focusinfocom

Empowering train operators in mobile network measurement

Tools, expertise, solutions

Holistic solutions for train operators

Decent mobile connectivity on board public transport is the foundation for technological developments and an important element for people when deciding how they travel. Done right, it can lead to cost improvements, new passengers and new revenue streams. Subpar solutions, however, waste time and resources and can even weaken customer satisfaction if their real experience falls short of their expectations.

Focus Infocom provides you with the tools, resources and services you need to get a complete picture of mobile coverage and the user experience on board trains or public transport in general. We help create the expertise and data you need to make solid investment decisions and deal with operators or suppliers of in-train systems such as repeaters or Wi-Fi routers.

Whether you are taking your first steps in this sector or you want to improve and expand on what you have already achieved, we are here to support you with our solutions.

Our service portfolio supports your team in the best possible way:

- Delivery of tools and systems
- Task-specific campaigns
- Complete operation and ongoing operational monitoring, processing of data

The resulting information is valuable not only for your investment decisions or the optimal use of your systems. It also enables you to clearly communicate your requirements to suppliers and evaluate their offers.

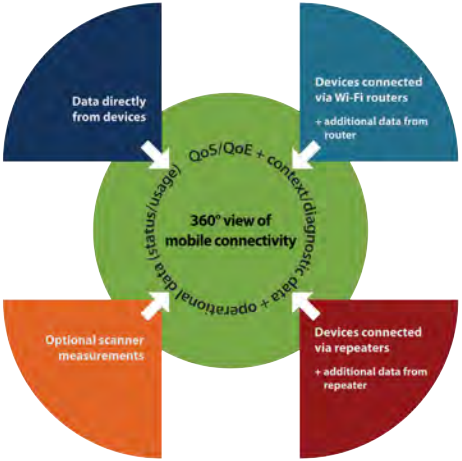
Creating a solid data base

Solid information is the basis for every investment decision. We offer the tools and expertise to reliably generate this foundation.

The common basis of all solutions are systems that provide insight into the quality of service from the passenger's point of view.

To this end, they perform the same activities as real users: making phone calls, surfing the internet, watching videos and using various apps.

Depending on the type of information you need, you can choose from a set of building blocks that together provide a 360° view of the connectivity on board.



Measurement types

QoS measurement

Permanent monitoring
The ACT family of autonomous measurement systems is the ideal choice for permanent monitoring. The members of this family include special systems certified for in-train usage and intended for permanent installation in trains.

Non-permanent or ad hoc measurements
Systems for these use cases can be flexibly deployed. Recommended system types for these fields of applications are:

- Autonomous systems of the ACT family that are not permanently installed.
- XGMA SP interactive measurement tools in various form factors, mostly in the form of multi-channel backpacks.
- SPO smartphone-only autonomous systems that can be used ad-hoc by anyone without expert knowledge, for example train attendants: switch on and start measuring.

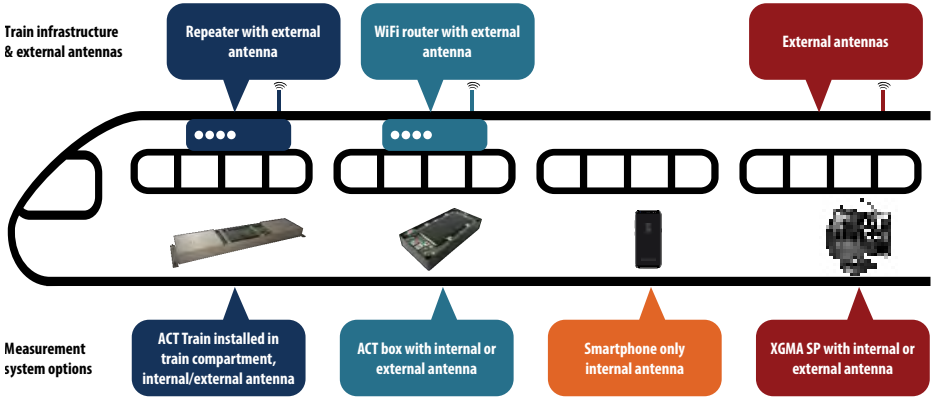
Fields of application

Permanent monitoring is beneficial on highly frequented routes of great economic importance with low tolerance to failures or degradation of performance.

Non-permanent measurements are useful for initial explorations, targeted campaigns, and occasional status monitoring.

While the above types measure the quality of service perceived by the user, **load measurements** aim to create information about the capacity of a network.

Measurement types



Load measurement

A load test uses multiple end-user devices to investigate the effects of concurrent use of networks and systems (e.g. Wi-Fi routers) under controlled conditions.

- Test the maximum capacity and examine the impact of high loads on Wi-Fi routers.
- Estimate the capacity of trackside mobile network coverage.
- Investigate the concurrency behavior of connectivity through in-train routers and mobile networks used directly by end user devices.
- Evaluate how the individual user's service QoE changes with increasing total load.

Getting the most out of your data

Post processing makes your collected data accessible and powerful, and various types of reports present this data in an easy to understand and versatile way.

Reports are mainly based on direct measurement data, but can also include diagnostic and status data from secondary sources such as on-board repeaters, Wi-Fi routers and other systems.

Internationally standardized KPIs provide information about the key characteristics of the system or network under test.

In addition to "static" report documents and presentations, we offer dynamic reports based on Tableau™ that allow users to interactively filter data, visualize it geographically, zoom into maps with the required resolution, and navigate the information as needed.

You can also export data at the source file, text table or database level for further processing and integration into your processes.

We fully disclose our database formats and structures to give you the freedom of choice for your specific use cases without locking you in.

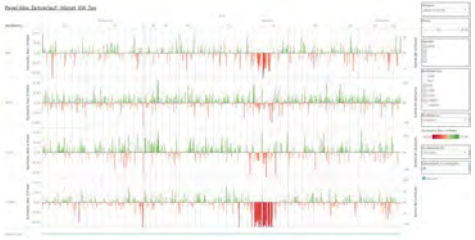
Data reports generated with FIMAS (Focus Infocom's post processing suite), Tableau™ or other report generators provide in-depth insight into a network.

Extended and custom metrics

Focus Infocom developed novel QoS metrics that leverage the unique properties of rail travel. These metrics provide a holistic view of the end-user's experience (QoE) for all types of telephony, including VoLTE and OTT services, and allow solid predictions for a variety of use case parameters based on measurement data. By extending the range of conventional QoS KPI, they describe the customer experience and therefore the business value of good connectivity more accurately, and provide improved guidance for network optimization.

These metrics were contributed to the international standardization community in ITU-T Study Group 12. The standard, ITU-T Recommendation G.1034, was approved by the ITU-T and is in force since January 13, 2020.

Tableau™ dashboard showing data rates, session times and drop rates per technology.



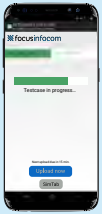
Tableau™ dashboard showing time-resolved repeater diagnostics making it easy to spot outages.

ACT Family

Focus Infocom's ACT family of autonomous systems covers a wide range of use cases and is available in different form factors. Custom designs for individual requirements are possible.

Features

- Remote distribution of measurement jobs
- Latest generation of smartphones
- Use of internal or external antennas, depending on use case
- Certified for railway use (ACT Train)
- Multi-SIM switcher
- Mobile network and Wi-Fi measurement
- Numerous telephony and data test services
- App-based tests (YouTube™, Skype™, Facebook™ etc.)
- Individual designs for installation in different train types
- Speech quality (POLQA, ITU-T P.863)



ACT SPO is a smartphone-only autonomous measurement tool ideal for quick and eady ad hoc use even by non-experts. It uses the internal antennas and delivers data from a user perspective.

ACT Standard/Dual Equipped with one/two UE for use with external antennas.

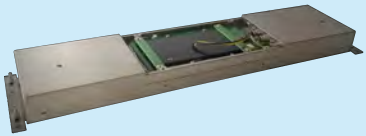
ACT LSP is a compact, lightweight, smartphone-only autonomous solution that uses the smartphone's internal antennas.

ACT GSM-R is a special ACT variant with support for GSM-R networks.

ACT Train

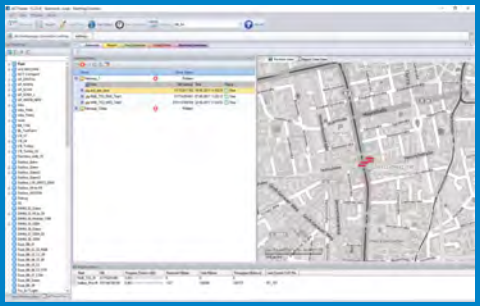
ACT Train is a certified autonomous measurement system for permanent installation in trains. The probes can be installed in the passenger compartment for measuring the user experience using internal antennas for a true QoS view.

To measure the coverage along the railway network, the systems can be equipped with external antennas.



With its elongated shape, ACT Train is certified for permanent installation in German trains. For other countries, other form factors with their own certification are possible.

Fleet Manager



The FleetManager is the heart and soul of every ACT fleet. It gives you full insight into the position and status of each system at any given time. With the FleetManager you define and distribute measurement jobs, update systems, schedule jobs, set alarms and more.

This allows you to plan measurement tasks for each box in advance. With its visual interface, managing complex tasks is done in a breeze. You can run the FleetManager by yourself, but we also have clients and projects where we take care of hosting and operation.

XGMA SP

XGMA SP is a powerful benchmark system based on up-to-date Android smartphones. With different shapes and sizes XGMA SP adapts to multiple use cases.

For mobile use in public transport compartments, stations or pedestrian areas, XGMA Smartphone is available as a robust backpack. Other form factors are also available.

Features

- Easy, automated operation
- Backpack format for easy transportation
- High-capacity batteries for long-term operation in the field
- Upgradeable with latest generation smartphones
- All telephony and data service tests
- Optional additional high-performance GPS for situations where smartphone GPS is insufficient.

Post Processing: FIMAS

Made for mass-data processing
Focus Infocom's post processing suite FIMAS was designed from the ground up with maximum performance and ease of use in mind.

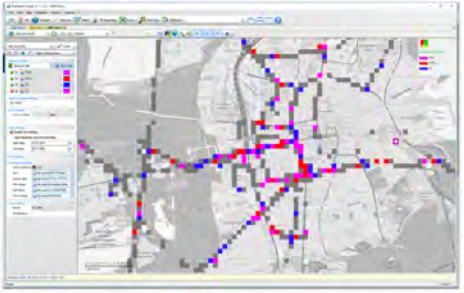
It is the ideal solution for data intensive benchmark measurements, and the perfect tool for diagnosis, optimization and reporting.

Quality of Service: The QoS perspective shows how users experience a network. Typical KPIs are drop rates, session times, data rates or speech quality.

Diagnostics: The diagnostic perspective gives you detailed insight into the root causes of problems and allows you to talk to providers at eye level.

Network capacity: Combined with Wi-Fi-based load measurements, you get an overview of the capabilities and the capacity of the network as a whole.

Geo Views for all KPIs give you a detailed, locally resolved overview about each KPI.



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Get in touch!

Focus Infocom
Gesellschaft für Informatik und
Telekommunikation mbH

Heinrichstraße 2
D-64283 Darmstadt
Germany

Phone: +49 6151 971100

Email: sales@focus-infocom.de

Internet: https://focus-infocom.de

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Focus Infocom is a Member of ETSI and Associate Member in ITU-T SG12

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