



## KEY ADVANTAGES AT A GLANCE

- High degree of technical expertise throughout the entire process
- Comprehensive, complete solutions from a single source
- Reliable systems and components with practical demonstration of MTBF values
- Systems of renowned Swiss quality at attractive prices
- Individual solutions tailored to meet your needs
- Experienced graduate engineers providing personal attention

## METRO AND RAILWAY SYSTEMS

COMLAB is your ideal partner for professional solutions in the RF sector. Our core business includes broadcasting, PMR and communication systems for railway and road tunnels, as well as building lighting, extensive outdoor radio coverage and specialised solutions.



# SOLUTIONS THAT DELIVER FULL COVERAGE

For over thirty years, we at COMLAB have focused on radio frequency (RF) technology. Our involvement includes design, development, production and installation of turnkey high-frequency radio systems. Our considerable expertise and many years of experience mean that we are able to competently support our customers in discovering solutions for all of their problems.

## TARGET SEGMENT

- Safety and Emergency Organisation
- Army, Border Guard and Civil Protection
- Mobile Network Operator
- Radio and TV Station
- Railway and Subway Operator
- Radio and Network Operator
- Public Authorities, Authority
- Private, Industry, Enterprise

## APPLICATION

- Road and Motorway tunnels
- Traffic and Escape routes
- Railway tunnels, Subway lines
- Football stadiums, Malls, Car parks, Stations
- Hospitals, Clinics
- Military and Civil Protection installations
- Intrain, Airports
- Industrial areas, Construction zones

## GUARANTEED QUALITY

COMLAB's systems demonstrate excellent MTBF (mean time between failures) values. Optimum product and system quality ensures fewer faults and hence lower life cycle costs.

## USAGE

COMLAB presents a highly flexible and modular multiband digital repeater system MUD/RUD(19)-5 for a large variety of frequency bands. It supports all kinds of services such as CDMA, TDMA, OFDMA, GSM, UMTS and LTE. All services can be mixed onto the same MUD.

The system is designed to be used as Inline Repeater, Off-air Repeater or Air-link Repeater.

The *Remote Units Digital* RUD(19)-5 are connected via fiber optical links to the central *Master Unit Digital* (MUD).



## FUNCTION

The COMLAB system treats the communication network signals separately in the uplink and downlink path.

The possibility to use the system for frequency-transformation is built in. Provider signals can be treated band- or channel-selective upon request. Automatic power level adjustment and monitoring can be provided for both downlink and uplink.

Redundant system parts and functions will enhance the overall reliability dramatically.

## SYSTEM PARTS

### MUD

Master Unit Digital  
66...1000 MHz, 380...2680 MHz

- 19" Rack x 450 mm, 4HU
- Up to 20 Fiber optic links to RUD per unit
- Auto level functionality
- Power supply DC or AC

### RUD5

Remote Unit Digital for outdoor use

- Up to 5 frequency bands
- Up to 3 Fiber optic interfaces
- Sub band ALC
- Automatic power control
- Power supply DC or AC

### RUD19-5

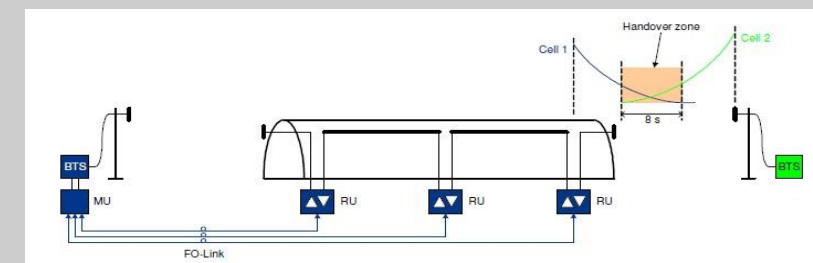
Remote Unit Digital for indoor use, rack integration

- 19" Rack x 455 mm, 4HU
- Up to 3 Fiber optic interfaces
- Sub band ALC
- Automatic power control
- Power supply DC or AC

### COSweb

Client Monitoring Software

- Web based software



## SERVICES

### System integration

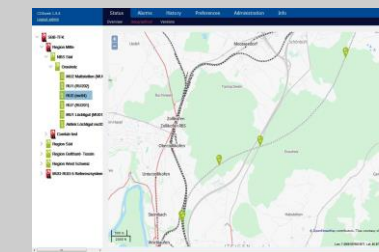
MUD/RUD(19)-5 on site integration, measurement and approval

- Engineering, transport, mounting
- Radiation measurements outdoor and in tunnels or buildings

### After Sales Support (Option)

1st and 2nd Level Support on site on request.

- Training Administrator, Observer
- On site support
- Maintenance, software updates



## USER GUI

### COSweb

Web based configuration and monitoring software

- Remote configuration of provider BTS-RUD relation
- Monitoring of all connected units
- Setting of RUD gain and output power
- Checking of logged data of all units connected to a system

## SPECIFICATIONS

### Key Advantages

- Multiple band, multiple operator
- Application modulation independent
- Five bands in one RU enclosure
- Highest power efficiency
- More than 16 sub-bands
- Signal distribution inside tunnel via leaky feeder cable or antennas
- Software defined radio applied
- Auto setup
- Band specific configuration
- Web based configuration
- Remote control by HSDM
- Extreme high reliability by system redundancy
- Best total cost of ownership

### Life cycle

- 10 year part availability

Frequency	66...2680 MHz
RF Power	25...47 dBm each band
Fibre optical loss	up to 14 dB WWDM
System	up to 64 RUD
Power Supply	18...64 VDC 50.4...137 VDC 90...264 VAC
Size	500x550x300 mm 19" Rack 450 mm, 4HU
Weight	7.8 kg each band
Enclosure	Wall mounted IP67 19" Rack IP20
Environment	-25...55°C, 95% HU -5...45°C, 95% HU
Cooling	passive or active FAN