



# Quality Monitoring System

A powerful and affordable solution to deliver the next generation of quality assurance in telco environments

## AT A GLANCE

- Unified mobile, fixed and cloud (FMC) system operations
- 5G and Cloud/VNF ready (MANO)
- Modular system capabilities
- Distributed autonomous agents and system operation with zero data loss
- Feature-rich and multi-layer with support of 100+ KPIs
- True end-to-end automated measurements and realistic load generation
- Several industrial and consumer grade measurement agent form factors
- GIS and operator-based KPI data enrichment
- Multiple enterprise and data streaming DB options



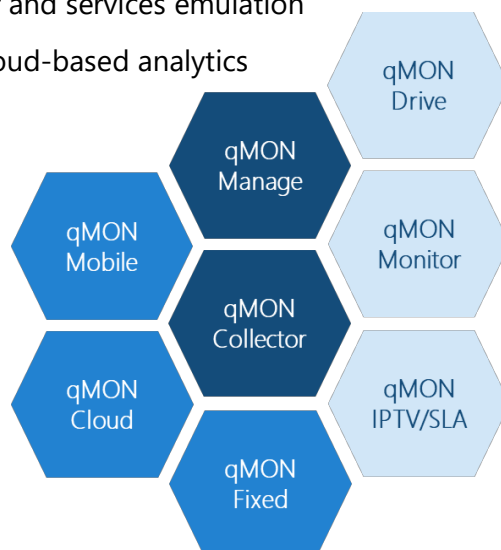
## SYSTEM COMPONENTS

qMON Manage – Centralized cloud-based device management

qMON Collector – Centralized KPI collector deployed on site or in the cloud

qMON NetworkSensor – Network agents for active user and services emulation

qMON Insight – Real-time monitoring and advanced cloud-based analytics



## USE CASES

- Network and services trending
- Drive and benchmark testing
- Coverage and performance assessment
- Live network and service troubleshooting
- SLS/SLA monitoring in real-time
- Continuous service monitoring
- End-to-end QoS and QoE monitoring of network and services in live environments
- Device and system performance predictions under realistic load conditions



# Quality Monitoring System

## DEVICES

- Mobile: Samsung Galaxy S7, S8 and S9 (Android 8)\*
- Mobile M2M: Advantech ARK\*\*, BeagleBone\*\*\*
- Fixed: Advantech ARK\*\*, Lenovo Tiny M700\*
- Cloud: VNF, VM, docker

## ENVIRONMENT

- Controlled \*
- Industrial – 40° to 85° \*\*
- Outdoor IP67+ \*\*\*

## MANAGEMENT

- All devices are managed through cloud-based management (qMON Manage)
- Multiple user profiles are available
- Remote control option: APN setting, reboot, USIM selection (Samsung only)

## MEASUREMENT AND KPI

- Centralized KPI collector (qMON Collector) on-site or in the cloud
- Multiple enterprise and data streaming DB outputs: My/MS-SQL, influxDB, Elastic, Kafka, Prometheus
- Real-time KPI streaming dashboard
- Advanced analytics with external enrichment

## ANALYTICS

- Flexible cloud-based analytics options
- E2E Real-time monitoring
- Advanced analytics with data enrichment and KPI visualization

## TECHNOLOGIES

- Mobile: GPRS, EDGE, WCDMA, HSPA+, LTE, LTE-A and LTE-A Pro (Cat3 to Cat18)
- Cloud: VNF, MANO (OSM 4 and 5), OpenStack, VMware, Docker
- Fixed: FE and GE

## OVER-THE-AIR (OTA) UPDATES

- "Live" system upgrades
- Autonomous agent operation with zero data loss

## PROTOCOLS

- TCP/IP (IPv4 and IPv6)
- SNMP (for SLA/SLS testing)
- IGMPv2/v3

## POSITIONING

- Android-based location services: GNSS, WiFi/Cellular if used indoor
- External industrial GNSS USB module

## NETWORK AND SERVICES TESTING

- Data based: DNS, PING, FTP UL, FTP/HTTP DL, Web browsing, YouTube
- IPTV (multicast)
- Voice: Q3 2019
- SMS/MMS: Q3 2019
- Synthetic traffic: IPERF UDP/TCP

## MOBILE NETWORK TESTING

- RSSI, RSRP, RSRQ, SINR, Tx Power
- PLMN ID/name, EARFCN, Band, BW, Cell ID, PCI, Carrier Aggregation, RRC state
- Radio sampling rate of 2 s (Samsung S8, S9)

## SLA/SLS MONITORING

- Combined active testing and passive KPI collection (SNMP based) from devices
- Standardized and proprietary SNMP OID's

## PLUG AND DRIVE

- Easy to use drive and benchmark testing with status monitoring

## MEASUREMENT DATA ENRICHMENT

- External GIS and operator data enrichment