



Regulation

ON THE TECHNICAL CHARACTERISTICS OF METALLIC LOCAL LOOPS AND NETWORK EQUIPMENT CONNECTED TO THEM

Helsinki on 15 February 2010

The Finnish Communications Regulatory Authority (FICORA) has, under Section 129 of the Communications Market Act of 23 May 2003 (393/2003), prescribed as follows:

1 §

Scope of application

This regulation applies to local loops consisting of a metallic twisted pair of balanced cable or parts of local loop and network equipment connected to them.

2 §

Definitions

In this regulation, a *two-wire local loop* means a local loop suitable for the data transmission originating from a metallic twisted pair of balanced cable.

In this regulation, a *multi-wire local loop* means a local loop suitable for the data transmission originating from several metallic twisted pairs of balanced cable.

In this regulation, a *part of a metallic local loop* means a part of a connection originating from the metallic twisted pair of balanced cable of a communications network, which connects the network termination point located in the subscriber's house cabinet to the connection point or termination point of the fixed, public telephone network.

In this regulation, *network equipment* means, in accordance with the definition in Section 4 of the Act on Radio Frequencies and Telecommunications Equipment (1015/2001, amended 46/2005), equipment that is designed for the purpose of transferring and directing messages in a communications network.

3 §

Technical characteristics of two-wire local loop

The cross-talk attenuation between two-wire local loops must be at least 70 dB when measured with 1,000 Hz signal. However, the near end cross-talk attenuation measured from the house end of a local loop must be at least 75 dB. During the measurement, the lines are terminated with a 600 Ω resistance.

The average effective value for disturbance voltage caused by mains voltage network to a two-wire local loop must not exceed 0.5 mV (-64 dBmp) when measured psophometrically using one-minute integration period. The disturbance voltage is measured at the subscriber end of the local loop when the connection is terminated with a 600 Ω resistance at both ends.

The insulation resistance between a two-wire local loop wire and any other wire, cable sheath or land must be at least 50 k Ω .

4 §

Technical characteristics of multi-wire local loop

The pairs of multi-wire local loop must be of similar structure, and the connection of the pairs of the same cable must be based on the same route in each part of the line. The shares originating from eventual single-pair cables must consist of cables that are similar to one another and built along the same route.

The electric characteristics of the pairs of multi-wire local loops must follow the requirements set in Section 3.

5 §

Electric characteristics of equipment connected to local loop

The network connection and purpose of use of equipment to be connected to the local loop must follow the standards.

6 §

Electric characteristics of VDSL equipment connected to local loop

Frequency ranges in accordance with Bandplan 998ADE must be applied to VDSL systems referred to in the ITU-T Recommendation G.993.2.

For VDSL equipment installed in a communications network, profiles related to bandplan 998 referred to in Annex B (Europe), as presented in Recommendation G 993.2, must be used in the frequency range 25 kHz ... 30 MHz by observing the following restrictions and specifications:

- 1) The use of the bandplan $f = 25 \dots 276$ kHz is divided in such a manner that the range $f = 25 \dots 138$ kHz is reserved for upstream transmission and range $f = 138 \dots 276$ kHz for downstream transmission.
- 2) When VDSL-DSLAM is placed in a street cabinet or similar facility located far from the telecommunications station (so-called FTTC) or apartment building or terraced house or other building of several users (so-called FTTB), the permitted profiles are 12a, 12b, 17a and 30a, and the frequency range in use is 276 kHz ... 30 MHz.
- 3) When a VDSL system is installed in an apartment building or terraced house or building for several residents (so-called FTTB), the downstream output level of a VDSL system in range $f < 2208$ kHz must be lowered and adjusted in a manner that depends on the attenuation of the cable between the telecommunications station and VDSL system, or alternatively, the use of the frequency range $f = 276$ kHz ... 2208 kHz must be completely prevented so that the disturbances caused by VDSL to the ADSL/ADSL2+ connections that possibly originate from a telecommunications station are minimised (DPBO, Downstream Power Backoff). Unless no twisted-pair cable connections originate from the telecommunications station, it is not necessary to adjust or suspend the output level of the frequency range $f < 2208$ kHz.

- 4) Upstream Power Backoff (UPBO) must be used in VDSL systems. However, UPBO may be left out if the attenuation between the nearest terminal equipment and VDSL-DSLAM in the frequency range $f = 1$ MHz is less than 1.8 dB (corresponding to 70 m for a 0.4 mm cable and approximately 100 m for 0.5 mm cable) and the attenuation difference between the furthest and nearest terminal equipment is less than 1.8 dB.

7 §

PSD masks of VDSL installations

The table below indicates the permitted PSD masks in accordance with G.993.2 as they must appear in various installation cases. The listings are based on the permitted characteristics referred to in Section 6 of this regulation.

Installation case	PSD mask in accordance with G.993.2 (Table B-6/G.993.2)	
	Short name	Long name
VDSL-DSLAM at the telecommunications station/exchange	B8-1	998-M1x-A
	B8-3	998-M1x-NUS0
	B8-4	998-M2x-A
	B8-7	998-M2x-NUS0
	B8-10	998ADE17-M2x-NUS0-M
	B8-11	998ADE17-M2x-A
	B8-15	998ADE30-M2x-NUS0-M
VDSL-DSLAM in street cabinet/building	B8-10	998ADE17-M2x-NUS0-M
	B8-15	998ADE30-M2x-NUS0-M

8 §

Entry into force

This Regulation enters into force on 1 March 2010 and will remain in force until further notice.

This regulation repeals FICORA's regulation of 16 March 2007 on technical characteristics of subscriber connections with metal conductors and telecommunications equipment connected to them (38 C/2007 M).

9 §

Information and publication

This regulation is included in the Series of Regulations issued by the Finnish Communications Regulatory Authority and available from FICORA's Customer Service:

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