LUMANTEK®

Manual

VENTUS-A+ DTV Analyzer

USB DTV Analyzer – ATSC/QAM/DVB-T2/DVB-T/DVB-C

VENTUS-A+ DTV Analyzer Manual

Revision Number: 1.2.3.0a
Distribution Date: Jan. 2016

Warranty Period
Lumantek's products comes with One(1) year limited warranty. Please contact below if you need more information. .

LUMANTEK CUSTOMER SERVICES

sales@lumantek.co.kr / TEL:02-6947-7422 / FAX:02-6947-7440

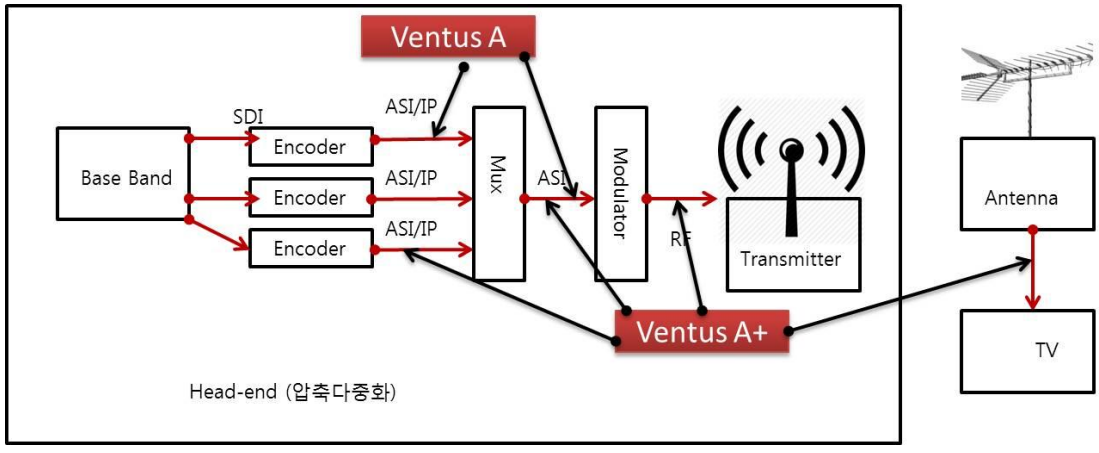
Contents

VENTUS-A+ DTV Analyzer

USB type DTV Analyzer for ATSC/QAM/DVB-T2/DVB-T/DVB-C

1. Introduction

VENTUS-A DTV Analyzer is designed to analyze MPEG-2 TS stream in real time/off line bases, Hardware and Software as in a package. The Hardware interlocks with the PC via USB cable to maximize its utilization as a mobile analyzer. Furthermore, it supports TS file output through ASI and real time input can re-transmitted via ASI.



1-1. Features

① Real time analysis via RF/ASI/IP input plus offline analysis via TS files
② ETSI TR 101 290 based error detection
③ Bit-rate, PTS-PCR, DTS-PCR measurement, Table repetition cycle analysis
④ Provide configuration information for each PID, Service and Table
⑤ Provide Table History and detailed Table analysis tool
⑥ Provide Media player and detailed analysis information for each services
⑦ Load/Save TS recording & Analysis log
⑧ Support the newest TTA standard (Korean type 3D TV and multi-channel service)
⑨ Provide MER/Packet error rate and receiver sensitivity during RF reception

1.2 Specification

- Demodulation : 8VSB, OpenCable(64QAM, 256QAM)
- Size : 154mm x 76.8mm x 28.4mm
- USB 2.0 bus powered, no power supply required.
- RF input connector : 75Ω F-Type 1ea
- ASI/SMPTE310M input connector : 75Ω BNC 1ea
- ASI/SMPTE310M output connector : 75Ω BNC 1ea
- ASI input bit-rate : 0~108Mbps
- ASI output bit-rate : 0~108Mbps
- SMPTE310M input bit-rate : 19.392Mbps
- SMPTE310M output bit-rate : 19.392Mbps
- RF Input Frequency Range : 40 ~ 1002 MHz
- RF Input Level : +7 ~ -84 dBm +6~ - 75 dBm(64QAM), +6 ~-66dBm(256QAM)

1.3 Software Specification

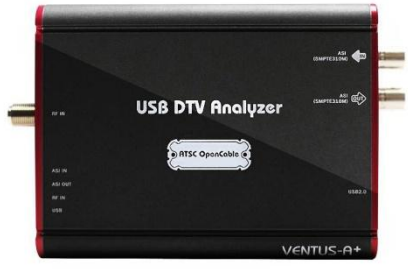
- TS input : ASI, SMPTE310M, File, IP(UDP/TS or UDP/RTP/TS), RF
- TS output : ASI or SMPTE310M (Not supported in IP Input, high speed analysis mode)
- Analysis mode : MPEG-2, ATSC, DVB
- Analysis Result Window
- Service, PID, Table, Service View, Bit-rate, TR 101 290, Table History
- Minimum System Requirements
- CPU : Intel Core i3 3.1GHz (Sandy Bridge) or above
- RAM : 2GB or above
- OS : Window 7
- Resolution : 1680x1050 or above

2 VENTUS-A Plus System Package

2.1 Parts Name

2.2 Package Contents

DTV Analyzer



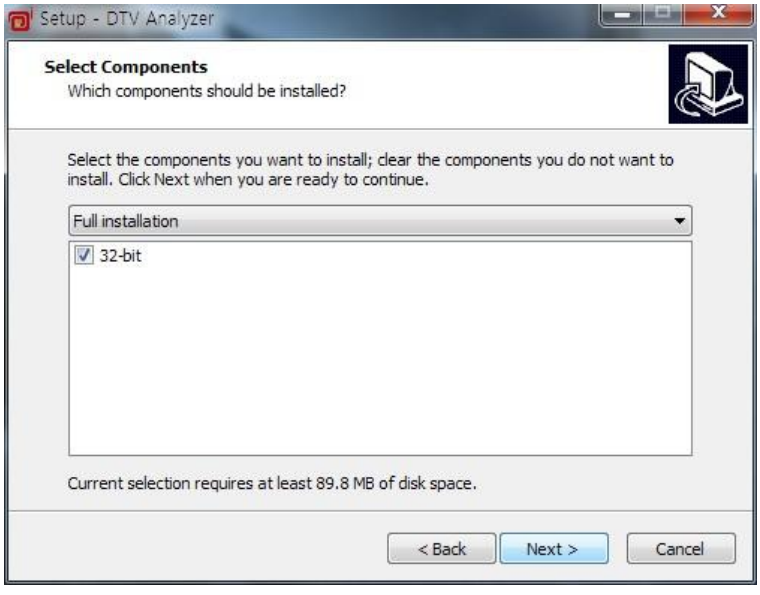
USB Connection Cable

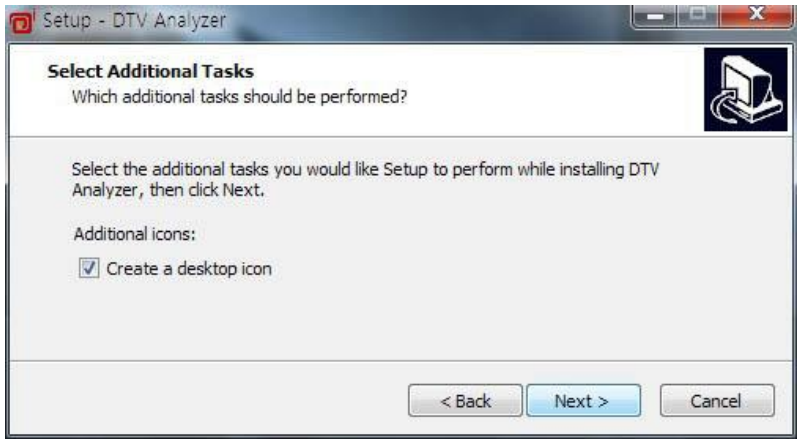
USB Memory
(w/ Software installation file)

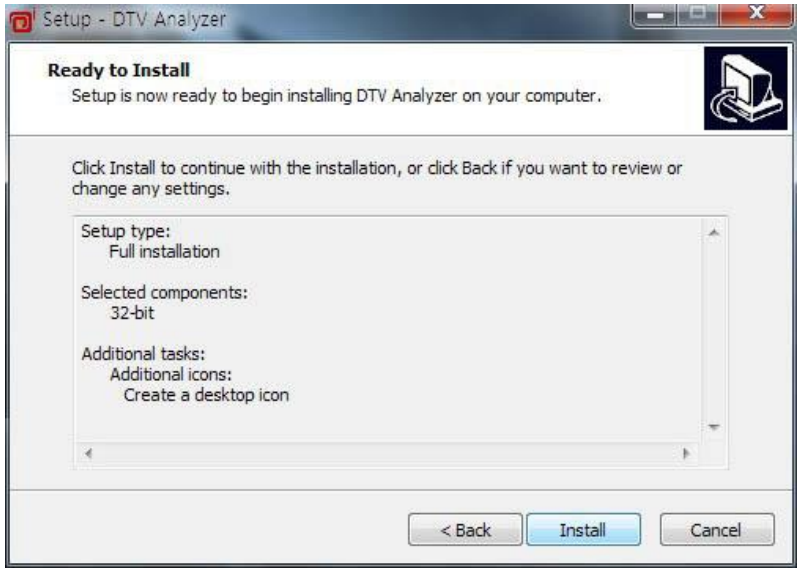
3 Installation

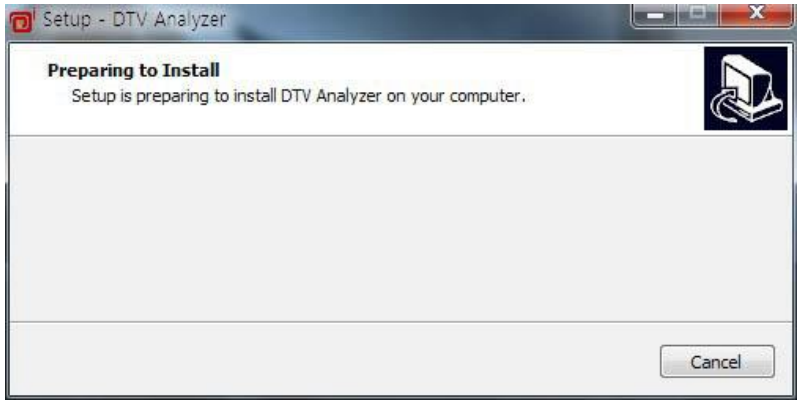
3.1 Software Installation

Please disconnect USB cables from the DTV analyzer before installation.
Run 'DTV Analyzer Setup' file in the USB memory provided with the package. Press 'Next' to proceed installation. (Run under 'Administrator Authority' for Windows OS 7 or above)

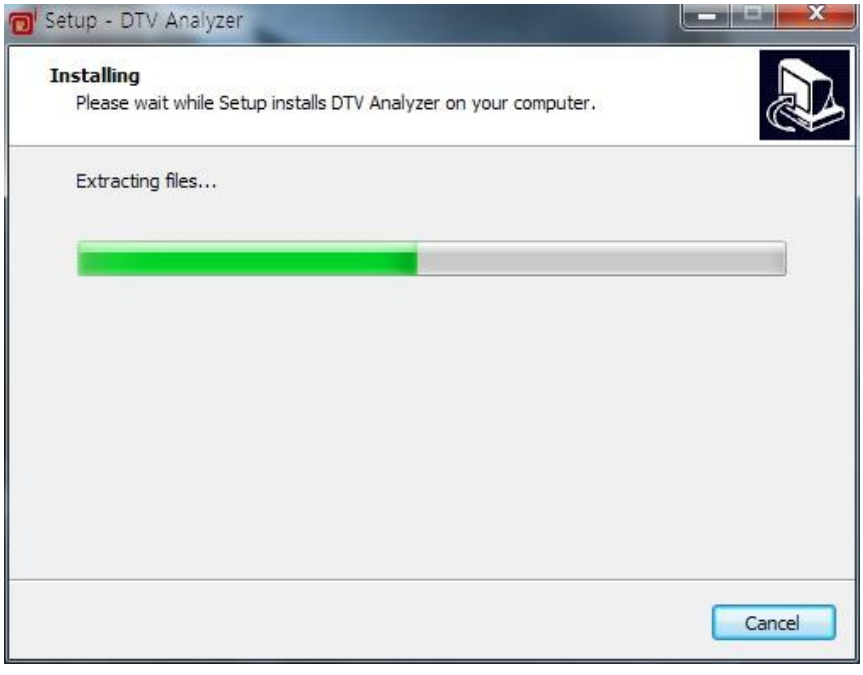



Setup - DTV Analyzer
Select Additional Tasks
Which additional tasks should be performed?
Select the additional tasks you would like Setup to perform while installing DTV Analyzer, then click Next.
Additional icons:
Create a desktop icon
< Back
Next >
Cancel

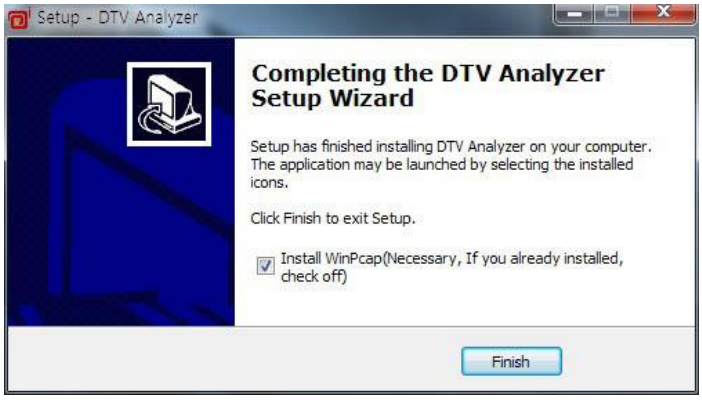

Setup - DTV Analyzer
Ready to Install
Setup is now ready to begin installing DTV Analyzer on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Setup type:
Full installation
Selected components:
32-bit
Additional tasks:
Additional icons:
Create a desktop icon
< Back
Install
Cancel

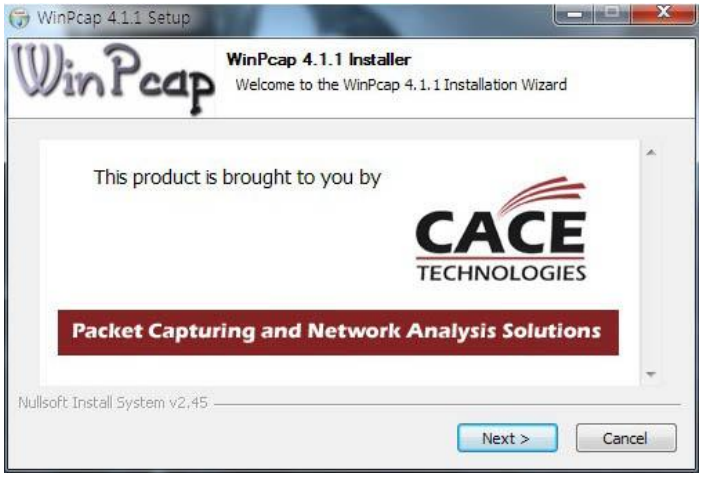

Setup - DTV Analyzer
Preparing to Install
Setup is preparing to install DTV Analyzer on your computer.
Cancel

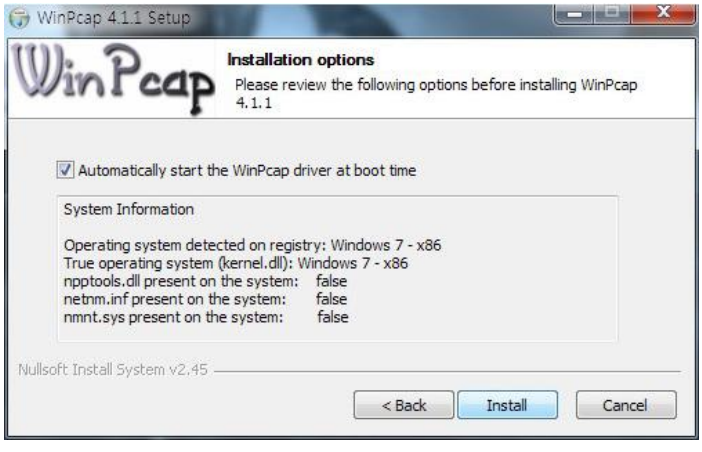
If you see below messages, please select ‘ Do not close the application’



After the installation is completed, the ‘WinPcap’ file needs to be installed. This must be done during the installation, no reinstallation required for version updates.





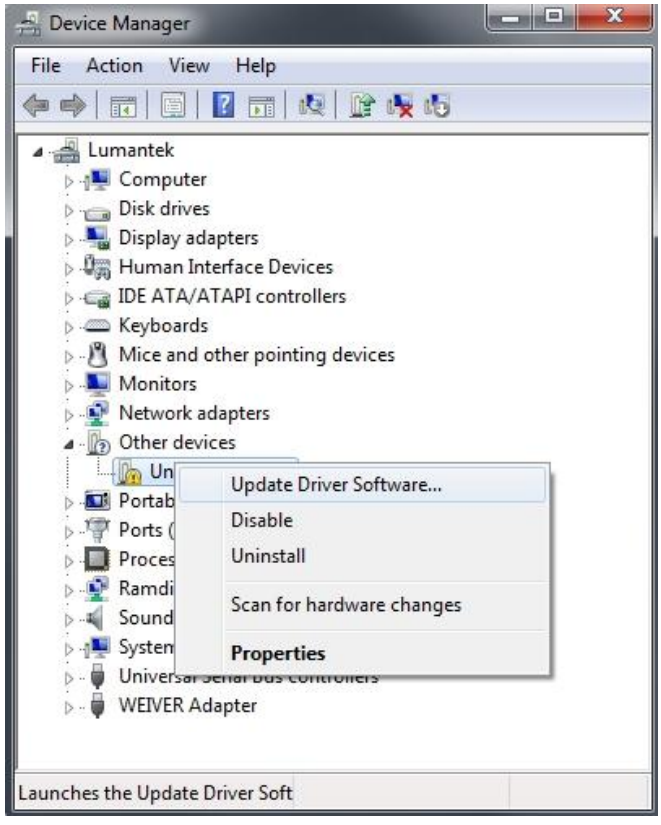


Automatically start the WinPcap driver at boot time’ must be selected during the installation.

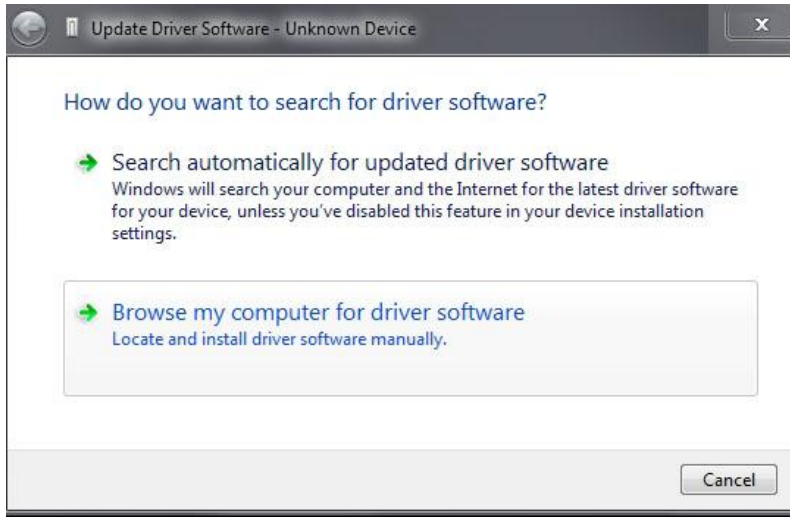
After the software installation is completed, the Driver will automatically start its installation when the hardware is connected. If not, please run ‘3.2 Driver Installation’.

3.2 Driver Installation

Connect DTV-Analyzer to PC with USB cable.



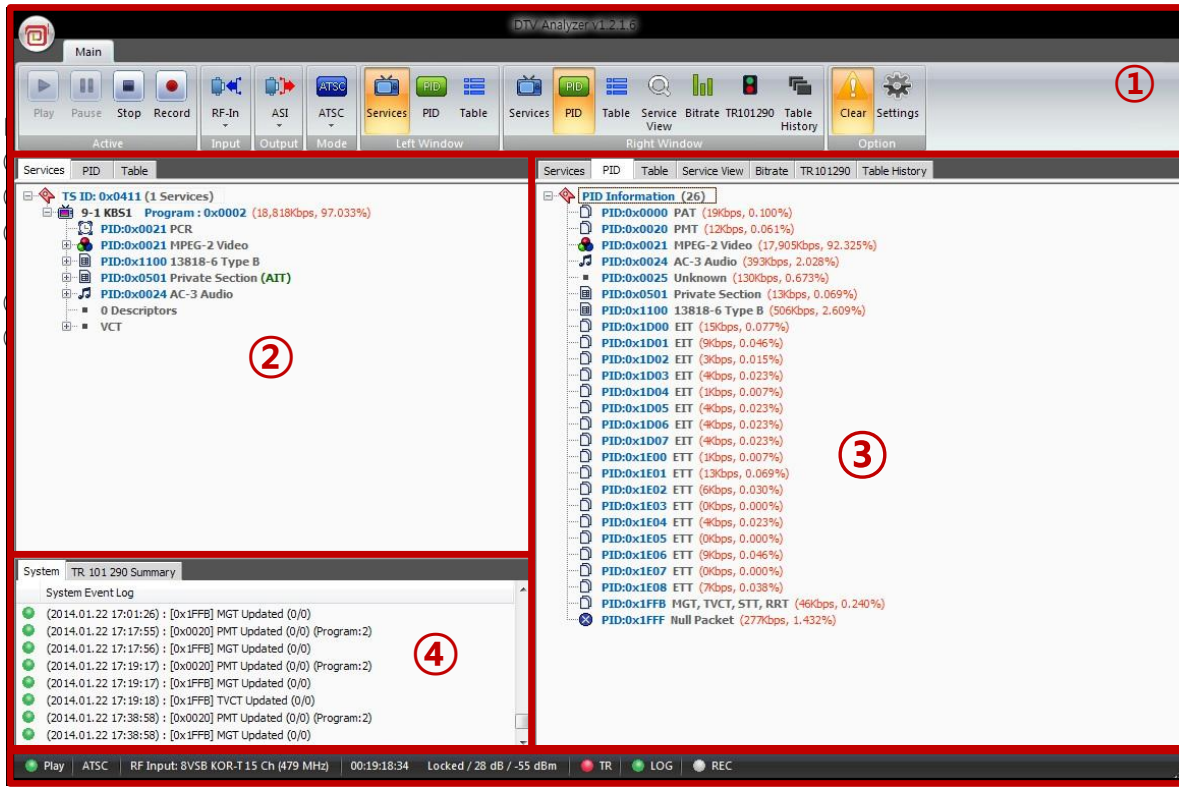
Right Click on 'Unknown device' in Device manager then click on Software upgrade.



Select 'Browse my computer for driver software' then select either "\Driver\Windows32bit.1" or \Driver\Windows64bit.1" based on your Window OS. Click on 'Next'.

Please check 'USB DTV Signal Generator -> Ventus 1.0' is shown in device manager after driver installation is completed.

4 DTV Analyzer Software



① Control Window
② Analysis Result Display (Left)
③ Analysis Result Display (Right)
④ System Message Display
⑤ Operation Status Indicator

4.1 Control Window

The Control Window shows the entire operational control and settings, with series of tabs including Active tab, Input tab, Output tab, Mode tab, Left/Right Window tab, and Option tab. ('Settings' Button for Input tab, Output tab, Mode tab and Option tab is activated only when system is NOT running)

• Active Tab

Controls 'Start', 'Pause' (in file analysis mode), 'stop', 'record' function. 'Record' button is activated only during the analysis in progress. It is a toggle switch, you can start/stop recording during the analysis at any point.

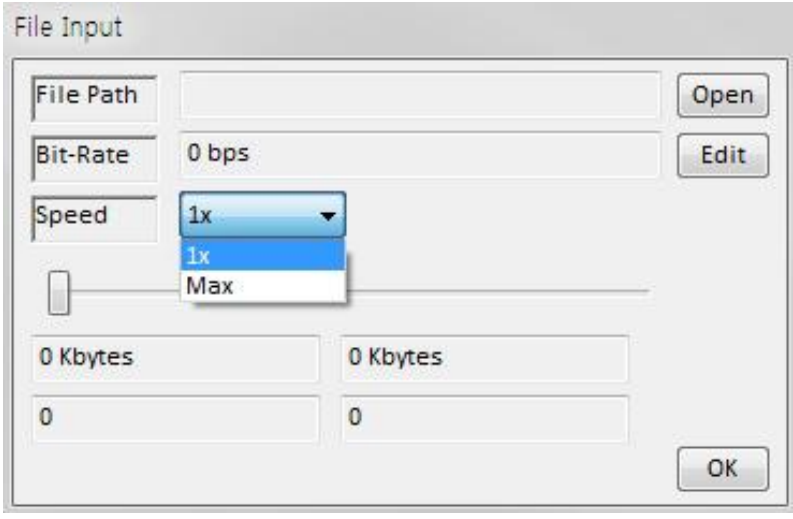
< Status: STOP>

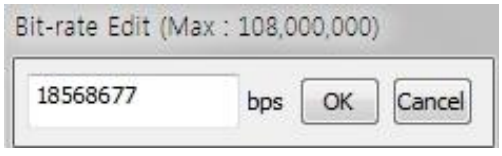
< Status: PLAY>

• Input Tab

You can select input port and detailed settings. File, TS-In, IP-In, and RF-In can be selected and each option comes with pop-up window for detailed settings.

< File Input Detailed setting Window >





① Select a file with ‘Open’ button.

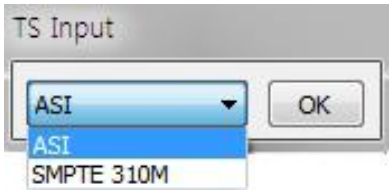
② Bit-rate is calculated automatically when the file has been selected, can be modified with ‘Edit’ button if necessary.

③ Speed: You can select among 1x analysis mode and High Speed Analysis mode(‘Max’)(1x mode run its analysis based on its designated Bit-rate with time, Data output through Media Player and output port is available. ‘Max mode enables High Speed Analysis but Data output through Media Player and output port is NOT available

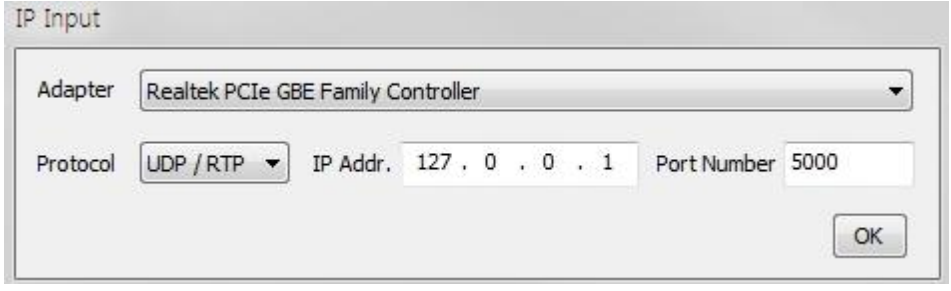
④ You can select the Analysis starting point by adjusting the navigation bar.

< TS-In Input detailed setting window >

You can select either ASI Input or SMPTE-310M.

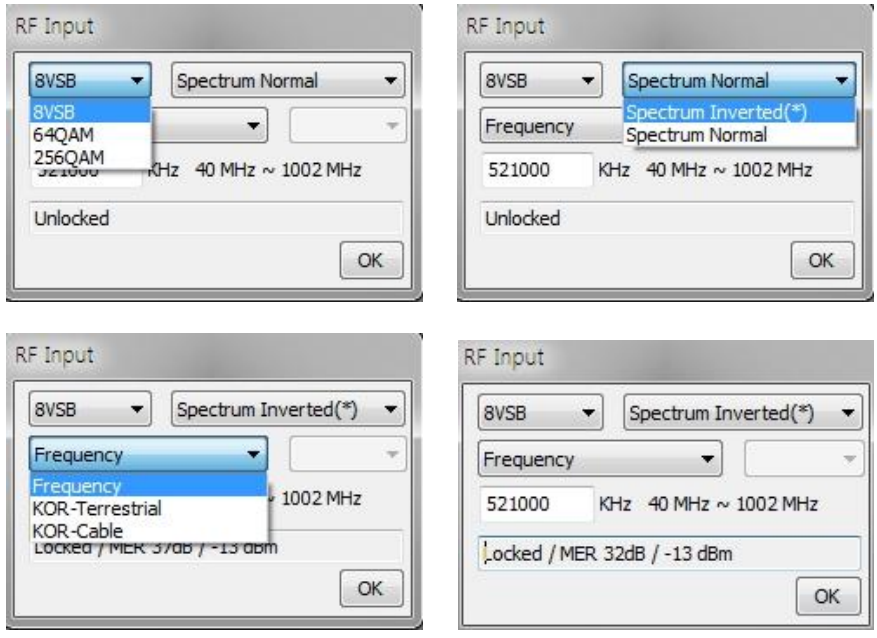


< IP-In Input Detailed setting Window>

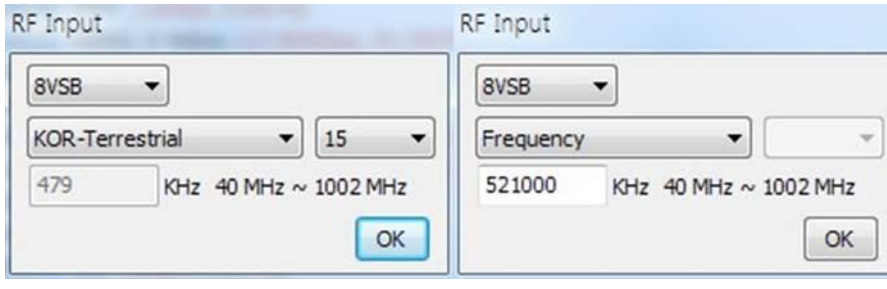


① You can select network adapter for IP input though the Adapter
② You can select UDP or RTP thorough Protocol
③ You can select the IP address and UDP through the Address and Port Number

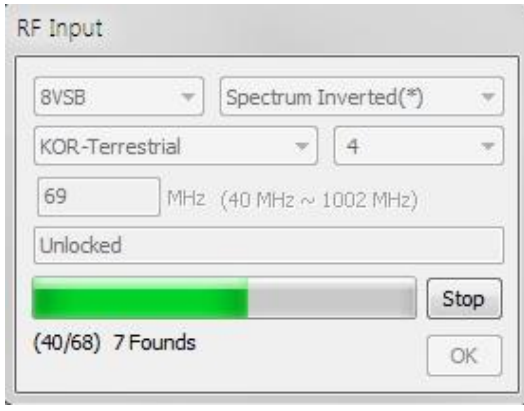
< RF-In Input Detailed setting Window >



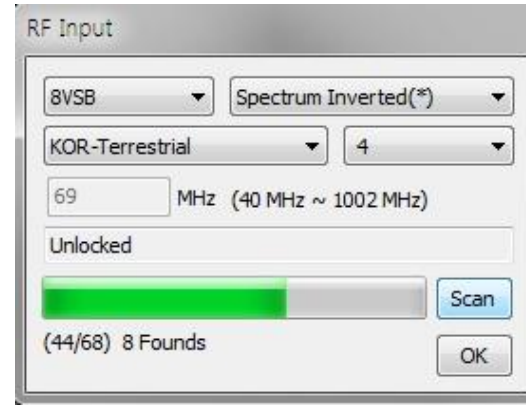
① You can select the modulation type, such as 8VSB, 64QAM, 256QAM in drop box menu on top left corner
② You can select 'spectrum INPUT type 'Spectrum Inverted' or 'Spectrum Normal'. The 'Spectrum Inverted' is set as the default.
③ It supports both frequency allocation, based on supported channel chart and direct selection of the frequency. (Current Selectable Chart: KOR-Terrestrial, KOR-Cable)
④ You can check the RF INPUT status with status bar at the bottom



⑤ Frequency Scanning Feature is available when such frequencies are selected based on the Channel Chart.

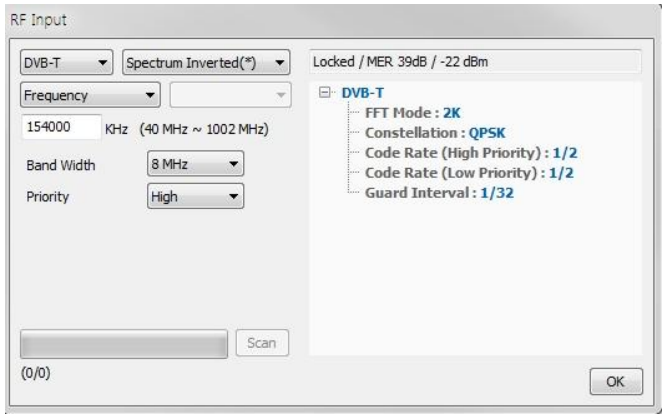


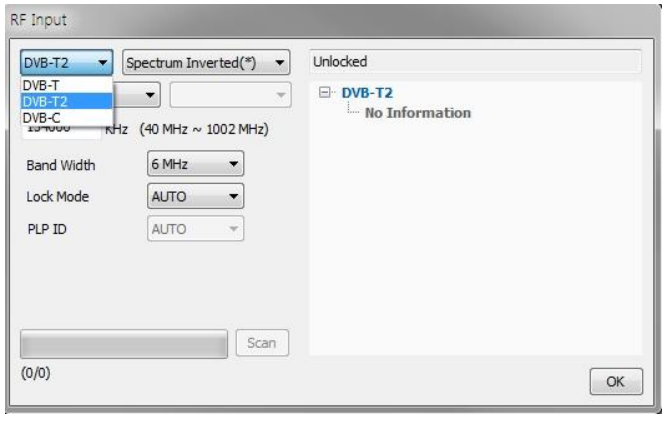
<Scanning >



<Scanning Completed>

< DVB-T2/T/C Type >



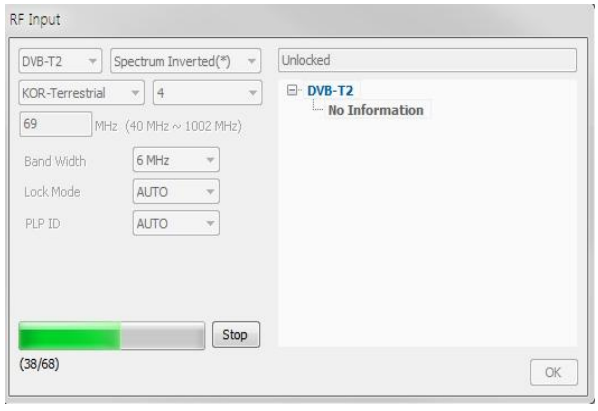


① Select frequency modulation from the drop down menu on top left. (DVB-T, DVB-T2, DVB-C)
② Please see the chart below for additional parameter settings for each modulation

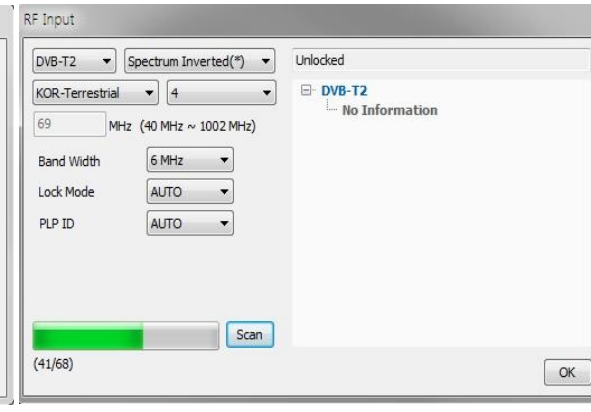
<Additional Parameter Setting>

	1	2	3
DVB-T	Band Width (6MHz/7MHz/8MHz)	Priority (High/Low)	
DVB-T2	Band Width (1.7MHz/5MHz/6MHz/7MHz/8MHz)	Lock Mode (BASE/LITE)	PLP ID (*Default: AUTO, Selectable after 'LOCK')
DVB-C	Symbol Rate (* unit: Ksps)	Constellation (16QAM/32QAM/64QAM/128QAM/256 QAM)	

③ Select spectrum input format through drop down menu on top center of the UI.
④ Spectrum Inverted, Spectrum Normal
⑤ Direct frequency input and allocation of frequencies based on the frequency chart settings supported.
⑥ KOR-Terrestrial, KOR-Cable EU-Normal, EU-Special(Radio), EU-Digital
⑦ RF Input Status Indicator.
⑧ Frequency scan features available when frequency is allocated based on the channel chart.



<Scan in Progress>



<Scan Completed>

• Output Tab

Select Output type of the Output port.

You can select between ASI output and SMPTE-310M output, internal Re-mux will be activated when it is necessary. (*When Re-Mux is being activated, the PCR related data will be modified from its original input data.)

Please refer to the following Chart for more details.

Input Port and Settings	Output Port	Data Output	Re-Mux Activation
File (1x Mode)	ASI	O	X
	SMPTE-310M	O	X
File (Max Mode)	ASI	X	X
	SMPTE-310M	X	X
TS-In (ASI)	ASI	O	X
	SMPTE-310M	O	O
TS-In (SMPTE-310M)	ASI	O	X
	SMPTE-310M	O	X
IP-In	ASI	X	X
	SMPTE-310M	X	X
RF-In	ASI	O	X
	SMPTE-310M	O	O

• Mode Tab

You can select Broadcasting standard applied for the analysis. Supporting MPEG-2, ATSC, DVB, and etc. (When MPEG-2 is selected, only items categorized in MPEG Standard will be analyzed)

If analysis mode and current selected TR101290 profile mode is conflicted, then a popup window prompt to change setting.

• Left Window Tab & Right Window Tab

You can select window portions to be shown either left or right.

① You can select Services, PID, Table in Left Window Tab
② You can select Services, PID, Table, Service View, Bit-rate, TR101290, Table History Right Window Tab

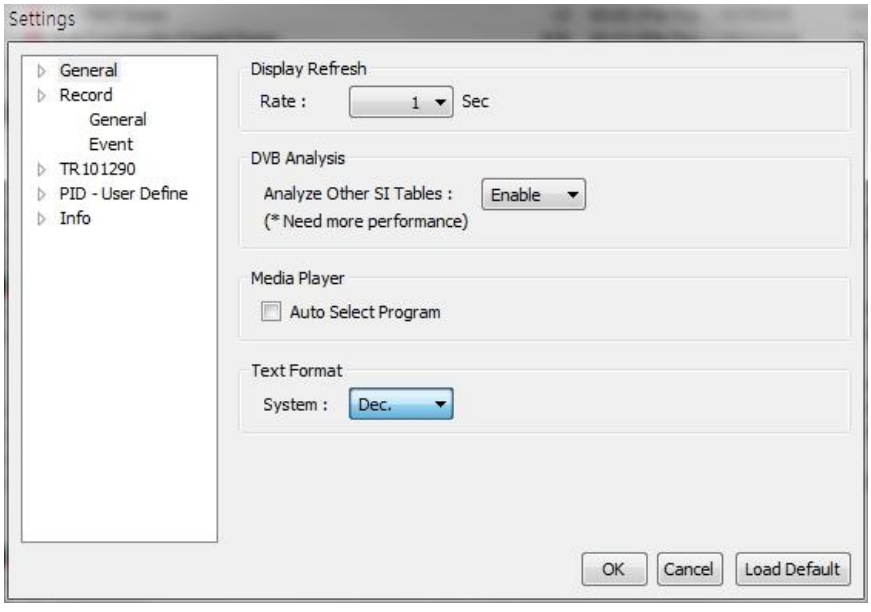
• Option Tab

Option Tab is comprised of ‘Clear’ and ‘Settings’ button . ‘Clear’ button will cancel the alarm and alarm status. The Color of the button will change to yellow with exclamation mark when the alarm is triggered. Click ‘Clear’ to clear alarm and initialize the status

< Normal >

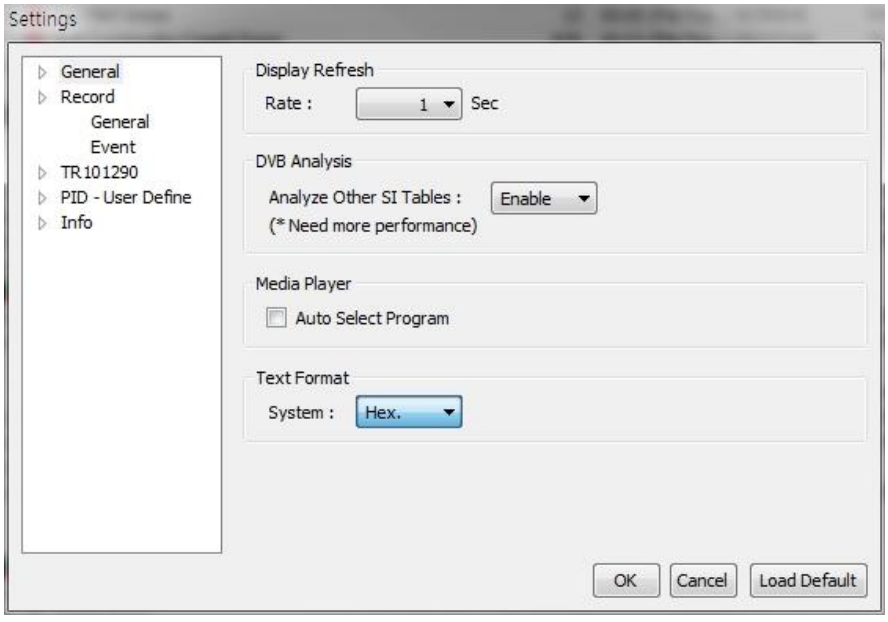
< Error Occurred >

When ‘Settings’ is clicked, Pop-up Window will appeared.



① ‘Settings’ Pop-up Window enables you to configure 5 categories. This includes General, Record, TR 101290, PID-User Default, and Info
② Selecting the option on left will display details of selected option on right
③ Press ‘Ok’ to save settings, ‘Cancel’ to cancel changes, ‘Load Default’ to initialize setting.

<Settings Popup Window– General>



① You can configure GUI refresh rate with 'Display Refresh'. (1~10 sec)

② DVB Analysis – Analyze Other SI Tables". During DVB analysis mode, determine whether to perform analyzing NIT-other and SDT-other as well as information on network and etc. When this mode is activated, may require higher performance PC

③ "Media Player – click on "Auto Select Program" enable automatically analyze service and if it finds services then display first program in "Service View Window ."

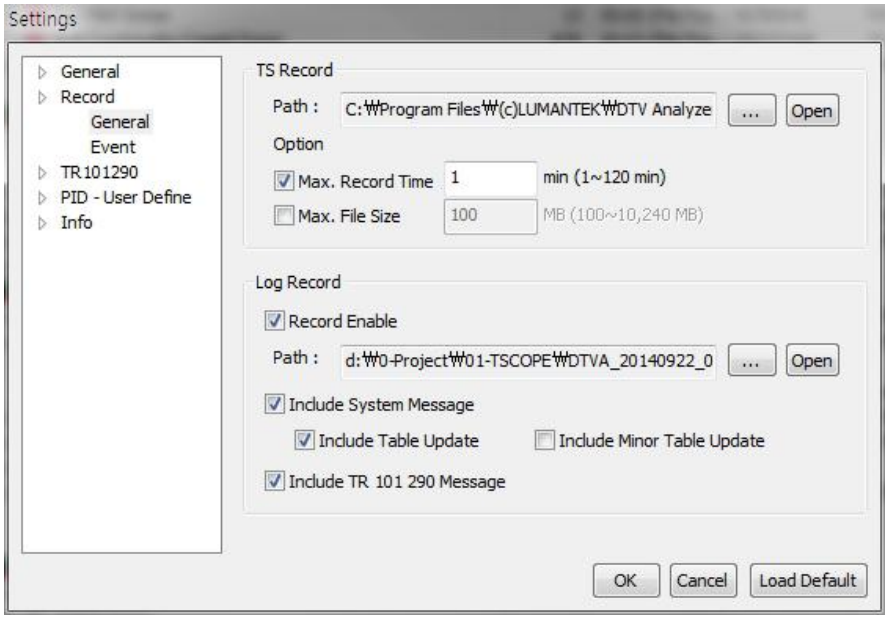
④ Turn ON/OFF Deinterlace option for 'interlaced Video' with 'Media Player – Deinterlace if necessary' checkbox.

⑤ Adjust HEVC Decoding option with 'Media Player-HEVC decode Mode' checkbox.

⑥ You can select text option with "Text Format" to display in decimal or hexadecimal.

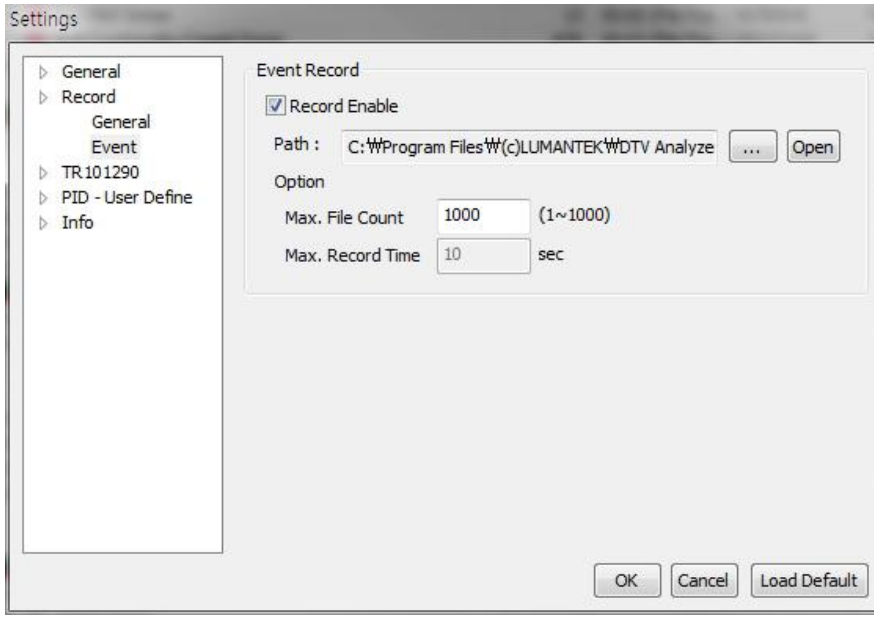
<Settings Popup Window– Record Tab>

- General



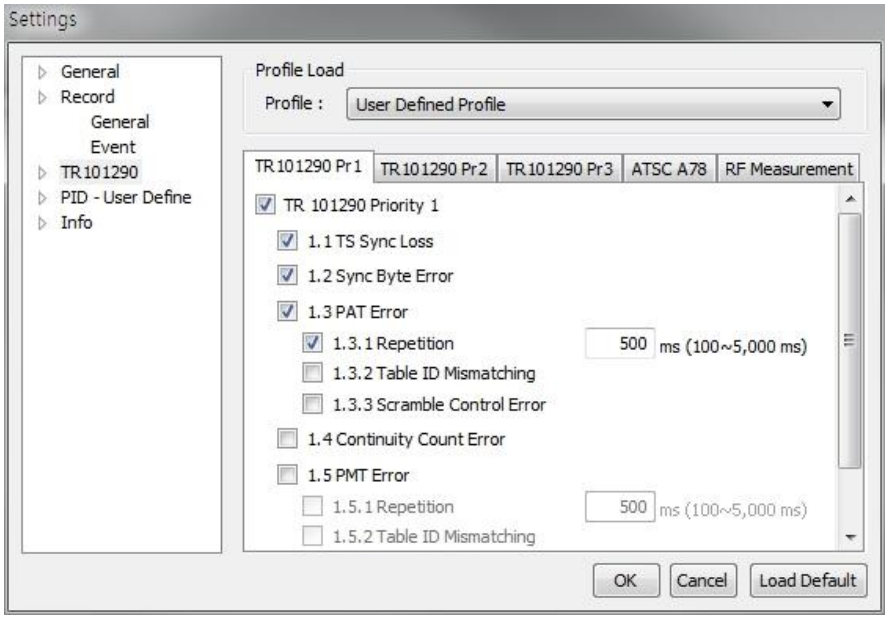
① TS Record path and name can be configured by pressing '…' button. (Recording date and time will be added to the actual file name)
② Press 'Open' button to see the file path in TS Record.
③ TS Record item Option – check box allows to save the file by maximum size and time (Maximum recording time and size is 120 Minutes or 10240 MB, respectively)
④ Check "Record Enable" box to save the log
⑤ Click '…' button in Log Record to configure file path and file name. (Recording date and time of the log data will be added to the actual file name) Log file is saved in '*.csv' format.
⑥ Press 'Open' button in Log Record to see file path.
⑦ Check 'Include System Message' box in Log Record to save system operation related message log data.
⑧ Check 'Include Table Update' box in Log Record to save information table update message log data during system operation
⑨ Check 'Include Minor Table Update' in Log Record to save frequently updated information table message log data during system operation. Frequently updated information table includes STT, EIT, STT in ATSC.)
⑩ Check 'Include TR 101 290 Message' box in Log Record to save TR 101 290 error message log data during system operation.

- Event



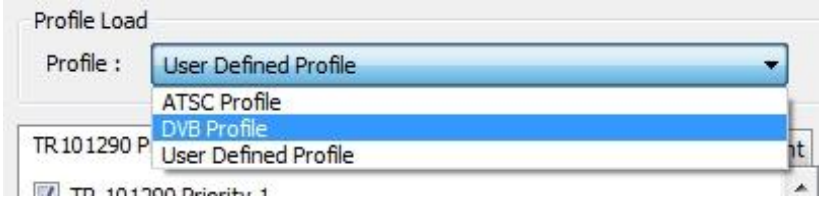
① Check “Record Enable” box from ‘Event Record’ to save event files during system operation.
② Designate the file name and path with “…’ button in ‘Event Record’(The recording date and time will be added to the actual saved file name)
③ Use “Open” button to check the file path of the ‘Event Record’
④ Configure the maximum number of files for event recording with ‘Max, File Count’ edit box in ‘Option’ of ‘Event Record’.

<Settings Popup window – TR101290 >

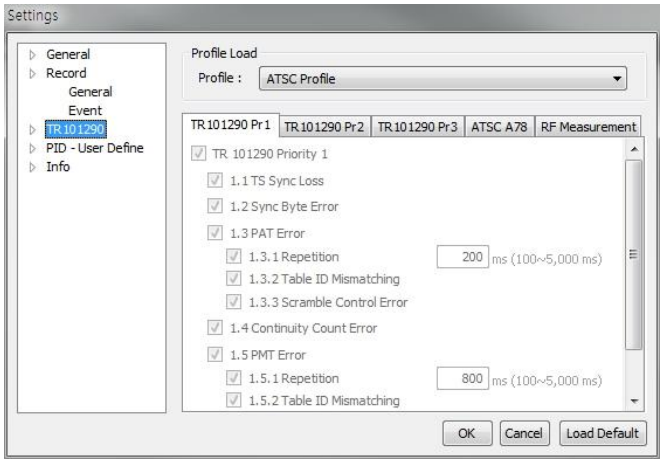


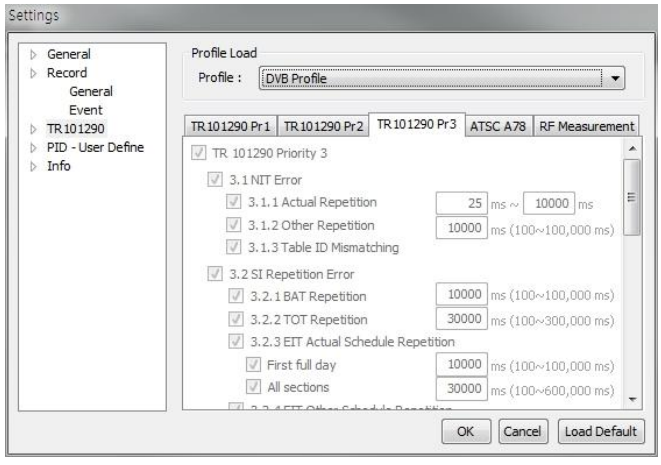
① You can configure ETSI TR 101 290 , ATSC A78 and RF Measurement analysis settings
② You can select ATSC, DVB, User-defined Profile
③ TR101290, ATSC A78 can be edited only if it is 'User-defined Profile'
④ RF Measurement can be edited at anytime
⑤ Use check box to enable/disable operation during analysis process
⑥ Parts with the numerical limitation would display such limitation on the right, and the ranges indicated in that box is the adjustable within its range.

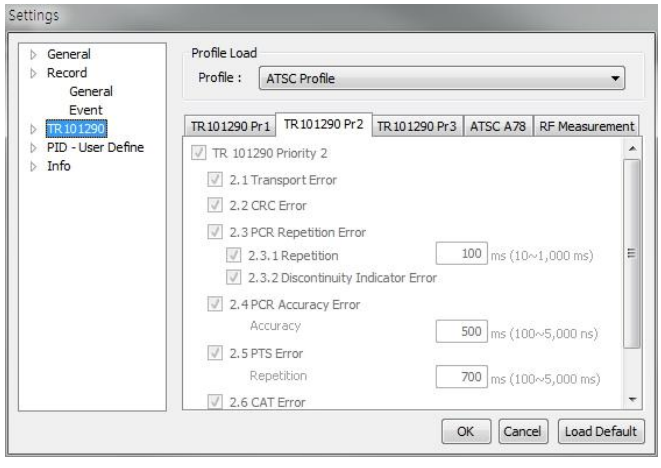
- Profile setting



<Settings Popup Window– ETSI TR 101 290







Detailed Setting for TR 101 290 Analysis.

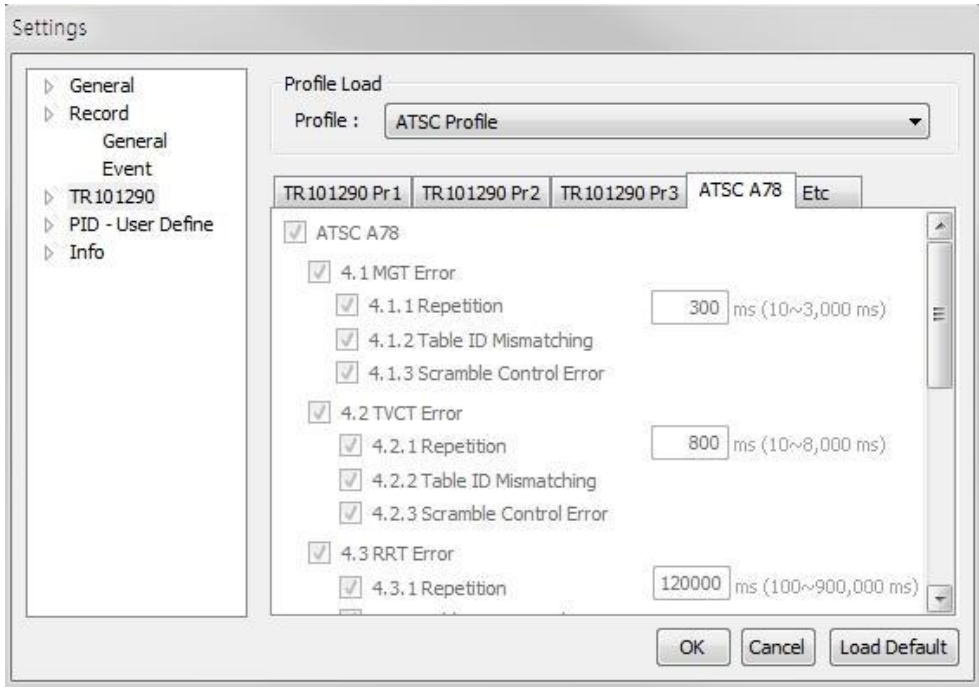
Can select from ATSC, DVB and User-defined Profile. You can set only preferred analysis items in User-defined Profile menu.

Analyze only checked box items, when it operate.

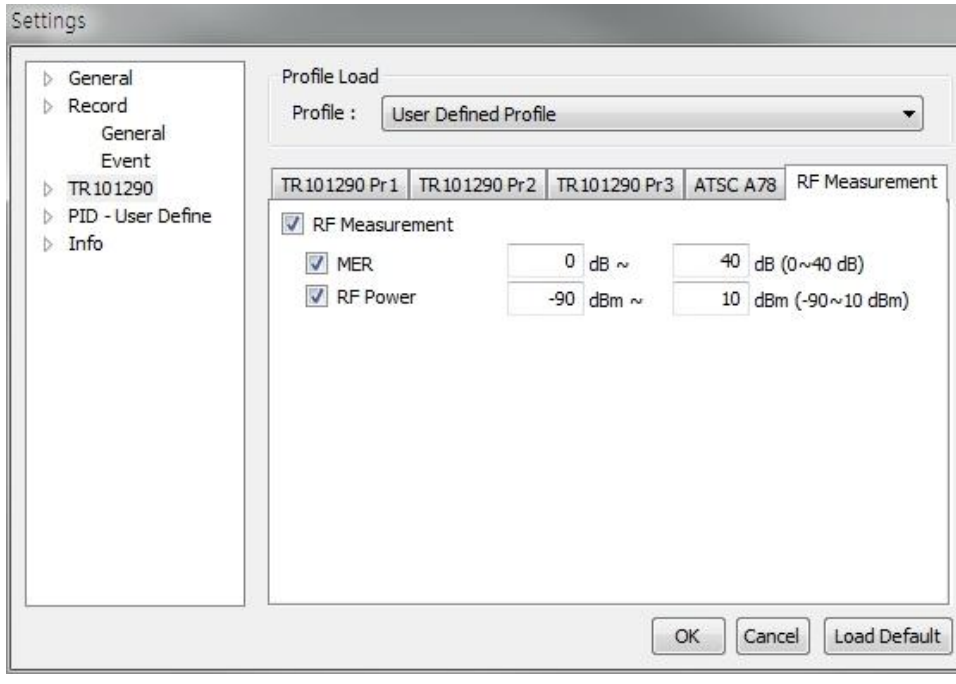
if there are numerical values in analysis and the limit values are configured as defined by to ATSC or DVB. Alternatively User can setup this limit value in User-defined Profile.

(in Priority 4 cases, the numerical limits range were set on basis of ATSC standard . You can configure related ATSC table value.)

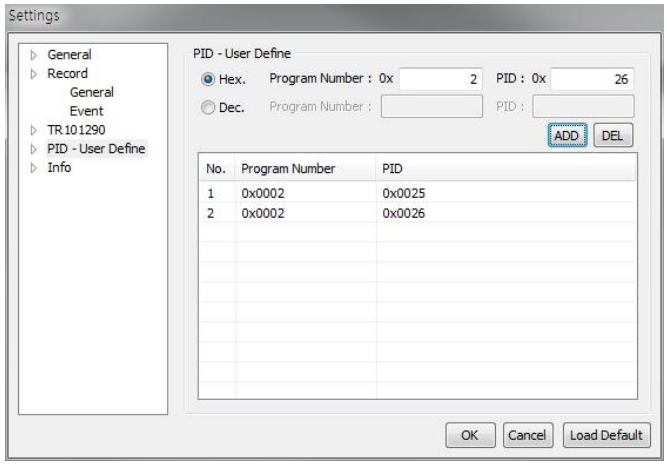
- ATSC A78

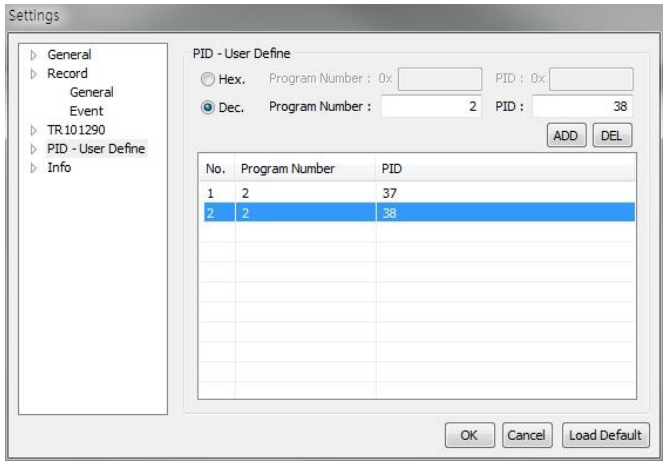


- RF Measurement



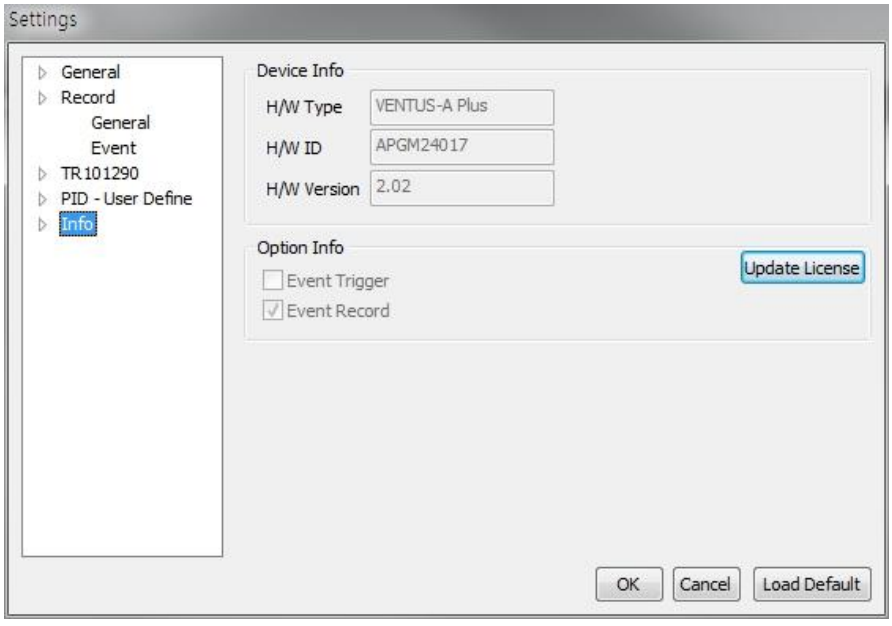
<Settings Popup Window– PID-User Define>





① Analyze PIDs in specific Program Number.
② Decimal/Hexadecimal INPUT supported
③ Insert Program Number and PID then press ADD button
④ Press 'DEL' to remove added PID (If there is no selected PID, it will delete from the most recently added files)

<Settings Popup Window– Info Tab>



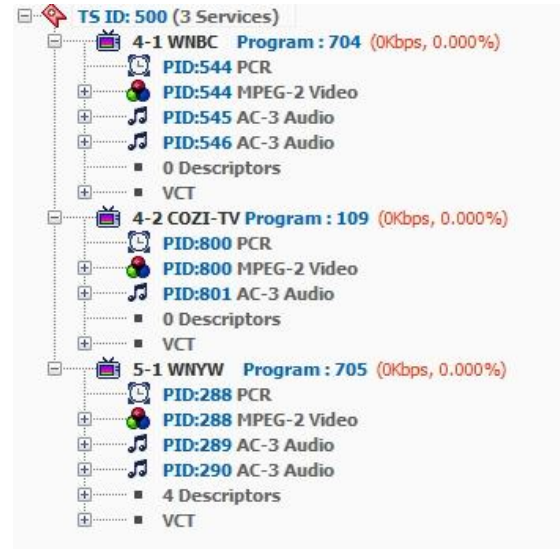
① Can check the serial number and properties of connected Device with “Device Info”
② Can Check the options supported by the connected Device with “Option Info” (Event Trigger option, Event Record option supported)
③ Press ‘Update License’ button to register /apply new license option

4. 2 Analysis Window – Services Tab

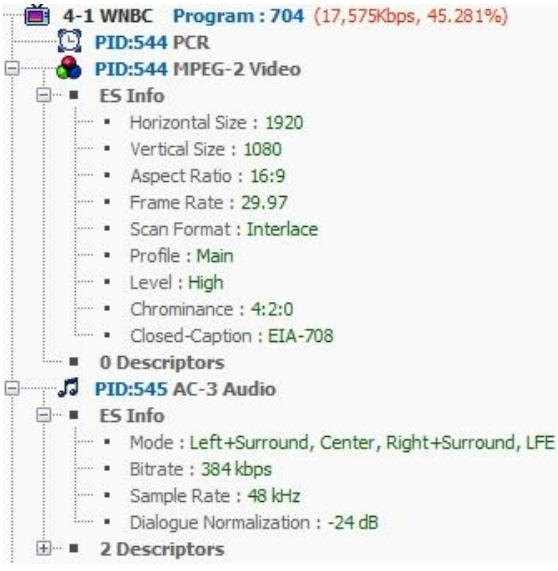
Service Tab shows the analysis result of service components in a tree structure format. Double Click on node or click on '+', '-' to expand or fold displays.

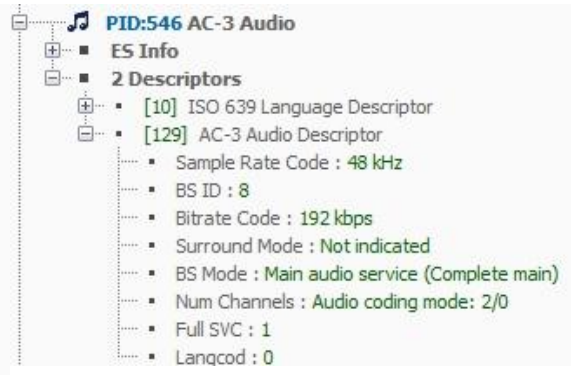
The top of tree structure shows the number of TS ID and number of Services.

For each services, the Service name, Program Number, bit rate and occupancy information is shown along with the configuration information in sub-node.



The component of each program shows PID and properties along with the ES Info and Descriptor in sub-node. The ES info shows component information analysis inside the ES (elementary Stream) data and Descriptor shows contents included in PMT information table.



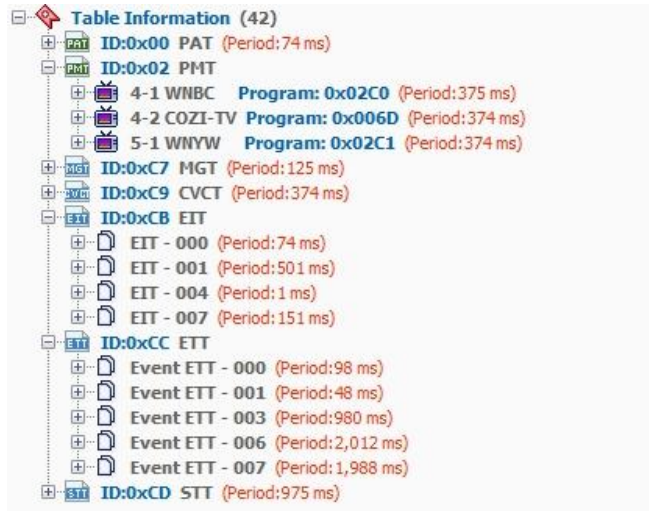


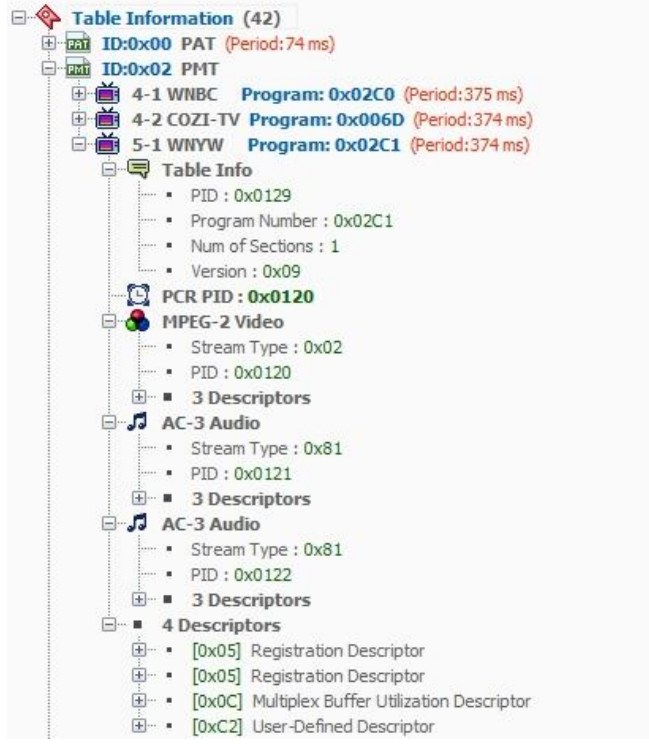
4. 3 Analysis Window – PID Tab

PID Tab shows the total number of analyzed PID with its properties, bit rate and occupancy.

4. 4 Analysis Window– Table Tab

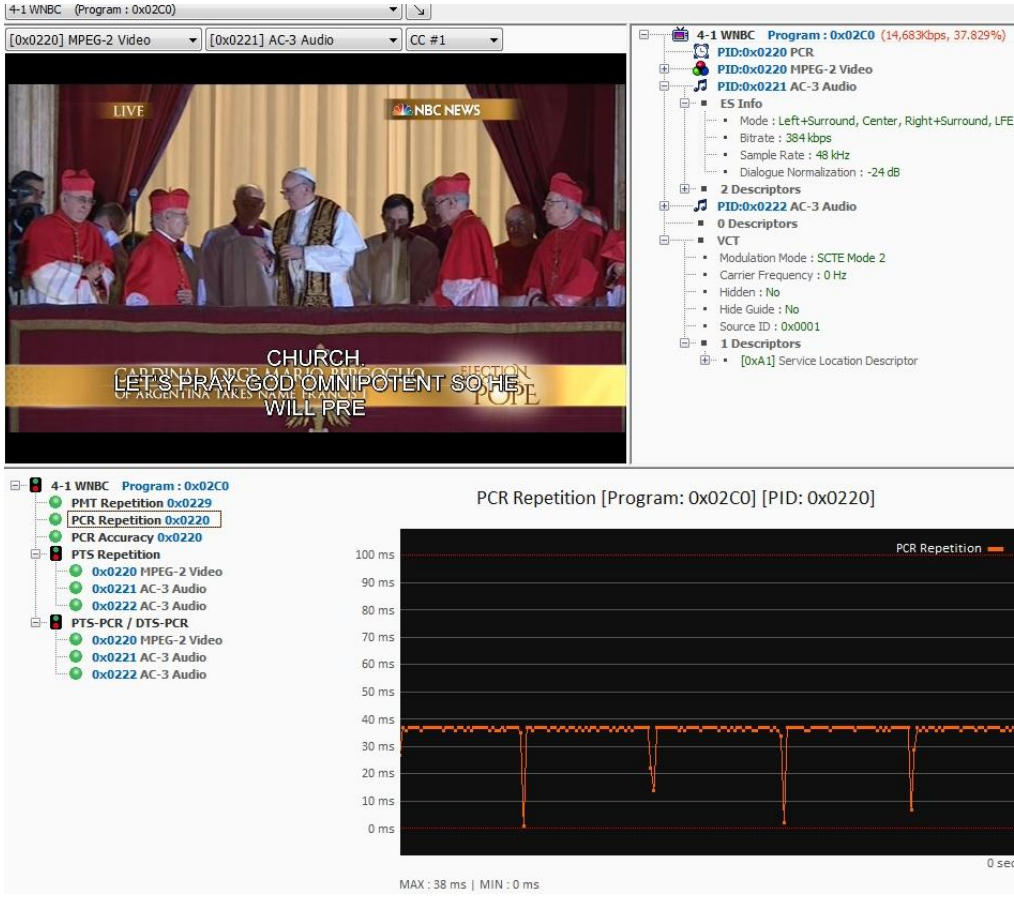
Service Tab shows collected information tables in sequence by its Table ID in a tree structure format.
Double Click on node or click on '+', '-' to expand or fold displays. It shows the information collected and the named of the tables, repeated cycle. the summary of the information displayed in sub-node.



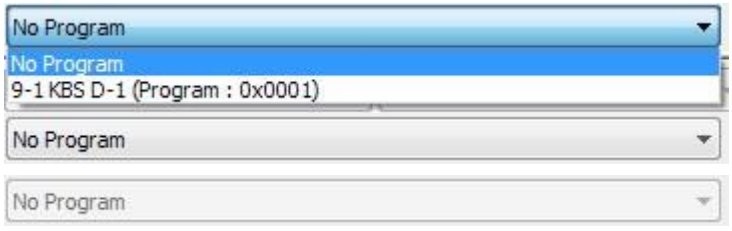


4. 5 Analysis Window – Service View Tab

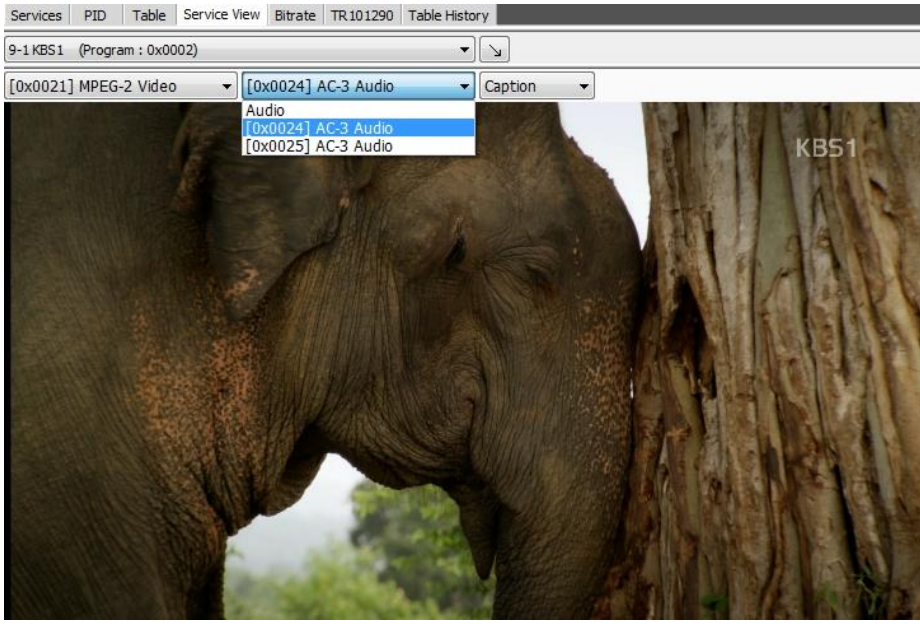
Service View Tab shows service component timing related error detection items with Media Player for one(1) selected program.



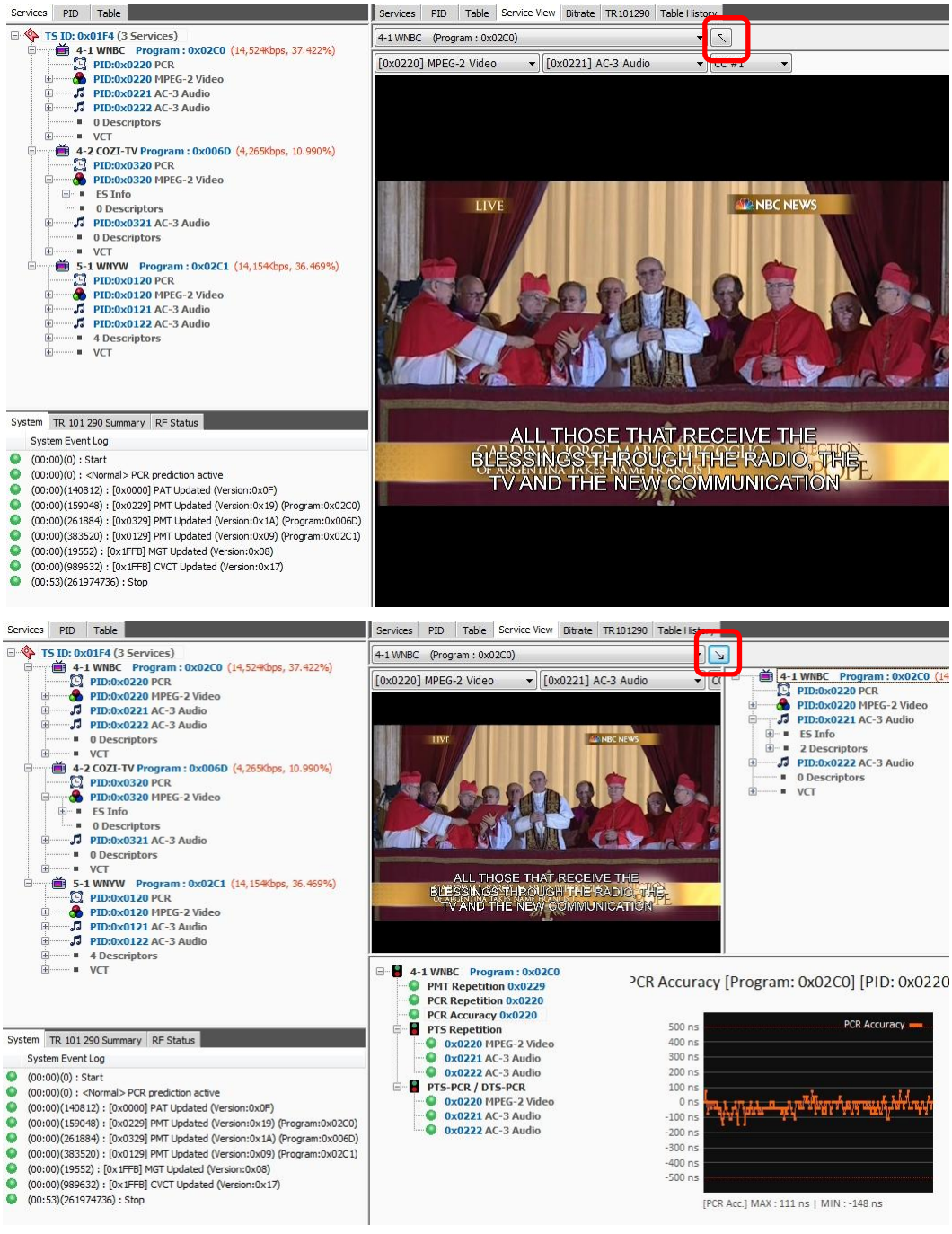
During the Analysis operation, the drop-box menu selection is inactivated until the program is detected. Upon the program detection the drop-box is activated.
(If 'Auto Select Program' has been selected in 'Settings-Service View' tab, the first program detected is specified as a program)



Once program is specified, Media player will be activated. (Not supported in 'Max Speed' of 'File input' Mode)
Three(3) drop box menus right above the Media Player screen will be activated after the program has been specified, you can select Video, Audio and Caption/Sub- title. (Only supports English sub-titles) Closed Caption will be displayed in a separate screen.

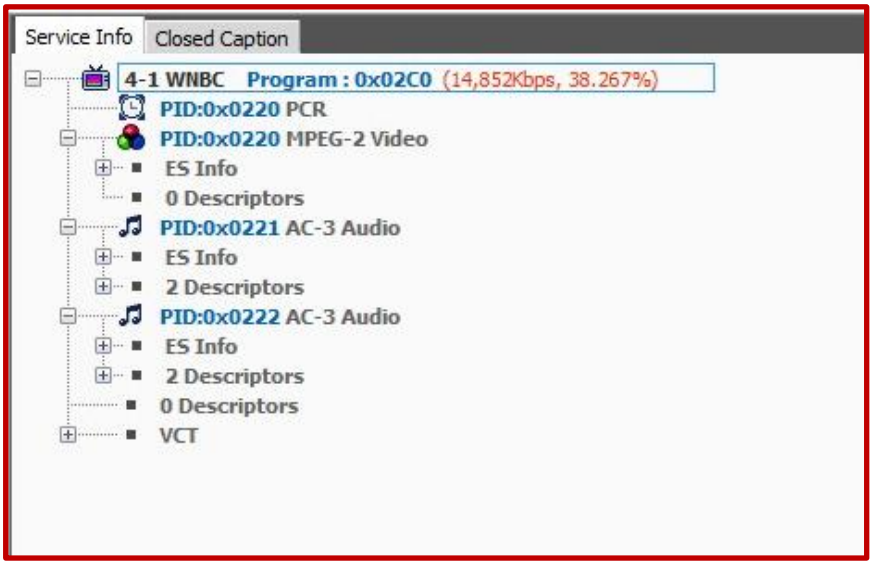


Arrow icon allows to expend or restore size of media player

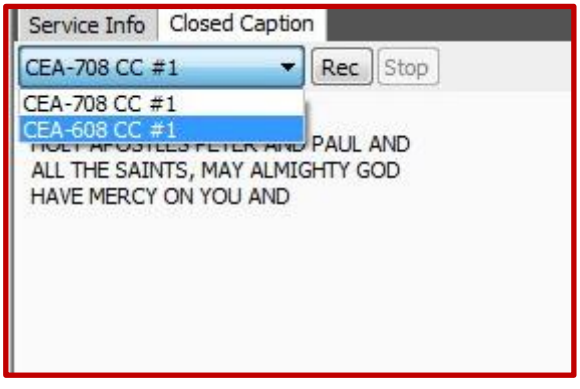


Screen on the right is switchable between the Service configuration or Closed Caption service.

Configuration tree on the right shows the components of the specified program and is same configuration as ‘Service Tab’

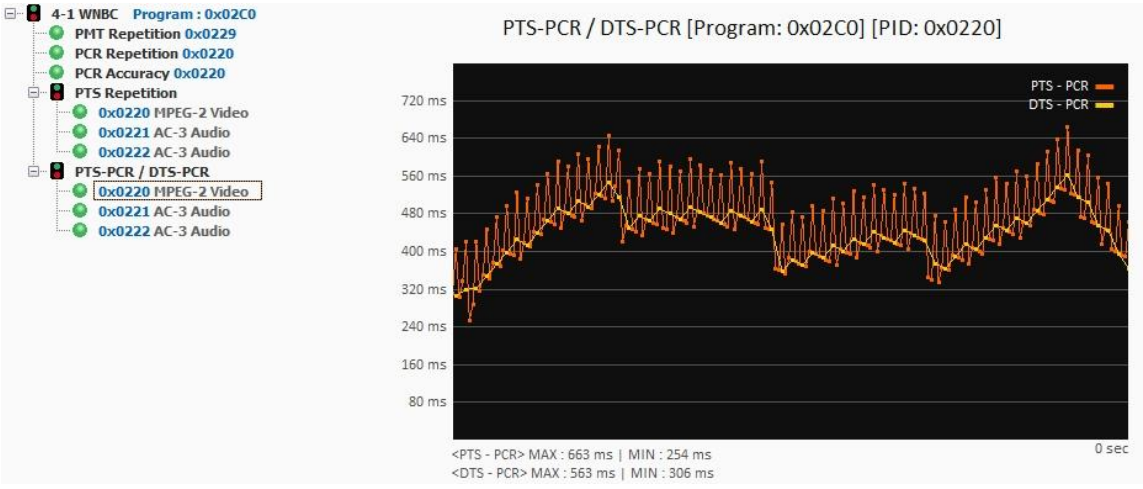


Closed Caption displays the CEA 608/708 data on screen.
Switchable CC Chanel through the channel list.
‘Rec’ allows users to record a detailed information of the Closed Caption data in ‘.csv’ format. (file saving path is as same as ‘Setting-Record-TS Record’ path.)



The timing related error items at the bottom shows PMT Repetition, PCR Repetition, PCR Accuracy, PTS Repetition plus PTS-PCR, PTS-PCR value as defined in TR 101 290.
(PTS-PCR indicates the difference in its value compare to PCR input value right before PTS)
(DTS-PCR indicates the difference in its value compare to PCR input value right before DTS)

Icon color indication:
Gray: (Not analyzed), Green (normal), Red (error)
Select each item on the left side table to show related graph.

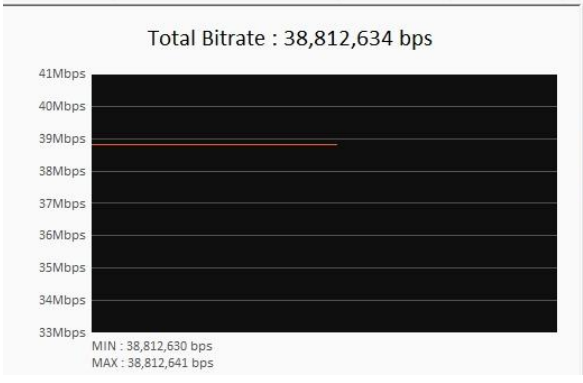


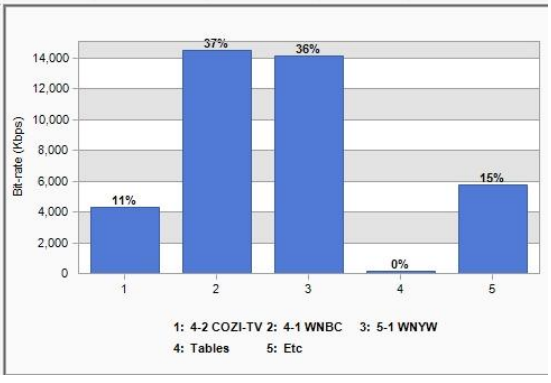
4. 6 Analysis Result Window – 'Bit-Rate' Tab

'Bit-rate' tab shows detailed information about measurement components of the 'Bit-rate'.

Service Bitrate | PID Bitrate

PID	type	ratio(%)	btr(Kbps)	btr_min(Kbps)	btr_max(Kbps)	btr_avg(Kbps)	CC error
Program	4-2 COZI-TV (Program : 0x006D)	10.990	4,265	1,213	5,596	3,986	
0x0320	MPEG-2 Video / PCR	10.478	4,067	1,016	5,399	3,789	0
0x0321	AC-3 Audio	0.511	198	197	198	197	0
Program	4-1 WNBC (Program : 0x02C0)	37.422	14,524	13,193	17,575	14,803	
0x0220	MPEG-2 Video / PCR	35.900	13,933	12,601	16,982	14,211	0
0x0221	AC-3 Audio	1.15	394	394	395	394	0
0x0222	AC-3 Audio	0.507	197	197	198	197	0
Program	5-1 WNYW (Program : 0x02C1)	36.469	14,154	14,097	14,400	14,279	
0x0120	MPEG-2 Video / PCR	34.768	13,494	13,437	13,738	13,618	0
0x0121	AC-3 Audio	1.185	460	460	463	461	0
0x0122	AC-3 Audio	0.515	200	198	200	199	0
Tables		0.352	136	126	148	137	
0x0000	PAT	0.54	21	19	21	20	0
0x0129	PMT	0.11	4	3	4	4	0
0x0229	PMT	0.11	4	3	4	4	0
0x0329	PMT	0.11	4	3	4	4	0
0x1000	EIT - 006	0.0	0	0	1	0	0
0x1001	EIT - 007	0.0	0	0	6	0	0
0x1002	EIT - 000	0.46	18	18	24	19	0
0x1003	EIT - 001	0.11	4	0	10	3	0
0x1004	EIT - 002	0.0	0	0	4	0	0
0x1005	EIT - 003	0.0	0	0	3	0	0
0x1006	EIT - 004	0.0	0	0	9	0	0
0x1007	EIT - 005	0.0	0	0	1	0	0





The upper window shows occupancy of each PIDs, Min/Max/Avg Bit-rate and number of Continuity Count error. These items can be organized and sorted by its components for each services PID.

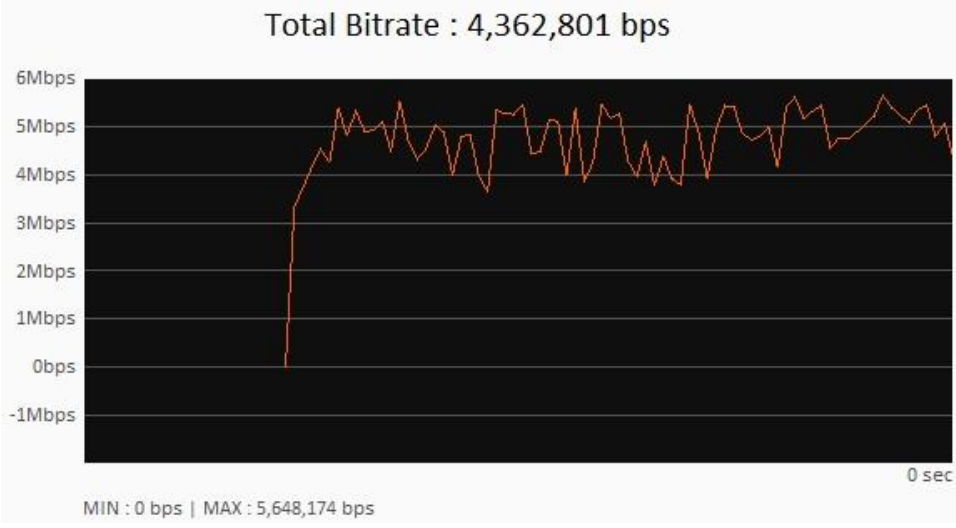
Service Bitrate | PID Bitrate

PID	type	ratio(%)	btr(Kbps)	btr_min(Kbps)	btr_max(Kbps)	btr_avg(Kbps)	CC error
Program	4-2 COZI-TV (Program : 0x006D)	10.990	4,265	1,213	5,596	3,986	
0x0320	MPEG-2 Video / PCR	10.478	4,067	1,016	5,399	3,789	0
0x0321	AC-3 Audio	0.511	198	197	198	197	0
Program	4-1 WNBC (Program : 0x02C0)	37.422	14,524	13,193	17,575	14,803	
0x0220	MPEG-2 Video / PCR	35.900	13,933	12,601	16,982	14,211	0
0x0221	AC-3 Audio	1.15	394	394	395	394	0
0x0222	AC-3 Audio	0.507	197	197	198	197	0
Program	5-1 WNYW (Program : 0x02C1)	36.469	14,154	14,097	14,400	14,279	
0x0120	MPEG-2 Video / PCR	34.768	13,494	13,437	13,738	13,618	0
0x0121	AC-3 Audio	1.185	460	460	463	461	0
0x0122	AC-3 Audio	0.515	200	198	200	199	0
Tables		0.352	136	126	148	137	
0x0000	PAT	0.54	21	19	21	20	0
0x0129	PMT	0.11	4	3	4	4	0
0x0229	PMT	0.11	4	3	4	4	0
0x0329	PMT	0.11	4	3	4	4	0
0x1000	EIT - 006	0.0	0	0	1	0	0
0x1001	EIT - 007	0.0	0	0	6	0	0
0x1002	EIT - 000	0.46	18	18	24	19	0
0x1003	EIT - 001	0.11	4	0	10	3	0
0x1004	EIT - 002	0.0	0	0	4	0	0

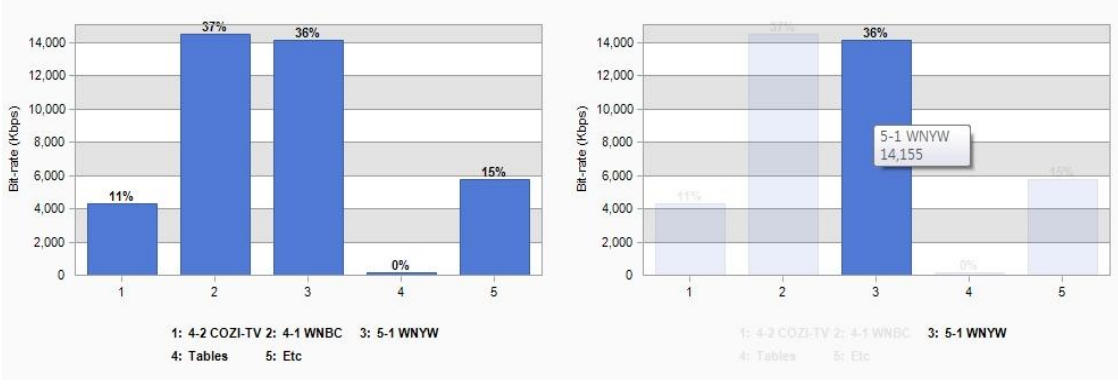
Service Bitrate | PID Bitrate

PID	type	ratio(%)	btr(Kbps)	btr_min(Kbps)	btr_max(Kbps)	btr_avg(Kbps)	CC error
0x0000	PAT	0.50	19	19	21	20	0
0x0120	MPEG-2 Video / PCR	35.264	13,687	13,437	13,738	13,619	0
0x0121	AC-3 Audio	1.189	461	460	463	461	0
0x0122	AC-3 Audio	0.515	200	198	200	199	0
0x0129	PMT	0.7	3	3	4	3	0
0x0220	MPEG-2 Video / PCR	34.768	13,494	12,601	16,982	14,198	0
0x0221	AC-3 Audio	1.19	395	394	395	394	0
0x0222	AC-3 Audio	0.507	197	197	198	197	0
0x0229	PMT	0.7	3	3	4	3	0
0x0320	MPEG-2 Video / PCR	11.617	4,509	1,016	5,399	3,802	0
0x0321	AC-3 Audio	0.507	197	197	198	197	0
0x0329	PMT	0.7	3	3	4	3	0
0x1000	EIT - 006	0.0	0	0	1	0	0
0x1001	EIT - 007	0.0	0	0	6	0	0
0x1002	EIT - 000	0.46	18	18	24	19	0
0x1003	EIT - 001	0.0	0	0	10	3	0
0x1004	EIT - 002	0.0	0	0	4	0	0
0x1005	EIT - 003	0.0	0	0	3	0	0
0x1006	EIT - 004	0.0	0	0	9	0	0
0x1007	EIT - 005	0.0	0	0	1	0	0
0x1080	Event ETT - 006	0.0	0	0	3	0	0
0x1081	Event ETT - 007	0.3	1	0	3	0	0
0x1082	Event ETT - 000	0.93	36	36	40	37	0
0x1083	Event ETT - 001	0.31	12	6	12	8	0
0x1084	Event ETT - 002	0.0	0	0	3	0	0
0x1085	Event ETT - 003	0.7	3	0	3	0	0
0x1086	Event ETT - 004	0.0	0	0	3	0	0
0x1087	Event ETT - 005	0.0	0	0	3	0	0
0x1FFB	MGT, STT, CVCT	0.89	34	31	34	33	0
0x1FFF	Null Packet	14.264	5,536	5,486	5,792	5,604	0
Total		100.0	38,812	38,812	38,812	38,812	

'Total Bit-rate' at the bottom shows the information of the entire bit-rate with its Max/Min information. Color graph on the right shows the program occupancy in percentage.



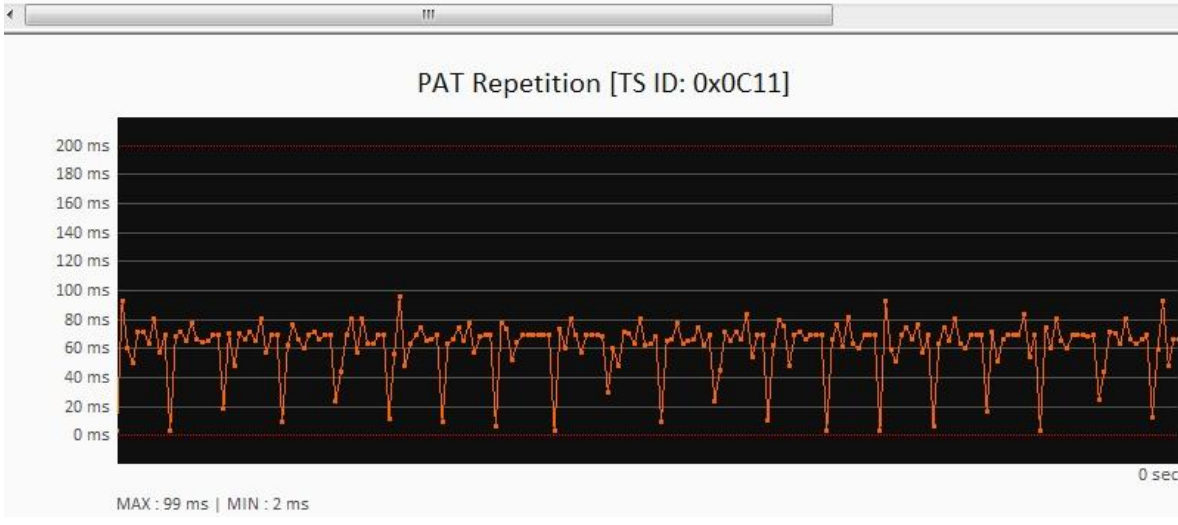
Below bar graph indicates share of each programs, If you put mouse point on the specific bar it will show the associated program name or program number as well as Bit-rate.



4. 7 Analysis result window – TR 101 290 Tab

'TR 101 290' Tab shows the result of error analysis based on 'ESTI TR 101 290', and ATSC A78 standard. Double Click on each nodes or click '+', '-' to expand or fold displays.

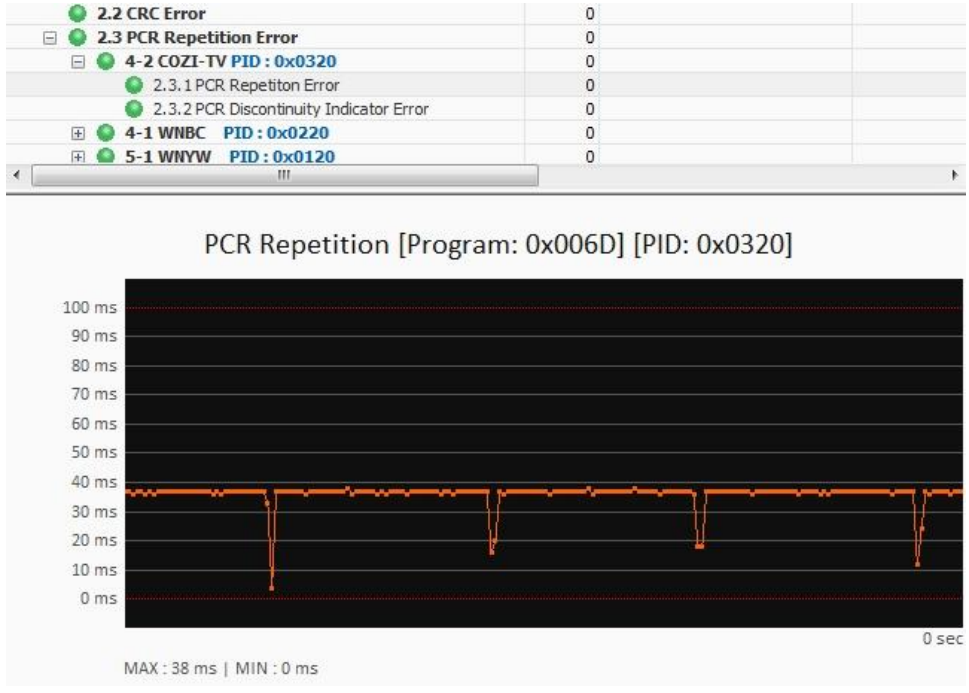
Parameter	# Error	Last Error Time/Pos	Event Detail
TR101290 Priority 1			
1.1 TS Sync Loss	0		
1.2 Sync Byte Error	0		
1.3 PAT Error	0		
1.3.1 Repetition	0		
1.3.2 Table ID Mismatching	0		
1.3.3 Scramble Control Error	0		
1.4 Continuity Count Error	0		
1.5 PMT Error	0		
1.6 PID Error			
TR101290 Priority 2			
2.1 Transport Error	0		
2.2 CRC Error	0		
2.3 PCR Repetition Error	0		
2.4 PCR Accuracy Error	0		
2.5 PTS Error	0		
2.6 CAT Error			
TR101290 Priority 3			
ATSC A78			
1 MGT Error	0		
2 VCT Error	0		
3 RRT Error			
4 EIT Error	0		
5 ETT Error			
6 STT Error	0		
RF Measurement			
1. MER Error	0		
2. RF Power Error	0		



More detailed information is provided for nodes with ‘Expand’ and ‘Fold’ indicators

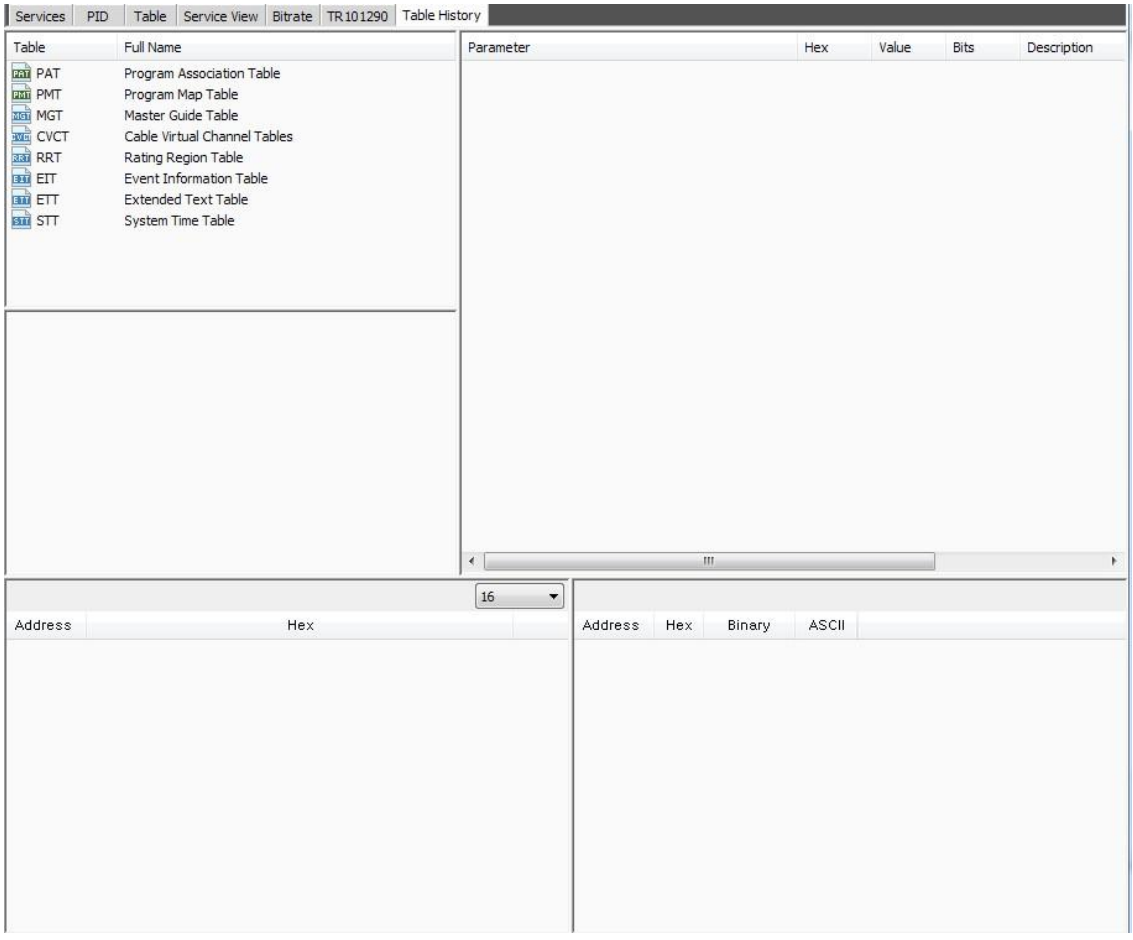
Parameter	# Error	Last Error Time/Pos	Event Detail
TR101290 Priority 1			
1.1 TS Sync Loss	0		
1.2 Sync Byte Error	0		
1.3 PAT Error	0		
1.3.1 Repetition	0		
1.3.2 Table ID Mismatching	0		
1.3.3 Scramble Control Error	0		
1.4 Continuity Count Error	0		
1.5 PMT Error	0		
1.6 PID Error			
TR101290 Priority 2			
2.1 Transport Error	0		
2.2 CRC Error	0		
2.3 PCR Repetition Error	0		
2.4 PCR Accuracy Error	0		
2.5 PTS Error	0		
2.6 CAT Error			
TR101290 Priority 3			
ATSC A78			
1 MGT Error	0		
2 VCT Error	0		
3 RRT Error			
4 EIT Error	0		
5 ETT Error	0		
6 STT Error	0		
RF Measurement			
1. MER Error	0		
2. RF Power Error	0		

Clicking on the timing related measurement items will display its relevant graphs at the bottom.

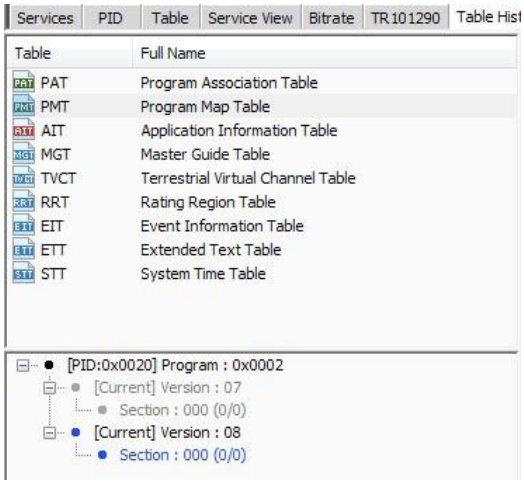


4. 8 Analysis Result Window– Table History Tab

'Table History' Tab shows all the components of collected information table and its history.



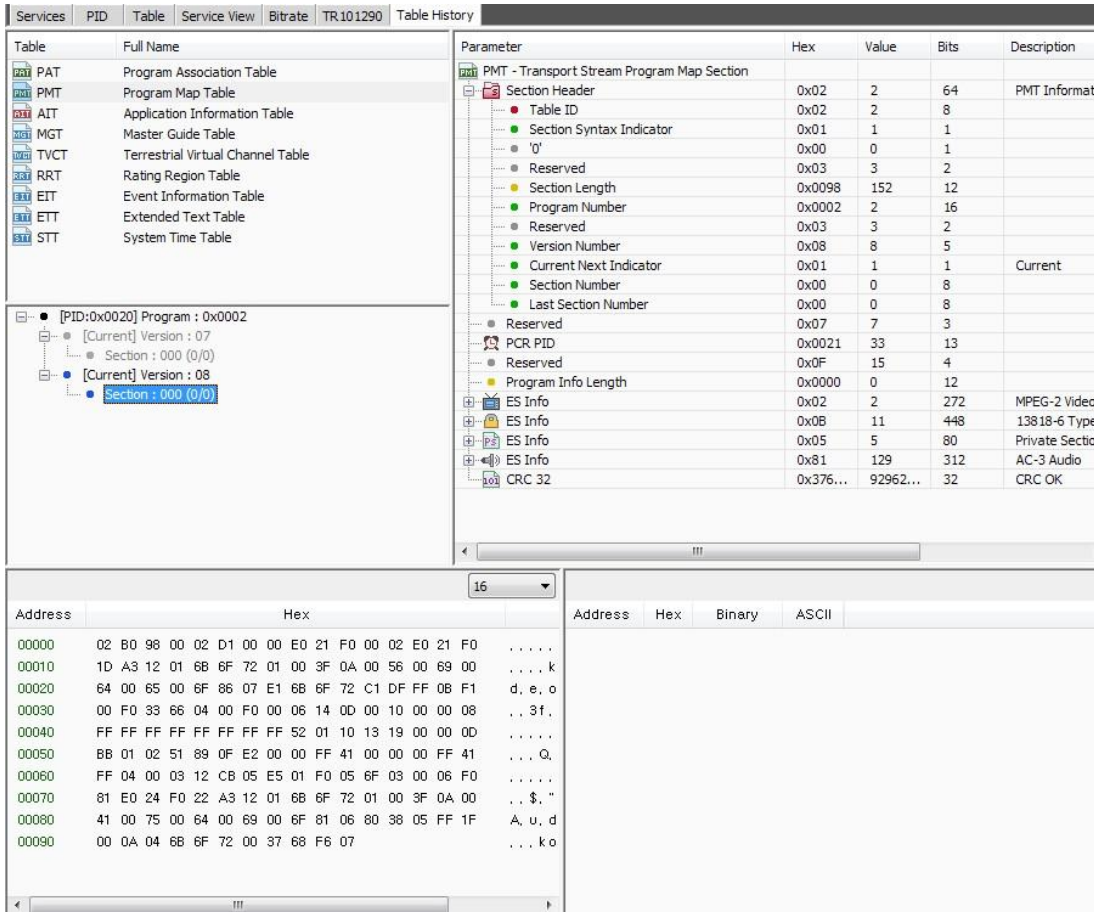
Top-left window shows the type of collected information table. When a specific information table has been clicked, a relevant collected history of information table appears on mid-left.



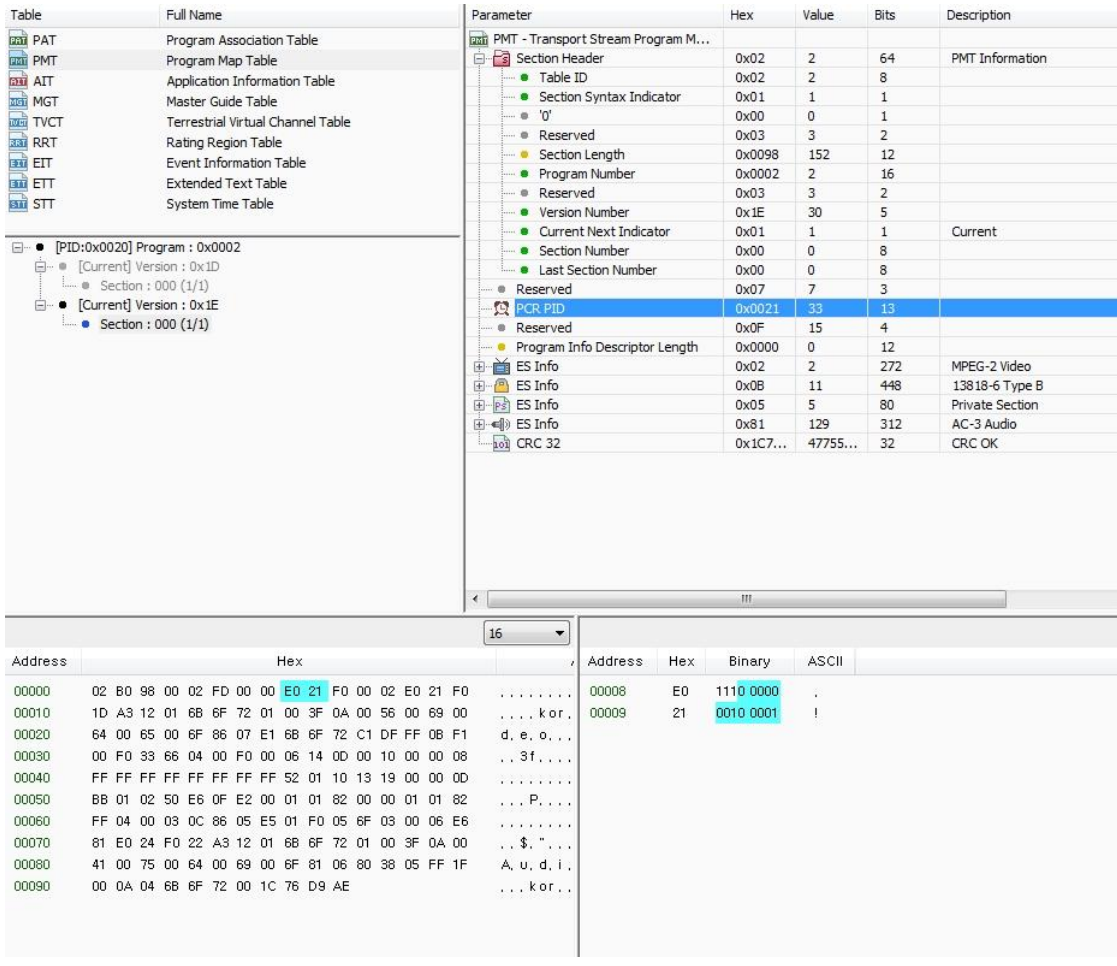
The collected information table data is saved as by the ‘section’.

When specific ‘section’ has been selected for the analysis, the analysis components will be displayed on the right upper window by information table configuration chart along with the byte-data information of such section shown at the bottom left.

(Section Number/Last Section Number will be indicated in the Section text)
(the latest information table data is indicated in ‘blue’ while previous ones are in ‘gray’)



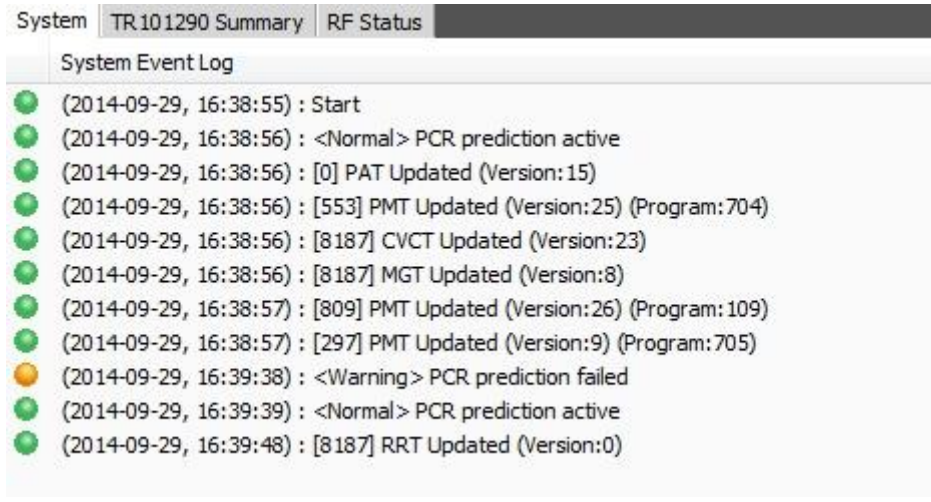
The byte-data is highlighted at the bottom left along with the binary data on the right when certain items have been selected from the analysis chart on upper right window.



4.9 System message and TR101290 summary window

System massage and TR101290 summary window is divided into 'System' and 'TR 101 290 Summary' tab.

< 'System' Tab >
'System' shows operation system messages in colors. Operation and stop message(Green) information table refresh message (Green), internal operation warning message (Orange).



Warning messages are as follows.

	Description	Reason
<Warning> PCR prediction failed	The system cannot carry out PCR data related analysis on input data	Input data
<Warning> [PID] "Name" Update failed	Abnormal data detected during the 'update' process after the table data collection	Input data
<Warning> [PID] "Name" PACKET COLLECTING FAILED	Information table packet collection failure	Input data
<Warning> Clean Unknown PIDs	Deleting any unknown PIDs from the memory when there is too many types of PID	Input data
<Warning> Media Player Packet Loss Occur	Packet Loss occurred during its data transfer to the Media Player while Media Player is in its operation at 'Service View'	PC calculation over flow
<SYS> Input Buffer Overflow	Data not processed. Omitted.	PC calculation overflow

4.10 TR 101 290 Summary' Tab

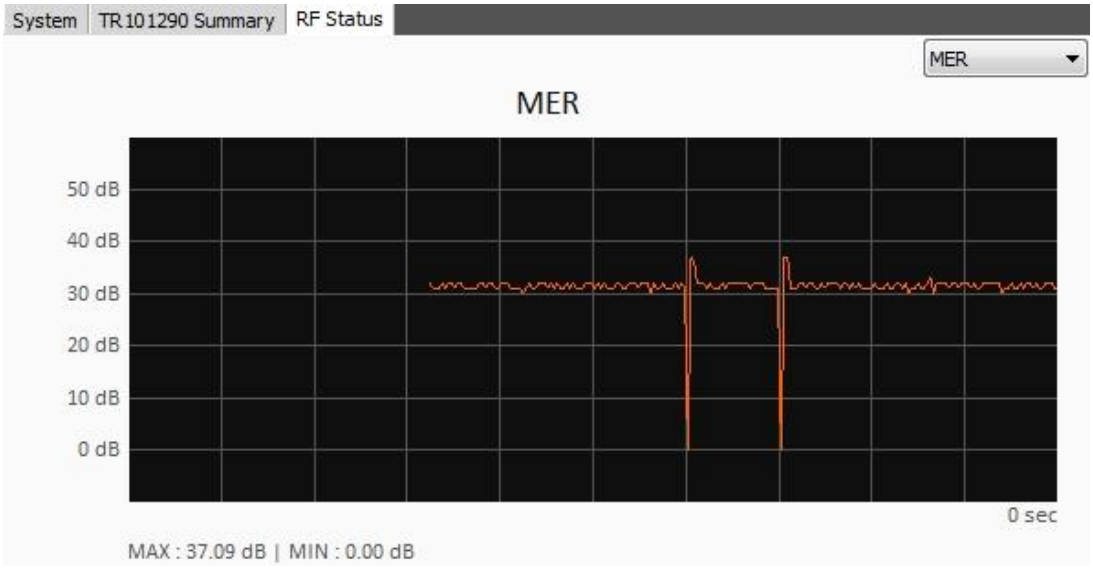
TR 101 290 & ATSC A78 error detection results are presented in a summarized format. For further information see. ' analysis window – TR101290'

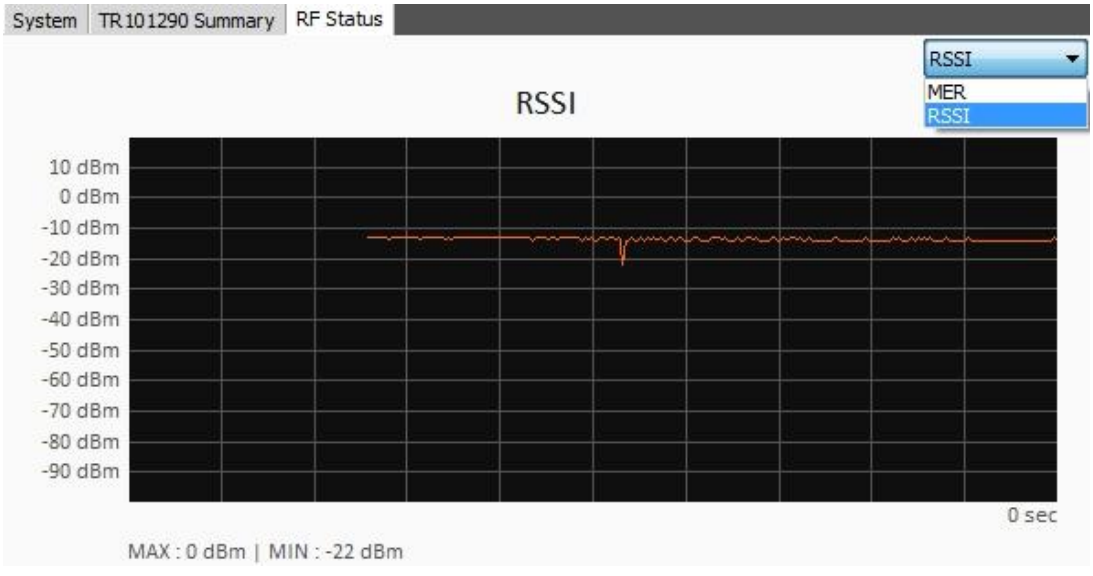
System | TR 101290 Summary | RF Status

Parameter	# Error	Last Error Time/Pos	Event Detail
TR101290 Priority 1			
1.1 TS Sync Loss	0		
1.2 Sync Byte Error	0		
1.3 PAT Error	2	2014-12-19, 15:23:23	PAT Repetition Error [205 ms]
1.4 Continuity Count Error	593	2014-12-19, 15:23:24	TS Continuity Counter Error [PID:
1.5 PMT Error	0		
1.6 PID Error			
TR101290 Priority 2			
2.1 Transport Error	8595	2014-12-19, 15:23:23	TS Error Indicator Error [PID:0x0
2.2 CRC Error	0		
2.3 PCR Repetition Error	4	2014-12-19, 15:23:23	PCR Discontinuity Indicator Error
2.4 PCR Accuracy Error	0		
2.5 PTS Error	0		
2.6 CAT Error			
TR101290 Priority 3			
3.1 NIT Error			
3.2 SI Repetition Error			
3.3 Buffer Error			
3.4 Unreferenced PID Error	208	2014-12-19, 15:25:00	Unreferenced PID Error [PID:0x0
3.5 SDT Error			
3.6 EIT Error			
3.7 RST Error			
3.8 TDT Error			
3.9 Empty Buffer Error			
3.10 Data Delay Error			
ATSC A78			
1 MGT Error	2	2014-12-19, 15:23:23	MGT Repetition Error [316 ms]
2 TVCT Error	1	2014-12-19, 15:23:23	VCT Repetition Error [1291 ms]
3 RRT Error			
4 EIT Error	1	2014-12-19, 15:23:23	EIT-0 Repetition Error [1258 ms]
5 ETT Error			
6 STT Error	0		
Etc			
1 MER Error	0		
2 RF Power Error	0		
3 PTS-PCR/ DTS-PCR Error	1	2014-12-19, 15:23:22	PTS-PCR Error [-47721742 ms]

4.11 RF Status Window

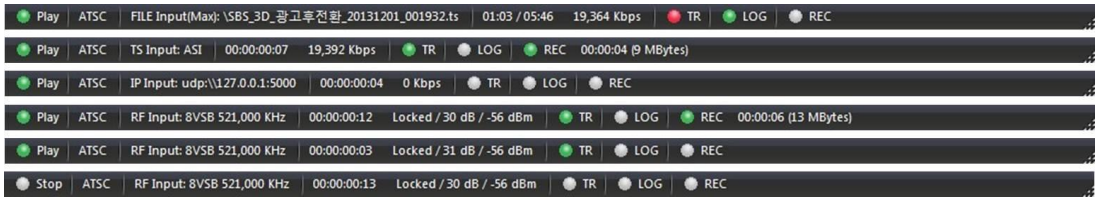
In RF quality, MER and RSSI measurement values of the last 150 seconds data are displayed in a Graph.





4. 12 Operation Status Window

Operation status window shows the summary of overall operation information.
Various operating status is shown below



Summarized information will be shown in following sequence.

① Operation status (Play, Stop, Pause , -current operating status)
② analysis mode (selected mode among MPEG-2, ATSC, DVB and ISDB)
③ input configuration (input port and detailed configuration information)
④ analysis processing time and input status (File/TS/IP input status shows its Bit-rate, whereas RF input shows quality of RF status - Lock, SNR, RSSI in this orders.)
⑤ TR 101 290 error detection status (Gray – operation disabled, Green- normal , Red –error occurred)
⑥ LOG record status (Grey –recording disabled , Green – recording)
⑦ TS Recording Status (Grey - recording disabled, Green – recording) (file size and recording time is shown additional during recording status)

APPENDIX A..TR 101 290 Analysis Criteria Description (Crucial items in Bold)

General Error categorization
① Data Loss
② Transmitter Defect
③ Error caused without the data loss factors. (Transmitter Defect)

	Item	Description (General Cause of the Error)
Priority 1	**1.1 TS Sync Loss**	Unable to Sync TS data in analysis stream. (①)
	1.2 Sync Byte Error	Fragmentary Sync error after TS data Sync.
	1.3 PAT Error 1.3.1 Repetition 1.3.2 Table ID Mismatching 1.3.3 Scramble Control Error	PAT Info table error (③) PAT info table unable to repeat within its time limit PAT info Table ID do not match PAT info table is scrambled
	1.4 Continuity Counter Error	Data Continuity cut off on TS data for each PID (①)
	1.5 PMT Error 1.5.1 Repetition 1.5.2 Table ID Mismatching 1.5.3 Scramble Control Error	PMT Info table error. (③) PMT info table unable to repeat within its time limit PMT info Table ID do not match PMT info table is scrambled
	1.6 PID Error	PID & PID data cycle unable to meet its parameter defined by user

	Item	Description
Priority 2	**2.1 Transport Error**	Error bit included in internal data of the TS packet (①)
	2.2 CRC Error	CRC for each info data do not match(②)
	2.3 PCR Error 2.3.1 PCR Repetition Error 2.3.2 PCR Discontinuity Indicator Error	PCR Time info error(③) PCR Time info unable to repeat within its time limit PCR Time info showing significant deviation without discontinuity command
	2.4 PCR Accuracy Error	PCR Time Info accuracy off its margin of error parameter (③)
	2.5 PTS Error	PTS Time info unable to repeat within its time limit. (③)
	2.6 CAT Error 2.6.1 Table ID Mismatching 2.6.2 Scramble Control Error	CAT Info table error. (③) CAT info Table ID do not match CAT info table is scrambled

	Item	Description
Priority 3	3.1 NIT Error 3.1.1 Actual Repetition 3.1.2 Other Repetition 3.1.3 Table ID Mismatching	NIT Info table error. (③) NIT-Actual info table unable to repeat within its time limit NIT-Other info table unable to repeat within its time limit NIT info table is scrambled
	3.2 SI Repetition Error 3.2.1 BAT Repetition 3.2.2 TOT Repetition 3.2.3 EIT Actual Repetition 3.2.3 EIT Other Repetition	SI Info table error. (③) BAT info table unable to repeat within its time limit TOT info table unable to repeat within its time limit EIT-Actual info table unable to repeat within its time limit EIT-Other info table unable to repeat within its time limit
	3.3 Buffer Error	TS buffer overflow (Not supported)
	3.4 Unreferenced PID Error	Unidentified PID reference (③)
	3.5 SDT Error 3.5.1 Actual P/F Repetition 3.5.2 Other P/F Repetition 3.5.3 Table ID Mismatching	SDT Info table error. (③) SDT-Actual Present/Follow info table unable to repeat within its time limit SDT-Other Present/Follow info table unable to repeat within its time limit SDT info table unable to repeat within its time limit
	3.6 EIT Error 3.6.1 Actual Repetition 3.6.2 Other Repetition 3.6.3 Table ID Mismatching 3.6.4 Present/Following Exist Error	EIT Info table error. (③) EIT-Actual info table unable to repeat within its time limit. EIT-Other info table unable to repeat within its time limit. EIT info Table ID do not match. EIT info Table without the ‘Present’ or ‘Following’ info.
	3.7 RST Error 3.7.1 Repetition 3.7.2 Table ID Mismatching	RST Info table error. . (③) RST info table unable to repeat within its time limit. RST info Table ID do not match.
	3.8 TDT Error 3.8.1 Repetition 3.8.2 Table ID Mismatching	TDT Info table error. (③) TDT info table unable to repeat within its time limit. TDT info Table ID do not match.
	3.9 Empty Buffer Error	TS buffer underflow. (Not supported)
	3.10 Data Delay Error	A single data delayed more than 1sec or a still cut image delayed more then 60 sec.(Not supported)

	Item	Description
ATSC A.78	1 MGT Error 1.1 Repetition 1.2 Table ID Mismatching 1.3 Scramble Control Error	MGT Info table error. (③) MGT info table unable to repeat within its time limit. MGT info Table ID do not match. MGT info table is scrambled.
	2 VCT Error 2.1 Repetition 2.2 Table ID Mismatching 2.3 Scramble Control Error	VCT Info table error. (③) VCT info table unable to repeat within its time limit. VCT info Table ID do not match. VCT info table is scrambled.
	3 RRT Error 3.1 Repetition 3.2 Table ID Mismatching 3.3 Scramble Control Error	RRT Info table error. (③) RRT info table unable to repeat within its time limit. RRT info Table ID do not match. RRT info table is scrambled.
	4 EIT Error 4.1 EIT-0 Repetition 4.2 EIT-1 Repetition 4.3 EIT-2 Repetition 4.4 EIT-3 Repetition 4.5 Table ID Mismatching 4.6 Scramble Control Error	EIT Info table error. (③) EIT-0 info table unable to repeat within its time limit. EIT-1 info table unable to repeat within its time limit. EIT-2 info table unable to repeat within its time limit. EIT-3 info table unable to repeat within its time limit. EIT info Table ID do not match. EIT info table is scrambled
	5 ETT Error 5.1 Table ID Mismatching 5.2 Scramble Control Error	ETT Info Table error. (③) ETT Info Table ID do not match. Error occurs when ETT info Table is scrambled
	6 STT Error 6.1 Repetition 6.2 Table ID Mismatching	STT Info table error. (③) STT info table unable to repeat within its time limit. STT info Table ID do not match.

	Item	Description
Etc	1. MER Error	RF Signal OFF the limited MER Range.
	2 RF Power Error	RF Signal OFF the limited Power Range.
	3 PTS-PCR/DTS-PCR Error	Deviation between PTS/DTS and PCR value off the limited range(③)

H/W Specification (ATSC type)

Demodulation	8VSB, QAM-B(64QAM,256QAM)
Size	154mm x 77mm x 29mm
POWER	USB2.0buspowered, No power supply required.
RF input connector	75 Ω F-Type 1ea
ASI/SMPTE310M connector	75 Ω BNC 1ea
ASI /SMPTE310M output connector	75 Ω BNC 1ea
ASI input bit-rate	0~108 Mbps
ASI output bit-rate	0~108 Mbps
SMPTE310M input bit-rate	19.392 Mbps
SMPTE310M output bit-rate	19.392 Mbps
RF Input Frequency Range	40~1002 MHz
RF Input Level	8VSB:+7~-84dBm OpenCable(QAM):+6~-66dBm

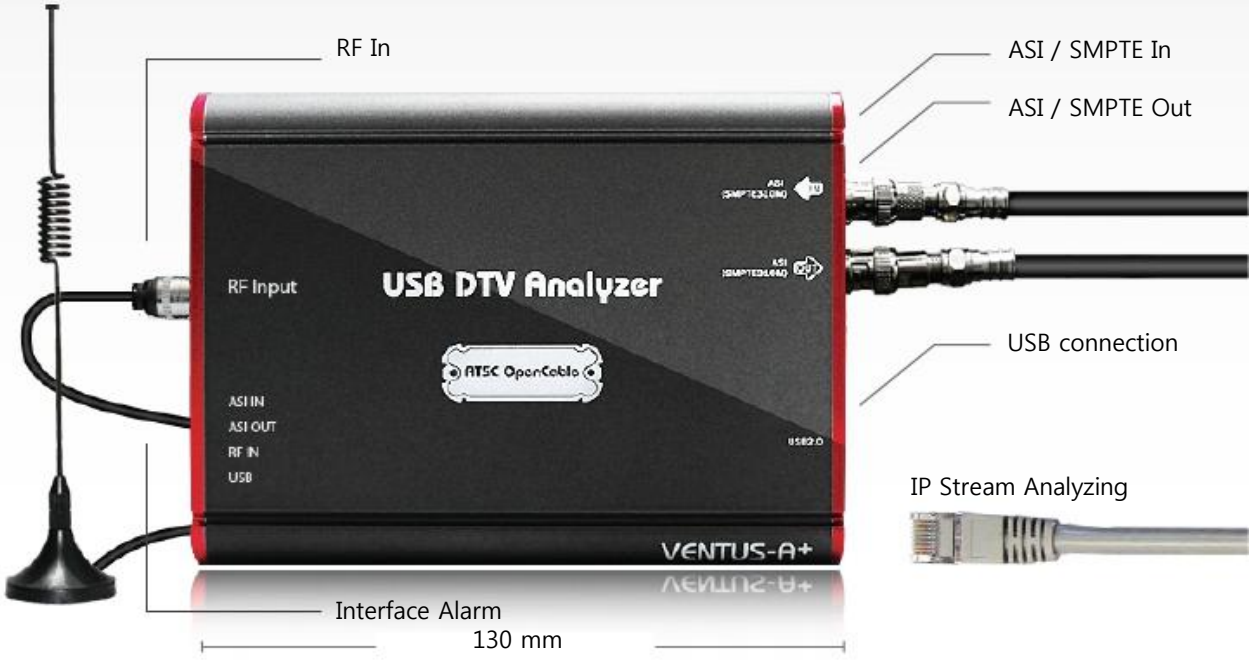
S/W Specification (ATSC type)

TS Input	ASI,SMPTE310M,File,IP(UDP/TS or UDP/RTP/TS),RF
TS Out	ASI or SMPTE310M (Allow when input is ASI,SMPTE310M,File,RF)
Analysis Mode	MPEG-2,ATSC,DVB
7 Analysis Window Tab	Service, PID, Table, Service View, Bit-rate,TR101290,TableHistory
Closed caption	
Real-time decoder	

Recommended system requirements

-CPU : better than IntelCore i3 3.1GHz (SandyBridge)
-RAM : betterthan2GB
-OS : Window7
-Resolution : bigger than 1680x1050

USB type DTV Analyzer (ATSC type)



H/W Specification (DVB type)

Demodulation	DVB-T2, DVB-T, DVB-C
Size	154mm x 77mm x 29mm
POWER	USB2.0buspowered, No power supply required
RF input connector	75 Ω F-Type 1ea
ASI input connector	75 Ω BNC 1ea
ASI output connector	75 Ω BNC 1ea
ASI input bit-rate	0~108 Mbps
RF Input Frequency Range	40~1002 MHz
RF Input Level	DVB-T2:+5~-78 dBm DVB-T:+7~-83 dBm DVB-C:+2~-67 dBm

S/W Specification (DVB type)

TS Input	ASI,SMPTE310M,File, IP(UDP/Ts or UDP/RTP/TS),RF
TS Out	ASI or SMPTE310M (Allow when input is ASI,SMPTE310M,File,RF)
Analysis Mode	MPEG-2,ATSC,DVB
7 Analysis Window Tab	Service, PID, Table, Service View, Bit-rate,TR101290,TableHistory
Closed caption	
Real-time decoder	

Recommended system requirements
-CPU : better than IntelCore i3 3.1GHz(SandyBridge)
-RAM : betterthan2GB
-OS : Window7
-Resolution : bigger than 1680x1050

USB type DTV Analyzer (DVB type)