Echo Studio – Technical Overview

Advanced mobile network measurement solution

Enhancell Echo mobile network measuring tools run directly on your PC and handsets.

With Echo you do not need custom test devices and firmware. This means that you can be assured to see the network exactly as your customers see it.

Having Echo run on commercial PCs and phones not only saves you from spending on expensive custom hardware but also allows you to easily transfer licenses from one device to another.

Automatic software updates guarantee that you are always running the latest software.

Echo Studio

Echo Studio is both a measurement and/or analyzing tool which offers quick and easy way to control measurement devices and produce reports and visualizations of the measurement test results. Synchronization to Cloud enables instantaneous report production of measurements performed remotely with other Echo devices. Echo devices can also be remotely controlled with Studio.

Echo Studio is a software-only product, and its licensing is delivered via Echo Cloud online service. This cloud-based solution is completely independent of physical production chains. Thus, the deliveries and manufacturing capabilities are stable, swift, and flexible.
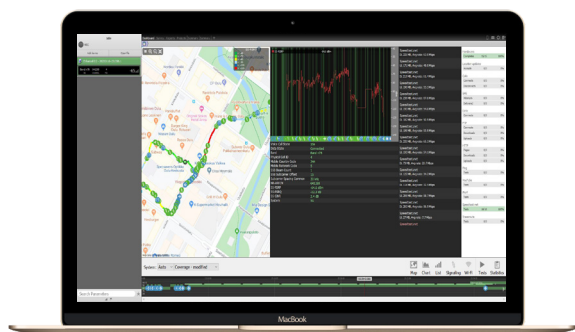
Full 5G support

Echo Studio supports measurement for a wide range of 5G parameters ensuring the full advantages of 5G measurement for the users. The support includes 5G FR1, FR2 and CPE support. 4G licenses are upgradeable to 5G making it convenient and cost-effective for existing customers.

Technologies

Echo Studio runs on Windows, Linux and macOS.

Echo Studio supports measurement and analysis for technologies including GSM, CDMA, EVDO, WCDMA, HSDPA, HSUPA, HSPA+, LTE/LTE-A, 5G SA and NSA (FR1 and FR2), Wi-Fi and Bluetooth.

Key benefits

Unparalleled flexibility on license

Echo offers unparalleled flexibility and cost-effectiveness with licenses: all technology functions are included by default and the license transfer is standard from desktop device to another.

Echo's cloud-based licensing guarantees the user full control over license transfers, and a real-time view of license usage. To add to the flexibility, both perpetual and rental licenses are available.
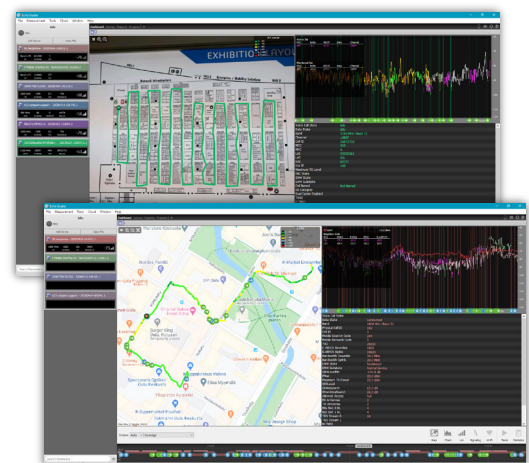
Indoor and outdoor maps

Echo Studio includes support for indoor and outdoor mapping and an offline mode map data caching for outdoor maps.

Echo Studio supports digital images and photos of the floor plan taken with the device as indoor maps. Indoor floor plans include markers and geodetic coordinates (support e.g. for iBwave and Ranplan format). This enables geocoding indoor floor plans on top of Google Maps.

Echo Studio supports Google Maps, OpenStreetMap and ÖPNV (public transport systems) as outdoor maps. The positioning of a measurement is based on the connected Echo device's GPS location. The drive route can be visualized on a map as color-coded parameter values in real-time.
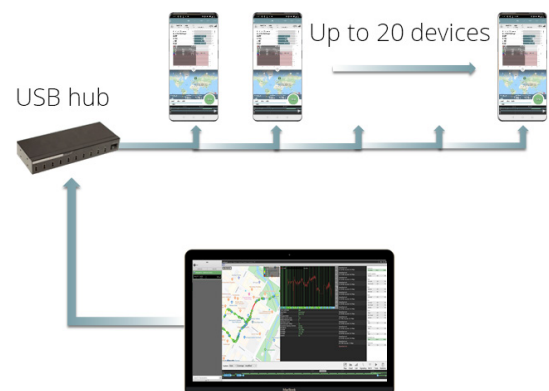
OTT application testing

Echo Studio supports several built-in application testing options. Echo enables the user to test a wide range of applications individually and with scripts.

Multi-phone benchmarking

Echo Studio provides unparalleled control with the ability to perform multi-phone benchmarking. Echo Studio can support up to 20 devices simultaneously.

Support for scanners

Echo Studio supports PCTel IBflex®, PCTel HBflex®, PCTel Gflex®, Ettus, EPIQ, and DRT 4311B scanners, as well as RF Explorer. Scanners can be connected via Bluetooth and RF Explorer via USB OTG cable.

Scanning modes

Echo tools enable different scanning modes: not only Smart Scan and auto-detect modes, but also customized scan. The Smart Scan mode detects automatically and continuously the channels for the technologies and bands the user has selected for scanning and performs a scan on all the found signals. The auto-detect mode includes one round of detection for systems and configures the scanner automatically based on the detection. In addition, the user can define technologies and bands for individual scans according to their demands.

Troubleshooting toolkit

The troubleshooting toolkit detects and displays the most typical network problems automatically for you. It includes cross feeder analysis, bad dominance or pilot pollution, and a call drop analysis.

This feature is aimed to automatize the process of detecting common errors in the network. It lists the detected problems allowing you to drill down to the details with the relevant parameters and highlights the issues on the map and charts.

Cell estimation*

The cell estimation tool automatically estimates and finds the location of all cell sites found on the measurement log file. The estimation can be run over one or multiple log files. Cell estimation is available for all technologies including 2G, 3G, 4G, and 5G, and for both mobile and scanner measurement log files.

The more files or measurement data there is, the more accurate the base station location estimates get, even with less than 50 meters error margin. After the automated cell locating, the cell locations can also be manually refined. In addition, the cell estimation tool can process the data in real time while making measurement.

When estimation is performed, cellular network coverage analysis is carried out simultaneously, and the complete information from acquired non-encrypted cells of detected cellular network are demodulated and displayed on a separate window on the Echo Studio user interface. The position estimation error ellipses and sector confidence are also available in display. The maps can be also pre-loaded and used in offline mode with Echo Studio.

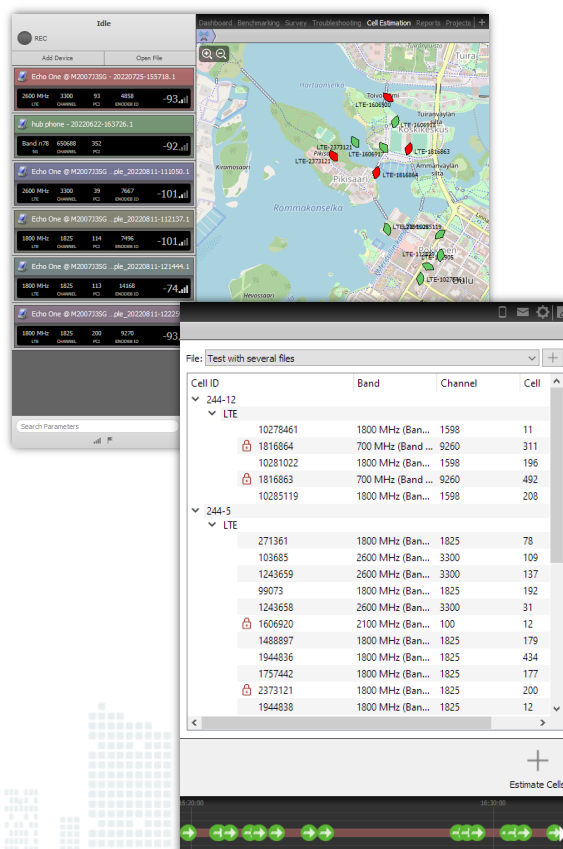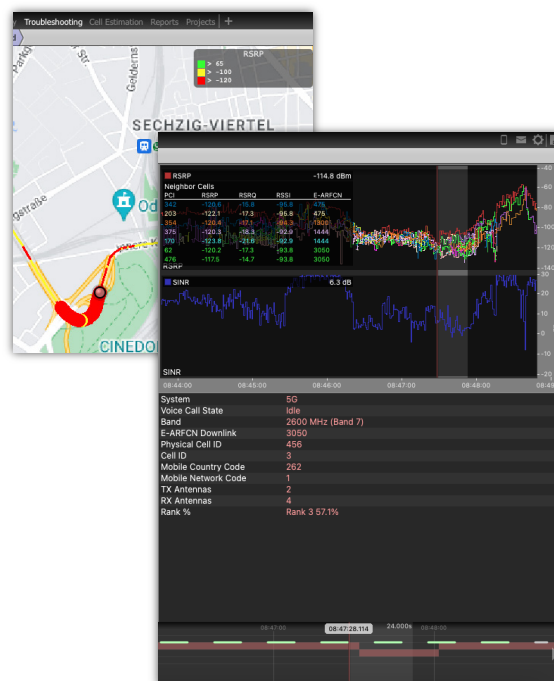*This feature is offered as a separate price list option.

Analysis and post-processing

Echo Studio comes with a powerful reporting engine that allows users to make customized reproducible Excel and PowerPoint-based report templates including customized Key Performance Indicators (KPIs) and Quick Plot visualizations. The user is in full control over the report's design.

Key Performance Indicators (KPIs) allow you to include all the relevant parameters you need and insert their values to the report template.

The unique Quick Plot feature enables easier and faster measurement data plotting, Quick Plots are easy to create and can be added anywhere on the Excel-based report templates or the placeholders on the PowerPoint-based report templates. Once created, the Quick Plots can be added to different reports, or the reports run with different measurement files. This makes benchmarking of results easy and quick.
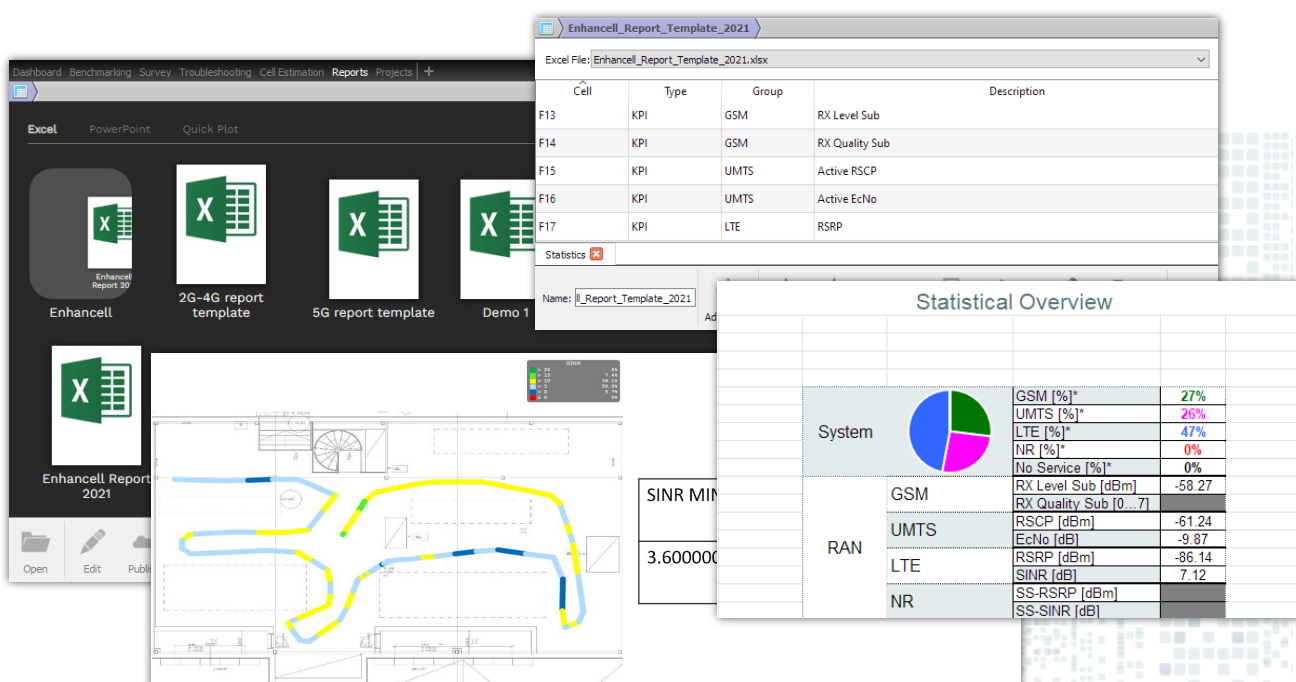
Finally, Echo Studio's highly optimized data and memory management enable the processing of large amounts of log files and to run countrywide reports and plots in a matter of seconds. Report templates and Quick Plots can be published to Cloud and shared with your entire team immediately after creation.

Key Features

- Supports Windows, Linux, and mac operating systems
- Advanced playback and troubleshooting capabilities
- Capability to control simultaneously several Echo devices and a scanner.
- Supports GSM, CDMA, EVDO, WCDMA, HSDPA, HSUPA, HSPA+, LTE/LTE-A, 5G, Wi-Fi, Bluetooth measurements
- Transferrable license allows you to move your software from one laptop to another with ease
- Instant Report after data collection allowing easy sharing of report in PDF format
- Support for Echo Cloud
  - Settings configuration from Cloud
  - License management
  - Automatic log file transfer to Cloud
  - Test and Script synchronization with Cloud
  - Measurement, script, and reboot scheduler
  - Indoor map synchronization with Cloud
  - Customized view sharing via Cloud
- Idle and Active testing using manual or scripted mode for voice call, voice quality, FTP, SFTP and HTTP data transfers, iPerf, HTML browsing, YouTube video streaming testing, SMS testing, traceroute testing, ping testing, and two-way ping (TWAMP) testing
- Manual and Scripted tests can be created and modified with built-in script editor in Echo, or in Cloud, from which tests are automatically synchronized to devices
- Option to set scripted tests in parallel
- Support for Google ViSQOL: an objective speech quality model for voice quality testing
- Support for POLQA v3 voice quality testing real-time MOS calculation (optional)
- Phone locking controlled from Studio: System lock, band lock, LTE cell lock, and carrier lock (UMTS) for controlled devices

- Remote control via Cloud for automated/remote test execution
- Real-time statistics view for monitoring test progress
- Signaling decoder for L3 and RRC signaling messages for signaling decode in real-time. Supports the following view types: line, bar, gauge graphs, and text views
- Layer3: updated RRC decoder for the release 15 with full support for 5G signaling decoding
- Troubleshooting toolkit with cross feeder analysis, bad dominance detection, and call drop analysis
- Cell estimation tool for estimating cell locations from measurement log files (phone and scanner)*
- User-defined views allowing parameter display in the following view types: line, bar, and text views
- Timeline to replay and pause measurement displays while making measurements and to view test progress in relation to time
- Support for indoor and outdoor mapping. Including offline mode map data caching for outdoor maps
- Indoor floor plans with markers and geodetic coordinates (support e.g. for iBwave format). Enables geocoding indoor floor plans on top of Google Maps
- Support for internal and external GPS via Bluetooth
- Support for PCTel IBflex®, PCTel HBflex®, PCTel Gflex®, DRT 4311B, EPIQm and Ettus scanners, and RF Explorer. Connected via Bluetooth and RF Explorer via USB OTG cable
- Full support for 5G scanner measurements using PCTel scanners.

*This feature is offered as a separate price list option.

Echo Cloud

Echo Studio includes the Cloud feature which gives you unparalleled control of your Echo devices from a remote location. Cloud enables:

- Store your log files automatically after recording
- Access measurements easily
- Download your measurements in a multitude of formats
- Configure and reboot Echo devices remotely
- Manage users and licenses
- Two-factor authentication for extra security
- Option to have dedicated private Cloud server in customer's desired geolocation*
- Real-time measurement and test execution control and real-time view of the measurement and key KPIs in Cloud UI

Create and tweak your tests in Cloud. You can access them whenever you want – you can even send test configurations directly to your Echo handheld device.
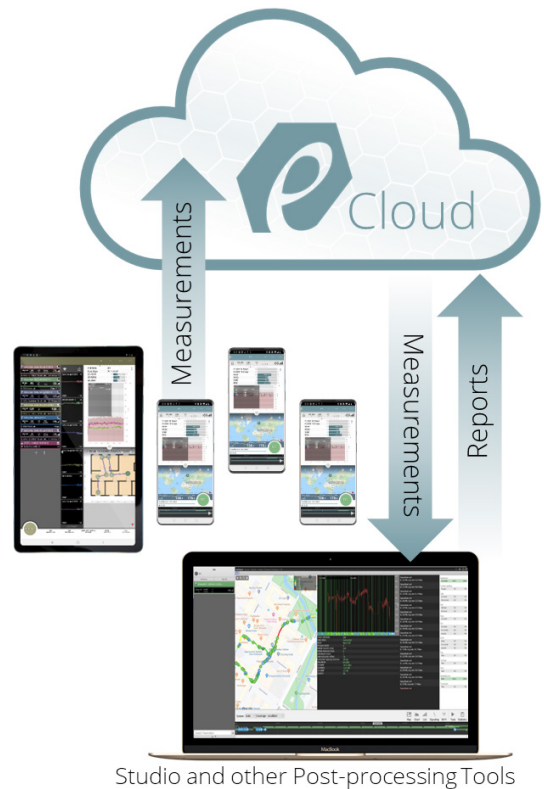
*For more details on the private Cloud server pricing, please contact Enhancell sales.

Echo Advantages

- Fully automated update via Cloud ensures that your software is always up to date
- Unique subscription-based pricing allows you to only pay for the licenses you need when you need them.
- Remote configuration via Cloud allows easy control of your Echo fleet
- Log file storage and export in Cloud allows you to make the most out of your data

Data post-processing

Measurement data can be exported directly from Echo devices to Cloud when they are connected. The data can be exported further from Cloud to Echo Studio or any other compliant 3rd party data post-processing software.

Studio and other Post-processing Tools

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