

# ReFeree T2



## DVB-T2 & DVB-T Measurement Receiver

### Complete DVB-T/T2 Analysis, from RF down to the Video

**ReFeree T2 is a DVB-T2/T measurement receiver cumulating DVB-T2 and DVB-T live reception with real-time analysis and recording.**

ENENSYS ReFeree T2 allows to monitor DVB-T2 parameters (RF, T2 frame structure, PLP parameters), whatever the DVB-T2 transmission mode (Single PLP, Multi PLP, SFN/MISO. ..). ReFeree T2 also allows to monitor DVB-T parameters (RF, TPS, MIP).

As forerunner on DVB-T2, ENENSYS proposes a real time application, capable to monitor simultaneously RF signal & Transport Stream content. Monitoring screens can be totally customized.

In its basic version, the ReFeree T2 features live stream capture capabilities for baseband stream (T2-MI and MPEG2-TS) recording. The application also integrates a video decoder enabling real-time decoding of any unencrypted services (SD, HD MPEG-2/4, H264).

To facilitate your analysis, ENENSYS RFScope plug-in includes a specific screen gathering the main RF parameters in real-time: Rotated Constellation, Impulse response, signal level, SNR level, error rates. Combined with ReFeree T2, RFScope plug-in provides accurate measurements of RF parameters (signal level, SNR, MER, echoes).

The T2MI plug-in software gives access to the most complete T2MI Multi-PLP analyzer: L1 specific screen (pre & post signalling), T2 Frame composition, T2 timestamp, ...

Finally, with the TS Analyzer plug-in, the Transport Stream contained inside the selected PLP of the DVB-T2 stream can be analyzed. PSI/SI tables are parsed and displayed (including Private Table parsing). The 3 priority levels of ETR290 are implemented. Bitrate can be monitored globally and for each service. Customizable alarms are also available.

### Applications

- R&D Labs
- R&D Test & Measurement
- DVB-T2 & DVB-T Baseband Signal Generation
- Broadcast
- RF Reception Quality Monitoring
- DVB-T2 & DVB-T Broadcast Network Troubleshooting
- Installation & Maintenance
- Coverage & Drive Tests

### Benefits

- Easy to use
- Compact, USB2-self-powered
- Complete 2-in-1 product:
  - RF + Baseband (ASI + IP)

### Characteristics

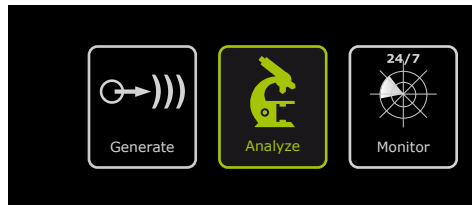
- Multi-Inputs:
  - RF input for DVB-T & DVB-T2
  - ASI input
  - IP input
- 1pps and 10MHz inputs for SFN Monitoring
- GPS input
- Single and multi-PLP support

### DiviSuite Software (included)

- Service Decoding (SD and HD, MPEG-2/MPEG4 H264)
- Advanced Transport Stream recording
- Transport Stream over IP forward

### Plug-in Options

- RFScope: Analysis of RF parameters (MER, ....)
- T2MI & Multi-PLP Analysis
- TS Analyzer (ETR290, PIDs, PSI/SI parsing...)



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## Input Interfaces

<b>RF input standards</b>	DVB-T2 & DVB-T
RF Connector	1x F-type (female) - 75 Ω
Frequency range	VHF Band III (174-230MHz) UHF Band IV (470-866 MHz)
Sensitivity	-80 to 5 dBm
Channel bandwidth	7 & 8 MHz
FFT Mode	1k, 2k, 4k, 8k, 8k extended, 16k, 16k extended, 32k, 32k extended
Modulation	QPSK, 16QAM, 64QAM, 256 QAM Normal & Rotated
1pps connector	1x BNC - 50 Ω
10MHz connector	1x BNC - 50 Ω
<b>DVB-ASI Connector</b>	1x BNC - 75 Ω
GPS Connector	1x MCX - 50 Ω

## RF Measurements

Constellation	Diagram display
Channel Impulse Response	Diagram display of echoes from 0dB down to -50dB, Delay up to 233μs
Signal level	+5 down to -85 dBm ±1 dBm
SNR	0 to 24 dB ±1 dB
Bit Error Rate	LDPC & BCH (DVB-T2), Viterbi & RS (DVB-T)
Modulation Error Rate	0 to 38, ±1 dB

## T2MI MPLP Analysis

- T2 Specific Analysis
- Multi-PLP support (PLP user selection)
- T2 Signalling Analysis: T2 Frame, BB Frame, L1, ...
- T2MI Analysis (on ASI or IP input)

## Transport Stream Analysis

**Transport Stream** monitored in **real-time** from either source:

- RF or ASI through USB from ReFeree T2
- IP from host Ethernet controller

### TR 101 290

- Priorities 1, 2 and 3 implemented

### Service information

- PSI/SI table display
- Service List
- PID Summary
- Private table parsing

### Bitrate monitoring

- Overall, or filtered by program or PID

### PCR Jitter

- PCR Jitter Accuracy graphs (real-time, history and density)

## Services Processing

- Service decoding: HD and SD, MPEG2/MPEG4 H264 decoding (unencrypted programs)
- Recording of the stream on HDD, TS over IP Forward
- Real-time forward of the entire multiplex to an IP address

## Environment

Operating temperature	0 to 55°C / 0 to 131°F
Storage temperature	-20°C to 70°C / -4°F to 158°F
Humidity	0 to 95%, non condensing

## Physical and Power

Length	210mm / 8.3 in.
Height	35 mm / 1.3 in.
Width	153 mm / 6.0 in.
Weight	Approx. 660 g
Power supply	USB2.0 self-powered

## Ordering codes

**ReFeree T2 - RF-T2 Analyzer:** DVB-T/T2 RF Analyzer. Shipped bundled with DiviSuite software for Windows 7 32b / 64b / XP providing Stream overview, Video decoding, stream recording

Plug-in Options:

**RFscope plug-in:** RF Analysis

**T2MI Analyzer plug-in:** T2MI Analysis Option for RF Analyzer

**TS Analyzer plug-in:** Transport Stream Analysis



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