

...the broadest narrowband money can buy

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About us

A b o u t u s

The year 1989 was not only the year of the Velvet revolution, which subsequently led to the fall of communism in the former Czechoslovakia, but also the year RACOM's foundation was laid. Even before the revolution we had already begun producing equipment for radio amateurs in a small workshop and had successfully begun exporting.

However, the amateur radio market was soon too small and so we began to look further afield...

Today RACOM is a private, wholly Czech-owned company and has been heavily involved in the development of wireless network solutions since 1990. The design, installation and management of networks built from components developed and manufactured by RACOM is an integral part of the wide spectrum of services offered to customers. We have been one of the leading players on the global market since the early 90's of the 20th Century and play a significant role in setting development trends in our field.

We own a technological centre for SMT and Hybrid Assembly, a subsidiary company RACOM Slovakia and a huge network of foreign partners distributing majority of our exports.

The company's products are best known for their performance, high-quality, reliability and added value for the user. One of the biggest advantages is the great deal of variability allowing us to tailor the design of communication solutions to specific applications. We have installed thousands of modems for hundreds of satisfied customers in tens of countries on all continents of the planet – a clear indication that we are doing our job well.



A b o u t u s



MORSE

M O R S E

MORSE is an advanced communication system based on hardware and software components developed and manufactured by RACOM. Radio modems form the core of this packet network despite the fact that almost any transmission medium may be used.

A MORSE network is always designed and dimensioned to a customer's specific requirements. As a customer's needs grow so can their network, thanks to the modular design of the system. The MORSE system is ideal for applications requiring frequent transmission of short messages with a minimum response time.



M O R S E

Benefits of the MORSE system:

- Proven functionality and reliability – **extensive networks** (more than 1300 points)
- Installations in both advanced as well as developing countries offering communication from such remote areas as the arctic circle to the equator
- Stationary **networks** of various types: **point-to-point**, **point-to-multipoint**, **multipoint-to-multipoint**
- **Mobile cell networks** – each point can simultaneously operate as base station for mobile site
- Different transmission media: radio channel, GPRS, IP..
- More than **70 industrial protocols** supported on serial interfaces (Modbus, IEC, DF1, DNP3, Profibus, etc.)
- Full integration of **Ethernet and IP** (TCP and UDP)
- **Dispersed intelligence** – identical hardware for remote stations, centres and repeaters
- **Unlimited number of retransmissions** – each modem can simultaneously operate both as remote station, repeater or base station of mobile network
- Unique **protocol** on the radio channel: anti-collision and highly secure
- **Virtual networks** for various applications within a single MORSE system
- **Remote control**, diagnostics and configuration of components
- **Free firmware updates**; on-line upgrades via remote access

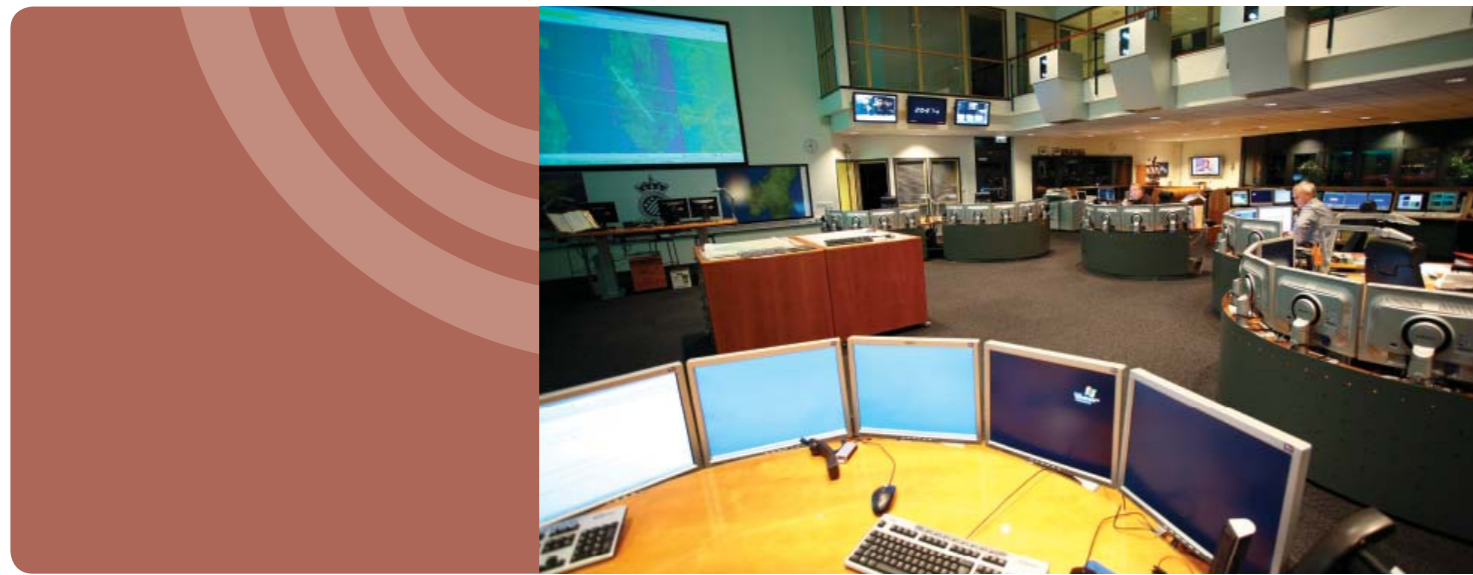


Applications

A p p l i c a t i o n s

Thanks to its versatility and its state-of-the-art technology the MORSE system can be employed for data transmission in a wide range of applications from conventional telemetry to accessing the Internet. The MORSE system can be found in places where other radio systems cannot be used and thus where you wouldn't even expect it.

The use of durable hardware of exceptional quality means that the MORSE network can be set up in the most demanding of environments.



Telemetry & SCADA

The MORSE system with its tens of industrial protocols for the user interface is an ideal solution for the transfer of data where you need to control technological processes in real time, i.e. SCADA applications. These applications include the distribution of drinking and waste water, the generation and distribution of electricity, gas or oil products. The MORSE system may also be applied to control street lamps or to transmit information to public information boards.

Mobile networks

The unique capabilities of the MORSE system – to communicate with mobile objects in a cell network – are used for controlling public transport, for the transmission of data to trains, monitoring taxis, communicating with rescue vehicles or communicating with ships at sea.

Transaction networks

Transaction networks require extremely short response times – an ideal application for the MORSE system. RACOM radio modems, with high transfer speeds and excellent switch times, provide communication possibilities for points of sale, ATMs and lottery systems.

IP networks

The ability to provide a transparent IP interface predestines MORSE systems for use in areas lacking networks built around a common infrastructure, e.g. on the open sea or in remote areas of third world countries.

Public safety

The MORSE system is ideal for communication within security systems thanks to its inherent characteristics and the use of the radio channel. To this end RACOM supplies its modems to Police Forces as well as to private agencies.

Internet access

The MORSE system is successfully exploited for accessing the Internet over extremely long distances or in areas with an underdeveloped infrastructure.

A p p l i c a t i o n s

Hardware

R a d i o m o d e m s

Radio modems for frequencies in the 160–400 MHz band are the primary building blocks of the MORSE communication system. Compared to standard radio modems, the main difference is represented by high-end intelligence and functionality of radio-routers.

RACOM offers modems for all common bands and channel widths in both half-duplex and full-duplex options with output power up to 25 watts. Their speed and switching time are always on the border of physical possibilities. The modular concept of construction means that solutions can be adapted to every customer's individual requirements.



Benefits

- Long-range coverage of **tens of kilometres** (without the need for direct visibility)
- Highest possible transfer speed – up to **196 kbps**
- Rx/Tx switching time < 1.5 ms
- **Sleep mode** with power consumption 2.5 mA
- **Programs** for remote control, set-up, and diagnostics **free of charge**
- Stationary **networks** of various types: **point-to-point, point-to-multipoint, multipoint-to-multipoint**
- **Mobile cell networks**
- Functionality proven in extreme climates world wide

Technical parameters

Frequencies	135–175 MHz 290–380 MHz 380–470 MHz 861–870 MHz
Channel [kHz] / speed [kbps]	12.5 kHz / 10.68 kbps 25 kHz / 21.68 kbps 200 kHz / 133 kbps 250 kHz / 196 kbps
VF power	0.1–5 W nebo 0.1–25 W
Sensitivity	better than -107 dBm for BER 10 ⁻³
Modules	RS232 (max 4x) RS422 / RS485 (max 2x) Ethernet (max 2x) GPS (max 1x) I/O (2xAI, 2xAO, 2xDI, 2xDO)
Power supply	13, 8 V (10.8–15.6 V)
Range of operating temperatures	-25 °C to +55 °C

All products are designed to comply with the most stringent European **ETSI** EN 300 113 standards for LBT (Listen Before Transmit) equipment as well as with American **FCC** and Canadian RSS standards. In the case of mobile installations the products comply with the **EHK10** standard.

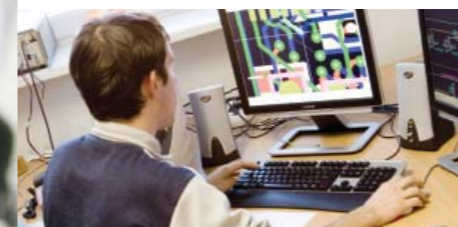
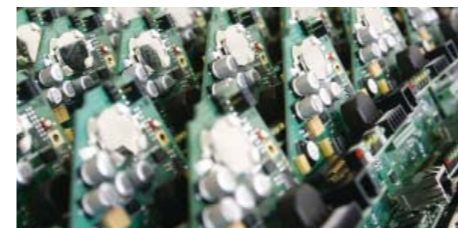
R a d i o m o d e m s

Hardware

O t h e r c o m p o n e n t s

Besides its radio modems RACOM also develops and manufactures other essential components of the MORSE system without which networks would not be able to achieve such peak performance parameters.

These additional hardware primarily allow other transmission paths besides the radio channel to be integrated into the MORSE system.



MG100

This is similar to a radio modem, however GPRS is used as the transmission medium. From the user's point of view and with respect to interface options the MG100 is fully compatible with radio modems. This means that a communication network can even be extended into areas where the use of radio technology is not permitted.

Controllers

These allow the MORSE network to be extended where a communication channel already exists (e.g. an IP network) and where there is no need to use radio or GPRS. From the user's point of view and with respect to interface options controllers are also fully compatible with radio modems.

MRouters

These are primarily used in network centres and in special applications. Depending on the type of MRrouter used several Ethernet type interfaces are available over which the MORSE network can be connected to many physically separated IP networks.

Power supplies

Owing to the extremely fast switch times achieved by RACOM radio modems, high demands are placed on the durability and quality of power supplies. For this reason RACOM manufactures the following 3 top-end power supplies:

- MS2000 – network power supply with an output voltage of 13.8 V or 24 V and a unique method of back-up
- MSU120 – solar power supply with an output voltage of 13.8 V
- DCC24 – a 24/13.8V DC voltage converter

Accessories

The RACOM product line also includes power converters and optic isolators between OPI interfaces and various types of switchboards. Although not manufactured in-house RACOM also supplies a wide range of additional accessories which are essential for operating a communication system.

O t h e r c o m p o n e n t s



VHF Data

MORSE network for communication of ships on an open sea:

- GPS tracking
- Email
- POS terminals
- Weather forecasting
- WWW browsing

Software

S o f t w a r e

High performance hardware produced in RACOM naturally deserves the highest quality software. For this reason we ensure that the software developed for the MORSE system is of the highest quality and is totally reliable. All software are continually perfected and tested and where appropriate customers' comments and suggestions arising from their use of RACOM products are flexibly implemented into the software. This leads to a systematic improvement in the performance, quality and efficiency of the MORSE system.

MORSE system users receive all software updates free of charge ensuring that networks are permanently maintained in peak form.



Software developed by RACOM can be split into 3 basic groups:

Firmware

This is the heart of the radio modem and related equipment. Its primary role is to ensure communication over user interfaces, control the configuration of the radio parts of the equipment, and last but not least to handle communication over the radio channel. All this in real time with maximum speed and efficiency.

Utility

This is a set of diagnostics and configuration tools for the MORSE network. These tools allow users to configure, diagnose and test individual components as well as whole networks by themselves and again they are available free of charge.

Network Management

This comprehensive software package, which we have named RANEC, is utilised for MORSE network management and supervisory control, although it may also be used for designing, developing and servicing networks. Thanks to the RANEC software, customers can monitor the operation of networks and alarms in real time, store and analyse various statistical data for individual points, work with a digital model of the terrain, and implement a whole host of other functions as well.

S o f t w a r e

Services

S e r v i c e s

RACOM provides its existing and potential customers with a range of services for assisting with running an existing network or for setting up a new radio data network.

Before any decision is made to purchase a RACOM solution we perform a thorough analysis free of charge to ascertain whether the MORSE system is the most suitable solution for the application in question.



Examples of the services provided by RACOM:

Designing and engineering of radio networks

Before a network is built theoretical calculations are made using a digital model of the terrain and our in-house software, RANEC. Test measurements are taken in the field using specific radio modems and design documentation is prepared for telecommunication authorities and for subsequent implementation of wireless solutions.

Installation

RACOM has its own in-house team for installing and commissioning MORSE networks.

Servicing and technical support

Customers may choose from a wide spectrum of servicing options. Our servicing options include occasional remote technical assistance, permanent network monitoring, or even servicing within 4 hours of receiving notification. Naturally, training for system users is an integral part of the service we provide.

MODANET

This is a public telecommunication network for data transmission based on the MORSE system operated by RACOM in the Czech Republic and Slovakia. MODANET is proof that the MORSE system is suited to building extensive nationwide networks containing hundreds of radio modems and allowing the simultaneous existence of multiple applications and users. Customers primarily value MODANET for its fast deployment and scalability without additional fees. Customers are also relieved of management duties associated with running a private network (periodical messages, notification of changes, etc.) and accountability to state authorities for its operation. Users keep all the characteristics and advantages of a private network.

S e r v i c e s

References

R e f e r e n c e s

Thanks to the use of state-of-the-art technology and reliable technical backup the MORSE system is running successfully in tens of countries on all continents of the globe. Users of the MORSE system always have technical support at hand thanks to RACOM's extensive international network of partners. The MORSE system is used by companies of all sizes from both the public and private sectors.

A few of the most interesting reference applications are illustrated below. Further information is available on www.racom.eu.



Telemetry & SCADA

The MORSE system provides communication possibilities for hundreds of telemetry applications around the world, for example:

- **Water and wastewater applications** – more than 500 networks in 13 countries
- **Gas applications** – the largest network based on the MORSE system (Slovakian Gas Industry – Slovakia more than 1300 points)
- **Energy and heating applications** – installed in nuclear power stations and utilised for monitoring and controlling vital processes in the development and distribution of electricity and heat
- **Oil applications** – data transmission from oil fields and prospecting sites
- **Monitoring the environment** (Saudi Arabia), weather (Yemen), seismology (Greece)

Mobile networks

- **City transport** – controlling public transport (Brno, Czech Republic more than 700 vehicles)
- **Metro** – communication system for underground trains (Porto, Portugal more than 70 trains)
- **Taxi service** – fleet management for the taxi service (Solun, Greece more than 600 taxis)
- **Rescue services** – management of the rescue service system (Graz, Austria more than 60 ambulances)

Transaction networks

- **Points of sale** – nationwide network of POS terminals at petrol stations (Czech Republic more than 300 locations)

IP networks

- **VHF Data** – mobile network for communication with ships on the open sea (Telenor, Norwegian coast)
- **ANS** – network with nationwide coverage for communication between banks (Arrow Network Systems, Ghana)

Security and surveillance

- **Police supervisory centre**, nationwide network (Czech Republic, MORSE system and more than 4000 special radio modems)

Internet access

- **JAVELIN** – a system using the MORSE network allowing secondary schools to connect to the Internet (nationwide, Ghana)

Other applications

- **Wireless transmission of lap times** during sporting events (orienteeing, karting, International six-day enduro, etc.)

R e f e r e n c e s



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Company profile



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