CW-4851
IP TV SERVER

Penetration of digital television technology is coming off under the public eye: the revolution of mobile telephony or the basic change in photography techniques touched everyone. Introduction of digital technology does not only mean reception of picture and sound in digital form, but also the change in the signal transmission media and broadening their range. Until now, receiving TV and radio programs has been considered axiomatically being done through radio waves, coaxial cable, and perhaps optical fibre. However in the future the line-phone provider, the mobile phone provider and the computer network operator will also be in the position to offer such services. The initials IP TV stand for the Internet provider's radio and television program service using Internet Protocol.

The CW-4851 IP TV Server is the smallest member of CableWorld's Transport Stream Remultiplexer family. The device receives at its inputs data streams containing usually 8-10 television programmes, and forms from them one data stream which can be distributed by the IP TV provider in IP environment. At designing the output data stream, the main consideration is the data rate rather than the number of programs. In case of the CW-4851, the user has the task to decide the programs and further data to be transmitted in the output data stream. In order to decrease the data rate, the IP TV Server removes the useless null packets and the bytes above 188 bytes in the packets; after this it builds the data content into UDP/IP packets.

In IP environment the data transmission is made in asynchronous way, and the packets get to their destinations upon their addresses. By controlling the network, the service provider controls those packets the particular subscribers should obtain. The IP TV Server is designed to generate and continuously send packet series, which contain e.g. several TV programs and are equipped with the given addresses. At the headend, the service provider needs to use as many IP TV Server units as many services (e.g. TV program groups) are to be provided at the same time.

Main features:

- Loop-through ASI inputs, 100 Mbit/s Ethernet output
- Capability for Multicast, Unicast and Broadcast addressing in IPv4 environment
- Setting and programming with external PC in Windows environment, operation without computer
- Data rate flexibly changing in a wide range
- PID Filtering and PID Remapping
- Handling of the PAT, PMT, SDT and NIT tables, facility for inserting user packets
- 19" × 1 HU frame, low power consumption, continuous service

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IP TV technology is evolving in these days, most of the technicians are only just now getting acquainted with the subject, and the number of devices for implementing IP TV is low yet. The CW-4851 IP TV Server is an upgraded version of CableWorld's CW-4852 Transport Stream Remultiplexer, thus in this description we focus on the new IP TV function; the device's remultiplexer function is described in the CW-4852, -4, -8 TS Remultiplexer data sheet.

With the IP TV Server, the data rate of the output data stream is set not by the operator but it arises from the data rate(s) of the input data stream(s). The resulting data rate arises from the data rates of the elementary streams, selected from the input signals for being transmitted. Without input signal the IP TV Server does not deliver output signal (more precisely delivers tables only). The CW-4851 has been elaborated from the CW-4852 two-input remultiplexer, but in case of demand IP TV Server based on the four- or eight-input remultiplexer can be delivered, too.

At its ASI inputs the CW-4851 IP TV Server can receive both 188 and 204 bytes format, carried by both continuous and burst format data streams. The device removes the null packets and the error correction codes placed above the 188 bytes, and forms UDP/IP data packets according to IPv4. The packets contain 7 × 188 bytes of synchronized (starting with h47) MPEG format (DVB) transport stream. For their reception IP TV set-top boxes are needed, which can work with this format.

The CW-4851 IP TV Server is configured with the SW-4851 TS Remultiplexer software that is equipped with a separate page for setting the special parameters of the server function. Assembling the output data stream is made with the usual remultiplexing procedure; setting of the IP TV operating modes will be made after that. This setting is made through the same 100 Mbit/s full duplex interface, which delivers the output signal. The device has to be equipped with an own IP address, so that the computer can recognise the device selected by the operator.

The other important content of the generated UDP/IP packets is the address built in the packet.

The SW-4851 can be set to following addressing modes:

- Send TS to Me – *The UDP/IP data packets will be sent to the computer, which addressed the Server. The address is read out of the command; the port is determined by the user.*
- Send TS to IP Address – *The packets will be sent to the preset address, after the device at the address has responded to the ARP messages sent to it.*
- Send TS to Broadcast - *The packets will be sent to the 255.255.255.255 IP address.*
- Send TS to Multicast - *The packets will be sent to the Port, IP and MAC address determined by the user. Sending is continuous after the command has been sent out.*

All data streams will be transmitted in Internet environment in asynchronous way, broken down to packets. In the headend of the IP TV system each IP TV Server generates the data packets of one program or program group. These packets are combined and transposed to a line of higher data rate (e.g. GBit line) by switches and routers. In the combined signal the programs' data streams can be distinguished and separated upon the addresses built in the packets.

Designing the system of addressing, assigning the subscriber IP addresses, and controlling which subscribers which packets can receive is the task of the system manager. In the IP TV system the programs are not scrambled, the pay TV system is based on controlling the availability of the packets. This control is operated and supervised by the system manager. One instrument of this control is the configurable switch, which is operated not by the physical layer but by a higher level, the information content (addresses etc.).

Setting the IP TV Server consists of two procedures. Assembling the program to be transmitted is a simple remultiplexing procedure, which needs special DVB knowledge. Setting the IP TV specific data is a simpler task, after the system manager has defined them. Establishing and operating the network, accomplishing the tasks of the system manager needs expertise in the field of computer networks.

TECHNICAL DATA

Data of the remultiplexer function	see in the CW-4852, -4, -8 TS Remultiplexer data sheet

Data of the IP TV service function

Output data format	UDP/IP
Protocol	according to IPv4
Data content	synchronized packets of 7 × 188 bytes, or CW-Net format
Data rate	0 ... 56 Mbit/s, the sum of the data rates of the elementary streams
Ethernet output	REALTEK RTL8201
Operating mode	100 Mbit/s (full duplex)
Type of the connector	RJ45
Üzemmódok	Send TS to Me Send TS to IP Address Send TS to Broadcast Send TS to Multicast

General data

Service period	continuous
Power requirement	90 ~ 264 V AC, 47 ~ 440 Hz
Power consumption	max. 35 VA
Mass	approx. 3.5 kg
Physical dimensions:	19" × 1 HU
Width × Height × Depth	483.0 × 43.6 × 473.0 mm
Environmental data	
Operating temperature range	+5 ... +40 °C
Relative humidity	max. 80 %
Non-operating	-25 ... +45 °C
Relative humidity	max. 95 %, non-condensing

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