now supporting
ATSC + DVB

Stream Explorer™ DVMD-B1

Enhanced MPEG2 analysis with Measurement Decoder DVMD

- Comprehensive analysis of MPEG2 transport stream contents
- Automatic error detection

- Realtime measurements with graphic display
- Clear presentation of analysis results
- User-friendly operation
- Windows 95/98 or Windows NT operating system

- Full remote control of DVMD
- Deferred time analyses possible
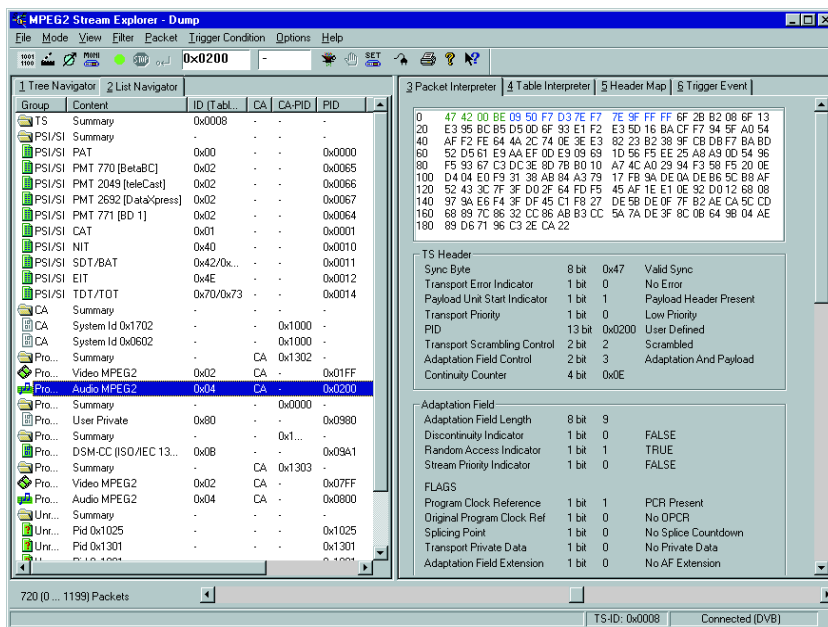- Interface for task-to-task communication COM/DCOM

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The software runs under Windows 95/98 or Windows NT on any PC or laptop connected to the DVMD via a serial interface. The easy-to-operate software and the clear presentation of test results in two windows of variable size ensure fast and effective working right from the start.

DVMD can store a transport stream of up to 2 Mbit and transfer it on request via the serial interface to the Stream Explorer™. DVMD uses several data or event filters (TRIGGER ON ERROR) which can be activated via the Stream Explorer®. The investigated data quantity of the transport stream can thus be considerably increased if required. Moreover, Stream Explorer™ can activate realtime analyses in the DVMD and output the results as moving graphic representations on the PC monitor. The realtime measurement functions of DVMD are thus considerably enhanced.

Fig. 1: All transport stream details under control with List Navigator and Packet Interpreter (DVB mode)
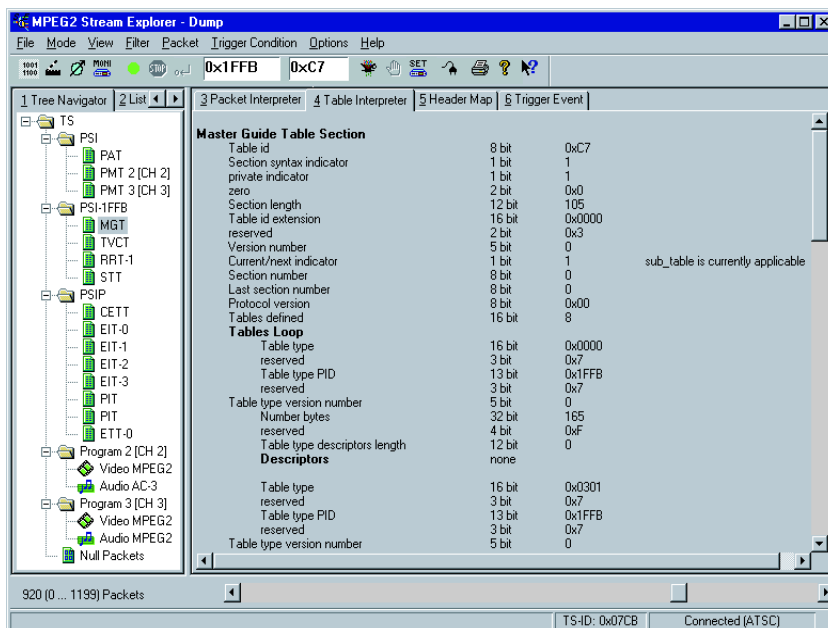
Fig. 2: Clear representation of transport stream structure with Tree Navigator and Table Interpreter (ATSC)

Five operating modes

- **DUMP**
  for comprehensive analysis of transport stream contents
- **TRIGGER ON ERROR**
  for detailed investigation of errors in transport streams
- **MEASURE**
  for graphic display of transport stream parameters in realtime

- **MONITORING**
  for transport stream monitoring and data rate measurement with graphic display in realtime
- **OFFLINE**
  for saving and subsequent restoring of any measurement scenarios (can be used with all four operating modes described above)

DUMP

This operating mode allows detailed analysis of the contents of transport streams (TS). The transport stream contents is represented by Stream Explorer™ in hexadecimal format as well as in an interpreted form. Via a syntax editor Stream Explorer™ can learn user-specific structures and interpret them similarly to the service
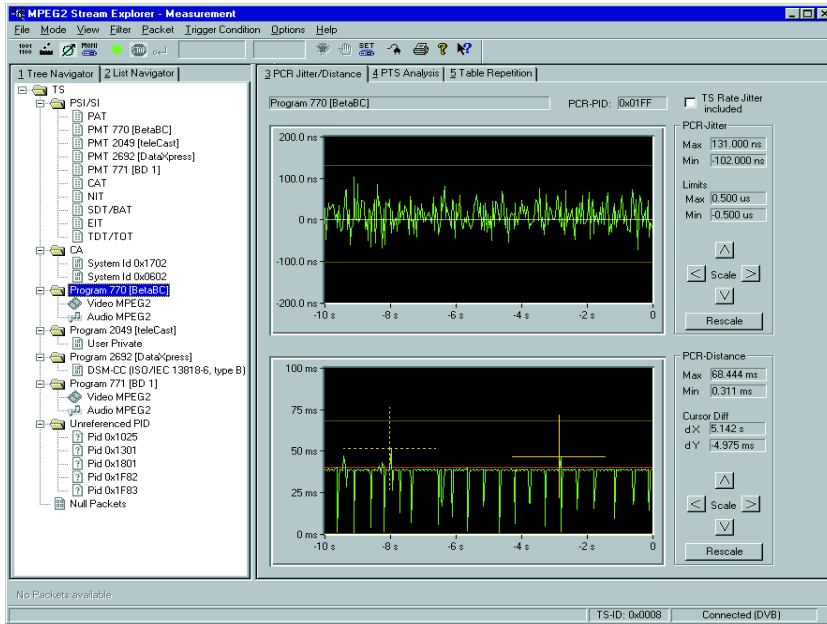
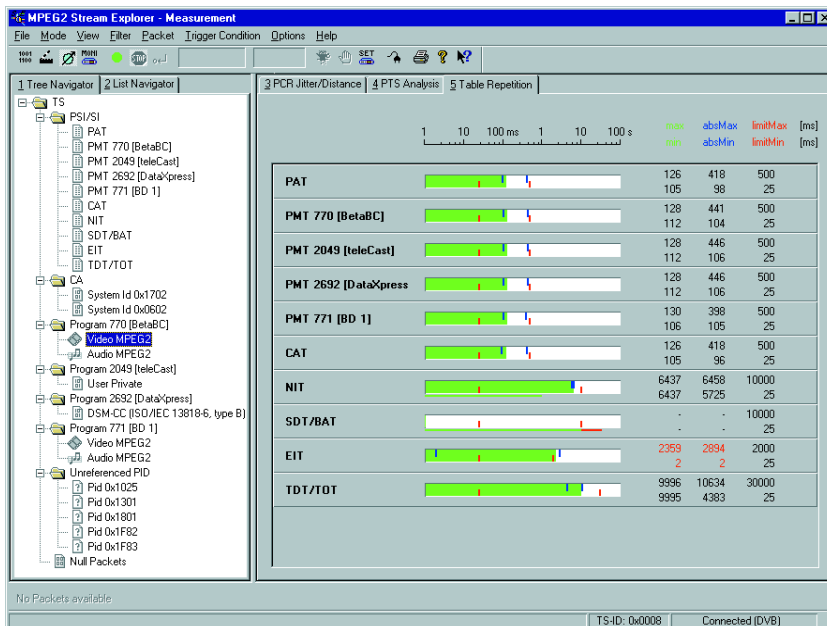**Fig. 3:** Realtime measurement of PCR jitter and PCR distance

Fig. 4: Realtime measurement of repetition rates of all tables

information (SI/PSI and/or PSI/PSIP tables) defined according to DVB/ATSC and MPEG2. This makes it very easy for the user to recognize any irregularities in the transport stream.

The transport stream data to be analyzed can be filtered for the following:

- TS packets with a specific PID and specific Table_ID

- TS packets with adaptation field
- TS packets with start of a PES packet (payload unit start indicator set)
- SI/PSI tables for DVB and PSI/PSIP tables for ATSC

Combinations of the above selection criteria are also possible. Irrespective of the filter settings, the complete structure of the transport stream contents is

additionally determined by Stream Explorer™ and displayed in the Navigator. The following **display modes** can be selected:

NAVIGATOR

Display of transport stream contents as a structure tree (Tree Navigator, Figs 2, 3 and 4) or in tabular form (List Navigator, Fig. 1 left) with general information about elementary streams such as PID, stream ID, data rate and information about scrambling. This display mode is always available together with a second display mode.

When an element is activated with the mouse cursor, the associated PID is immediately entered into the associated dialog box below the menu bar and in the case of service information tables the table ID is now additionally entered into a separate box. Especially for the ATSC standard the table ID is an essential criterion for table selection. Upon selection of the packet filter, these two parameters can directly be used to choose the data to be analyzed.

PACKET INTERPRETER (Fig. 1 right)
Display of a TS packet in hexadecimal format and at the same time as an interpreted contents list for header and adaptation field. A colour code for the various parts of the packet (header, adaptation field, payload, etc) makes for a clear representation. The packets are selected either via the NAVIGATOR or via a software slide switch allowing all buffered packets to be addressed in their original sequence.

TABLE INTERPRETER (Fig. 2 right)
Lists all elements of a selected table and interprets the contents. The following tables can be selected:
for all standards: CAT, PAT, PMT, *only DVB:* BAT, DIT, EIT, NIT, RST, SDT, ST, SIT, TDT, TOT; **only ATSC:** CVCT, EIT, ETT, MGT, PIT, RRT, STT, TVCT.
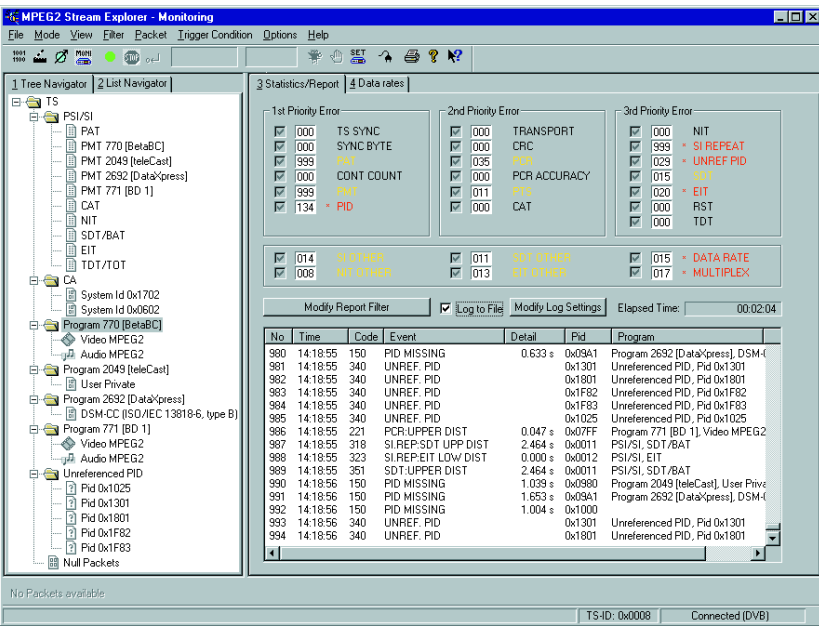
Fig. 5: All results of monitored transport stream at a glance

Fig. 6: Full remote control of MPEG2 Measurement Decoder DVMD

HEADER MAP

Gives an overview of the distribution of elementary stream packets within the transport stream. The headers of a selected elementary stream are highlighted in green and correspond to the relevant entries in the Navigator which are also marked green.

TRIGGER ON ERROR

Stream Explorer™ makes use of the TRIGGER ON ERROR function supported by DVMD. If an error occurs in the transport stream applied to DVMD, the data in the region of the error are stored in the DVMD and made available to the Stream Explorer™ for

evaluation. The cause of the error can thus be reliably detected and displayed in detail.

The following trigger events can be selected:
• all monitored real time errors, which can be assigned to a transport stream packet
• any choice and combination of specific real time errors
• occurrence of a predefined PID

TRIGGER EVENT

This display mode is available in addition for error investigation. It shows the structure elements in which the error occurred. Faulty data are shown in red. The type of error is also explained.

MEASURE

This operating mode provides realtime analysis of several transport stream parameters and graphic display in the form of bargraphs or traces:

• PCR jitter (Fig. 3)

• Distance of PCR values in transport stream (Fig. 3)
• PTS/PCR delay
• Distance of elementary-stream-related PTS values
• Repetition of PSI/SI respectively PSI/PSIP tables

MONITORING

This is the remote-controlled version of the standard operating mode of the DVMD itself. All monitoring details can be set and displayed via the user interface of the Stream Explorer™. Just as with the DVMD itself, all errors to ETR290 or any choice thereof can be displayed in the report (Fig. 5).
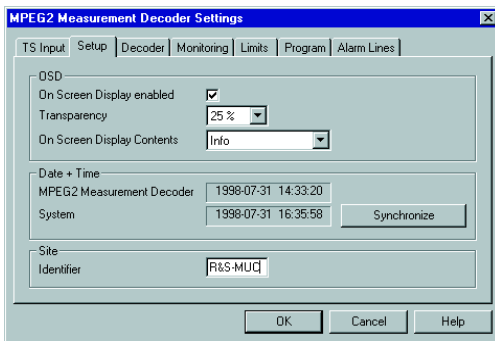
Moreover, the report can continuously be stored on hard disk. In contrast to the internal report, the number of entries is not limited in this case. It is thus ensured that even over a longer period of observation no error will go unnoticed. The error report is output in *.csv format, which is extremely convenient for further processing using other software applications for word processing and table calculation.

Additionally available is the realtime graphic display of the data rates of all SI/PSI and/or PSI/PSIP tables, of all individual elementary streams as well as sum values for programs in the form of bargraphs.

OFFLINE

On switching from any operating mode to the offline mode, the current measurement scenario, the operating mode itself as well as all transport stream packets involved will be saved on hard disk. The online analysis can fully be restored in the offline mode by reloading it. In this

MPEG2 Measurement Decoder DVMD and PC software Stream Explorer™, an ideal pair for monitoring and in-depth analysis of MPEG2 transport streams

Remote control

way measured values can very easily be recorded by simply storing them.

 All local functions of DVMD can be remote-controlled by the Stream Explorer™ (Fig. 6).

The Stream Explorer™ itself can be remote-controlled by means of other software packages via an interface for task-to-task communication. The two software packages can also exchange commands and data throughout a network. All functionalities and measurement results of DVMD and Stream Explorer™ are thus also available for other software packages, eg overall monitoring and management systems, throughout a network.

Specifications

Number of transport stream packets that can be displayed at a time	1200 (in Dump mode)
	800 (in Trigger on Error mode)
Number of programs that can be monitored at a time	20 (ATSC)
	25 (DVB)
Number of accumulated error seconds	max.1000
Total number of entries in statistics report	max.1000 for display on screen
	unlimited for storage in data file
Software interface for task-to-task communication	Microsoft COM/DCOM (Distributed) Component Object Module

System requirements
PC or laptop with Pentium processor (recommended clock frequency: min.100 MHz), Windows 95/98 or Windows NT operating system, min. 16 Mbyte RAM (Windows NT: 32 Mbyte), required memory on hard disk: approx.10 Mbyte, 1 free RS-232 interface (recommended data rate: 115 kbit/s), 1 parallel printer interface, 3.5'' disk drive

Ordering information

Stream Explorer™ DVMD-B1	2068.9406.02
Equipment supplied	3.5" floppy disks with setup program; cable for connecting the DVMD to the PC, manual and dongle for connection to the parallel printer output of the PC

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Certified Quality System
ISO 9001
DQS REG. NO 1954 QM

Certified Environmental System
ISO 14001
DQS REG. NO 1954 UM

More information at
www.rohde-schwarz.com
(search term: DVMD-B1)

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