



F-Lab

Complex testing and emulation system



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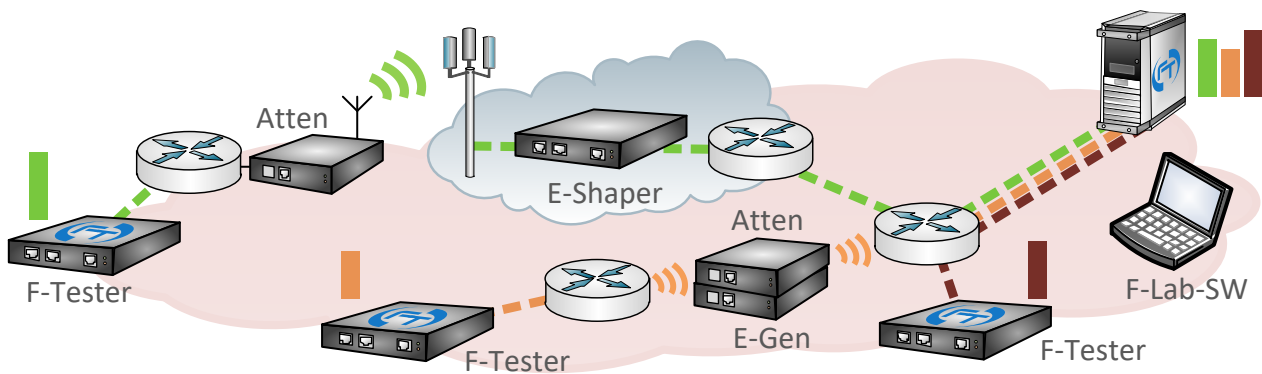
DATASHEET

In general, the test and emulation system verify the capabilities of the **communication technologies and end-to-end ICT systems** under different conditions. It is possible to emulate the following events:

- Analog environment of communication channels – noise, disturbance, interference
- Features of a complex data network based on IP (commonly TCP/IP)
- Concurrent data streams, competing traffic, different types of network attacks

The testing procedure can be automated. Put the individual tests into scenarios and control the entire system remotely. The system is built from the central control server with **F-Lab-SW**. The F-Lab is composed of several components according to a specific type of test. The basic set of components consists of:

- **F-Tester** (Flow Tester) - measuring parameters of TCP/ IP family-based communications devices. Measurement scenarios can be defined with any data profile (time sequence) of the generated data for both types of communication protocols - TCP, UDP.
- **E-Shaper** (Ethernet Shaper) - emulation of a communication network with defined parameters (throughput, packet loss, delay), including their changes over time. You can define templates for a variety of communications networks and technologies such as different generations of mobile networks, xDSL, or Wi-Fi devices.
- **F-Cap** (Flow Capture) - device for capturing and analyzing of data traffic.
- **Atten** – remote-controlled attenuator for setting up defined communication channel features in wireless, mobile and fixed network variants (PLC/BPL, xDSL) with the possibility of interference injection.
- **E-Gen** (Signal Generator Controller) – IP based signal generator controller for controlling the generator to add a defined noise or interference level to communication channel.



Example of complex testing system

Additionally, weighing and matching elements are part of the assembly, based on specific test conditions, as well as a LAN (Ethernet) controlling data network.

Specifically, the channel capacity, data performance, error rate and other parameters of the communication systems are depended on the signal-to-noise ratio (SNR). The test conditions nearly real systems can be emulated by the laboratory devices: the attenuator sets value of the signal on input of receiver; the generator sets value of the noise in communication channel.

Technical parameters

F-Tester, E-Shaper, F-Cap device:

- data interface
 - 2 x RJ-45 Ethernet 10/100/1000BASE-T
- control interface
 - 1 x RJ-45 Ethernet 10/100/1000BASE-T
 - 1 x DB9 - RS232
- data storage: SSD 256+ GB (F-Cap - HD 1 TB)

Attenuators:

- control interface
 - 1 x RJ-45 Ethernet 10/100/1000BASE-T
- signal interface
 - 2 x BNC (fixed networks) + 2 x BNC for noise injection
 - 2 x SMA (radio-networks)
- frequency band
 - 10 kHz – 1 GHz (fixed networks)
 - 100 kHz – 6 GHz (radio-networks)
- attenuation band:
 - max. 63 dB
 - step of 0,5 dB
- maximum of signal power
 - 0,25 W (fixed networks)
 - 1 W (radio-networks)

E-Gen – parameters dependent on the generator model. Typical noise models:

- White noise AWGN
- Impulsive noise REIN
- Radio-interference

General features:

- power supply: 12V DC, maximal power 12 W
- environmental conditions: 0° - 85° C
- Control: WEB interface, terminal
- IP Code: IP40