data Logger and Tele-Service Module ESX®-C2C

The freely programmable ESX®-C2C module not only provides data-logging capabilities for mobile machines, but also for remote diagnosis e.g. for support of client services via an internal GSM modem.

- Data transfer via GSM/GPRS or internet
- Bridge and Gateway functionality
- Automatically sending of SMS text messages
- Up/Download of data, software, others
- Alarm system with definable text messages
- Interface: max. 2x CAN 2.0 B, 2x RS232



GIS: Geographic Information System

Geographic Information Systems (GIS) consisting of hardware, software, data and application, were first introduced in 1963 in a computer supported geographic information system in Canada. Geographic information (GI) is always computer-generated data. This data is combined with the known coordinates of the surface of the earth and is designed for navigation, planning, visualization or documentation purposes. Geographic information is used daily in digital maps, for fleet management, for creating agriculture yield mapping, or for documentation purposes in quality assurance.

GPS: Global Positioning System

The GPS signal is used for time and location orientation. Its use is free of charge and the signal can be received regardless of weather or time of day. The system is based on 21 + 3 satellites that circle the earth twice a day at an altitude of approximately 12,500 miles. A minimum of 3 satellites have to be visible to the receiver to define a two-dimensional position, and at least 4 satellites must be visible to determine a three-dimension position. Based on the transmitted satellite positions and the transmission times, a specific location can be determined. An accuracy of within 9 miles.

DGPS: Differential Global Positioning System

The accuracy of the GPS navigation systems is not sufficient for certain uses such as site specific farming. Accuracy can be improved by the transmission of a correction signal, and this is the case in Differential Global Position Systems (DGPS). An additional reference station at a known location provides the correction signals via radio frequencies or satellites. This improves accuracy, depending on the system use, to a range of within a few centimeters.

GSM: Groupe Spéciale Mobile/Global System for Mobile Communications

GSM has been the worldwide standard for digital mobile telephone networks since 1992. Currently, GSM is used in frequencies of 900 MHz and 1,800 MHz (Australia, Asia, Europe), and 1,900 MHz (North America, Latin America). The data transfer rate lies in the area of 9.6 Kbit/s, and is therefore not sufficient for broadband applications. User fees are typically calculated based on connection times.

GPRS: General Packet Radio Service

GPRS is a transmission standard for digital mobile telephone networks based on GSM. It transmits data packages instead of a continuous flow of data. Fees are typically calculated based on volume of data instead of connection time. With GPRS, the information is split into separate but related "packets" before being transmitted and reassembled at the receiving end. By bundling 8 of the maximum available GSM data-channels, a theoretical transmission speed of up to 171.2 Kbit/s is possible.

UMTS: Universal Mobile Telecommunications System

UMTS is the mobile phone-standard of the next generation. The essential difference between UMTS and its predecessors is the higher data transfer rate. The maximum data transfer rate is 2 Mbit/s – 32 times the speed of ISDN devices in a cable network. However, with broad area coverage this speed cannot be realized, in rural areas, so-called Marco-cells can provide transmission speeds of up to 144 Kbit/s. Micro-Cells, offering the possibility of transmission rates of 384 Kbit/s, may be used to cover municipal areas. The smallest cell is the Pico-cell, in which up to 2 Mbit/s may be realized. These high-speed "hotspots" are designed to cover areas of high use such as trade show centers, large office complexes, or airports.

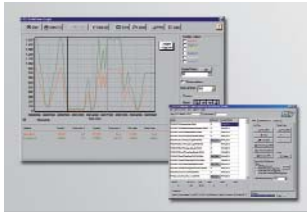
Bluetooth

Bluetooth is an industrial standard under IEEE 802.15.1 for wireless interconnection of devices over a short distance. Bluetooth devices operate as Short Range Devices in the license free ISM band between 2.402 GHz and 2.480 GHz. They can be used throughout the world without registration or authorisation. To ensure robust communication frequency hopping is used, with the band divided into 79 frequency steps of 1 MHz, and up to 1600 hops per second. Theoretically a data transfer rate of 706.25 kBit/s can be achieved for download, and 57.6 kBit/s for upload.

Technical Data

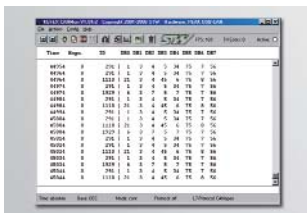
Technical Data		ESX®-C2C Variation		
In- / Outputs	I/Os	up to 5		
	I/O - Variant	A	B	C
	Analog inputs, 0 ... 30 V, $f_{\max}$ 200 Hz, short circuit protected	2	3	4
	RPM input $f_{\max}$, diagnosable, short circuit protected	1	0	0
	PWM outputs 1.5 A high side switch, 0 ... 100%, diagnosable, short circuit protected	2	2	1
Communication	GSM (Q-band / GPRS / EDGE compatible)	optional		
	Bluetooth (Class 2)	optional		
	2x CAN	CAN 2.0 B (11 und 29 Bit Identifier), Low/High-Speed up to 1 MBit/s		
	2x RS232	Serial interface with programmable baud rate		
Processor system	Processor system	16 bit Controller: programmable Watchdog		
	SRAM	512 kByte		
	Flash	1 MByte application software memory, 1 MByte data memory		
	EEPROM	4 kByte		
	GPS 12 Kanal SBAS support (WAAS/EGNOS/MSAS)	optional		
	RTC 2 kByte battery backup RAM, Li-Batt. (15 years), Wake-up-Function	optional		
	Signal LEDs	6 programmable Status LEDs, trichromatic		
System data	Voltage supply	9 ... 32 V DC		
	Current requirements	Stand-by < 0.5 mA RTC-wake-up-mode approx. 4 mA Operational approx 300 mA (without load)		
Mechanical	Connector	16 pol. automotive type (AMP)		
	Chassis	IP 65, die-cast aluminum, GORE-TEX® breathing filter for pressure equalization and high moisture protection		
	Weight	approx. 5 kg (1.1 lbs)		
	Size	approx. 97 mm x 125 mm x 45 mm (38.1" x 49.2" x 17.7")		
Operational environment	Density	IP65		
	Temperature range	-40°C to 85°C chassis temperature with GSM: -30°C to 65°C chassis temperature with Bluetooth: -20°C to 55°C chassis temperature		
	Qualifications / Prüfungen	According to automotive, agricultural and construction industry standards; CE-conformity e1-accreditation of Federal Bureau of Motor Vehicles and Drivers		

ESX®-KEFEX offers users the following options:



System Diagnostics with RAMView

- Real-time monitoring of values held in the RAM
- Design and maintain additional individual variable lists in function-specific windows



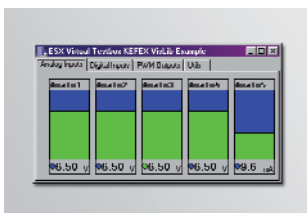
Monitor CAN-Data with CANMon

- Display and transmit messages on the CAN-Bus
- Receipt of CAN-messages with time stamps
- Evaluation of higher CAN protocols, such as CANopen



Download Software with WinFlash

- Specific programming of individual controllers in the CAN-network
- Additional security features for software downloads
- Download via CAN or RS232



Visualize Complex Structures with VisLib

- Create customized PC interfaces for service and diagnostics
- Easy integration of features from E2Edit, RAMView, CANMon and WinFlash
- Extensive graphics libraries for visualization components



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