

## Echo Cloud – Technical Overview

## Advanced mobile network measurement solution

Enhancell Echo mobile network measuring tools run directly on your handset. They are designed for PC-less drive and walk surveys.

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 phones not only saves you from spending on expensive custom hardware but also allows you to easily transfer licenses from one phone to another.

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



## Echo Cloud

Echo Cloud is an online service included in all Echo products. In addition to providing storage and automatic syncing of device settings and log files, Cloud gives you unparalleled control of your Echo devices from a remote location similarly to Echo Plus and Echo Studio.

Cloud provides the user an easy-to-use UI for creating and managing device configurations, tests, results, and maps, which can all be synchronized with Echo devices.

## 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.

## Full 5G support

Echo supports measurement for a wide range of 5G parameters ensuring the full advantages of 5G measurement for the users. 4G licenses are upgradeable to 5G making it convenient and cost-effective for existing customers.

# Key Features

- Capability to control Echo devices and scanners remotely
- Two-factor authentication for extra security
- License management: transfer licenses between devices, pull them from devices, and see who is using licenses
- User management: control user information, permissions, and notifications
- Configure Echo devices remotely: all measurement and test settings can be pushed from Cloud to Echo devices
- Manual and Scripted tests can be created and modified with built-in script editor in Cloud. When tests are edited in Cloud, they are automatically synchronized with Echo devices
- Scheduler for several different commands including setting measurements and scripts to start or stop at a certain time or interval, and rebooting devices
- Send messages to and receive them from Echo devices
- Automatic log file storing after recording
- Access measurements easily
- Build-in project management tool to coordinate tasks and teams
- Download your measurements in a multitude of formats (Echo, Nemo, CSV, Qualcomm, ESRI Shape, Google Earth KLM, PCAP, ZK-SAM, GNS)
- Project management tool to allocate all information to separate teams to work on different projects
- Base station locations (cell files) handling
- Build-in converter to convert Enhancell native file format to other formats
- Planned drive routes can be pushed from Cloud to Echo devices
- Customized measurement views can be published to Cloud from Echo devices, and shared with and utilized by other users
- Support for indoor and outdoor mapping. Including offline mode map data caching for outdoor maps
- Indoor map synchronization
- Indoor floor plans with markers and geodetic coordinates (support e.g. for iBwave format). Enables geocoding indoor floor plans on top of Google Maps
- Indoor map import from any image file format (.jpg, .png, .bmp, etc.)
- Full support for 5G scanner configurations for PCTel scanners. Support for PCTel IBflex®, PCTel HBflex®, PCTel Gflex®, DRT 4311B and EPIQ scanners, and RF Explorer.
- Option to have a 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

\*For more details on the private Cloud server pricing, please contact Enhancell sales.

The screenshot displays the Enhancell Cloud interface, which is divided into several sections. On the left, there is a 'DEVICES' table listing various Echo devices and their status. The main area shows a 'MEASUREMENTS' table with columns for Name, Device, Type, Notes, Position, Size, and Start Time. On the right, there is a map view showing the location of the measurements.

Device	Status	Group	Model	App
Echo One @ ONEPLUS A6013	Recording		ONEPLUS A6013	Echo On
Echo One @ Pixel 3 XL	Recording		Pixel 3 XL	Echo On
Echo One @ AC2003	Idle		AC2003	
35362707371631	Recording		Nexus 5X	
Echo Plus @ SM-P610	Recording		SM-P610	
Pasi iMac	Idle		Mac	
Echo One @ moto g 5G plus	Recording		moto g 5G plus	
Studio Support 2	Recording		Windows	
a6a20330c08aef5b87a0cf84bb1c7b9b7830d92	Idle		Windows	
Echo One @ SM-G990B	Idle		SM-G990B	
6c7a08669c87293768486c8888e3ac9a0b9b72a0	Idle		Mac	

Name	Device	Type	Notes	Position	Size	Start Time
202208-22-1642-313.ech	Oulu-Debug-Zero	Wi-Fi		GPS	42 kB	22/08/2022 16:42
data-sa-mple_2-0220811-122259.1.echo	Echo One @ M2007J3SG Mobile	DL + UL + Ping data drive test oulu		GPS	4.2 MB	11/08/2022 12:23
csfb-sa-mple_2-0220811-121444.1.echo	Echo One @ M2007J3SG Mobile	csfb call drive oulu		GPS	3.7 MB	11/08/2022 12:15
volte-sa-mple_2-0220811-112137.1.echo	Echo One @ M2007J3SG Mobile	short volte drive oulu		GPS	1068 kB	11/08/2022 11:21
volte-sa-mple_2-0220811-111050.1.echo	Echo One @ M2007J3SG Mobile	volte drive test oulu		GPS	3.0 MB	11/08/2022 11:12

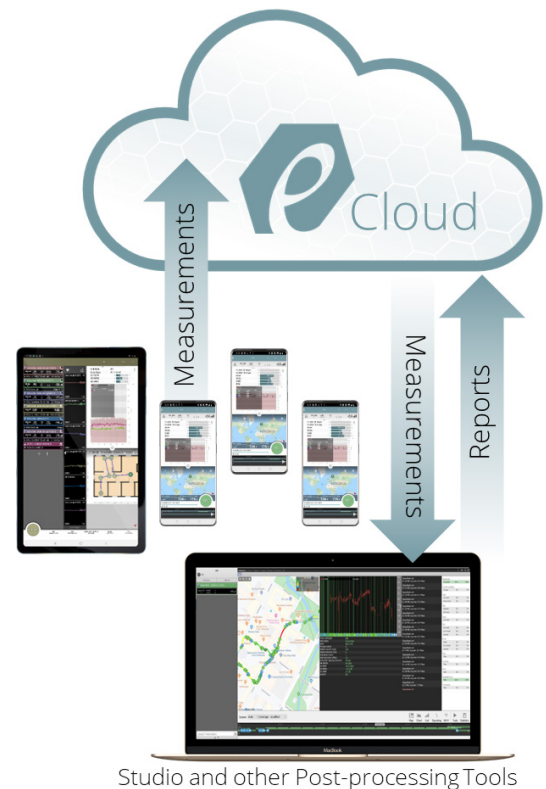
## Data post-processing

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 3<sup>rd</sup> party data post-processing software.

## Echo Cloud versions

Cloud S	Free of charge with all Enhancell Echo tools, 1 GB of storage, no backup service, no de-centralization of data. Recommended client count** is up to two (2).
Cloud M	100 GB of storage, no backup service, no de-centralization of data. Recommended client count** is up to 40.
Cloud L	500 GB of storage, automatic backup of all data, no de-centralization of data. Recommended client count** is up to 200.
Cloud XL	1 TB of storage, automatic backup of all data, no de-centralization of data. Recommended client count** is up to 400.
Cloud XXL	2 TB of storage, automatic backup of all data, data stored in two separate physical locations. Recommended client count** is 400+.
Cloud Dedicated L	500 GB of storage, automatic backup of all data, data stored in two separate physical locations. Recommended client count** is up to 200.
Cloud Dedicated XXL	5TB of storage, automatic backup of all data, data stored in two separate physical locations. Recommended client count** is 400+.
Private Cloud XXL	Storage, backup, and data de-centralization to be determined. Recommended client count** is 400+.

\*\*The client count is based on the average log file size when measuring 8 hours per working day



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