CW-4871
QPSK DEMODULATOR QUAD

DVB Digital Video Broadcasting

Introduction of digital television and spreading of IP TV demand in an increasing number demodulators, which deliver ASI signal for further processing. For satisfying this demand, CableWorld developed a Quad demodulator family, which comprises QPSK, QAM and OFDM demodulators.

Today the stage of technical development allows accommodating four independent demodulators in a 1 HU instrument frame instead of one demodulator so far. Beyond quadruplicating the number of demodulators, by applying CableWorld's CW-Net Device Control System, these devices provide facilities, which cannot be found yet in products of any other manufacturer: the output transport streams can be analyzed, saved in file, played on monitor etc. in the controlling computer. At the same time the CW-Net performs also system management.

The CW-4871 QPSK Demodulator Quad comprises four independent QPSK demodulators with loop-through inputs and double ASI outputs by channel. The QPSK demodulator is based on the most up-to-date „Zero IF" technology; the circuitry automatically identifies the FEC, to be entered are only needed the channel frequency and the symbol rate. As a device of the new generation, the CW-4871 QPSK demodulator has no controls on its front panel; all settings and programming are made from the computer. The SW-4871 control software of the device is available for free download at www.cableworld.hu.

In the CW-Net Data Transmission and Device Control System each device is equipped with an individual IP address, thus the number of devices the connected single computer can handle is not limited. The devices operate independently from the computer, which is needed for their programming and supervision only.
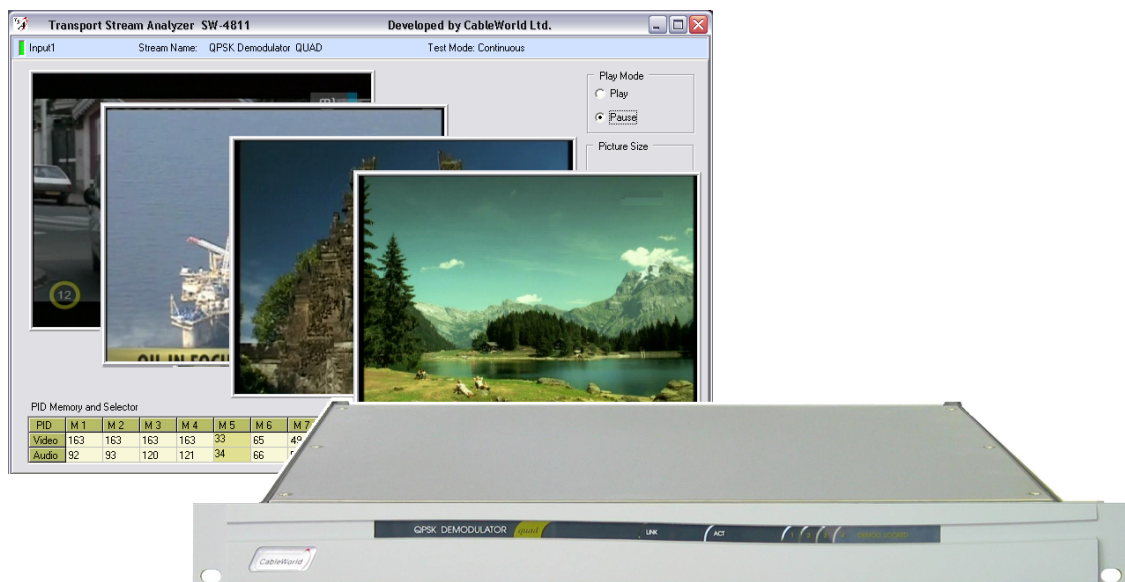
Main features:

- Four QPSK demodulators with loop-through inputs for the 950 ... 2150 MHz band
- Symbol rate between 2 MS/s and 45 MS/s, MCPC and SCPC mode
- Computation of the C/N value in the 2 ... 18 dB range
- Direct Conversion technology
- Common Interface compatible 204 byte/packet format output signal (CI module under design)
- Computer management system
- Built-in stream analyzer and picture/sound reproduction
- 19" × 1 HU unit frame, 3.3 V supply voltage, low power consumption, continuous service

The CW-4871 QPSK demodulator is a member of CableWorld's demodulator quad family, providing satellite FTA reception. The loop-through inputs of the four demodulators highly simplify the distribution of the SAT KF signal. The Direct Conversion system assures excellent demodulation parameters; the tuner operates from 3.3 V and comprises almost no analogue components. The main functions of the demodulator (AGC, Nyquist filter etc.) are all implemented by digital solutions, thus beyond the excellent technical data the reliability and expectable lifetime are also very good. The number of adjustable parameters of the device has been limited for easy usability, and checking-up the optimal operation state is facilitated by numerous information data. The user's job has also been eased by applying „auto" mode at all places where it was possible.

The outputs deliver 204 byte/packet format Common Interface compatible signal. Beyond the FTA version, the version with four CIs is already being designed. The two ASI outputs per channel permit driving two independent ASI lines.

The CW-4871 QPSK Demodulator Quad – as all new devices of CableWorld's digital headend – is programmed in IP environment from the user's computer or the computer built in the headend.

The SW-4871 QPSK Demodulator Controller software shows the operational state and the actual reception parameters of the four demodulators simultaneously. Setting the parameters is made with CW-Net instructions; the settings are stored in an EEPROM. The number of possible reprogramming is more than 1,000,000.

The computer control via CW-Net permits the device to be used also in automatic measuring and monitoring systems where the signals of the four outputs are supervised in time-sharing mode. The CW-Net system is a 100 Mbit/s Ethernet network, where both the transport stream and the device control commands are transmitted built in UDP/IP packets. CW-Net is an open system; its description is available for download in the CW-Net.pdf file at www.cableworld.hu.

By the device's output selector the CW-Net system permits any of the output signals to be put into the computer in real-time mode for being analyzed and reproduced there. Nearly all software available at CableWorld's web site can be used with the device, e.g. one of the output signals can be supplied directly into an IP network.

The highest supply voltage in the CW-4871 QPSK Demodulator Quad is as low as 3.3 V that results in a high reliability and long lifetime.

For powering the LNBs and distributing their signals the CW-4010 SAT IF Distributor is recommended.

Technical data

(The technical data are identical for all four channels.)

Input data

RF input

Input frequency band	950 … 2150 MHz
Input signal level	-65 dBm … -25 dBm
RF input impedance	75 Ω
RF input connector	F type socket
RF output connector	F type socket
Insertion attenuation	±5 dB, typically 0 dB

Input signal processing

Modulation	QPSK according to ETS 300 421 (DVB-S)
Symbol rate	2 … 45 Msps
Convolution ratio	1/2 ... 7/8, with automatic identification
Roll-off	35 %
Eb/N0	typ. 4.7 dB (code rate 3/4, BER $< 2 \times 10^{-4}$)

Output data

Transport stream output	asynchronous series (ASI) (DVB-TM1449)
Nominal output impedance	75 Ω
Output amplitude	typ. 800 mVpp
Output data rate	270 MBaud
Output connector	BNC socket
Front panel LED signalisation	LINK, ACT, DEMOD LOCKED

General data

Service period	continuous
Power requirement	90 ~ 264 V AC, 47 ~ 440 Hz
Power consumption	max. 40 VA
Mass	approx. 3.5 kg
Physical dimensions	19" × 1 HU
Width × Height × Depth	483 mm × 43.6 mm × 473 mm
Environmental data	
Operating temperature range	+5 ... +40 ^{o}C
Relative humidity	max. 80 %
Non-operating	-25 ... +45 ^{o}C
Relative humidity	max. 95 %, non-condensing