



**WENZEL**  
ELECTRONIC::SYSTEMS

## Wenzel-MACS-R Dispatcher System for GSM-R



Wenzel-MACS-R is a modular communication system for railway applications, outstandingly suited for use in Train Control Centres (TCC).

The Wenzel-MACS-R permits access to a wide range of communication technologies used in railway infrastructures such as legacy technologies (e.g. like local battery LB, central battery CB, ISDN and analogue train radio) as well as GSM-R Voice over IP.

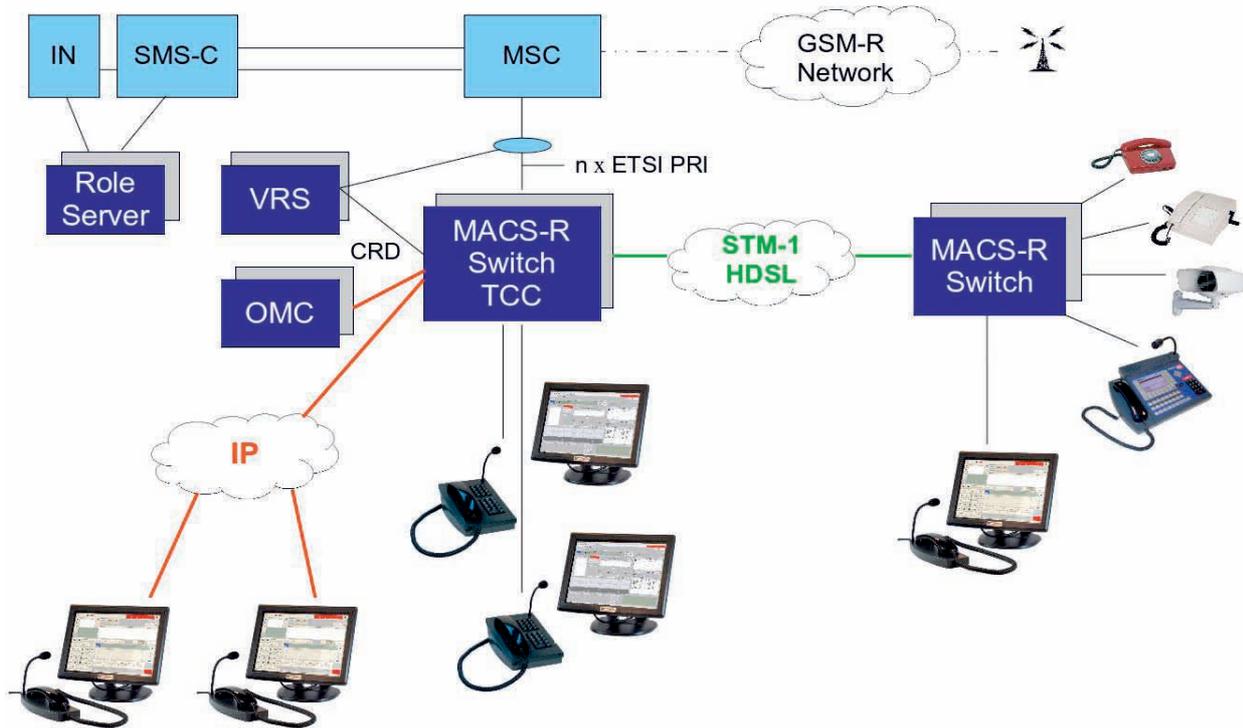
Integration of the various communication services via a uniform system and unified dispatcher terminals leads to a **significant reduction of operating costs**. Legacy systems can be connected and functionally integrated to Wenzel-MACS-R.

The versatile interface modules for a variety of subscriber and network interfaces guarantee high **protection of investments** because of the integration of existing communication equipment and infrastructure.

Thanks to the modular architecture the Wenzel-MACS-R can be scaled from a system with a few dispatchers controlling a single line up to a country wide network with several train control centres and many stations at the lines.

Wenzel-MACS-R ensures **high reliability** due to its fully redundant system architecture. The system redundancy comprises self-restoring network topologies ensuring the redundancy of central control components and different default routing strategies in case of failure. Wenzel-MACS-R is available even as a **geo-redundant** two-site solution in which a backup site takes over all functionalities of a main site in case of disaster or faults.

As part of the Wenzel-MACS-R the MACS-R Role Server provides an **efficient role management** where calls are notified to all dispatchers registered for the related role. This ensures role sharing by several dispatcher terminals during peak hours and handling of several roles by one dispatcher. The role management secures that no role can be left unmanned in the system and no calls get lost.



The Wenzel-MACS-R central Voice Recording System (VRS), connected at the interface to the MSC, records all GSM-R calls including extensive Call Related Data (CRD) like functional numbers etc.

The Wenzel-MACS-R switch is connected to the GSM-R network via redundant ETSI PRI (S2m) EIRENE compliant fixed connections to the Mobile Switching Centre (MSC).

In conjunction with SMS-C and IN-interfaces, functional addressed SMS are fully supported. Train position information can be provided to the IN for proper eLDA support.

Wenzel-MACS-R Dispatcher terminals can be connected to the switch via basic rate interface (S0), U-interface (Up0), LAN (VoIP) or GSM-R air interface.

### Wenzel-MACS-R Dispatcher Terminals

The Wenzel-MACS-R allows the use of various types of dispatcher consoles for GSM-R as well as for legacy train control voice applications.

From desktop dispatcher terminals like the Wenzel-MACS-GeFo particularly suited for local train stations up to screen based workstations with a graphic user interface (GUI) for train control centres a wide range of dispatchers are available.

The GUI dispatcher terminals are based on a low power embedded Linux PC without any moving parts.

The ergonomic design of the user interfaces ensures a smooth, convenient operation even in critical situations. The dispatcher terminals are fully compliant to the EIRENE specification.

Administration, configuration, and maintenance are done remotely from the central OMC.



GSM-R screen optimized for touch operation

For the Wenzel-MACS-R system several operator consoles are available. They can be combined with touch panel devices (12"-19") or monitors with mouse operation.



The audio device **MFAD** is best suited for operator stations with extremely limited desk space.

All functionalities like call acceptance and dialling can be managed via mouse or touch panel.

Beside handset with PPT button and gooseneck mic, the MFAD comprises a loudspeaker for hands-free speaking and listen-in to a second active call.

The **MFTT** is optimized in desk space and functionalities. Due to programmable keys for most used functions as well as for RECs and navigation the handling is easy.

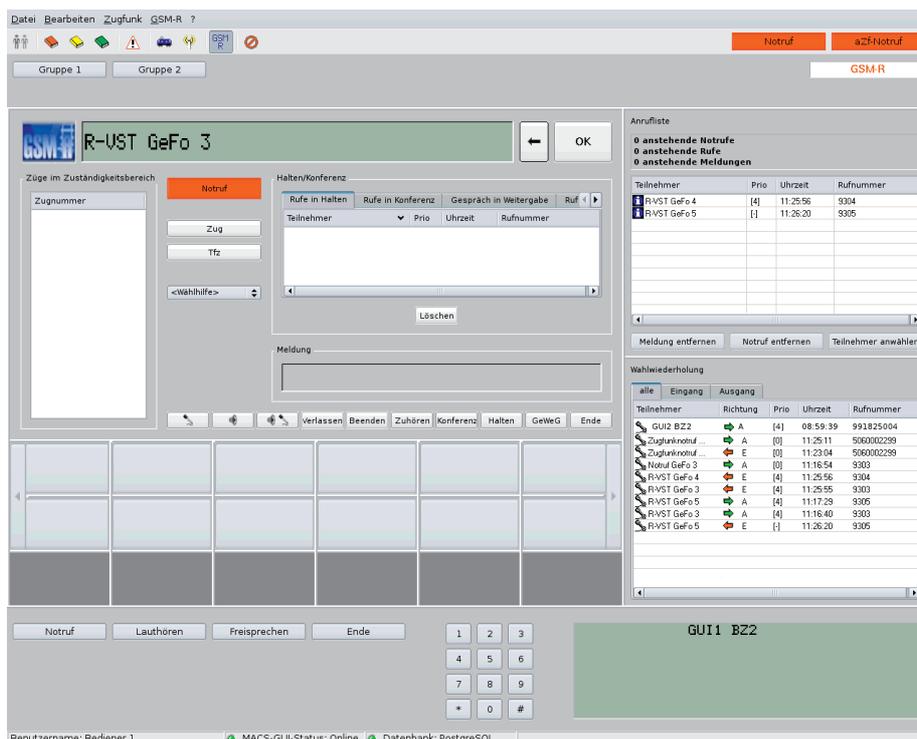
Arbitrary calls or group calls can put onto the listen-in loudspeaker.

The MFTT supports call acceptance and dialling functional numbers by special keypad.

The **MFTK** comprise 48 line keys, 8 programmable LCD keys, direct dialling keys as well as function keys.

All incoming calls are queued according to time and priority onto the LCD keys. Emergency calls are lighted in red. The key shows mnemonic, functional address or number of incoming calls. The operator can answer the call by simply pressing the LCD key.

All operator consoles mentioned above include a gooseneck microphone, hands free loudspeaker, handset with integrated PTT button, and connectors for an optional headset.



GSM-R screen for mouse operation

## Operation & Maintenance Centre

The Operation and Maintenance Centre (OMC) provides the management capabilities for the entire Wenzel-MACS-R. From here the system configuration is initiated including full-automatic distribution of new software versions.

All configuration data are stored in the central database at the OMC and can be downloaded automatically or on request.

This ensures easy system maintenance and backup functionality which results in a significant reduction of operating and service costs.

Via a powerful network based tool set configuration changes can easily be performed from any location connected to the network.

All important system diagnostic states are logged at the OMC and together with the stored configuration the administrator has permanent control of the whole system.

Of course the OMC access is password protected, and all OMC actions are logged.

### Features

- Connection of dispatcher terminals via BRI, Up0, GSM-R air interface or VoIP
- All telecommunication services via a uniform system
- Efficient role management
- Functional addressed SMS
- Train position provision to IN for eLDA support
- Central voice recording including all relevant call related data
- High reliability due to fully redundant system architecture and geo-redundancy
- Compliant to EIRENE specification
- Wide range of dispatcher terminals available
- Administration, configuration and maintenance via central OMC

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