

GPRS in modern Telemetry

“GPRS in modern Telemetry” is an advanced technical training covering all aspects related to telemetric data transmission applications, utilizing GPRS packet transmission in GSM, UMTS and LTE mobile networks. Since GSM technology has the largest geographical coverage and highest reliability, it is presented as a base solution for telemetric applications. Other mobile technologies – UMTS and LTE are described from the point of view of differences in relation to GSM technology, as they are solutions used to ensure high bitrates or minimize delays. The training covers also other services offered by mobile networks that can be used to transfer telemetric data (SMS, USSD, CSD).

Target audience

The training is dedicated to developers and users of telemetric GPRS systems.

Training contents

- **Introduction**
(mobile systems standardization, cellular system concept, theoretical and real cell shapes, radio transmission problems and solutions),
- **Network structure**
(nodes and interfaces, addressing and identification, APN),
- **Signalling procedures**
(terminal registration in network, location update, session establishment, IP address allocation, parameters negotiated during signalling procedure affecting delay and battery consumption),
- **GPRS radio transmission**
(physical and logical channels used in packet transmission, static and dynamic GPRS channels configured in cell, channel allocation and release, channels sharing by multiple terminals, difference in behaviour of different standard terminals – from R96 to R9, differences between GPRS and EGPRS/EDGE, physical channel throughput, data and IP header compression)
- **QoS**
(QoS parameters negotiation between terminal and network, sources of QoS parameters, QoS profile parameters in R96 and R99),
- **GPRS terminal**
(telemetric terminal types, multislot classes, power classes and other basic catalogue terminal parameters, communication between GPRS terminal and telemetric application, AT commands),
- **Security procedures**
(authentication, ciphering, integrity control using SIM and USIM parameters, terminal legality verification),
- **Other data transfer services in mobile networks**
(SMS, USSD, CSD, missed call signalling utilization),
- **Outdoor antenna systems**
(cell coverage, radio link budget, logarithmic scale, units used in calculations, types and characteristics of antennas attached to a terminal, directional antenna gain, coaxial cable attenuation, attenuation of different types of objects (walls, ceilings, metal boxes, PVC boxes, windows, practical measurements of signal level),

- **GPRS communication reliability**
(dual SIM, roaming, SGSN in pool, SIM card configuration),
- **Practical presentation of telemetric system**
(practical demonstration of test telemetric system with active cooperation of students).

Prerequisites

General knowledge in the domain of telecommunication/electronics/informatics at university level.

Training method

Lectures, practical presentation, practical and theoretical exercises.

Duration

2 days

Level

Advanced

Practical telemetric system

