CAROLA
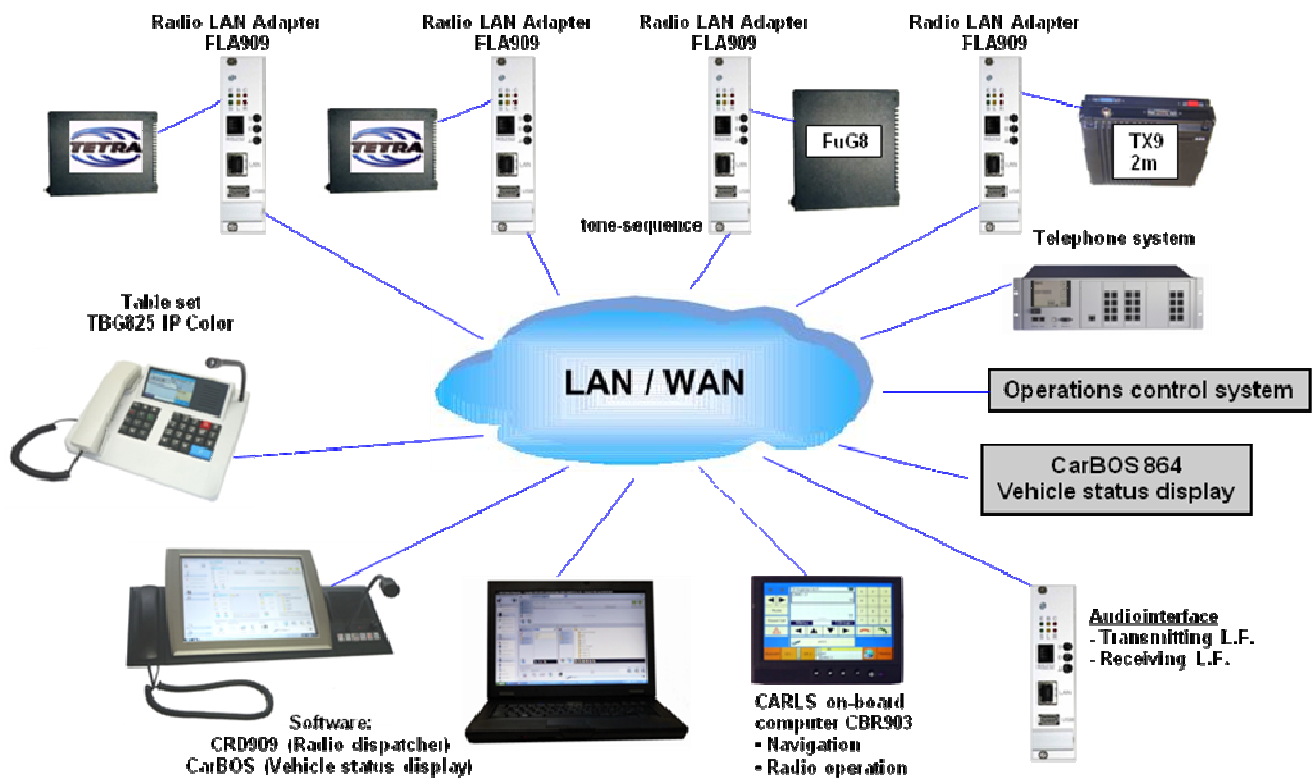
CARLS Radio Over LAN

CAROLA stands for „CARLS Radio Over LAN". It is a system to operate analog and digital radios over IP-based networks. It provides a highly scalable system architecture with three different control sets, a standalone table set, a on-board computer and a software solution running on standard PC hardware. All the control sets are fully compatible and can be used together in mixed installations. CAROLA is suitable for office installations and is also a practical backup solution for control centers. It is a perfect fit for mobile control centers, too. By being independent from any wire-based interfaces of digital radio infrastructures it is easy to implement cost-effective system setups.

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System overview

- Four components:
  - ➢ Radio LAN Adapter **FLA909** to connect radios to the LAN
  - ➢ Table set **TBG825 IP Color**
  - ➢ PC-Software CARLS Radio Dispatcher **CRD909**
  - ➢ Carls on-Board Computer **CBR903**
- Architecture based on concept "No single point of failure"
  - ➢ High security and availability
  - ➢ Defect of a single component does not impact other parts of the system
- Supports TETRA radios of various manufacturers
- Supports analog radios
- Supports telephone systems
- Support for operations control systems
- Supports vehicle state indication (CarBOS864)
- Connection between radio interface and console IP-based
- Digital transmission of voice data (VoIP)
- Flexible and scalable system setup
- Up to 100 radio interfaces (**FLA909**)
- Up to 100 control sets (**CRD909, TBG825 IP Color** and **CBR903** mixed)

System functionality

TETRA

Funktionen	TBG825 IP Color	CRD909	CBR903
Group call / Individual call	X	X	X
DMO / TMO selection	X	X	X
TETRA – Emergency	X	X	X
Gateway	X	X	X
Repeater	X	X	X
Dynamic Groups	X	X	X
Readout and use of talk groups configured in radio	X	X	X
Readout and use of radio's folder structure	X	X	X
User defined folder structure		X	
Send and receive SDS and status messages		X	X
Quality of Service	X	X	X
Direct access to the MMI (console interface) of the radio system	X	X	X

Availability of functionality depends on the services the TETRA radio supports over its PEI interface.

Intercom

Two control sets, both the **TBG825 IP Color** and the **CRD909,** support direct voice communication. For this kind of communication radio resources are not involved. There are two different modes. First is a unidirectional broadcast call from one control set to all other sets in the system. In addition a bidirectional One-To-One communication can be initiated.

Radio-LAN-Adapter FLA909

The Radio-LAN-Adapter **FLA909** allows separation of radio and control set via a LAN/WAN connection.

Design
- Printed circuit board (PCB) for use in 19" racks, comes with additional backplane PCB (Height: 3HE, Width: 6TE)
- Power supply and radio access via backplane
- LAN connection (Ethernet 100 MBit) via front panel

Variants
- Single: Supports only one radio (but many control sets) in one installation
- Multiple: Supports combination of many radios and many control sets

TETRA connectivity
- Supports TETRA radios of various manufacturers
- Readout and caching of talk groups configured in radio
- Readout and caching of radio's folder structure
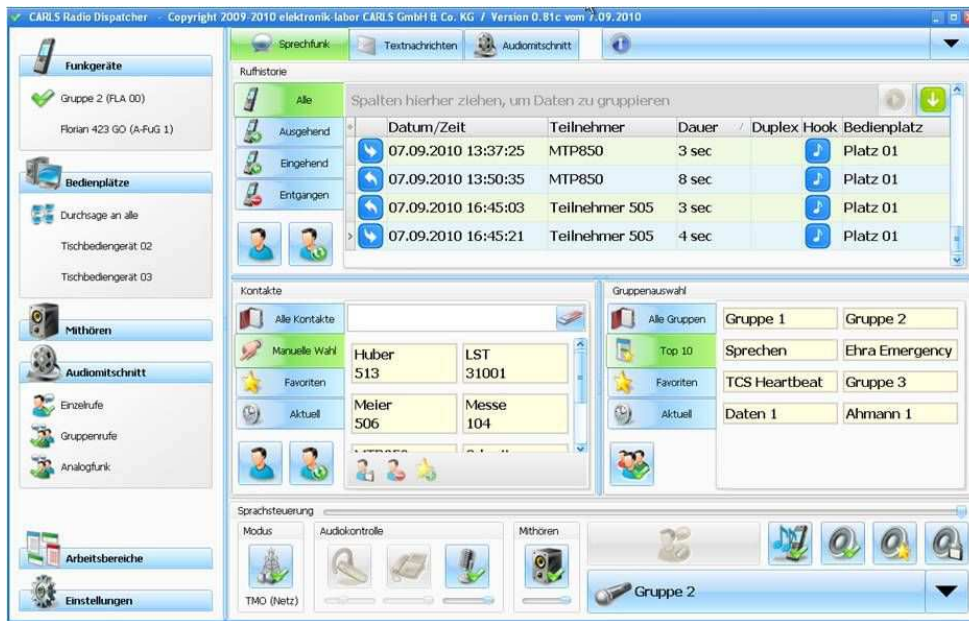
Analog radio connectivity
- Support of 4m- und 2m-radios of different brands
- Channel selection BCD coded
- Switching between operating modes (Simplex/Duplex)
- Operate squelch
- Support for SAS interface of Teledux9 radios

Telephony

In addition to their ability to operate the radios of a CAROLA installation all control sets can act as a phone. This feature requires an optionally available telephone gateway unit. The gateway connects the CAROLA control sets to telephony systems like GSM/UMTS gateways or a PBX. CAROLA works with telephony systems that support the SIP protocol standard for signaling.

Carls Radio Dispatcher CRD909

The Carls Radio Dispatcher **CRD909** is an application running on PC hardware. The **CRD909** enables its users to operate all radios available in the CAROLA installation.
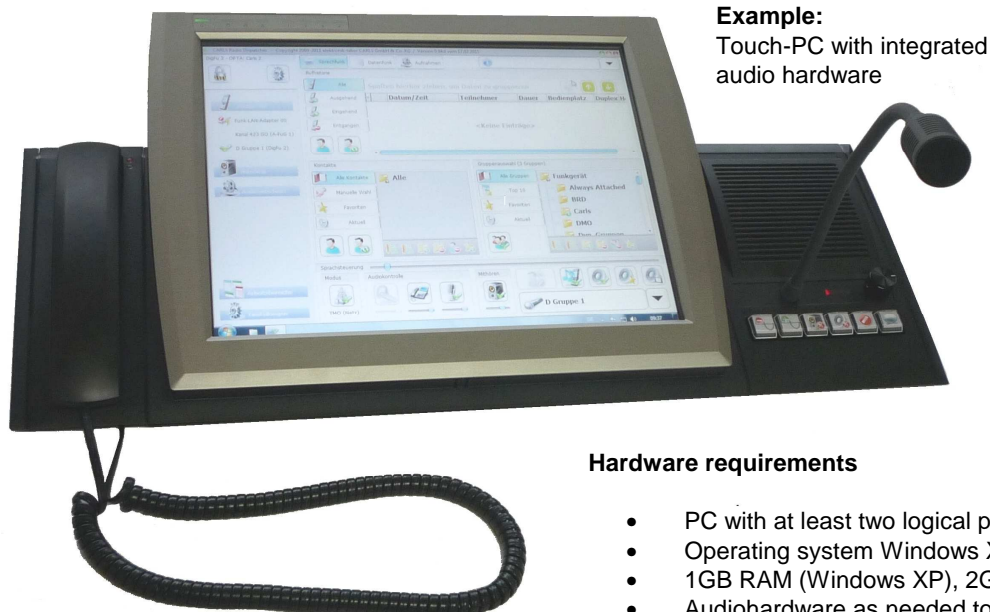

User interface

- Modern look, intuitive use
- Direct access to the MMI of digital radios (console interface)
- Two concepts of use:
  1. Mouse and keyboard
  2. Touchscreen
- Extensive administration of user rights
- Look and functional range widely adjustable
- Headset, Handset and/or Microphone/Speakers can be attached
- External PTT using a pedal switch

Features

- Select active radio, select talk group, select individual call partner
- Automatic use of talk groups as available in selected radio
- Switching between TMO and DMO modes
- Individual calls (Half duplex and full duplex), groups calls, extensive call history
- Flexible volume control (Master volume, separate control of headset volume, handset volume, volume of ambience listening)
- Ambience listening on dedicated speakers
- Send and receive SDS messages, SDS template management
- Operation of analog radios
- Fully customizable voice recording (Optional)
- Telephony support (Optional)
- Map integration supporting GPS-based location systems (Optional)

Example:
Touch-PC with integrated audio hardware

Hardware requirements

- PC with at least two logical processor cores
- Operating system Windows XP or Windows 7
- 1GB RAM (Windows XP), 2GB RAM (Windows 7)
- Audiohardware as needed to install microphone, speakers, headset and/or handset

Table set TBG825 IP Color

The **TBG825 IP Color** is a versatile remote controller in a modern style case for in-house usage. It supports control of and voice communication over all digital and analog radios available in a **CAROLA** installation.

- Convenient and efficient controlling for one or more operators
- Build-in version for control station tables
- Easy handling with goose-neck microphone and speaker
- Integrated monitoring speaker
- Optional connectors for a third and forth speaker
- Hand set with PTT-Key for private conversation (duplex)
- High-contrast 4,3" color-display 480 x 272 Pixels
- Interface to external accessories (headset, pedal switch and voice recording)
- LAN connector   (Ethernet 100 MBit)

Specifications TBG825 IP Color

Power supply	12V DC / 800mA using an external power supply unit or PoE (Power over Ethernet)
Temperature range	0° up to +60° Celsius
Dimensions	18 mm (Front) raising to 48 mm (Back) x 300 mm x 225 mm (H x W x D)
Color	Light grey (similar RAL 7035)
Material	ABS

On-board computer CBR903

The CARLS on-board computer **CBR903** was developed especially for in-car installations. It can also be used as a compact alternative to the other two control set options, **TBG825 IP Color** and Carls Radio Dispatcher **CRD909**.

The **CBR909** is operated via its touchscreen. For voice communication several different options are available:
- Handset
- Headset
- Speaker/microphone combination

In mobile control centers or for other mobile solutions the **CBR903** can be provided with an optional route guidance system (See product information sheet **CBR903 DAT**).

On demand we can deliver special editions. We also develop customised solutions for your hard- and software requirements.