C2Xpress

DVB-C2 Signal Generator

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Essential Tools for Digital-TV Professionals

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Revision History

Revision	Date	Changes
V1.10.0.35	2011.04.21	Added option for generating a part of the spectrum of a C2-System Added support for L1 parameter updates Updated big-TS splitting
V1.9.1.32	2011.03.17	Fixed problem when using L1 TI mode: 4 or 8 symbols
V1.9.0.31	2011.02.17	Added support for DTA-2111 Added OFDM symbol filtering Fixed SDT-Other generation in common PLP Removed .NET 2.0 SP2 dependency
V1.8.0.30	2010.12.21	Added test point data output Fixed 4K-QAM RF-signal problem Fixed (re)start generation without RF-signal
V1.7.0.27	2010.12.03	Improved MPLP and ISSY supported Added ACM test option Added experimental support for 16K QAM and 64K QAM Added "Notch test" parameter to allow out of range notches Added "L1 part2 change counter" parameter Fixed narrow band notch width Fixed zero length data slices
V1.1.0.19	2010.08.30	Added peak-to-average power reduction Incorporated DVB-C2 V1.1.2 specification changes Added support for DTA-116 and DTA-117 Fixed bitrate when ISSY is enabled
V1.0.1.17	2010.04.19	Fixed detection of capable output adapters
V1.0.0.16	2010.03.16	Initial version

1. Introduction

The DTC-379 ***C2Xpress*** software package is designed to create DVB-C2 test signals in the form of I/Q sample files or DVB-C2 RF output signals. ***C2Xpress*** can be installed by the user on any qualifying PC, as specified in section 2.

C2Xpress allows you to set the DVB-C2 parameters, specify the Data Slice Parameters, PLP parameters and select the PLP sources, add noise, add multiple channel simulation paths and generate the DVB-C2 test signals.

The I/Q sample file can be processed by your application or it can be played out through the ***StreamXpress***.

Note: The ***C2Xpress*** functions depend on the installed options, as specified in section 3.

2. Minimum PC Requirements

Platform	Windows XP/2003/Vista with .NET v2.0
Processor*	P4@2.0GHz (off-line generation) Core 2, Core i7 (real-time output)
RAM	1 GB

* Or equivalent AMD processor

3. C2Xpress Software Options

The ***C2Xpress*** software requires a valid license to be installed. Without a valid ***DTC-379-C2*** license installed, ***C2Xpress*** will operate in demo mode and is to not enable to generate DVB-C2 signals.

The following options are available:

Option	Description
DTC-379-C2	***C2Xpress***: Enables DVB-C2 RF output
DTC-371-IQ	Option to enable DVB-C2 I/Q sample generation, and playout of I/Q samples through the ***StreamXpress***
DTC-305-CM	Option to enable channel modelling

4. C2Xpress Software Installation

The ***C2Xpress*** software installation and ***C2Xpress*** license installation instructions can be found in the 'DTC-379 C2Xpress Installation' document, which is included in the install package.

5. C2Xpress Overview

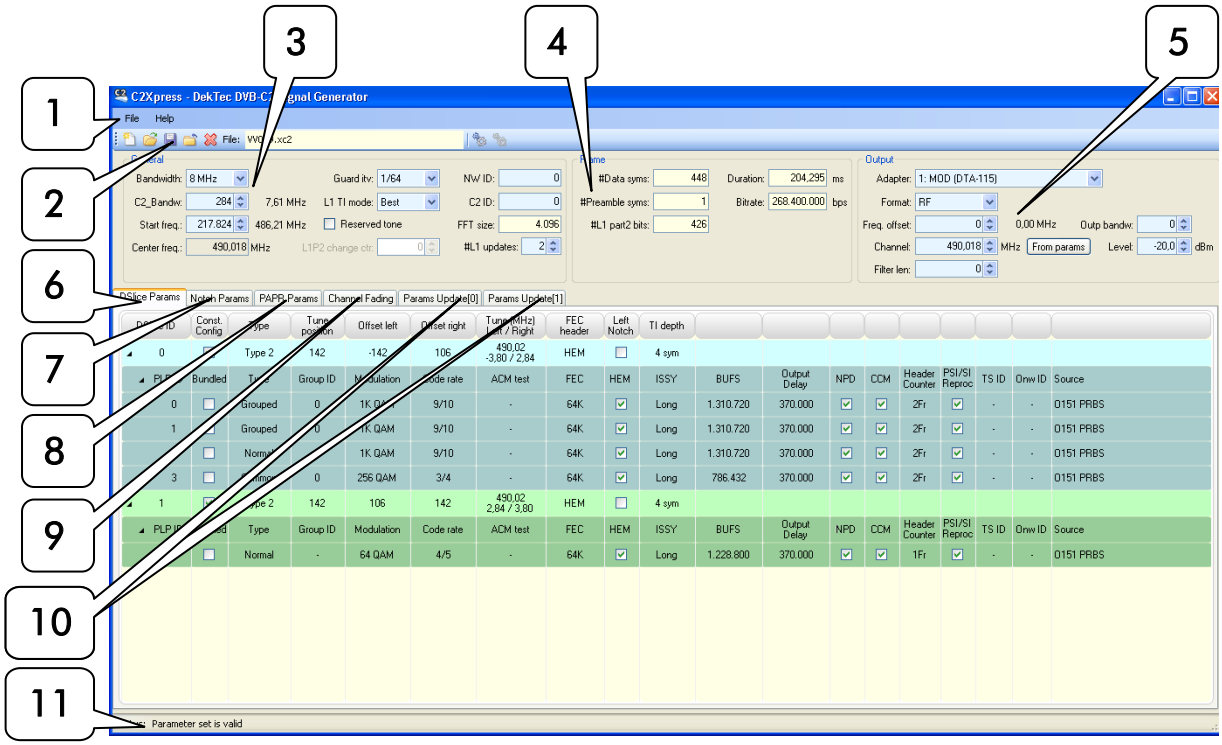
5.1. Launching C2Xpress

The ***C2Xpress*** program can be started simply from the Start Menu:

Start > All Programs > DekTec > C2Xpress

A dialog appears that allows you to specify all parameters, to save and load parameter sets from file, and to start generation of the DVB-C2 signal.

5.2. C2Xpress Application Layout



1. Menu Bar

The top area of the *C2Xpress* application contains two menus: File and Help.

2. Tool Bar

This area contains the following commands: New File, Open File, Save File, Close File, Clear, Generate output and Cancel. This area also displays the name of the C2Xpress -settings file.

3. General DVB-C2 Parameters

This area allows you to set the general DVB-C2 parameters.

4. Frame Information

This area displays the DVB-C2 frame information.

5. Output Settings

This area allows you to specify the name, location, size and the format for the generated signals.

6. Data Slice and PLP Parameters

This area allows you to specify the Data Slice and PLP parameters and to select the Transport Stream source for each PLP.

7. Notches

This area allows you to specify Notch bands.

8. PAPR Parameters

This area allows you to specify the Peak-to-Average-Power-Ratio (PAPR) reduction parameters.

9. Channel Fading

This area allows you to add noise to the output signal and to specify multiple simulated fading paths. For each path you can specify the channel-simulation parameters.

10. L1 Parameter Updates
This area allows you to specify the L1 parameter updates. For each update a tab page is inserted where you can specify the updated parameters and the number of frames the updated parameters set is used.

11. Status Bar
The status bar shows the validity of the DVB-C2 parameter set.

6. Walkthrough: Generation of a DVB-C2 RF signal

This walkthrough will guide you through the generation of a DVB-C2 RF signal.

- Start C2Xpress application
  C2Xpress can be started from the start menu or using the desktop shortcut.
  After start-up all DVB-C2 parameters are set to default values.
- Set general DVB-C2 parameters
- Set Data Slice and PLP Parameters
  Modify the Data Slice and PLP parameters and optionally add more Data Slices and/or PLPs.
  To add more Data Slices right-click the mouse in the Data Slice and PLP parameter area and select: Add Data Slice. Alternatively, the Insert key can be used.
  To add more, select the Data Slice to which the PLP has to be added then right-click the mouse and select: Add PLP. Alternatively, the Insert key can be used.
  To remove a complete Data Slice or a PLP or, select the Data Slice or PLP then right-click the mouse and select: Remove Data Slice or Remove PLP. The shortcut key in this case is Delete.
  To navigate through the Data Slice and PLP parameters, use the arrow keys. After selection you can press the Enter key to modify the parameter. When done, press the Enter key for further navigation.
  To modify the PLP's source, double click on the PLP's source parameter and select a Transport-Stream file or the O151 PRBS test signal.
- Set Output Format
  Set the Format to *RF,* thereafter you can specify the output adapter, RF frequency and RF level.
- Check Status Bar
  The status bar should indicate: *Parameter set is valid*. If otherwise, correct the settings.
- Save C2Xpress-Settings
  Optionally save the current C2Xpress settings to file by pressing the save button in the toolbar, or selecting Save File in the menu bar.
- Generate RF signal
  The generation of the RF signal can be started by pressing the Generate output button in the toolbar, or selecting Generate output in the menu bar.
  The generation can be stopped by pressing the Cancel generation button in the toolbar, or selecting Cancel generation in the menu bar.

7. C2Xpress Application GUI

The following sections describe the parameter groups and areas in the GUI of the *C2Xpress* application.

7.1. Menu Bar

The menu bar contains two menus:

- File Menu

Submenu	Description
New	Create a new C2Xpress-settings file; Settings are set to default
Open …	Open an existing C2Xpress-settings file
Save	Save the current C2Xpress-settings to file
Save As …	Save the current C2Xpress-settings to file using a different file name
Close	Close the current file
Clear	Clear the current settings. All settings are set to default
Generate output	Start the generation of the DVB-C2 signal
Cancel generation	Cancel the generation of the DVB-C2 signal

- Help Menu

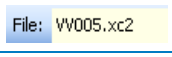
Submenu item	Description
About	Provide information about the current ***C2Xpress*** version

7.2. Tool Bar

- Toolbar buttons

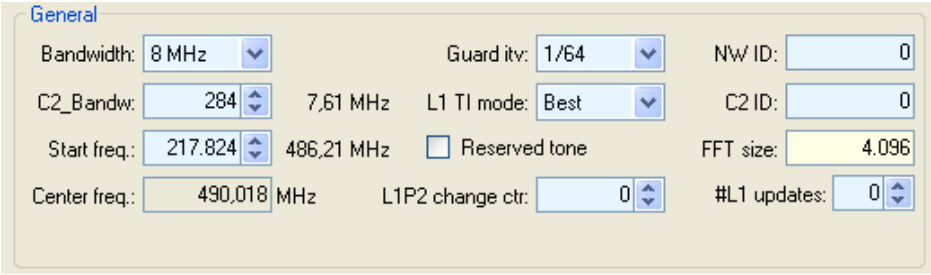
Toolbar button	Description
	Create a new C2Xpress-settings file; Settings are set to default
	Open an existing C2Xpress-settings file
	Save the current C2Xpress-settings to file
	Close the current file
	Clear the current settings; All settings are set to default
	Start the generation of the DVB-C2 signal
	Cancel the generation of the DVB-C2 signal

- Additional information

Toolbar info	Description
	The name of the current C2Xpress-settings file.
	During the generation of the output file(s) the progress is displayed.

7.3. General DVB-C2 Parameters

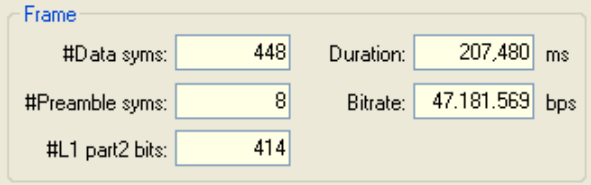
This group of parameters allows you to specify the general DVB-C2 parameters.



Parameter	Description
Bandwidth	Channel raster bandwidth: 6 or 8 MHz
C2_Bandw.	Bandwidth of the current C2 system specified in multiples of the pilot carrier spacing.
Start freq.	Start frequency of the current C2 System by means of the distance from 0 Hz in multiples of the carrier spacing of the current C2 System.
Center freq.	Center frequency. (Display only).
Guard itv.	Guard Interval: 1/128 or 1/64
L1 TI mode	Mode of time interleaving for L1-part2 of the C2 Frame: No time interleaving, Best Fit, 4 or 8 OFDM symbols.
Reserved tone	Reserved tone flag. If checked, reserved tones are activated. E.g. if PAPR is enabled, reserved tones should be checked.
L1P2 change ctr	Value send in the L1_PART2_CHANGE_COUNTER field of the L1 part 2 information. If the current value of the counter is >= 256, 0 is sent instead. If different from 0, it is decremented at the end of every frame. In combination with the "Append files option" it allows you to create IQ-files with dynamically changing DVB-C2 paramters. This option is disabled if L1 updates are provided.
NW ID	Network ID. Uniquely identifies the DVB-C2 network
C2 ID	C2 System ID. Uniquely identifies a C2 system within the DVB-C2 network
FFT size	FFT size. (Display only).
#L1 updates	The number of L1 part2 parameter updates. Tab pages appear in the GUI for each L1 part2 parameter update. See also section 7.11. The first update is applied immediately. After the last update is applied, it loops to the first one.

7.4. C2-Frame Information

This group shows information on the DVB-C2 frame structure.



If the DVB-C2 parameter set is valid, this area displays the derived frame information.

Parameter	Description
#Data syms	The number of data symbols in a C2 Frame (L_{data}) excluding the preamble symbols
#Preamble syms	The number of preamble OFDM symbols within the C2 Frame (L_P)
#L1 part2 bits	The number of information bits in L1-part2 signaling excluding the padding field ($K_{L1part2_ex_pad}$)
Duration	The duration of a C2-frame in milliseconds
Bitrate	The total Transport Stream bitrate of the PLPs

7.5. Output settings

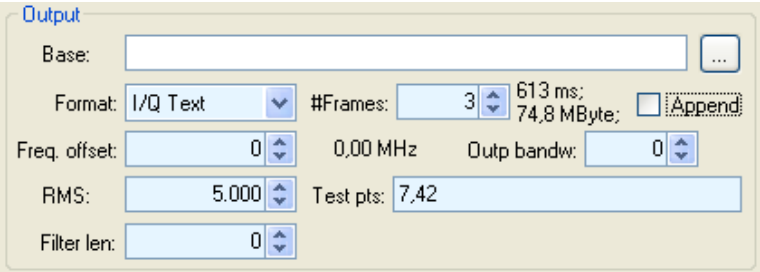
This area allows you to specify the output settings. Dependant on the selected output format, other selection fields are shown in this area.

- Format

Format	Description
I/Q Float32	Pairs of 32-bit floats in I, Q order
I/Q Int16	Pairs of signed 16-bit integers in I, Q order, little Endian: Byte #0: Least-significant byte I Byte #1: Most-significant byte I Byte #2: Least-significant byte Q Byte #3: Most-significant byte Q Etc.
I/Q Text	Text (ASCII)-based format consisting of pairs of four-character hexadecimal values with 0x prefix in I, Q order. The I and Q values are separated by a TAB and I/Q pairs are separated by a linefeed. Example: 0x2b45<TAB>0x1c3f<LF> 0xfeA9<TAB>0x0073<LF>
RF	DVB-C2 RF output through the selected DVB-C2 modulator port

7.5.1. I/Q Output Settings

In case the output type I/Q samples is selected (I/Q Float32, I/Q Int16 or I/Q Text), this area allows the selection of the location and the base name of the generated I/Q sample file and test point data files.



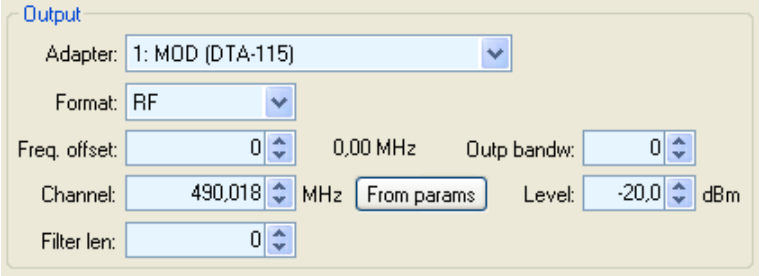
I/Q samples file settings

- #Frames
  The number of C2 frames to be generated. The resulting file length and size are displayed.
- Append files
  If not checked, C2Xpress overwrites the previously generated file. If checked, the C2Xpress appends the new generated data to the end of the existing file. In combination with the "L1 change" option it allows you to create IQ-files with dynamically changing DVB-C2 paramters.
- Freq. offset
  Output frequency offset by means of the distance in number of carriers from the start frequency of the C2 System. The offset must be a multiple of the carrier spacing.
  This option in combination with the output bandwidth allows you to generate a part of the spectrum of the C2 System, starting at 'start frequency' + 'output frequency offset' and ending at 'start frequency' + 'output frequency offset' + 'output bandwidth'.

- Outp. bandwidth
  Output bandwidth in number of carriers. 0 selects the default output bandwidth. The output bandwidth must be a multiple of the carrier spacing.
- RMS
  The Root Mean Square (RMS) of the complex samples. This value should be set as large as possible to have the largest SNR, but small enough to avoid saturation. When a DekTec card is used for play-out of the I/Q samples, the value 5000 is a good value.
- Test pts
  Enables the generation of test point data files according to the document: "Generating DVB-C2 Reference Streams". Test points have to be separated by commas. The following test points are supported: 1, 7, 8, 10, 13, 15, 18, 20, 22, 26, 27, 31, 32, 33, 37, 40, 41 and 42.
- Filter len
  The number samples of the OFDM symbol transition zone on which filtering is performed.
  This is an experimental parameter. The valid range is 0…32 for guard interval 1/128 or 0…64 for Guard Interval 1/64.

7.5.2. RF Output settings

In case the output type DVB-C2 RF is selected this area allows the selection of the DVB-C2 capable modulator card and the RF parameters. The "From params" button allows you to derive the carrier frequency from the DVB-C2 parameters.



DVB-C2 RF output settings

- Freq. offset
  Output frequency offset by means of the distance in number of carriers from the start frequency of the C2 System. The offset must be a multiple of the carrier spacing.
  This option in combination with the output bandwidth allows you to generate a part of the spectrum of the C2 System, starting at 'start frequency' + 'output frequency offset' and ending at 'start frequency' + 'output frequency offset' + 'output bandwidth'.
- Outp. bandwidth
  Output bandwidth in number of carriers. 0 selects the default output bandwidth. The output bandwidth must be a multiple of the carrier spacing.
- Channel
  Carrier frequency for the RF signal.
- Level
  Level (in dBm) of the output signal.
- Filter len
  The number samples of the OFDM symbol transition zone on which filtering is performed.
  This is an experimental parameter. The valid range is 0…32 for guard interval 1/128 or 0…64 for Guard Interval 1/64.

7.6. Data Slice and PLP Parameters

The DSlice parameter tab allows you to specify the Data Slice parameters and the PLP parameters. The light coloured rows specify the parameters of the Data Slices. Each Data Slice can contain zero, one or more PLPs. The parameters of the PLPs within a Data Slice are specified in the slightly darker coloured rows below the Data Slice parameters.

7.6.1. Data Slice Parameters

Each light coloured row specifies the parameters for a Data Slice.

DSlice ID	Const. Config	Type	Tune position	Offset left	Offset right	Tune (MHz) Left / Right	FEC header	Left Notch	TI depth
0	☑	Type 2	142	-142	142	490,02 -3,80 / 3,80	Robust	☐	None

Data Slice parameter	Description
DSlice ID	Unique identification of a Data Slice within a C2 system
Const. Config	Indication whether the Data Slice configuration is variable or fixed. If checked, the configuration is constant. This parameter is only used in combination with Data Slice Type 2.
Type	Data Slice Type: Data Slice Type1 or Data Slice Type 2
Tune position	Tuning position of the Data Slice relative to the start frequency (DVB-C2 general parameter) specified in multiples of the pilot carrier spacing.
Offset left	Start position of the Data Slice by means of the distance to the left from the tuning position specified in multiples of the pilot carrier spacing. Note: Offset left may have negative or positive values.
Offset right	End position of the Data Slice by means of the distance to the right from the tuning position specified in multiples of the pilot carrier spacing.
Tune/Left/Right	This field gives an outline on the Data Slice tuning in MHz.
FEC header	FECFrame header type: Robust mode or High efficiency mode
Left Notch	Indication whether a left neighboured Notch band is present. If checked, the start of the Data Slice is neighboured by a Notch band.
TI depth	The time interleaving depth within the Data Slice: No time interleaving, 4, 8 or 16 OFDM symbols

To add more Data Slices, right-click the mouse in the Data Slice and PLP parameter area and select: *Insert Data Slice*. Alternatively, the Insert key can be used.

To remove a Data Slice, select the Data Slice then right-click the mouse and select: *Remove Data Slice*. The shortcut key in this case is Delete.

To navigate through the Data Slice parameters, use the arrow keys. After selection you can press the Enter key to modify the parameter. When done, press the Enter key for further navigation.

7.6.2. PLP Parameters

Each dark coloured row below the Data Slice parameters specifies the parameters for a PLP.

PLP ID	Bundled	Type	Group ID	Modulation	Code rate	ACM test	FEC	HEM	ISSY	BUFS	Output Delay	NPD	CCM	Header Counter	PSI/SI Reproc	TS ID	Onw ID	Source
0	☐	Normal	-	256 QAM	5/6	-	64K	☑	Long	2.097.152	600.000	☑	☑	1Fr	☑	-	-	0151 PRBS

PLP parameter	Description
PLP ID	Unique identification of a PLP within a C2 system
Bundled	Indication whether the PLP is bundled with other PLPs within the C2 System. If checked, the PLP is bundled with PLP(s) in other Data Slice(s) (having the same PLP ID)
Type	PLP Type: Common PLP, Grouped Data PLP or Normal Data PLP
Group ID	PLP Group ID. Identifies the PLP group with which the PLP is associated. This parameter is not used when the PLP type is Normal Data PLP
Modulation	Modulation type used by the PLP:16-QAM, 64-QAM, 256-QAM, 1024-QAM or 4096-QAM
Code rate	Code rate used by the PLP: 2/3, 3/4, 4/5, 5/6, 8/9 (16K LDPC) or 9/10(64K LDPC)
ACM test	Displays the number of modulation and coding parameter settings defined for Adaptive Code and Modulation (ACM) testing. This is only available for type 2 Data Slices. If no settings are defined for ACM testing, ACM testing is disabled and the modulation and coding parameters from the PLP-parameter page are used. If one or more settings are defined for ACM testing, ACM testing is enabled. Successive XFEC frames of the PLP use the modulation and coding parameter setting from the ACM-testing list. After the last parameter setting from the list is used, the first setting is used again. When double clicking on the ACM test field, a dialog is opened that allows you to specify the PLP modulation and coding parameters for ACM testing. By a right mouse click you can add or remove entries. Per entry you can specify the FEC Type, Modulation, Code rate, Header Counter and the number of XFEC frames using these parameters.
FEC	FEC type used by the PLP: 16K LDPC or 64K LDPC
HEM	High Efficiency Mode / Normal Mode selection. If checked, the PLP uses High Efficiency Mode
ISSY	Input Stream Synchronization mechanism: None, Long (=3byte) or Short (=2byte) field
BUFS	Maximum size of the requested receiver buffer to compensate for delay variations. This variable uses the ISSY field and therefore it is only enabled if the ISSY field is used
Output Delay	Delay (in T units) between the incoming data and the output TS in the receiver model.
NPD	Null Packet Deletion. If checked, the PLP uses Null Packet Deletion
CCM	CCM/ACM flag (Constant Coding and Modulation or Variable/Adaptive Coding and Modulation). If checked, CCM is signalled, otherwise ACM.
Header Counter	Number of FECFrames following the FECFrame header: 1 or 2 FECFrames
PSI/SI Reproc	Indication whether the PSI/SI is reprocessed or not. If checked, this indicates that the PSI/SI is reprocessed and the receiver can rely on the PSI/SI information
TS ID	Transport Stream ID that serves as a label for the identification of this TS from any other TS within the C2 System. This is used when the PSI/SI is not

	reprocessed
Onw ID	Gives the Original Network ID. This is used when the PSI/SI is not reprocessed
Source	Displays the selected source. When double clicking on the source, a dialog is opened that allows you to select the source. The source of a PLP can be: (a) 0151 PRBS test signal The PID has to be specified and optionally null packet insertion can be enabled (Q>0). If null packet insertion is enabled, P specifies the number of non-null packets and Q specifies the number of null packets in a sequence of Transport Stream packets. In case the scheduling method Dynamic is selected, the bitrate has to be specified too. (b) Transport Stream file The path of the Transport Stream can be selected. If possible the bitrate is estimated automatically. Four different modes of Transport Stream insertion are supported: i) Complete Stream The complete Transport Stream file is included in the PLP. ii) Partial Stream Data Extraction One service from the Transport Stream file has to be selected; the related data is extracted and included in the data PLP. The included data comprises the service components, a PAT, an SDT-actual and the PMT-table. iii) Partial Stream Common Extraction All common data related to the selected services in the same PLP group is extracted from the Transport Stream file and included in the common PLP. This common data is co-timed with the data in the data PLPs. (c) No data No data is provided for this PLP. This option has to be selected if the PLP has to be present in the L1 part2 signalling but without carrying data.

To add more PLPs, right-click the mouse in PLP parameter row below the Data Slice to which the new PLP will be added and select: *Insert PLP*. Alternatively, the Insert key can be used.

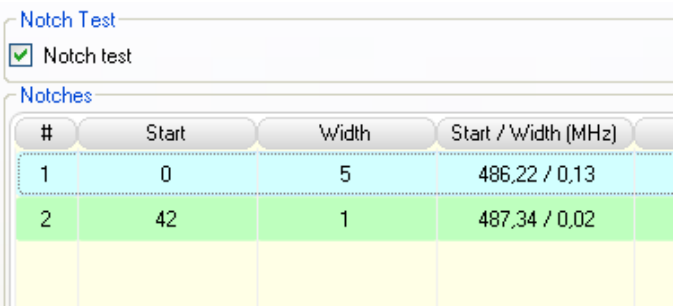
To remove a PLP, select the PLP then right-click the mouse and select: *Remove PLP*. The shortcut key in this case is Delete.

To navigate through the PLP parameters, use the arrow keys. After selection you can press the Enter key to modify the parameter. When done, press the Enter key for further navigation.

7.7. Notch Parameters

The Notch tab allows you to specify the Notch bands within the C2 Frame.

Each row specifies the parameters for one Notch band.



Notch parameter	Description
Notch test	If checked, allows non-spec compliant notches: broadband notches are allowed to be inside a data slice. Moreover, notches are allowed to start dx carriers before the modulated spectrum and to stop dx carriers after the modulated spectrum to cancel the edge carriers.
Start	Notch band start position relative to the start frequency (DVB-C2 general parameter) specified in multiples of the pilot carrier spacing
Width	Width of the Notch band specified in multiples of the pilot carrier spacing
Tune/Width[MHz)	This field gives an outline on the Notch band in MHz

7.8. PAPR Reduction Parameters

If PAPR is used in combination with I/Q or RF output, the PAPR-Params tab allows you to specify the peak-to-average power ratio reduction parameters.
Note that not all PAPR-reduction parameter settings can be executed real-time.

7.8.1. PAPR TR

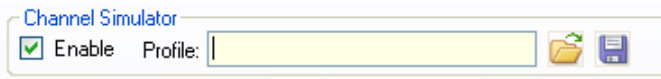
The PARP-TR group enables you to specify the parameters for the Tone Reservation technique. If the Enable box is checked, the clipping threshold and the maximum number of iterations can be specified.

7.9. Channel Fading

The channel-fading tab allows you to specify the parameters for the channel simulator:
- White noise
- Reflections (multipath echo's)
- Doppler effects because of a moving receiver

7.9.1. Channel Simulator

The Channel-Simulator group contains the overall enable box.

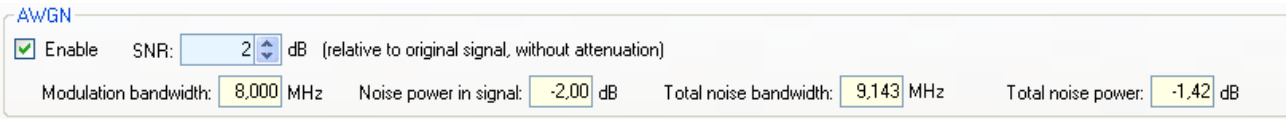


If checked, channel simulation is enabled and noise and fading-path parameters can be specified. If unchecked, no channel simulation is applied.

The File Open button enables you to load a previously saved set of channel-simulation settings. The File Save button allows you to save the current settings.

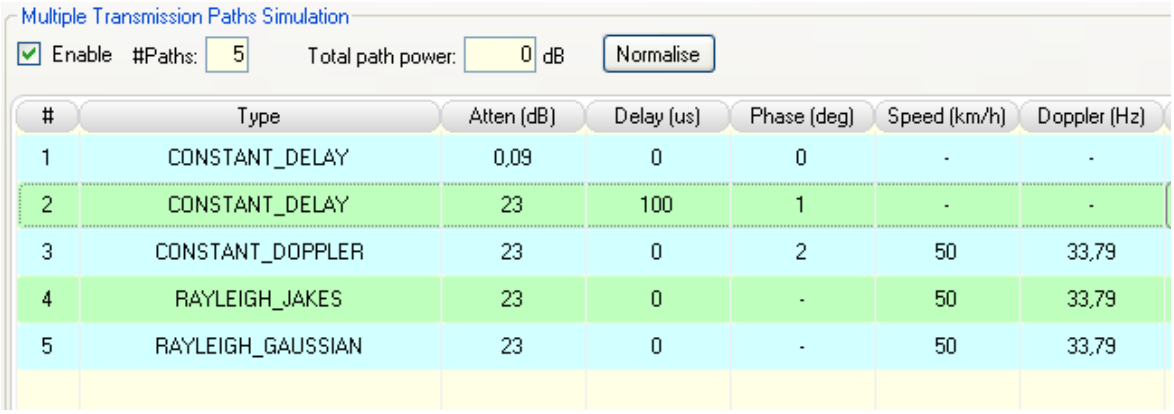
7.9.2. AWGN

The AWGN group enables you to specify parameters for the addition of Gaussian-distributed noise to the I/Q samples. If the Enable box is checked, the Signal-To-Noise ratio relative to the original signal can be specified.



7.9.3. Multiple Transmission Paths Simulation

This group allows you to specify up to 32 transmission paths.



#	Type	Atten (dB)	Delay (us)	Phase (deg)	Speed (km/h)	Doppler (Hz)
1	CONSTANT_DELAY	0,09	0	0	-	-
2	CONSTANT_DELAY	23	100	1	-	-
3	CONSTANT_DOPPLER	23	0	2	50	33,79
4	RAYLEIGH_JAKES	23	0	-	50	33,79
5	RAYLEIGH_GAUSSIAN	23	0	-	50	33,79

The following parameters can be specified per fading path:

PLP parameter	Description
Type	Echo Type: Constant Delay, Constant Doppler, Rayleigh fading with Gaussian spectrum or Rayleigh fading with Jakes spectrum
Atten (dB)	Attenuation of the path in dB
Delay (us)	Delay of the path in microseconds
Phase (deg)	Phase shift of the path in degrees. Only for Constant Delay and Constant Doppler path types
Speed (km/h)	Speed of the simulated moving receiver in km per hour. The resulting Doppler frequency in Hz is displayed. Only for Constant Doppler, Rayleigh Jakes and Rayleigh Gaussian path types.

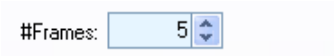
If the Multiple Transmission Paths Simulation is disabled, it acts as a single path without attenuation and without delay. If the Multiple Transmission Paths Simulation is enabled and no paths are defined, it acts as a pure noise generator.

The sum of path power is displayed. The normalize button allows you to normalize the attenuation of the paths such that the total power is 0dB again.

7.10. General DVB-C2 Parameters

7.11. L1 Parameter Updates

The Parameter Update tab pages allow you to specify L1 parameter updates. For each L1 update (#L1 updates field in the general DVB-C2 parameter area) a tab page is inserted where you can specify the updated Data Slice parameters and the PLP parameters and the number of frames the updated parameters set is used. The first update is applied immediately. After the last update is applied, it loops to the first one.



Adding, removing and changing of the global DSlice and PLP parameters have to be performed in the DSliceParams tab page.

7.11.1. L1 Update Data Slice Parameters

Each light coloured row specifies the update parameters for a Data Slice.

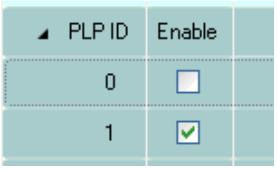
Data Slice update parameter	Description
DSlice ID	Unique identification of a Data Slice within a C2 system. (Display only).
Enable	Enable or disable the DSlice. Only dummy data slices can be disabled. A data slice is considered as dummy if either: OffsetLeft equals OffsetRight in the DSliceParams tab page; or all its PLPs don't carry data.
Tune position	Tuning position of the Data Slice relative to the start frequency (DVB-C2 general parameter) specified in multiples of the pilot carrier spacing. (Display only).
Offset left	Start position of the Data Slice by means of the distance to the left from the tuning position specified in multiples of the pilot carrier spacing. Note: Offset left may have negative or positive values.
Offset right	End position of the Data Slice by means of the distance to the right from the tuning position specified in multiples of the pilot carrier spacing.
Tune/Left/Right	This field gives an outline on the Data Slice tuning in MHz.

To navigate through the Data Slice update parameters, use the arrow keys. After selection you can press the Enter key to modify the parameter. When done, press the Enter key for further navigation.

Adding, removing and changing other Data Slices parameters have to be performed in the DSliceParams tab page

7.11.2. L1 Update PLP Parameters

Each dark coloured row below the Data Slice parameters specifies the update parameters for a PLP.



PLP update parameter	Description
PLP ID	Unique identification of a PLP within a C2 system. (Display only).
Enable	Enable or disable the PLP. Only PLPs without carrying data can be disabled (i.e. PLP source 'No data' is selected).

To navigate through the PLP update parameters, use the arrow keys. After selection you can press the Enter key to modify the parameter. When done, press the Enter key for further navigation.

7.12. Status Bar

The Status Bar appears in the lower left corner of the *C2Xpress* application. The Status Bar indicates whether the combination of current DVB-C2 parameters is valid.