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ITU-T

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G.997.1
Amendment 5
(11/2015)

SERIES G: TRANSMISSION SYSTEMS AND MEDIA,
DIGITAL SYSTEMS AND NETWORKS

Digital sections and digital line system – Metallic access
networks

Physical layer management for digital subscriber
line transceivers

Amendment 5

Recommendation ITU-T G.997.1 (2012) –
Amendment 5

ITU-T



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Recommendation ITU-T G.997.1

Physical layer management for digital subscriber line transceivers

Amendment 5

Summary

Amendment 5 to Recommendation ITU-T G.997.1 (2012) includes:

- Support for ITU-T G.993.2 Annex Q (profile 35b).
- Support for retransmitted DTU counter parameters.

History

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Recommendation ITU-T G.997.1

Physical layer management for digital subscriber line transceivers

1) Support for G.993.2 Annex Q (Profile 35b)

1.1) Clause 7.3.1.1.11

Modify clause 7.3.1.1.11 as follows:

7.3.1.1.11 VDSL2 profiles enabling (PROFILES)

This configuration parameter contains the ITU-T G.993.2 profiles to be allowed by the near-end xTU on this line. It is coded in a bit-map representation (0 if not allowed, 1 if allowed) with the following definition:

Bit	Representation
-----	----------------

Octet 1

1	ITU-T G.993.2 profile 8a.
2	ITU-T G.993.2 profile 8b.
3	ITU-T G.993.2 profile 8c.
4	ITU-T G.993.2 profile 8d.
5	ITU-T G.993.2 profile 12a.
6	ITU-T G.993.2 profile 12b.
7	ITU-T G.993.2 profile 17a.
8	ITU-T G.993.2 profile 30a.

Octet 2

<u>1</u>	<u>ITU-T G.993.2 profile 35b.</u>
<u>2</u>	<u>reserved by ITU-T.</u>
<u>3</u>	<u>reserved by ITU-T.</u>
<u>4</u>	<u>reserved by ITU-T.</u>
<u>5</u>	<u>reserved by ITU-T.</u>
<u>6</u>	<u>reserved by ITU-T.</u>
<u>7</u>	<u>reserved by ITU-T.</u>
<u>8</u>	<u>reserved by ITU-T.</u>

1.2) Clause 7.3.1.2.15

Modify clause 7.3.1.2.15 as follows:

7.3.1.2.15 VDSL2 PSD mask class selection (CLASSMASK)

In order to reduce the number of configuration possibilities, the limit power spectral density masks (limit PSD masks) are grouped in the following PSD mask classes:

- Class 998 Annex A of [ITU-T G.993.2]: D-32, D-48, D-64, D-128.
- Class 997-M1c Annex B of [ITU-T G.993.2]: 997-M1c-A-7.
- Class 997-M1x Annex B of [ITU-T G.993.2]: 997-M1x-M.
- Class 997-M2x Annex B of [ITU-T G.993.2]: 997E17-M2x-A, 997E30-M2x-NUS0.

- Class 998-M2x Annex B of [ITU-T G.993.2]: 998-M2x-A, 998-M2x-M, 998-M2x-B, 998-M2x-NUS0, 998E17-M2x-NUS0, 998E17-M2x-NUS0-M, 998E30-M2x-NUS0, 998E30-M2x-NUS0-M, 998E17-M2x-A.
- Class 998ADE-M2x Annex B of [ITU-T G.993.2]: 998-M2x-A, 998-M2x-M, 998-M2x-B, 998-M2x-NUS0, 998ADE17-M2x-A, 998ADE17-M2x-B, 998ADE17-M2x-M, 998ADE17-M2x-NUS0-M, 998ADE30-M2x-NUS0-A, 998ADE30-M2x-NUS0-M; ~~HPEADE1230, HPEADE1730.~~
- Class 998-B Annex C: POTS-138b, POTS-276b (clause C.2.1.1 of [ITU-T G.993.2]), TCM-ISDN (clause C.2.1.2 of [ITU-T G.993.2]).
- Class 998-CO Annex C of [ITU-T G.993.2]: POTS-138co, POTS-276co (clause C.2.1.1 of [ITU-T G.993.2]).
- ~~– Class HPE-M1 Annex B of [ITU-T G.993.2]: HPE17-M1-NUS0, HPE30-M1-NUS0, HPE1230-M1-NUS0, HPE1730-M1-NUS0.~~
- Class 998E35-M2x Annex B of [ITU-T G.993.2]: 998-M2x-A, 998-M2x-M, 998-M2x-B, 998-M2x-NUS0, 998E17-M2x-NUS0, 998E17-M2x-NUS0-M, 998E17-M2x-A, 998E35-M2x-A.
- Class 998ADE35-M2x Annex B of [ITU-T G.993.2]: 998-M2x-A, 998-M2x-M, 998-M2x-B, 998-M2x-NUS0, 998ADE17-M2x-A, 998ADE17-M2x-B, 998ADE17-M2x-M, 998ADE17-M2x-NUS0-M, 998ADE35-M2x-A, 998ADE35-M2x-B, 998ADE35-M2x-M.

Each class is designed such that the PSD levels of each limit PSD mask of a specific class are equal in their respective passband above 552 kHz.

One CLASSMASK parameter is defined per the ITU-T G.993.2 Annex enabled in the XTSE. It selects a single PSD mask class per the ITU-T G.993.2 Annex that is activated at the VTU-O. The coding is as indicated in Table 7-6.

Table 7-6 – Definition of values of CLASSMASK per ITU-T G.993.2 Annex

Parameter value	ITU-T G.993.2 Annex A	ITU-T G.993.2 Annex B	ITU-T G.993.2 Annex C
1	998	997-M1c	998-B
2		997-M1x	998-CO
3		997-M2x	
4			
5		998-M2x	
6		998ADE-M2x	
7		HPE	
<u>8</u>		<u>998E35-M2x</u>	
<u>9</u>		<u>998ADE35-M2x</u>	

NOTE – A single PSD mask class shall be selected per ITU-T G.993.2 Annex.

1.3) Clause 7.3.1.2.16

Modify clause 7.3.1.2.16 as follows:

7.3.1.2.16 VDSL2 limit PSD masks and band plans enabling (LIMITMASK)

This configuration parameter contains the ITU-T G.993.2 limit PSD masks of the selected PSD mask class, enabled by the near-end xTU on this line for each class of profiles. One LIMITMASK parameter is defined per the ITU-T G.993.2 Annex enabled in the XTSE.

The profiles are grouped in the following profile classes:

- Class 8: Profiles 8a, 8b, 8c, 8d
- Class 12: Profiles 12a, 12b
- Class 17: Profile 17a
- Class 30: Profile 30a
- Class 35: Profile 35b

For each profile class, several limit PSD masks of the selected PSD mask class (CLASSMASK) may be enabled. The enabling parameter is coded in a bit-map representation (0 if the associated mask is not allowed, 1 if it is allowed).

The parameter has the bit definitions for each PSD mask class as indicated in Table 7-7.

Table 7-7 – Definition of bits of LIMITMASK for each CLASSMASK

Bit number	Profile class	PSD mask classes									
		Annex A	Annex B							Annex C	
		998 Annex A	998-M2x Annex B	998ADE-M2x Annex B	997-M1x Annex B	997-M1c Annex B	997-M2x Annex B	998E35-M2xHPE-M1 Annex B	998ADE35-M2x Annex B	998-B Annex C	998-CO Annex C
<i>Octet 1</i>											
1	8	D-32	M2x-A	M2x-A		M1c-A-7		<u>M2x-A</u>	<u>M2x-A</u>	POTS-138b	POTS_138co
2	8	D-48	M2x-B	M2x-B				<u>M2x-B</u>	<u>M2x-B</u>	TCM-ISDN	POTS_276co
3	8		M2x-M	M2x-M	M1x-M			<u>M2x-M</u>	<u>M2x-M</u>	POTS_276b	
4	8		M2x-NUS0	M2x-NUS0				<u>M2x-NUS0</u>	<u>M2x-NUS0</u>		
5	8										
6	8										
7	8										
8	8										
<i>Octet 2</i>											
1	8	D-64									
2	8	D-128									
3	8										
4	8										
5	8										
6	8										
7	8										

Table 7-7 – Definition of bits of LIMITMASK for each CLASSMASK

Bit number	Profile class	PSD mask classes									
		Annex A	Annex B							Annex C	
		998 Annex A	998-M2x Annex B	998ADE-M2x Annex B	997-M1x Annex B	997-M1c Annex B	997-M2x Annex B	998E35-M2xHPE-M1 Annex B	998ADE35-M2x Annex B	998-B Annex C	998-CO Annex C
8	8										
<i>Octet 3</i>											
1	12	D-32	M2x-A	M2x-A				<u>M2x-A</u>	<u>M2x-A</u>	POTS-138b	POTS_138co
2	12	D-48	M2x-B	M2x-B				<u>M2x-B</u>	<u>M2x-B</u>	TCM-ISDN	POTS_276co
3	12		M2x-M	M2x-M	M1x-M			<u>M2x-M</u>	<u>M2x-M</u>	POTS_276b	
4	12		M2x-NUS0	M2x-NUS0				<u>M2x-NUS0</u>	<u>M2x-NUS0</u>		
5	12										
6	12										
7	12										
8	12										
<i>Octet 4</i>											
1	12	D-64									
2	12	D-128									
3	12										
4	12										
5	12										
6	12										

Table 7-7 – Definition of bits of LIMITMASK for each CLASSMASK

Bit number	Profile class	PSD mask classes									
		Annex A	Annex B							Annex C	
		998 Annex A	998-M2x Annex B	998ADE-M2x Annex B	997-M1x Annex B	997-M1c Annex B	997-M2x Annex B	998E35-M2xHPE-M1 Annex B	998ADE35-M2x Annex B	998-B Annex C	998-CO Annex C
7	12										
8	12										
<i>Octet 5</i>											
1	17	D-32	E17-M2x-NUS0	ADE17-M2x-A			E17-M2x-A	E17-M2x-NUS047-M1-NUS0	ADE17-M2x-A	POTS-138b	
2	17	D-48	E17-M2x-NUS0-M	ADE17-M2x-B				E17-M2x-NUS0-M	ADE17-M2x-B	TCM-ISDN	
3	17		E17-M2x-A	ADE17-M2x-NUS0-M				E17-M2x-A	ADE17-M2x-NUS0-M	POTS_276b	
4	17			ADE17-M2x-M					ADE17-M2x-M		
5	17										
6	17										
7	17										
8	17										
<i>Octet 6</i>											
1	17	D-64									
2	17	D-128									
3	17										

Table 7-7 – Definition of bits of LIMITMASK for each CLASSMASK

Bit number	Profile class	PSD mask classes									
		Annex A	Annex B							Annex C	
		998 Annex A	998-M2x Annex B	998ADE-M2x Annex B	997-M1x Annex B	997-M1c Annex B	997-M2x Annex B	998E35-M2xHPE-M1 Annex B	998ADE35-M2x Annex B	998-B Annex C	998-CO Annex C
4	17										
5	17										
6	17										
7	17										
8	17										
<i>Octet 7</i>											
1	30	D-32	E30-M2x-NUS0	ADE30-M2x-NUS0-A			E30-M2x-NUS0	30 M1-NUS0		POTS-138b	
2	30	D-48	E30-M2x-NUS0-M	ADE30-M2x-NUS0-M				1230 M1-NUS0		TCM-ISDN	
3	30			HPEADE1230 NUS0				1730 M1-NUS0		POTS_276b	
4	30			HPEADE1730 NUS0							
5	30										
6	30										
7	30										
8	30										
<i>Octet 8</i>											

Table 7-7 – Definition of bits of LIMITMASK for each CLASSMASK

Bit number	Profile class	PSD mask classes									
		Annex A	Annex B							Annex C	
		998 Annex A	998-M2x Annex B	998ADE-M2x Annex B	997-M1x Annex B	997-M1c Annex B	997-M2x Annex B	998E35-M2xHPE-M1 Annex B	998ADE35-M2x Annex B	998-B Annex C	998-CO Annex C
1	30	D-64									
2	30	D-128									
3	30										
4	30										
5	30										
6	30										
7	30										
8	30										
<i>Octet 9</i>											
<u>1</u>	<u>35</u>							<u>E35-M2x-A</u>	<u>ADE35-M2x-A</u>		
<u>2</u>	<u>35</u>								<u>ADE35-M2x-B</u>		
<u>3</u>	<u>35</u>								<u>ADE35-M2x-M</u>		
<u>4</u>	<u>35</u>										
<u>5</u>	<u>35</u>										
<u>6</u>	<u>35</u>										
<u>7</u>	<u>35</u>										
<u>8</u>	<u>35</u>										

Table 7-7 – Definition of bits of LIMITMASK for each CLASSMASK

Bit number	Profile class	PSD mask classes								
		Annex A	Annex B						Annex C	
		998 Annex A	998-M2x Annex B	998ADE-M2x Annex B	997-M1x Annex B	997-M1c Annex B	997-M2x Annex B	998E35-M2xHPE-M1 Annex B	998ADE35-M2x Annex B	998-B Annex C
NOTE – All unassigned bits are reserved by ITU.										

1.4) Clause 7.5.1.26.2

Modify clause 7.5.1.26.2 as follows:

7.5.1.26.2 Downstream H(f) linear subcarrier group size (HLINGds)

This parameter is the number of subcarriers per group used to report HLINpsds. The valid values are 1, 2, 4, ~~and 8~~ and 16. For ADSL, this parameter is equal to one and, for VDSL2, it is equal to the size of a subcarrier group used to compute these parameters (see clause 11.4.1 of [ITU-T G.993.2]).

NOTE – The values of the subcarrier group size parameters (HLING, HLOGG, QLNG and SNRG) may not all be independent.

1.5) Clause 7.5.1.26.5

Modify clause 7.5.1.26.5 as follows:

7.5.1.26.5 Downstream H(f) logarithmic subcarrier group size (HLOGGds)

This parameter is the number of subcarriers per group used to report HLOGpsds. The valid values are 1, 2, 4, ~~and 8~~, and 16. For ADSL, this parameter is equal to one and, for VDSL2, it is equal to the size of a subcarrier group used to compute these parameters (see clause 11.4.1 of [ITU-T G.993.2]).

1.6) Clause 7.5.1.27.2

Modify clause 7.5.1.27.2 as follows:

7.5.1.27.2 Downstream QLN(f) subcarrier group size (QLNGds)

This parameter is the number of subcarriers per group used to report QLNpsds. The valid values are 1, 2, 4, ~~and 8~~, and 16. For ADSL, this parameter is equal to one and, for VDSL2, it is equal to the size of a subcarrier group used to compute these parameters (see clause 11.4.1 of [ITU-T G.993.2]).

1.7) Clause 7.5.1.28.2

Modify clause 7.5.1.28.2 as follows:

7.5.1.28.2 Downstream SNR(f) subcarrier group size (SNRGds)

This parameter is the number of subcarriers per group used to report SNRpsds. The valid values are 1, 2, 4, ~~and 8~~ and 16. For ADSL, this parameter is equal to one and, for VDSL2, it is equal to the size of a subcarrier group used to compute these parameters (see clause 11.4.1 of [ITU-T G.993.2]).

2) Support for retransmitted DTU counter parameters

2.1) Clause 7.2.2.1.4

Add clause 7.2.2.1.4:

7.2.2.1.4 Retransmitted DTU – Channel (RTXTX-C)

This parameter is a count of rtx-tx anomalies (the number of retransmitted DTUs, see clause 12 of [ITU-T G.998.4]) occurring in the bearer channel during the accumulation period.

2.2) Clause 7.2.2.2.4.

Add clause 7.2.2.2.4:

7.2.2.2.4 Retransmitted DTU – Channel far-end (RTXTX-CFE)

This parameter is a count of far-end rtx-tx anomalies (the number of retransmitted DTUs, see clause 12 of [ITU-T G.998.4]) occurring in the bearer channel during the accumulation period.

2.3) Tables 7-24 and 7-25

Modify Tables 7-24 and 7-25 as follows:

Table 7-24 – Channel performance monitoring parameters

Category/Element	Defined in clause:	Q-Interface	U-C Interface	U-R Interface	T-/S-Interface
<i>Near-end (xTU-C) performance monitoring counters (current and previous 15-minute interval)</i>					
CV-C counter 15 minutes	7.2.2.1.1	R (M)	R (O)		
FEC-C counter 15 minutes	7.2.2.1.2	R (M)	R (O)		
RTXUC-C counter 15 minutes	7.2.2.1.3	R (M)	R (O)		
<u>RTXTX-C counter 15 minutes</u>	<u>7.2.2.1.4</u>	<u>R (M)</u>	<u>R (O)</u>		
<i>Near-end (xTU-C) performance monitoring counters (current and previous 24-hour interval)</i>					
CV-C counter 24 hours	7.2.2.1.1	R (M)	R (O)		
FEC-C counter 24 hours	7.2.2.1.2	R (M)	R (O)		
RTXUC-C counter 24 hours	7.2.2.1.3	R (M)	R (O)		
<u>RTXTX-C counter 24 hours</u>	<u>7.2.2.1.4</u>	<u>R (M)</u>	<u>R (O)</u>		
<i>Far-end (xTU-R) performance monitoring counters (current and previous 15-minute interval)</i>					
CV-CFE counter 15 minutes	7.2.2.2.1	R (M)		R (O)	
FEC-CFE counter 15 minutes	7.2.2.2.2	R (M)		R (O)	
RTXUC-CFE counter 15 minutes	7.2.2.2.3	R (M)		R (O)	
<u>RTXTX-CFE counter 15 minutes</u>	<u>7.2.2.2.4</u>	<u>R (M)</u>		<u>R (O)</u>	
<i>Far-end (xTU-R) performance monitoring counters (current and previous 24-hour interval)</i>					
CV-CFE counter 24 hours	7.2.2.2.1	R (M)		R (O)	
FEC-CFE counter 24 hours	7.2.2.2.2	R (M)		R (O)	
RTXUC-CFE counter 24 hours	7.2.2.2.3	R (M)		R (O)	
<u>RTXTX-CFE counter 24 hours</u>	<u>7.2.2.2.4</u>	<u>R (M)</u>		<u>R (O)</u>	

Table 7-25 – Support of channel performance monitoring parameters per Recommendation

Category/Element	ITU-T G.992.1	ITU-T G.992.2	ITU-T G.992.3	ITU-T G.992.4	ITU-T G.992.5	ITU-T G.993.2	ITU-T G.998.4
<i>Near-end performance monitoring counters (current and previous 15-minute interval)</i>							
CV-C counter 15 minutes	Y	Y	Y	Y	Y	Y	
FEC-C counter 15 minutes	Y	Y	Y	Y	Y	Y	
RTXUC-C counter 15 minutes							Y
<u>RTXTX-C counter 15 minutes</u>							<u>Y</u>
<i>Near-end performance monitoring counters (current and previous 24-hour interval)</i>							
CV-C counter 24 hours	Y	Y	Y	Y	Y	Y	
FEC-C counter 24 hours	Y	Y	Y	Y	Y	Y	
RTXUC-C counter 24 hours							Y
<u>RTXTX-C counter 24 hours</u>							<u>Y</u>
<i>Far-end performance monitoring counters (current and previous 15-minute interval)</i>							
CV-CFE counter 15 minutes	Y	Y	Y	Y	Y	Y	
FEC-CFE counter 15 minutes	Y	Y	Y	Y	Y	Y	
RTXUC-CFE counter 15 minutes							Y
<u>RTXTX-CFE counter 15 minutes</u>							<u>Y</u>
<i>Far-end performance monitoring counters (current and previous 24-hour interval)</i>							
CV-CFE counter 24 hours	Y	Y	Y	Y	Y	Y	
FEC-CFE counter 24 hours	Y	Y	Y	Y	Y	Y	
RTXUC-CFE counters 24 hours							Y
<u>RTXTX-CFE counters 24 hours</u>							<u>Y</u>

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