A QoS and QoE Measuring and Monitoring Company

TELCO, Media, IT, Regulators

IN FACTS WE TRUST®

COMPU-CONSULT Ltd.

2019.
COMPU-CONSULT Ltd.

A brief history of the company

COMPU-CONSULT Ltd. was founded in 1990. Our company is the supplier of major Hungarian telecommunication service providers and the Hungarian National Media and Infocommunications Authority.

Our registered trademark:

IN FACTS WE TRUST®

In accordance to this, we as a registered Expert Witness company also support Hungarian and EU law enforcement and court proceedings in IT, electronics and telecommunications matters. We investigate IT security issues with IP stream logging and analysis tools.

With our TELE-OPERATOR® UTS instrument family in Hungary we were the first to introduce Internet, ADSL performance measurements, CLIP, Fix SMS, analog fax and 4-line dial-up measurements (UTS v.9), Internet call test (UTS v.10), Internet speed measurement (UTS v.11), SMS testing (UTS v.12) and IPTV test (UTS v.14) as an integrated device. The devices are developed to meet international and up-to-date quality standards, all are shipped with calibration and provide legally effective measurement protocols. Upon request, we provide lifetime support for our measurement devices.

In 1991 we participated in the Modernization of ARF crossbar telephone exchanges in the Hungarian telecommunications network. Data Logger, Billing System, and Alarm Management Software Software for 650,000 Line Subscriber Capacity (400 Computers and 13,000 ARD and RSM-DS Control Unit). As a result of this, our company has become the supplier of the complete software for the largest Hungarian microprocessor system.

Our practice in delivering continuous and high-reliability software was later utilized in the delivery of 24/7 and on the spot measuring systems in the same categories.

Our company participated in the measurement technology support of the introduction of ADSL, VDSL providers in Hungary in the national distribution of the first real broadband Internet.

We are determined to help service providers and authorities to achieve quality and IT security targets.

Let us present below some of our products and systems.

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1. TELE-OPERATOR® UTS v.18 mobile internet neutrality measurements

With our UTS v.18 system developed in 2016, mobile operators can measure their neutrality according to BEREC specifications.

Fixed lined and traffic management monitoring upgrades under development.

4 locations, 4x2 test heads, Max 4x2x40=320 SIM cards
2. **TELE-OPERATOR® UTS v.11+ calibrated internet quality measurements**

In operation since 2014 UTS v.11 + calibrated internet quality measurements from 100 kbit/s up to 4 Gbit/s download and upload speed, packet loss and delay. We use specialized hardware test probes capable Wi-Fi, PPPoE, Ethernet and mobile internet measurements, which can be controlled even from a smartphone’s browser!

Calibrated measurement with EU BEREC statistics.
3. **TELE-OPERATOR® UTS v.20 DVB-S/S2 measurement system**

In 2018, we developed our UTS v.20 DVB-S / S2 measurement system. The system measures 70 RF, 54 MPEG, 39 TR290 and 56 ITU-T P.1201.2 QoE parameters. Concurrent measurement on 8 channels (4 fixed antennas and 3 controlled dishes). Channels can be reduced or extended on demand.

Concurrent recording of 160 programs permanently or on demand if fulfilling trigger parameters fail.
4. TELE-OPERATOR® UTS v.16 DVB-T/T2 measurements
Since 2010 in operation our UTS v.16 DVB-T monitoring instrument, which has been upgraded to T / T2 service in 2016. In addition to RF parameters, the instrument provides detailed information on the parameters of programs broadcast by neighboring countries and home providers by processing data from Transport Stream. RF and MPEG program measurements, RS232 and LAN option.
5. **TELE-OPERATOR® UTS v.9 telephone technology measurements**
Calibrated measurement of billing system accuracy, ITU P.862 PESQ + speech quality measurement on analogue interface of wired, VoIP and mobile networks.

![UTS v.9 MOS voice quality measurement probe](image1)

![UTS v.9 MOS voice quality measurement probe](image2)

2017.09.07
6. **TELE-OPERATOR® UTS v.9 FAX measurements**


7. **TELE-OPERATOR® UTS v.14 Field IPTV measurements**

Our company first supplied UTS v.14 Field measuring instruments for the introduction of IPTV in Hungary, which have been purchased in the quantity hundreds by Magyar Telekom (subsidiary of Deutsche Telekom) and Invitel.
8. **TELE-OPERATOR® UTS v.12 SMS Quality Measurements**
Calibrated measurement of success and delay parameters.

**UTS v.12 SMS Measurement**

Measurement configuration:
- 4 SMS modems / instrument
- Interlocation and interprovider measurement
9. TELE-OPERATOR® UTS v.17 postal services measurements

Our UTS v.17 measurement system, in operation since 2013, enables a more accurate measurement of postal services, which, with a tracking and electronic reporting system, enhances the on-line tracking of panel members' activities, and also enables the objective calculation of measurement accuracy.

Nanowatt technology zero RF emission trackers that are used in the postal test mail.
An example posted test mail’s activity monitored by tracker and evaluated.

10. TELE-OPERATOR® UTS v.2.0 Gbit IP & Audio Logger

With our UTS v.2.0 Gbit IP & Audio Logger system sold since 2016, we provide IT logging and audio reporting of error events with full IP packet traffic, IP address and DNS address detection without interfering with the network.
Amount of data per domain names discovered in a quarter-hour breakdown:

Checking the amount of data used on the Internet for monthly limited service packets:

<table>
<thead>
<tr>
<th>No.</th>
<th>Sec_IP</th>
<th>Dist_IP</th>
<th>Dist_domain</th>
<th>First packet</th>
<th>Last packet</th>
<th>Total IP bytes</th>
<th>Facebook</th>
<th>Facebook</th>
<th>Twitter</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>192.168.001.200</td>
<td>0.01.013.084.006</td>
<td>b-aplfacebook.com</td>
<td>2018.09.01 18:40</td>
<td>2018.09.01 18:40</td>
<td>2 945</td>
<td>0</td>
<td>0</td>
<td>2 945</td>
</tr>
<tr>
<td>49</td>
<td>216.058.209.163</td>
<td>192.168.001.200</td>
<td>b-aplfacebook.com</td>
<td>2018.09.01 18:40</td>
<td>2018.09.01 18:40</td>
<td>1 495</td>
<td>0</td>
<td>0</td>
<td>1 495</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>317 073 001</td>
<td>340 884</td>
<td>204 434 466</td>
<td>112 297 651</td>
</tr>
</tbody>
</table>

- Social pack data (byte): 323 731
- Other data (byte): 17 153
- Other/total %: 5% / 0%

- Logger: Vodafone
- Deviation[V-L]: Percent

- Total (byte): 317 073 001
- Facebook+Twitter (byte): 316 741 472
- Billable data (Total-social pack) (byte): 331 529
- Billable data (Total-social pack) (GB): 0.0003

- Remaining data from provider website
  - Vodafone old (GB): 5.48
  - Vodafone new (GB): 5.48
- Billed data Old - New (GB): 0

- Billing unit (GB): 0.01
- Deviation billable-billed (GB): 0.0003

- Assessment (allowed deviation = half of billing unit): OK
11. Measuring QoE Quality Parameters of MPEG4 Stream according to ITU-T P.1201.2

Concurrent recording of 160 programs permanently or on demand if fulfilling trigger parameters fail.
12. Expert Witness services

Since 2010 our company is a registered Expert witness company. We work on EU level providing expert witness services in the following areas:

- wired electronic communications;
- software;
- design and organization of IT systems;
- IT security;
- electromagnetic compatibility (EMC);
- electronic communication measurement technology;
- computer hardware, computers, peripherals and local area networks (hardware);
- manufacture of measuring instruments;
- manufacturing of telecommunication products and equipments;
- digital broadcasting.