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

General

DIGITAL PROTECTED MONITORING POINTS

Reedition of CCITT Recommendation G.772 published in
the Blue Book, Fascicle III.4 (1988)

NOTES

- 1 CCITT Recommendation G.772 was published in Fascicle III.4 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).
- 2 In this Recommendation, the expression “Administration” is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Recommendation G.772

DIGITAL PROTECTED MONITORING POINTS

(Melbourne, 1988)

Note – The detailed requirements contained in this Recommendation are applicable to the 2048 kbit/s hierarchy. The application of the principles defined in this Recommendation to the 1544 kbit/s hierarchy is for further study.

1 Definition

A **protected monitoring point (PMP)** provides a digital interface at which it is possible to monitor the transmitted signal and to make measurements with suitable test equipments [1].

2 Location

The possible locations for protected monitoring points can be:

- a) at the output ports of an equipment;
- b) in the signal path between equipments.

Some examples are shown in Figure 1/G.772.

3 Electrical characteristics of the protected monitoring point

Note – The reference for all parameters associated with protected monitoring points shall be the relevant output interface as defined in Recommendation G.703 [2] (see Figures 1/G.772 and 2/G.772).

3.1 Impedance

The load impedance presented by the test equipment at the protected monitoring point is the nominal impedance for the corresponding transmission path interface as defined in Recommendation G.703.

3.2 Attenuation

The attenuation between the transmission path interface and the protected monitoring point, when the impedance presented by the test and measuring equipment connected to the protected monitoring point is equal to the nominal impedance for the relevant interface as defined in Recommendation G.703, shall be $A \pm 1$ dB for all frequencies in the range 2.5% to 150% of the nominal bit rate at the interface (see Figure 2/G.772).

Different values may be necessary at different nominal bit rates.

The value of A is under study.

The digital signal level presented at the transmission path interface of the protected monitoring point shall be as defined in Recommendation G.703 but modified by the characteristics of the interconnecting cable. The attenuation of the cable shall be assumed to follow a \sqrt{f} law and the loss X at a frequency equal to half the nominal bit rate is given below:

$$0 \leq X \leq 3 \text{ dB for } 64 \text{ kbit/s}$$

$$0 \leq X \leq 6 \text{ dB for } 2 \text{ and } 8 \text{ Mbit/s}$$

$$0 \leq X \leq 12 \text{ dB for } 34 \text{ and } 140 \text{ Mbit/s.}$$

Note – For a protected monitoring point device at an equipment output port, as described in Figure 1a/G.772, the value of X is 0 dB.

3.3 *Protection of the PMP device*

3.3.1 The protection of the protected monitoring point device against electrostatic discharges shall accord with the requirements of Recommendation K.21 [3] and IEC Publication 801-2 [4].

3.3.2 No damage shall result from the application of any load impedance, including short and open circuits, to the protected monitoring point.

3.3.3 The protection against the inadvertent application of voltages to the protected monitoring point is under study.

4 **Electrical characteristics of the transmission path interface**

Note – The reference for all parameters associated with the transmission path interface shall be the relevant output interface as defined in Recommendation G.703.

4.1 *Impedance*

The transmission path interface shall have the nominal impedance as defined in Recommendation G.703 for the relevant bit rate output interface.

4.2 *Return loss*

With the transmission path interface terminated with its nominal impedance, the return loss shall comply with the requirements defined in Recommendation G.703 for the relevant bit rate output interface. This shall apply with any value of load impedance, including short and open circuits, applied to the protected monitoring point.

4.3 *Attenuation*

The attenuation in the transmission path, when the transmission path interface is terminated in its nominal impedance, shall be less than Y dB (see Figure 2/G.772) for all frequencies in the range 2.5% to 150% of the nominal bit rate, when the protected monitoring point is terminated in any load impedance, including short and open circuit.

The value of Y is for further study; 1 dB has already been proposed.

4.4 *Impact of the protected monitoring point on the maximum cable length*

The introduction of a protected monitoring point as described in Figure 1b with an attenuation of Y dB will effectively reduce the maximum attenuation allowed for in Recommendation G.703 by Y dB.

4.5 *Protection of the transmitted signal*

Under study.

The degree of protection shall be specified in terms of an $X\%$ variation in the pulse mask of the signal on the transmission path when the protected monitoring point is terminated in any impedance including short and open circuit.

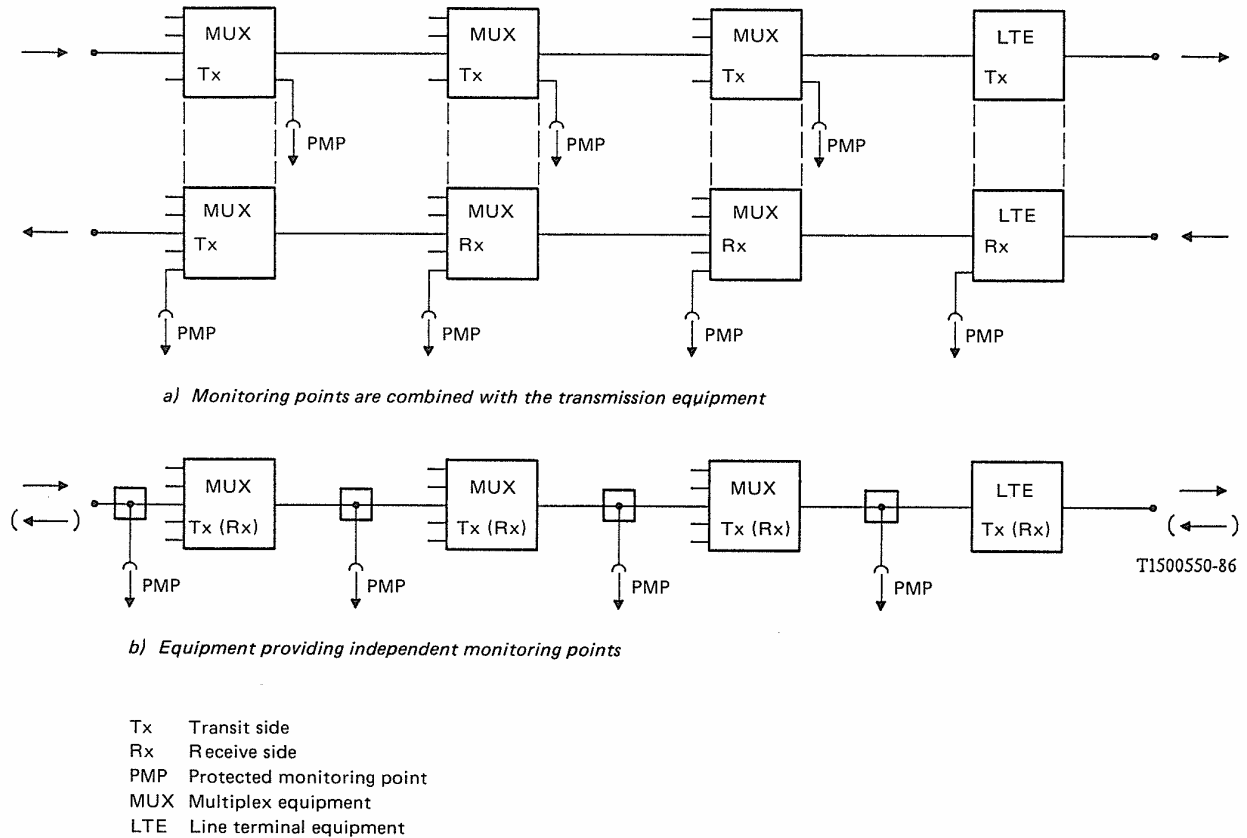


FIGURE 1/G.772

Examples for the implementation of monitoring points

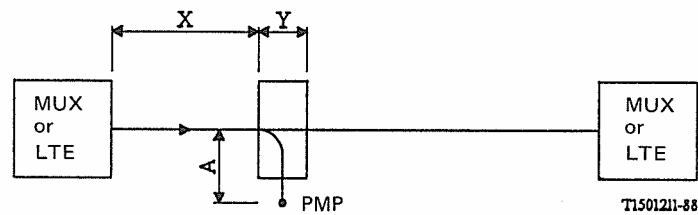


FIGURE 2/G.772

Definition of A, X and Y

References

- [1] CCITT Recommendation *Maintenance terminology and definitions*, Vol. IV, Rec. M.60.
- [2] CCITT Recommendation *Physical/electrical characteristics of hierarchical digital interfaces*, Vol. III, Rec. G.703.
- [3] CCITT Recommendation *Resistability of subscribers terminals to overvoltages and overcurrents*, Vol. IX, Rec. K.21.
- [4] IEC Publication 801-2 *Prescriptions relatives aux décharges électrostatiques*.

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