VELOX Lab kit 100

Indoor 2x2 MIMO 100 MHz 5G network, packaged in a compact kit with a smartphone and SIM card, for development and tests.
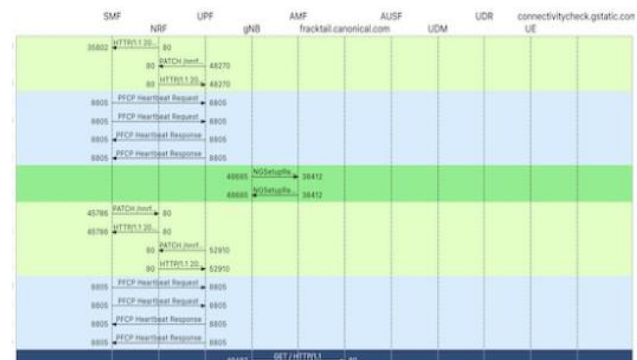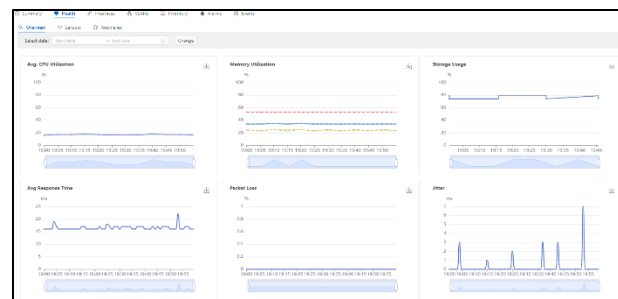
Fit for research and development

VELOX Lap kit 100 is a perfect fit for research centers, R&D labs and universities who want to

develop and test innovative use-cases in their premises with a real 5G network.

What you get

VELOX Lap kit 100 can be used to:

● Build and run small demonstrations and proof of concepts using 5G

● Connect 5G smartphones, tablets, industrial routers, cameras and other devices, using 100% of the capacity of a 5G 2x2 MIMO network

● Kick start research on 5G network protocols, thanks to an all-in one, plug & play package

● Develop extensions or integrate third party software

● Analyze and robustify 5G security protocols

● Train teams and students to configure and troubleshoot a real 5G network via GEMS

VELOX Lap kit 100   comes with online access documentation. You also get

access to TTG Int. LTD's Customer Service portal, where you can raise questions and submit issues.

With Gold Support, our experts will guide you through the configuration and operation of Orion

VELOX Lab kit 100 and the provided smartphone, or any 5G device validated by TTG Int. LTD.

If your objective is to integrate VELOX Lap kit 100 with third party software or with devices not yet

validated by TTG Int. LTD, or to develop your own software extensions, TTG Int. LTD 's Platinum Support is just what you need to help you reach your goal.

Quarterly releases

TTG Int. LTD publishes software releases 4 times a year, with new features, enhancements and bug

corrections. You can upgrade your software version from TTG Int. LTD 's online repository using a

simple command.

As long as you subscribe to TTG Int. LTD 's Gold or Platinum Support & Maintenance, you will get access to TTG Int. LTD 's latest software releases.

What you get

VELOX Lap kit 100 is composed of:

● 1 PC containing:

○ 5G Core Network software

○ 5G Radio Access Network software

○ 5G Network Management System

○ Wireshark software

○ configuration files

○ scripts for starting, stopping and

checking the status of the cellular network

● 1 Software Defined Radio running at 100 MHz, 2x2 MIMO, with 2 antennas and power supply

● 4 SFP+ multimode transceivers and 2 optical cables (10m), 1 RJ45 cable (2m)

● 1 rugged 5G smartphone with SIM card

What you can do

VELOX Lap kit 100 has the latest software installed, configured and ready to use. Simply

assemble the hardware components to get your 5G network on air in less than 15 mn.

With VELOX Lap kit 100, you can:

● Deploy and update your 5G network with TTG Int. LTD 's command line scripts

● Configure the network's central frequency band, bandwidth, TDD mode and attenuation by GEMS

● Observe protocol messages between network elements using Wireshark

● Inspect extensive log files and view the detailed list of network events

Features

VELOX Lap kit 100 supports:

● 5G in Standalone (SA) mode

● most used 5G TDD frequency bands under 6 GHz

● 100 MHz bandwidth in SISO and 2x2 MIMO

● 5-10m coverage

● up to 800 Mbps downlink and 80 Mbps uplink bit rates

● real time visualization of bit rate, consumed resources, number of connected devices

● SIM cards and eSIMs

● Quality of Service (QoS): configure higher priority streams

● REST API for remote monitoring and control

Price

It must be purchased with either Gold or Platinum support & maintenance:

SUPPORT & MAINTENANCE	GOLD %10	PLATINUM %15
VELOX 100 documentation	✓	✓
TTG customer service	✓	✓
Support for configuration and operation	✓	✓
Software upgrades	✓	✓
Support for integration of 3rd party devices or radios	**X**	✓

Invoicing and Payment Terms

Invoicing Terms

● 100% invoice at order Payment Terms

● 30 days net until date of invoice

Delivery and Warranty

Delivery Duty Paid (DDP)

● 8-12 weeks

Warranty

● 1 year

Technical Specifications

Hardware

PC	
Dimensions H × W × D / weight	430 mm × 200 mm × 377 mm / 6.8 kg
CPU	Intel Core i9-12900K (3.2 GHz / 5.2 GHz)
RAM	32 GB
Storage	SSD 500 GB
Network connectivity	1 x 2.5 GbE, Wifi 6 Intel NIC 710 with 2x 10GbE SFP+ slots 2x 10GbE SFP+ multimode transceivers
USB	2 x USB 2.0 ports (Type-A), 1 x USB 3.2 Gen 2 port (Type-A), 1 x USB 3.2 Gen 2x2 (Type-C), 2 x USB 3.2 Gen 1 (Type-A)
Power supply voltage input	100 - 240V AC
Operating system	Linux Ubuntu 20.04 LTS with 5.4.0-126-lowlatency kernel

Software Defined Radio	
Dimensions H × W × D / weight	357.1 mm x 211.1 mm x 43.7 mm / 2,78 kg
Frequency bands	10 MHz to 6.0 GHz
Bandwidth	Up to 100 MHz (SISO, 2x2 MIMO)
Max output power	18 dBM (63 mW)
Antennas	4 x omnidirectional antennas : 617-960 MHz, 2496-2690 MHz, 3300-5000 MHz

5G Smartphone	
Brand & Model	Crosscall Core-Z5
Dimensions H × W × D / weight	175 x 81 x 14 mm / 281 g
5G Frequency bands	n38 (2600MHz) / n40 (2300MHz) / n77 (3700MHz) / n78 (3500MHz)
Operating System	Android 12
Processor	Qualcomm® QCM6490
Head/Body SAR	1,5 W/kg - 1,03 W/kg
SAR Limbs	2,63 W/kg
RAM	4 GB
Flash	64 GB
IP Rating	IP 68
Resistance	salt water (2 m / 30 min), dust (IP 68), falls (6 faces, 2m on concrete)
SIM card	rewritable, unique IMSI, MILENAGE authentication algorithm, PLMN: 999.99

Software

5G Core Network software	
Network functions	SMF, AUSF, UDM, UDR, AMF, UPF, NSSRF, NRF, PCF
Container platform	Docker

5G Radio Access Network software	
Frequency bands	n38 (2600MHz) / n40 (2300MHz) / n77 (3700MHz) / n78 (3500MHz) / n79 (4800 MHz)
Bandwidth	40/100 MHz
Transmission Modes (downlink)	SISO, MIMO 2x2
Modulation schemes	Up to 256 QAM
Subcarrier spacing	30 kHz
Active users	32

5G Network Management System software	
Dashboard	Core & Cell status, global number of active / connected devices, global downlink & uplink bit rate / resource consumption, detailed list of cells
Cell metrics	Downlink & uplink bit rate / resource consumption, number of connected devices
SIM management	Add SIM, device status (online, offline)
User management	Add, remove, manage user profiles (Standard, Expert, Admin)
QoS management	Priority configuration of streams (IP / port range)
Logs	User connections