

Coverage

SAM-CV 1000

DVB Drive Test Solution

DVB-T

DVB-T2

◇ Key Features

- support of DVB-T and DVB-T2
- based on common PC and Interface HW, no special HW necessary
- several DVB-T/-T2 channels and/or several DVB-T2 PLPs can be measured and recorded simultaneously
- recording of key RF parameters
 - Signal Strength (Rx Level) [-10dBm .. -90 dBm]
 - Carrier Noise Ratio (C/N)
 - DVB-T Bit Error Ratio before Viterbi (BERbV)
 - DVB-T Bit Error Ratio after Viterbi (BERaV)
 - DVB-T2 Bit Error Ratio (BER)
 - Modulation Error Ratio (MER) [max. 40dB]
 - Packet Error Ratio (PER)
 - DVB-T2 Frame Error Ratio (FER)
 - Signal Quality
- recording of important stream parameters
 - Cell ID, Network ID
 - DVB-T2 System ID, DVB-T2 PLP ID
 - number of DVB-T2 PLPs
- Constellation Diagram
 - streaming/saving of diagram snapshots
- streaming of the entire Transport Stream (TS) via IP
- recording of important modulation parameters
 - CodeRate, Guard, Constellation, FFT ...
 - DVB-T2 PLP info data
- comprehensive and interactive map display
 - Free editable Threshold Profiles
 - Various Visualization Styles and Color Gradients
- all data are stored in XML format



◇ SAM-CV 1000 At a Glance

SAM-CV 1000 is a cost efficient turnkey solution based on common Laptop, GPS and RF hardware. It turns a common laptop hardware into a powerful coverage measurement and drive test device.

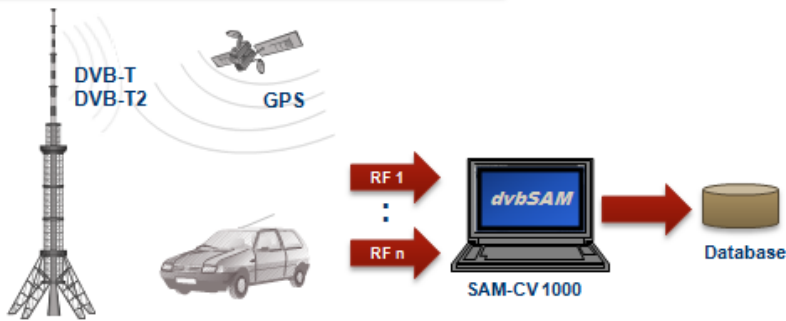
SAM-CV 1000 enables network operators to perform field coverage measurements for both **DVB-T** and **DVB-T2** broadcasts.

SAM-CV 1000 can be used to measure several RF channels (DVB-T and/or DVB-T2) simultaneously, permitting to measure all interesting channels and T2-PLP's simultaneously with a single coverage drive.

SAM-CV 1000 is suited ideally for drive tests of DVB-T2 Multi-PLP broadcasts because the solution is able to measure all PLP's simultaneously.

SAM-CV 1000 provides a feature-rich and interactive map display based on Google Earth for visualizing all recorded parameters with color gradients based on editable threshold profiles.

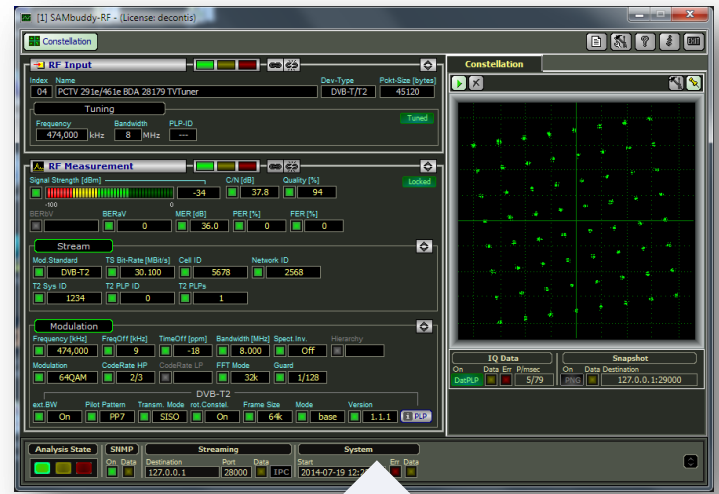
◇ Application



Step 1 :: Test Drive

During a test drive SAM-CV 1000 collects the RF measurements from one or more RF input as well as the GPS data for the current position. With one SAM-CV 1000 the network operator is able to get the coverage for several DVB-T/T2 channels or for several DVB-T2 PLPs with just one single test drive.

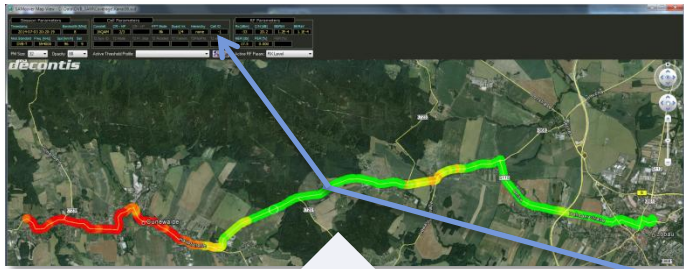
All relevant RF parameter measurements of all processed DVB-T/T2 RF channels and/or all DVB-T2 PLPs along with simultaneously aggregated geographical coordinates and further meta data are stored into XML based data files.



All relevant RF measurements including the constellation as well as important stream- and modulation parameters are also visible at one glance during the entire test drive.

Step 2 :: Data Evaluation

The recorded data can be evaluated and displayed in a map by using Google Earth™. For every measurement point a place mark gets painted onto the map, whose color indicates whether the particular RF parameter value is OK or close to the configured WARNING or ERROR thresholds. Threshold profiles for various purposes, e.g. indoor/out-door reception, can be defined and can then be applied to the data evaluation in the map window with a single mouse click.



With click on a place mark in the map all corresponding measurement data from this position get updated in the upper part of the window, i.e. all Session, Cell and RF Parameters get updated.

Session Parameters				Cell Parameters				RF Parameters			
Timestamp	2014-07-03 20:20:19	Bandwidth [MHz]	8	Constellation	16QAM	CR - HP	2/3	Rx [dBm]	-33	C/N [dB]	20.2
Mod Standard	DVB-T	Freq [kHz]	594000	Modulation	64QAM	Constellation	2/3	BER before Viterbi	1.2E-4	BER after Viterbi	1.1E-4
		Spd [km/h]	96	TS Sys ID	1234	TS Mode	1	MER [dB]	17.5	PER [%]	0.000
		Sat	9	T2 Sys ID	1234	T2 Mode	1	PER [%]			

Green place marks mean the particular RF parameter is "well within the thresholds". Green going toward yellow means the particular RF parameter comes close to the warning threshold, but is still OK. Yellow going toward red means the particular RF parameter crossed the warning threshold and comes closer to the error threshold, but still didn't cross it. Red means that the particular RF parameter crossed the error threshold.

This visualization makes it very simple to evaluate the recorded RF parameters visually over the complete region.

By changing the RF parameter selection the map display gets updated immediately. Available parameters include RX Level (dBm), Carrier Noise Ratio (dB), BER before Viterbi and BER after Viterbi, Modulation Error Ratio MER (dB), Packet Error Ratio (%) and DVB-T2 Frame Error Ratio (%).

Example Test Drive:

- (1) display Rx Level
- (2) display Bit Error Ratio after Vitebi (BERaV)
- (3) display Packet Error Ratio (PER)

◇ Technical Specification

RF Input

PCTV 292e	DVB-T/-T2 USB Receiver
HVR-1975	DVB-T/-T2 USB Receiver

System ¹⁾

Processor	Intel Core i3/i5/i7
RAM	4 GByte
HD	500 Gbyte
USB	2.0 / 3.0

¹⁾ system components are individually configurable

GPS Input

USB GPS receiver supporting NMEA-0183

OS

Windows 7 professional / enterprise
Windows 8.1 professional / enterprise

Dimensions ²⁾

	Dimension	Weight
15" Laptop	370 x 25 x 280 mm	2,3 kg

²⁾ depends on actual configuration