

# Channel Link Model (v2.1) Ad Hoc Activity Report

Marek Hajduczenia, Nokia Siemens Networks S.A.

# Contributors

- Alphabetic list of contributors to Channel Link Model ad hoc (I do hope to have them all):
  - Andrey Kobayakov
  - Duane Remein
  - Frank Effenberger
  - Marek Hajduczenia
  - Pete Anslow
  - Piers Dawe
  - Robert Lingle
  - Sergey Ten
  - Tsutomu Tatsuta

# Current Status [1]

- Chartered tasks and status up to v2.0
  - see 3av\_0709\_hajduczenia\_1.pdf
- v2.1 of the spreadsheet was produced – a number of changes were introduced:
  - added a legend for the field color code
  - uniformization of the **Tx\_Chirp\_Parameter\_Max** with the official definition in Agrawal's "Fiber-Optic Communication Systems"
  - correction in the **Dispersion\_Penalty** formula (typo)
  - several minor updates in the **Comments** column

# Current Status [2]

- v2.1 of the spreadsheet was produced – a number of changes were introduced:
  - removal of the circular reference in the **Fibre\_Attenuation\_Value** formula for G652AB and G652CD options in the **Fibre\_Attenuation\_Curve** parameter
  - parameter **Tx\_Spectral\_Width\_Max** was removed
    - it was not used in any calculations; a carry on from the previous spreadsheet version)
  - added **TDP** parameter cell (user defined) > cell B36
  - updated the Channel Link Model Illustration (see tab Link model illustration)

# Current Spreadsheet

	A	B	C	D	E	F	G	K	L	M	N	O	P	Q
1	Parameter name	Value	Unit	Description	Value min	Value max								
2														
3	<b>Transmitter parameters</b>													
4	ITU_EFnom	6.00	dB	Extinction Ratio used to convert average power values to OMA values	0.00	9.00								
5	ITU_Tx_Ave_Min	2.00	dBm	Average output power in ITU format (min)	-99.00	99.00								
6	ITU_Tx_Ave_Max	7.00	dBm	Average output power in ITU format (max)	-99.00	99.00								
7	IEEE_Tx_OMA_Min	2.78	dBm	Average output power in IEEE OMA format (min)										
8	Tx_Wavelength_Min	1260.00	nm	Transmitter wavelength (min)	1200.00	1600.00								
9	Tx_Wavelength_Max	1280.00	nm	Transmitter wavelength (max)	1200.00	1600.00								
10	Tx_Wavelength_Uc	1270.00	nm	Transmitter wavelength (central wavelength)	1260.00	1280.00								
11	Tx_Chirp_Parameter_Max	-2.00	-	Chirp parameter for transmitter signal (max) [C] (Normal DML's are negative)										
12	Tx_Data_Rate	10312.50	MBd	Effective data rate in Mbaud	9500	11500								
13														
14	<b>Link parameters</b>													
15	Fibre_Attenuation_Curve	G652AB	-	Fibre attenuation curve type (lambda <sup>3</sup> -4,G652AB,G652CD models)										
16	Fibre_Attenuation_Curve_Type	min	-	Maximum / minimum value curve (not available for lambda <sup>3</sup> -4 model)										
17	Fibre_Attenuation_Base_Value	0.35	dB/km	Base fibre attenuation (for lambda <sup>3</sup> -4 model)	0	1								
18	Fibre_Attenuation_Base_Wavelength	1270.00	nm	Base wavelength for fibre attenuation estimation										
19	Fibre_Attenuation_Value	0.40	dB/km	Fibre attenuation at base wavelength										
20	Channel_Length_Max	10	km	Maximum distance between an ONU and the OLT	0.5	20								
21	Fibre_Loss	4.00	dB	Fibre (no connectors) CHIL @ Tx_Uc										
22	PSC_Split_count	16.00	-	Number of splitter ports (powers of 2 only)	2	64								
23	PSC_Loss_Curve	max	-	Type of PSC loss curve (minimum, average and maximum types)										
24	PSC_Loss	14.93	dB	PSC induced CHIL										
25	SRS_Loss	1.00	dB	SRS induced nonlinear penalty (from other services)		10								
26	Excess_Loss	0.07	dB	Connectors, splices and any other excess loss										
27	ITU_Optical_Path_Penalty	3.00	dB	Optical path penalty in accordance with ITU definition	0	5								
28	Channel_Loss_Min	8.00	dB	Channel Insertion Loss (CHIL) (min) - user input	0	20.00								
29	Channel_Loss_Max	20.00	dB	Channel Insertion Loss (CHIL) (max)		29								
30	Dispersion_Uc_Min	1300.00	nm											
31	Dispersion_Uc_Max	1324.00	nm											
32	Dispersion_So	0.09	ps/nm <sup>2</sup> ·km											
33	Dispersion_D_Max	-1.90	ps/(nm·km)											
34	Dispersion_D_Min	-6.42	ps/(nm·km)											
35	Dispersion_Penalty	-0.41	dB	Dispersion penalty calculated following 3av_0705_saeki_1.pdf										
36	TDP	1.00	dB	Transmitter Dispersion Penalty	0	10								
37														
38	<b>Receiver parameters</b>													
39	ITU_Rx_Sensitivity_Ave	-21.00	dBm	Average power receiver sensitivity @ BER 1e-3										
40	ITU_Rx_Sensitivity_Ave_OMA	-20.22	dBm	OMA receiver sensitivity (dBm) @ BER 1e-3										
41	ITU_Rx_Sensitivity_Ave_OMA	20.45	uW	OMA receiver sensitivity (uW) @ BER 1e-3										
42	IEEE_Rx_Stressed_Sensitivity_Ave	-18.00	dBm	Average stressed receiver sensitivity in IEEE formalism @ BER 1e-3										
43	IEEE_Rx_Stressed_Sensitivity_OMA	-17.22	dBm	OMA stressed receiver sensitivity in IEEE formalism (dBm) @ BER 1e-3										
44	IEEE_Rx_Stressed_Sensitivity_OMA	36.43	uW	OMA stressed receiver sensitivity in IEEE formalism (uW) @ BER 1e-3										
45	IEEE_Rx_Sen_OMA	-18.22	dBm	OMA ideal receiver sensitivity in IEEE formalism (dBm)										
46	IEEE_Rx_Sen_OMA	30.05	uW	OMA ideal receiver sensitivity in IEEE formalism (uW)										
47	Rx_Overload	-1.00	dBm	This is what the overload needs to be...										
48														
49	<b>Check Conditions</b>													
50	Dispersion_Penalty <= ITU_Optical_Path_Penalty			PASSED										

<b>Color Code Key</b>	
	User input field (unlocked)
	Introduced value is OK
	Introduced / Calculated value is outside of expected range
	Locked fields, not accessible to a user
	Comments