

4T2 Rack

the versatile digital broadcast monitoring probe

Advanced Broadcast Components
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4T2 Rack



Company introduction

- Advanced Broadcast Components Ltd. is located in Bad Segeberg, Germany and operates since June 2005
- The privately owned company started-off as a portable digital-terrestrial test equipment manufacturer through the acquisition of all intellectual property to build the AdCoCom 4T2 DVB-T Portable Test Set under the ABC brand name
- Following it's mission of “building the best digital-terrestrial broadcast measurement receivers available in the marketplace”, the company expanded the product lines from terrestrial DVB towards other terrestrial standards, as well as satellite and IPTV reception

Product introduction

- By 2009, the company introduced the 4T2 Content Analyser, a comprehensive software application, designed from ground-up for monitoring
- This application provides software interfaces that are available for all in-house designed hardware devices
- The 4T2 Rack is a compact and affordable 19" 1U integrated monitoring system, based on the latest technologies available
- Through focusing on standardised processing hardware, the ABC product achieves very high reliability and huge economy-of-scale advantages

4T2 Rack



4T2 Rack multiple interface monitoring



- dual Gbit LAN
 - UDP/RTP transport stream input
 - SNMP remote
- ASI transport stream input
 - Content Analysis
- DVB-T/T2
 - RF interface measurements & Content Analysis
- DVB-S/S2
 - RF interface measurements & Content Analysis
- DVB-C (available on request)

4T2 Rack superior functionality



- monitor wall feature
- industry standard software codec support
- simultaneous monitoring of multiple physical inputs
- DVB T2-MI analysis
- multi monitor output for visualisation
- source scanner and automated report generation

4T2 Rack latest generation built



- Windows™10 64bit system platform
- compact 19" x 1U x 250mm
- multi-standard digital reception
- six-core Coffee-Lake i7 CPU
- m.2e solid state drive
- 4k dual HDMI output

4T2 Rack multiple interface monitoring

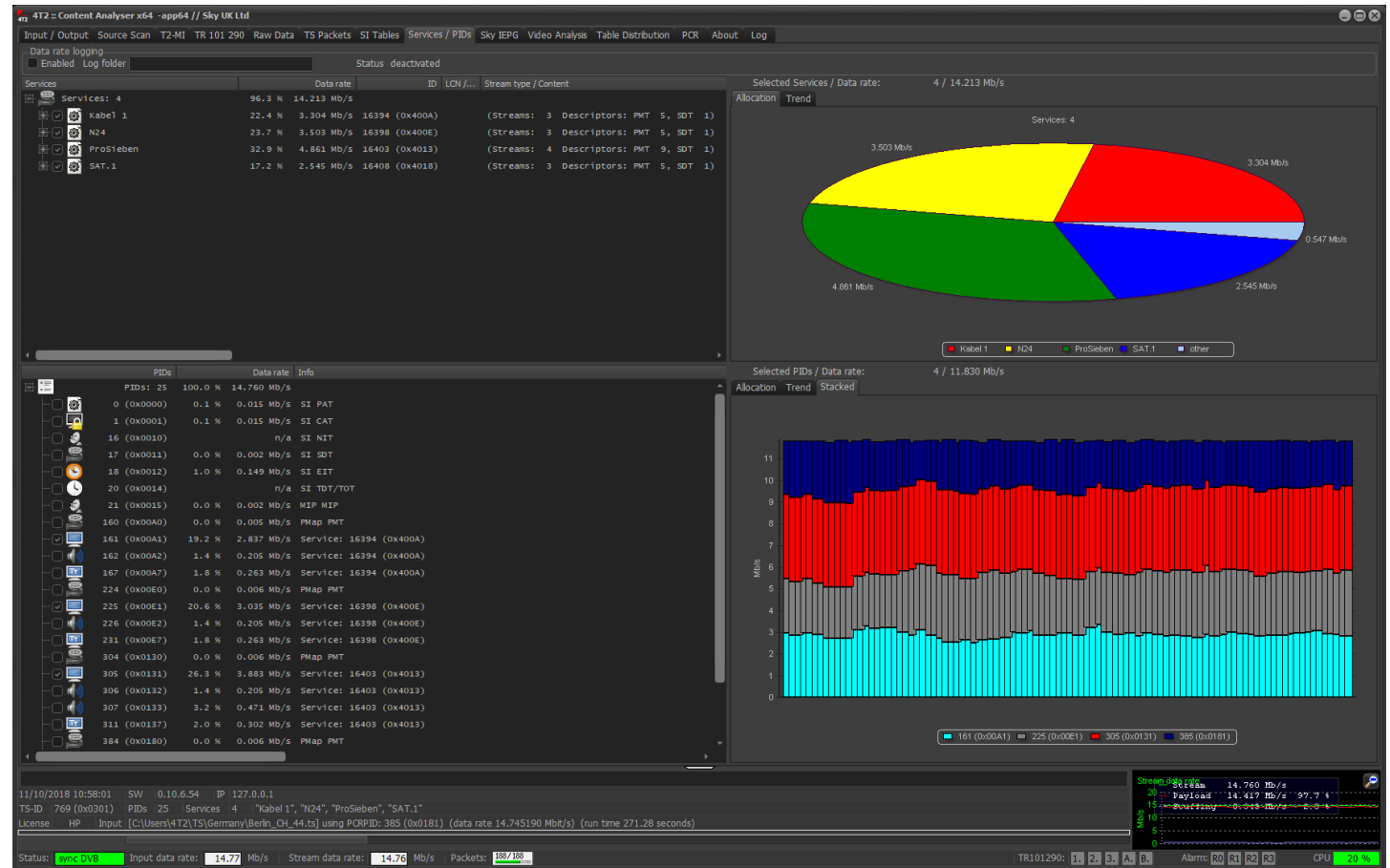
- DVB-T2 MI analyser
 - on ASI and on IP input
- Transport Stream analyser with Multi-Viewer
 - SI-Tree, SI-table repetition, TR.101.290 1st, 2nd, 3rd priorities, Services & PIDs display, Data-rates display & graph, PCR-rate & Jitter, Black/Freeze detector, Audio mute, triggered capture, log-file
- H.262 SD/HD, H.264 SD/HD, and H.265 Ultra HD decoder with 4k hdmi output
- DVB-T/T2 RF analyser with
 - Level, MER, EVM, bit errors
 - Constellation display, Impulse Response display, Spectrum display

SERVICES PIDs (all inputs)

Data-rate displays with virtual and logical channel numbers sorted by services and PIDs

Pie-chart and trend-line displays with relative and absolute data-rates

All components of service displayed

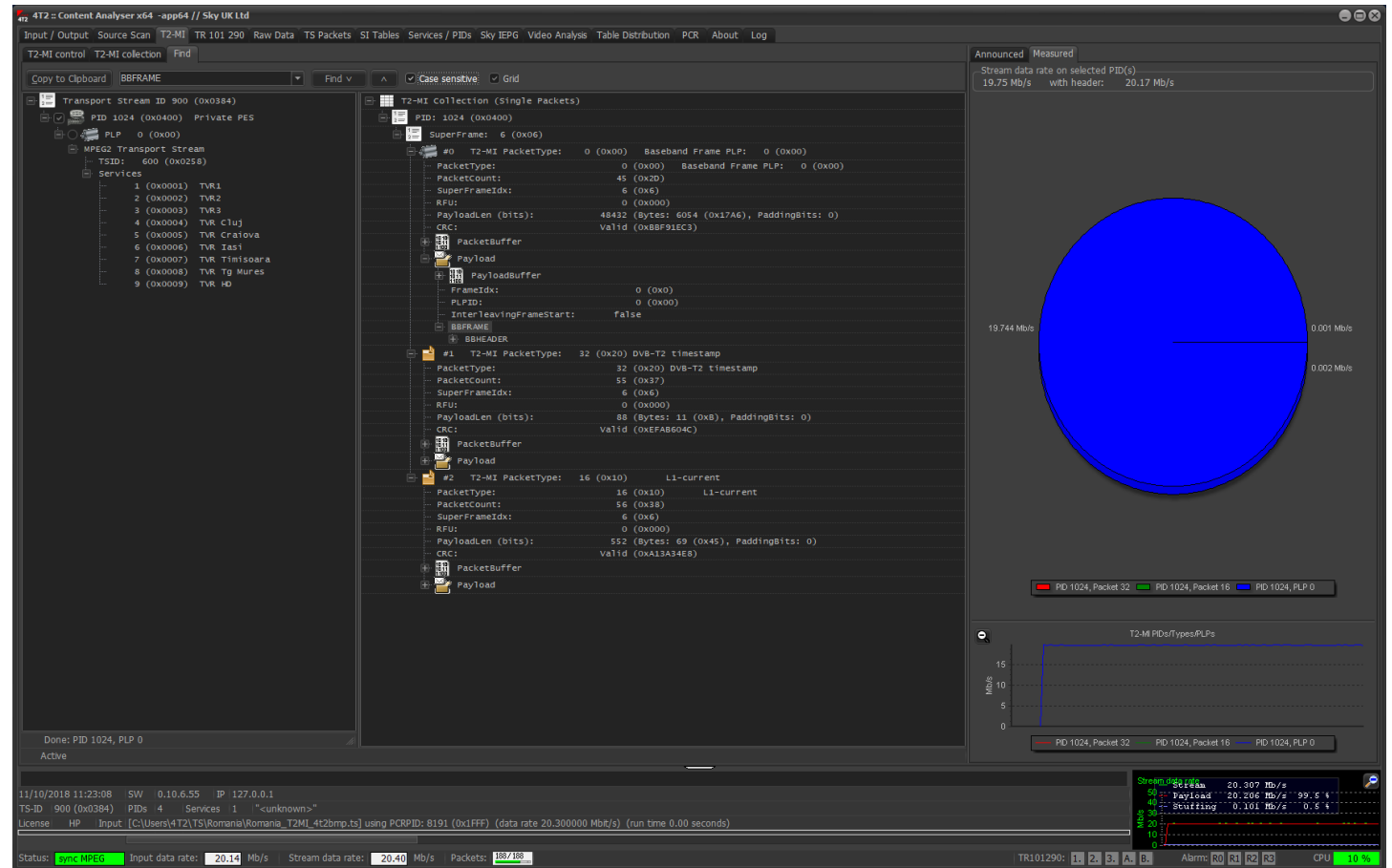


T2-MI (ASI, IP inputs)

T2-Modulator interface
real-time analyser

De-capsulation of
embedded single-, or
multi-program transport
streams

Re-routing into Content-
Analyser for full
visualisation and
analysis



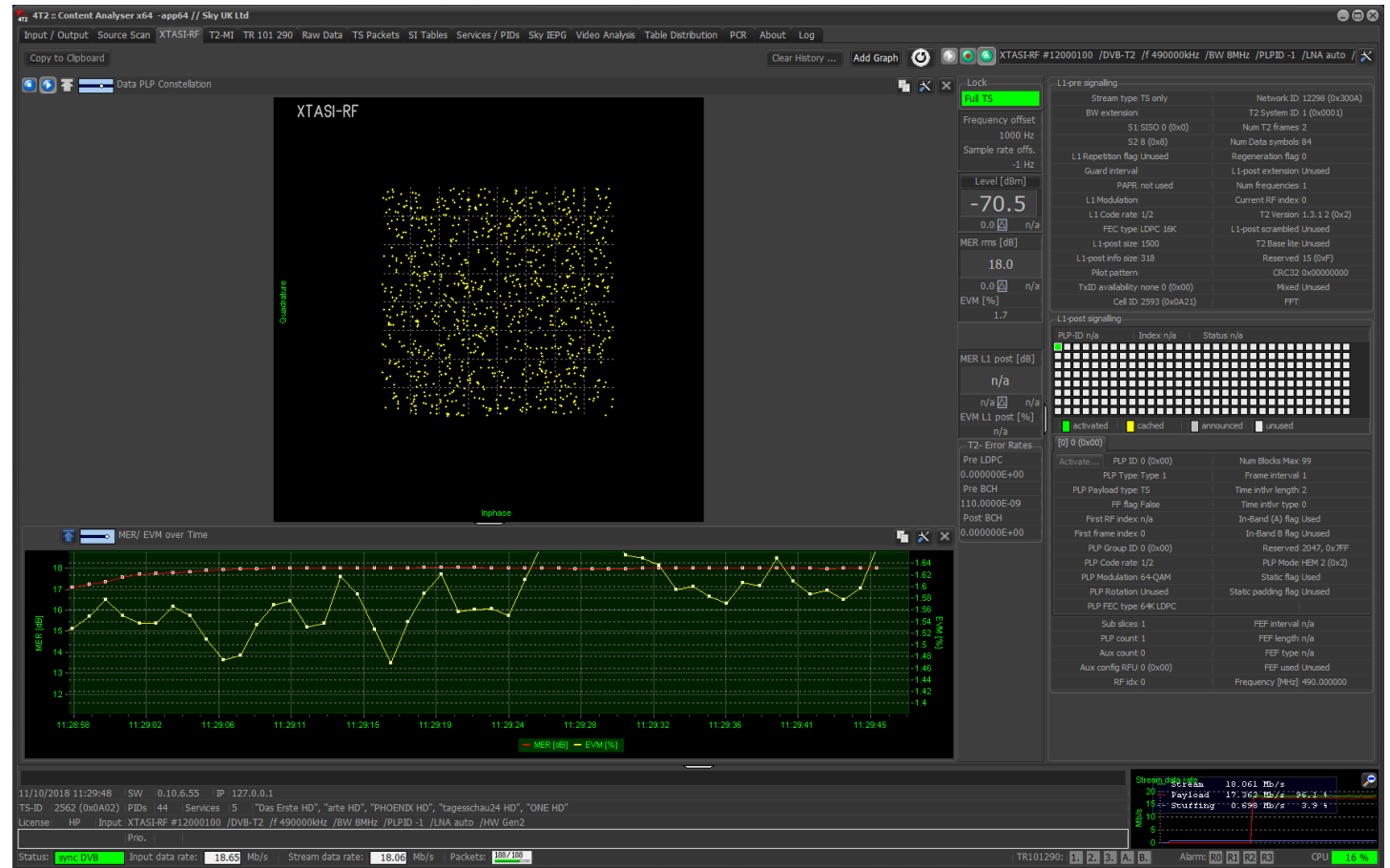
DVB-T/T2 RF (terrestrial inputs)

Constellation, Impulse-Response, Spectrum displays

Calibrated level, MER, EVM, BER

Decoded TPS information, L1 pre, L1 post

>42dB MER performance



TR 101 290 (all inputs)

Evaluation of TS following TR101290 1st, 2nd, 3rd priority (including T2-MI extensions)

Groups, or individual error measurements

All errors are logged with date and time of occurrence

Selection can be used as trigger for Stream Capture

Pre and post trigger capture

Adjustable quota for current file and overall storage

The screenshot displays the 4T2 Content Analyser x64 software interface. The main window shows a tree view of error categories for TR 101 290, including First priority, Second priority, and Third priority errors. The status bar at the bottom indicates the current status is 'sync DVB', with an input data rate of 42.10 Mb/s and a stream data rate of 41.99 Mb/s. The interface also shows various settings like buffering, quotas, and current usage.

4T2 Content Analyser x64 -app64 // Sky UK Ltd

Input / Output Source Scan T2-MI TR 101 290 Raw Data TS Packets SI Tables Services / PIDs Sky IEPG Video Analysis Table Distribution PCR About Log

TS-Capture on error events Buffering [seconds] Quota [GBytes] Current usage [GBytes]
1st 2nd 3rd Priority Pre 10.0 File n/a
Manual Post 10.0 Apply Folder 2.000 Apply Folder 0.000

Explorer: Captured streams

Category Indicator # Errors Time of Last Error Last Error Message

- TR 101 290
 - 1 First priority
 - 1.1 TS_sync_loss
 - 1.2 Sync_byte_error
 - 1.3.a PAT_error_2
 - 1.4 Continuity_count_error
 - 1.5.a PMT_error_2
 - 1.6 PID_error
 - 2 Second priority
 - 2.1 Transport_error
 - 2.2 CRC_error
 - 2.3 PCR_error
 - 2.3.a PCR_repetition_error
 - 2.3.b PCR_discontinuity_indicator_error
 - 2.4 PCR_accuracy_error
 - 2.5 PTS_error
 - 2.6 CAT_error
 - 3 Third priority
 - 3.1 NIT_error
 - 3.1.a NIT_actual_error
 - 3.1.b NIT_other_error
 - 3.2 SI_repetition_error
 - 3.3 Buffer_error
 - 3.4.a Unreferenced_PID
 - 3.5 SDT_error
 - 3.5.a SDT_actual_error
 - 3.5.b SDT_other_error
 - 3.6 EIT_error
 - 3.6.a EIT_actual_error
 - 3.6.b EIT_other_error
 - 3.6.c EIT_PF_error
 - 3.7 RST_error
 - 3.8 TDT_error
 - 3.9 Empty_buffer_error
 - 3.10 Data_delay_error
 - A.1 Packet_header_inconsistent
 - B T2-MI errors
 - B.2 T2-MI syntax errors
 - B.2.1 T2MI_packet_type_error
 - B.2.2 T2MI_packet_payload_error
 - B.2.3 T2MI_packet_count_error
 - B.2.4 T2MI_CRC_error
 - B.2.5 T2MI_payload_error
 - B.2.6 T2MI_d1p_num_blocks_error

11/10/2018 10:06:11 SW 0.10.6.54 IP 127.0.0.1

TS-ID 1 (0x0001) PIDs 114 Services 37 "Miracle TV", "CNA", "Lbya Ahlra", "AGHAPY TV", "RTV", "Alasr TV", "Al Omma TV", "Al Basra", "Hom TV", "Light TV", "Al Magharbia", "Dala 3", "Yemanyan", "BTV", "Hodhod TV", "SHEBA", "Al Eyman",

License HP Input [C:\Users\4T2\TS\UKOther\UK_VeryBadVideoQuality_ab7.ts] using PCRPID: 308 (0x0134) (data rate 42.103287 Mbit/s) (run time 709.67 seconds)

Status: sync DVB Input data rate: 42.10 Mb/s Stream data rate: 41.99 Mb/s Packets: 1887188

TR101290: 1 2 3 A B Alarms: R0 R1 R2 R3 CPU 42%

Stream of Streams
100 Payload 41.979 Mb/s 98.5 %
40 stuffing 0.616 Mb/s 1.5 %
20
0

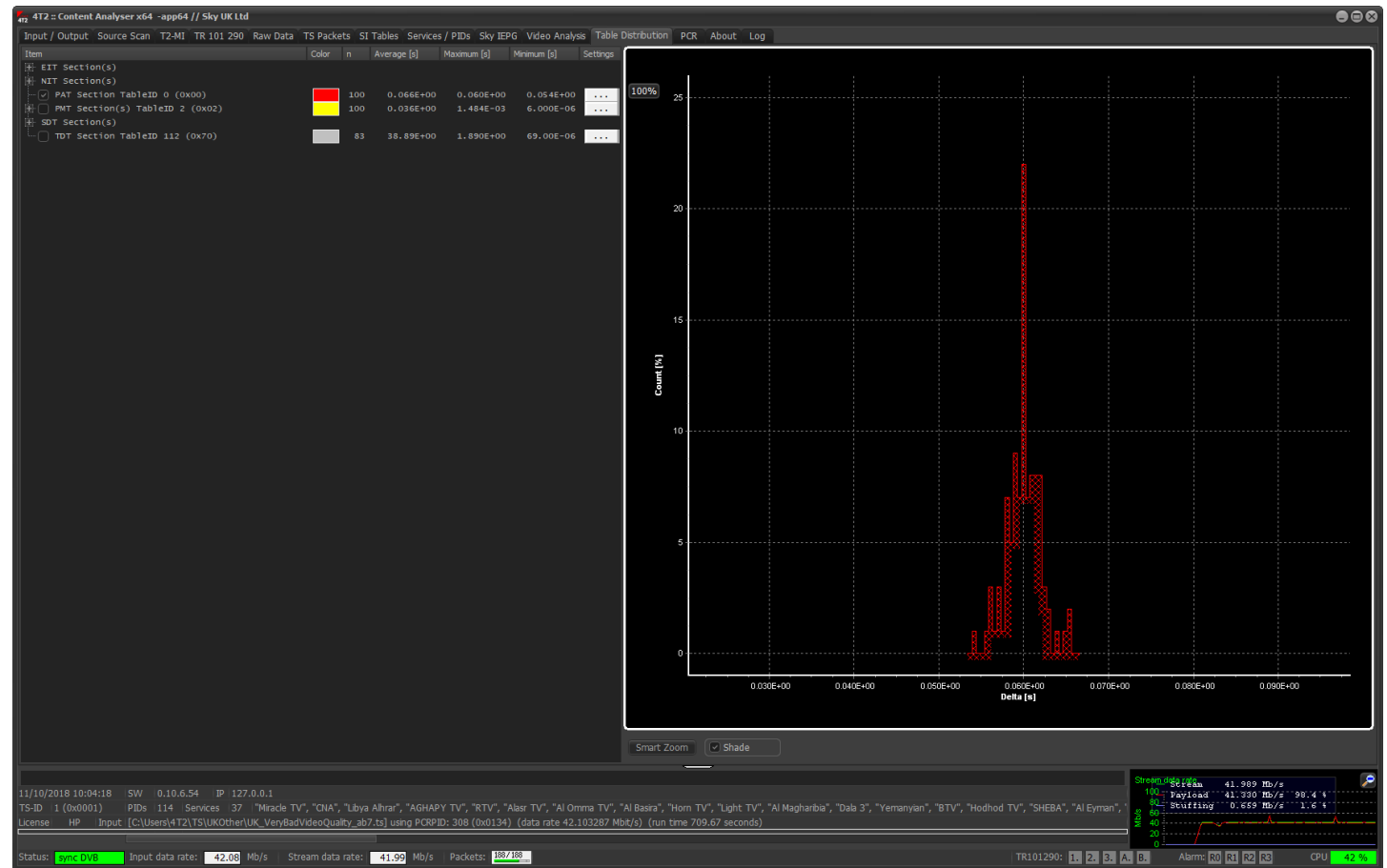
Table and PCR Distribution/Jitter (all inputs)

Distribution of SI-tables in the Transport Stream

Individual tables can be selected and the repetition rates are displayed in form of a histogram

Smart-zoom assists on positioning the histograms

PCR Distribution and Jitter allows for most detailed measurements



SI tables (all inputs)

Display of the service information tables (SI) with:

- find function
- comprehensive tree exporting options
 - all SI-tree
 - sub-tree
 - individual entries

SI of DVB, ATSC, and ISDB supported

The screenshot shows the Content Analyser x64 software interface. The top menu bar includes options like Input, Output, Source Scan, T2-MI, TR 101 290, Raw Data, TS Packets, SI Tables, Services / PIDs, Sky IEPG, Video Analysis, Table Distribution, PCR, About, and Log. The main window is titled "412: Content Analyser x64 -app64 // Sky UK Ltd". The left sidebar shows a tree view of service information tables, including PAT Table, PMT Table, CAT Table, NIT Table, and EIT Table. The "SI Tables" section is expanded, showing a list of service information tables. The main window displays the details of a selected service information table, including its ServiceID, TransportStreamID, OriginalNetworkID, and SectionData. The SectionData is displayed as a list of hex values and their corresponding decoded text, such as "N088.0...1..NA." and "Star Trek - Dee". The bottom status bar shows the current status, input data rate, stream data rate, and CPU usage.

TS Packets (all inputs)

3rd generation expert function

Sophisticated packet filtering with multiple triggers and filter expression editor

Unique and powerful tool for finding problems in transmission chains and multiplexers

The screenshot displays the 4T2 Content Analyser x64 interface. The main window shows a list of packets with columns for Number, Delta, PID, StartIndicator, and Arrival. A detailed view of a selected packet (PacketData) is shown, displaying hexadecimal and ASCII data. The interface includes a search bar, a table of packet details, and a right-hand panel with various control options like Trigger mode, Packet display, and PID gate. The bottom status bar shows input and stream data rates, packet counts, and system metrics like CPU usage.

Packet	Number	Delta	PID	StartIndicator	Arrival
0	0	n/a	161 (0x00A1)	Yes	2018-10-11, 10:59:57-995
1	92	5	161 (0x00A1)		2018-10-11, 10:59:57-995
2	98	6	161 (0x00A1)		2018-10-11, 10:59:57-995
3	103	5	161 (0x00A1)		2018-10-11, 10:59:58-006
4	109	6	161 (0x00A1)		2018-10-11, 10:59:58-006
5	113	4	161 (0x00A1)		2018-10-11, 10:59:58-006
6	116	3	161 (0x00A1)		2018-10-11, 10:59:58-006
7	121	5	161 (0x00A1)		2018-10-11, 10:59:58-006
8	125	4	161 (0x00A1)		2018-10-11, 10:59:58-006
9	128	3	161 (0x00A1)		2018-10-11, 10:59:58-006

Log (all inputs)

Most comprehensive logging system with integrated find and sorting features

Automated logfile storage with integrated garbage collection

Easy logfile post-processing available on-the-fly using Windows tools

The screenshot displays the 4T2 Content Analyser software interface. The main window is titled "4T2 = Content Analyser x64 -app64 // Sky UK Ltd" and contains a log window with the following columns: Group, Log-Level, Group, SubGroup, Date and Time, Class/Name, Instance, and Message. The log entries include various messages such as "Rest of T2-MI Packet too short!", "Discontinuity detected while collecting PES Packet", "NewVideoAnalyserFrame added", "TransportStreamID 900 (0x0384)", "Data processing slow! 0 events suppressed", "Execute: Synced to 188 byte packets", "Try to activate file reader", "failed to execute TFormTSAnalyserMain.TSAnalyserReset (500ms) after step 9999", "TryEnter TFormTSAnalyserMain.TSAnalyserReset, FResetCS.TryEnter(500ms)", "Try to stop file reader", "First synchronization (0 packets discarded during synchronization)", "CPU usage: 18.0%", "Memory usage: all 615.0MB, allocated 374.5MB, overhead 22.7MB", and multiple "Discontinuity detected while collecting PES Packet" warnings with associated PID numbers (e.g., PID 307, PID 162, PID 306, PID 391, PID 231, PID 386, PID 226, PID 311, PID 167, PID 306, PID 162, PID 307, PID 161, PID 225, PID 305, PID 385, PID 391, PID 307, PID 162, PID 306, PID 391, PID 231, PID 386, PID 226, PID 311, PID 167, PID 306, PID 162, PID 307, PID 161, PID 225). The bottom status bar shows "Status: Sync MPEG", "Input data rate: 20.15 Mb/s", "Stream data rate: 20.31 Mb/s", "Packets: 188/188", "TR101290: 1, 2, 3, A, B", "Alarm: R0 R1 R2 R3", and "CPU 12%".

further benefits

- based on industry-standard hardware: Mini-itx, ATX, m.2e or SATA-III, USB3, hdmi
- Windows™ system, supporting any standard application software
- all measurements performed simultaneously
- unlimited storage of measurement reports on either SSD, or USB memory stick
- hardware and software from one supplier

These were just a few features of our product.

Further information is available at
www.4T2.eu

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