DIGITAL TELEVISION SYSTEMS AND INFOCOMMUNICATION DEVICES

CW-4000

CW-4957 64-Channel Real-Time TS Analyzer

analyzer with 60 IP + 4 ASI inputs for monitoring the operation of digital TV systems

Spreading of digital television more and more demands measuring equipment for monitoring the operation of the systems and for removing possible errors. With using IP technology, beyond analyzing the transmitted digital television signals inspecting also the signals of the IP network is required. Digital technology of course requires entirely different measuring technique and equipment than used for analogue technology.

With the CW-4957 type 64-Channel Real-Time TS Analyzer CableWorld Ltd. offers the operators of digital television systems a measuring device, which is capable of the simultaneous and continuous monitoring of 64 transport streams and the IP network itself, and which permits the measuring results to be accessed from everywhere via Internet. For improving the quality and reliability of digital services the CW-4957 type 64-Channel Real-Time TS Analyzer monitors and gathers numerous data in addition to those described in Recommendation TR 290, thus giving increased support to the job of the user. The features of the device include such novelties as long-term gathering of the data amount of elementary streams that permits system operators to compare the data amount of their VBR streams they paid for and that was actually broadcasted.

The CW-4957 type 64-Channel Real-Time TS Analyzer comprises three main measuring systems: the input unit provides detailed information on the data traffic of the IP network, the real-time TS analyzer module continuously records the parameters of 64 input data streams, and the sample analyzer unit permits scrutinizing the content of any selected data stream in full depth. The measuring system and the interface providing access to the measuring results via Internet are separated both physically and logically that assures the television network 100 % protection against impacts from the Internet. The measuring results are displayed on a lucid web interface, and in explorer mode its pages can be turned without the risk of unauthorized interfering to anywhere.

For increased reliability the input signals can be transmitted to the device beside over conventional UTP cable also over optical cable. The device is built of advanced FPGA circuits; the internal core operates from 1.0 V supply voltage, thus the power consumption of the device is extremely low. This low consumption and the applied vapour soldering technology result in high reliability and long life-time.

- Access to the measuring results from anywhere over Internet
- 64 transport streams continuously monitored at 60 IP inputs and 4 loop-through ASI inputs
- Gigabit IP input with optical or UTP cable connection in unicast or multicast mode
- Logically and physically separated IP measuring circuit, device control and Internet connection
- Inspection of the transport stream according to TR 290
- Continuous inspection of the traffic and the parameters of the IP network
- Gathering the data amount of the elementary streams for a period of as long as a year
- Facility for the analysis of the tables and the elementary streams even down to byte depth
- Low power consumption (typically 20 W), high reliability, long life-time

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At transmitting the transport stream over IP network more and more users realize the importance of the smoothness and continuity of the data transmission capability of the IP network. In order to measure and document the errors occurring in the IP network the input module of the CW-4957 produces statistical report on the data packets arriving over the IP network. The documents provided by the device show the errors of the IP network in chronological order.

The errors found at analyzing the transport stream originate either from the errors in the transmission path or from the errors in compiling the transport stream. The CW-4957 permits inspecting both of them. Errors in the transmission path indicate smaller or larger errors in the operation of the system (e.g. low signal level because of heavy snowfall, broken optical cable etc.) thus upon them different kinds of alarms can be set off. Errors in the structure of the transport stream typically exist continuously and their removing needs high level professional competence. By providing access over Internet the CW-4957 permits using also external support for solving the problems.

In explorer mode the web interface of the CW-4957 permits only viewing the measuring results, whereas in password protected mode the skilled personnel can freely configure the device and can change the measuring setup. For the in-depth analysis of elementary streams (e.g. MPEG-4 video data streams, audio data streams etc.) the transport stream analyzer module allows the user to use beside the free CableWorld software also other software companies' free (VLC, TS Reader) or purchased (Interra VEGA H264) software.

The CW-4957 type 64-Channel Real-Time TS Analyzer operates according to the latest relevant standards and is prepared for being extended with new elements at a later date by local or remote software upgrade. In the device control software the most up-to-date Java technology has been used, thus it operates in any operating system (Windows, Linux). Fig. 1 shows the graphic illustration of the transport stream structure at using Mozilla Firefox.

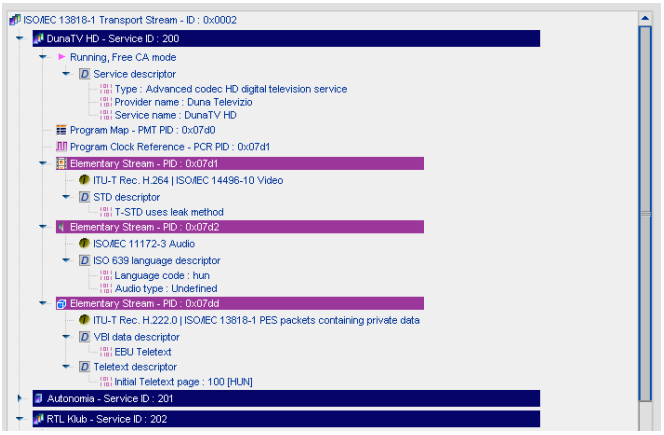

Figure 1
Illustration of the structure of the transport stream on the web interface

CableWorld developed the 64-channel real-time transport stream analyzer to facilitate the easy orientation in the vast data-sets of digital television and the examination of even their tiny details. The extremely low power consumption of the device permits its operation in 24/7 mode permitting the user continuous inspection and receiving prompt information about possible faults and operating troubles.

Technical data

IP input

TS input	10-, 100- and 1000Base-T (auto negotiation)
Protocol	Ipv4, ARP, IGMP, ICMP-Ping, UDP
Number of inputs	60 unicast / multicast connections
Type of the connector	RJ-45
Optical input	receptacle for SFP (Mini-GBIC) module

ASI inputs and (loop-through) outputs

Structure and protocol	according to TM 1449 Rec. 1
Impedance	75 Ω
Number of connectors	4 × 2 BNC socket (loop-through inputs)
Input data rate	max. 640 Mbit/s (total for all ASI inputs)

Internet connection

IP connection	10-, 100Base-T (auto negotiation)
Protocol	Ipv4, ARP, ICMP-Ping, TCP, HTTP/1
Number of simultaneous clients	max. 4
Type of the connector	RJ-45

Measuring parameters

1. IP Network Analyzer

Number of inputs	60 channels (simultaneously)
Measured parameters	UDP packet format, CRC, amount and data rate of the packets, arrival times of the packets etc.

2. TS Analyzer

Number of measured TSs	60 IP+4 ASI channels (simultaneously)
Measured parameters	packet format, data rate, elementary stream data rate and data amount, sync and CC error, TS structure etc.
Table parameters	structure, data content, repetition time, date of the version change, CRC etc.

3. Sample analyzer

Place of sampling	at the programmed PID value,
Time of sampling	backwards from the time of querying (FIFO)
Sample size	between 0.1 and 10 Mbyte programmable
Access to the sample	in file, at the place of the analysis (TCP transmission)

Programming the device

Programming and control	over Internet, separated from the internal IP network
Programming software	on web interface (Java technology)
Recording of the measuring data	saved in text file, data file or picture file with printing facility

General data

Front panel LED displays	LINK, ACT, FIBER, Power On Internet status, Analyzer connection Memory operation, Erorrs, Alarms
Rear panel LED displays	2 × LINK & ACT, Gigabit mode, FIBER (optical transmission)
Mass	approx. 3.5 kg
Size W × H × D	19" × 1 HU 483 × 43.6 × 473 mm
Service period	continuous
Power requirement	90 … 264 V AC, 47 … 440 Hz
Power consumption	max. 25 W
Operating temperature range Relative humidity	+5 … +40 °C max. 80 %
Storage temperature range Relative humidity	-25 ... +45 °C max. 95 %, non-condensing

CableWorld Ltd.
Budapest XI., Kondorfa u. 6/B
Hungary
Tel.: +36 1 204 7815
Fax: +36 1 204 7839
Internet: www.cableworld.eu
E-mail: cableworld@cableworld.hu