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Echo Trek– Technical Overview

Advanced backpack solution for drive and walk surveys

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

Echo Trek is a perfect addition to the Echo family providing a customized backpack solution to easily carry all the measuring devices while performing measurements afoot, in a vehicle or in any static location.

Echo Trek is ideal for multi-device drive and walk surveys making network testing more convenient than ever.

Echo Trek

Echo Trek backpack is a custom-designed solution for drive and walk surveys. It is convenient, compact, and cost-effective solution to make benchmarking with both outdoor and indoor measurements easier than ever.

Echo Trek is a standalone system that comes with standard built-in batteries* providing more than 10 hours of continuous usage. It is also designed to charge batteries and the phones from a one single power input. Echo Trek enables the use of several different measurement setups combining phones and a scanner up to 7 devices in one backpack.

In addition to smart power system, Echo Trek is designed for optimum airflow to ensure that devices stay at operating temperature even during long walk tests. Its thermostat-controlled fans are designed to also keep the optional scanning receiver always cool.

The waterproof materials and the padding are designed to keep all the phones and the scanner protected while making the backpack convenient and comfortable to carry even for longer walk tests.

Echo Trek is a low-profile backpack with its fully integrated design that allows measurements to be performed discreetly while avoiding any disturbances.

*Please note that we are currently shipping batteries only to Finland due to flight cargo safety regulations. For more details on the batteries, please see the hardware specifications at the end of this document.

Echo solution

Echo product line consist of Echo One for phones, Echo Plus for tables, Echo Studio for PC, and the Echo Cloud online service.

Echo One is a measurement tool for Android and Harmony OS (Huawei) phones. Echo Plus is software for tablet devices with the same measurement features as Echo One. The difference is, Echo Plus can control other devices including Echo One devices and a scanner. Echo Studio is a post-processing and analysis tool with a powerful report engine. In addition, Echo Studio can also control other Echo devices, including Echo Plus and devices connected to it.

The backbone of the Echo solution is the Echo Cloud online service. The user is in full control of their Echo fleet via Echo Cloud. Echo Cloud enables license administration and transfer, the synchronization and control of Echo tools, and the management and exporting of measurement log files.

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. New customers can enjoy the 5G license benefits on most 5G supported Android and Harmony OS handsets and regardless of the post-processing tools they use.

Echo Trek advantages

You can take Echo Trek with you as easily as any backpack to any location to perform measurements: to different vehicles; cars, trains, buses; carry it while walking; take it to a rooftop box. Measurements can be controlled either with an Echo Plus tablet tool or remotely from any location via Cloud. Echo Trek can also be used as a target for call tests: place one Echo Trek unit with phones to a fixed location and perform calls to the phones from another Echo Trek unit.

Economic efficiency with flexibility

The remote control via Cloud enables anyone to carry Echo Trek around while measurements are controlled, and settings and tests pushed remotely to the Echo Trek devices. This is convenient especially in situations where the measurement areas require security clearances or other permissions. Simply hand the Echo Trek backpack to a person who has the clearances and permissions while the devices are controlled remotely by technical personnel.

PC-less drive surveys without upfront preparations

Echo Trek does not require a PC to perform measurements and therefore it offers unparalleled flexibility when it comes to mobility in vehicles and public locations. Simply place Echo Trek backpack or only the device frame in the designated vehicle or location for measurement. Echo Trek is immediately ready for use and under no circumstances requires upfront preparation.
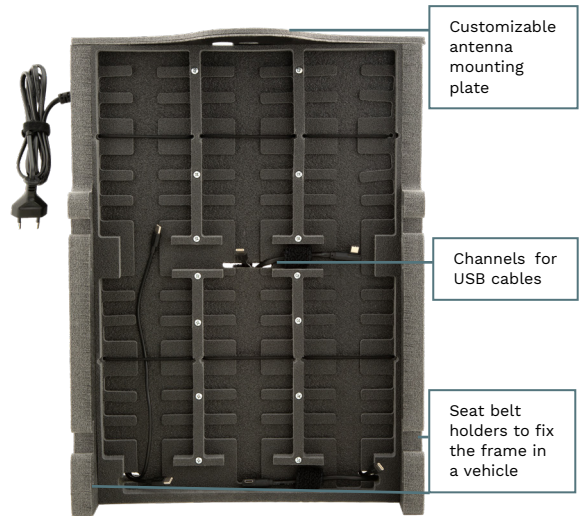
Key Features

- Lightweight high-quality backpack with ergonomic design
- Controlled locally via Echo Plus tablet tool or remotely via Cloud. Cloud also enables the control of Echo One and Plus devices remotely with Echo Studio
- Detachable device frame with placeholders for six (6) phones, a scanner (1), and four (4) standard batteries with adjusting straps and rubber bands to ensure fit for devices of different sizes. The Frame is fixed to the backpack with two (2) clip-on straps
- Easy access to view or swap phones in the slots; the device compartment has full panel zip access
- Support for scanner with customizable detached MIMO / GSP antenna mounting plate
- Heat management system by active cooling consisting of two (2) ventilators with a thermostat to manage the backpack temperature*
- Central charger with pass through charging: devices can be charged overnight or anywhere in the field
- Several air flow channels in the mobile compartments to ensure cooling airflow for the phones.
- Four (4) standard batteries** for longer measurement campaigns
- Pass through charging to enable the charging of phones and batteries** simultaneously
- Easy and clean plug-in: only one power cable output
- All required customized USB cables for phones and a power cable for the charger are included.
- Wire holes and channels between device and battery compartments for easy setup and a clean look
- Unique fixture to use backpack inside a car or remotely in a rooftop box: detachable device frame easily fixed with a seat belt in a vehicle.
- Ventilated backpack with flaps on the sides and a mesh bottom for extra ventilation
- Two (2) side compartments for miscellaneous items
- Detachable belt pack on the front for an Echo Plus control device
- Attachment clip for the belt pack when not in use
- Large laptop sleeve for 15" laptop in the device compartment
- All compartments are padded to prevent damage to the devices
- Firm, reinforced handle on the top and firm, padded, adjustable shoulder, waist, and chest straps for added comfort and support. The straps transfer weight to the lower body decreasing the strain on the shoulders
- Padded backside with breathing mesh areas for comfort
- Waterproof surface materials and zippers
- Compact backpack meeting the carry-on luggage restrictions of most airlines
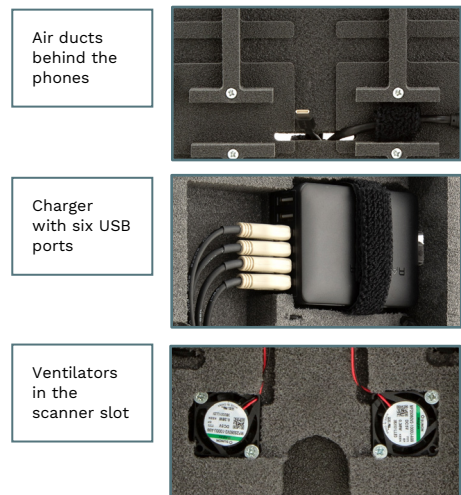- Spare parts available: backpack, device frame, customized USB cable packet.

*Please check the operating temperatures of measurement devices from the device vendors.
**Please note that we are currently shipping batteries only to Finland due to flight cargo safety regulations. For more details on the batteries, please see hardware specifications at the end of this document.
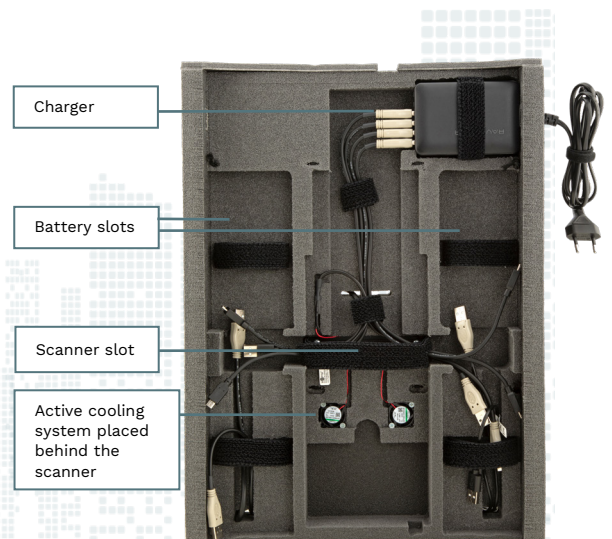
Device frame front

Customizable antenna mounting plate

Channels for USB cables

Seat belt holders to fix the frame in a vehicle

Details

Air ducts behind the phones

Charger with six USB ports

Ventilators in the scanner slot

Device frame back

Charger

Battery slots

Scanner slot

Active cooling system placed behind the scanner

Control 12 phones with Echo Plus

Echo Plus can control up to 12 phones simultaneously, therefore, if more than six measurement devices are needed, two Echo Trek units can be controlled simultaneously with only one set of configurations with Echo Plus tablet tool or remotely via Cloud.

Echo Trek package content

– Backpack
– Detachable belt pack for a tablet device
– Device frame with **slots for** six (6) phones, a scanner, an antenna (customized mounting plate), four standard (4) batteries, a charger and two (2) ventilators
– One (1) charger with a total of 6 USB ports
– Power cable for the charger
– Two (2) ventilators for active cooling
– All required customized USB cables to connect phones to the batteries.
– Four (4) standard batteries* with a total of 8 USB ports

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Dimensions (HWD)

Backpack: 54 x 41/51* x 18 cm

Device frame: 45.8 x 33.7 x 13/15.8** cm

Phone slot: 18 x 9 x 1.5 cm, fits phones with up to 7.5'' screen

Battery slot: 15.5 x 8 cm, depth adjustable

Weight empty***: 2.85 kg

Weight fully equipped***: approx. 7.5 kg

*Width including the side compartments.

**Depth of the antenna mount.

***Weight empty includes backpack, belt pack, device frame, charger, USB cables, ventilation fans. Weight fully equipped includes all the above mentioned and six phones, a scanner, scanner antenna, scanner battery, and four standard batteries.

Software specifications

Technologies: GSM, CDMA, EVDO, WCDMA, HSDPA, HSUPA, HSPA+, LTE/LTE-A, 5G, Wi-Fi and Bluetooth.

Devices: Echo product line supports Android 4.3 and newer and Qualcomm chipsets, and Harmony OS and HiSilicon chipsets. This means that there over 180 off-the-shelf handsets to choose measurement devices from.

System architecture: Echo Plus tablet tool can control and monitor multiple (six or ever up to 12) smartphones and a scanner via BlueTooth. In addition, the same level of control can be achieved remotely with Cloud via internet connection.

Protocol Layers: Signaling decoder for L3 and RRC signaling messages. Allowing signaling decode in real-time. Supports the following view types: line, bar, gauge graphs, and text views.

User interface: Easy-to-use user interface with real-time data and test progress displays, and a benchmarking view. Outdoor maps based on Google Maps, Google Satellite, OpenStreetMap,

or ÖPNVKarte. Indoor floor plans with markers and geodetic coordinates (support e.g. for iBwave format). Enables geocoding indoor floor plans on top of Google Maps.

Service testing options: Service testing and benchmarking is possible with the following tests:

- Voice telephony: Voice call (MOC & MTC), VoLTE, VoWi-Fi, MOS-LQO (ViSQOL), MOS (POLQA)
- Data tests: FTP DL/UL, SFTP DL/UL, HTTP DL/UL, Ping, TW Ping, iPerf TCP/UPD (UL/DL), Traceroute test
- Browsing: HTTP
- Messaging: SMS
- Video streaming: Youtube
- Application service: Ookla Speedtest.net UL/DL/Ping.

Positioning: Echo product line can reach all locations, mobile or static, from mobile drive and walk surveys to offices and rooftops. Echo supports remote control and full location logging using internal, external or BlueTooth GPS source for outdoor testing and indoor maps with geodetic coordinates for indoor testing.

Control and Analysis: Device, measurement and test configurations can be sent to Echo One devices directly from the controlling Echo Plus tablet device or remotely from Cloud. Both Echo Plus and Cloud can be used to control measurements and tests on Echo One devices. Real-time data is displayed on both Echo Plus and Echo One devices.

Data management: Measurement data collected with Echo One on the smartphones can be set to synchronize automatically with Cloud. In Cloud, the data is immediately accessible for viewing, post-processing and exporting for all users regardless of their physical location.

Measurement events: Customizable real-time measurement data and related events displays are included on both the controlling tablet device and the smartphones performing the measurements in the backpack.

Post-processing platform: Echo Studio is a measurement and analysis tool which offers quick and easy way to 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 locally or remotely controlled with Studio.

Post-processing compatibility: 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

Hardware specifications

Charger specifications:

- Charger input: AC 100-240V 50/60Hz 1.3A MAX
- Charger output: 60W Total

Battery* specifications:

- Battery capacity: 4 x 20 000mAh 3.7V (74Wh)
- Output specifications: 6 x 5V/2A USB ports
- Operating temperature: 0°C ~ 45°C

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