

Recommendation **ITU-T K.60 (07/2023)**

SERIES K: Protection against interference

Emission levels and test methods for wireline telecommunication networks to minimize electromagnetic disturbance of radio services

Recommendation ITU-T K.60

Emission levels and test methods for wireline telecommunication networks to minimize electromagnetic disturbance of radio services

Summary

Broadband services have fundamentally changed the utilization of the telecommunication network. First, transmissions are now present on the network at all times (i.e., 'always-on'). Second, the transmission frequency range employed by broadband is much greater than that of previous access systems. Consequently, the risk of interference with radio services has increased. In the event of interference, the share of responsibility between the network operator and the national responsible body, as well as the levels of the radiated field are not clearly defined.

Recommendation ITU-T K.60 proposes a measurement method and target levels to guide administrations in case of interference with radio services. In addition, a methodology for solving the interference and under what circumstances the case is to be forwarded to the national responsible body is discussed.

History *

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In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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Introduction

This Recommendation discusses emissions of electromagnetic disturbances from wireline telecommunication networks, as defined in clause 3, and addresses all parties tasked with investigations of complaints of radio interference. It specifies levels for permissible disturbance emanating from such networks and suitable methods of measurement used for evaluation of individual cases of radio interference under *in situ* conditions.

Recommendation ITU-T K.60

Emission levels and test methods for wireline telecommunication networks to minimize electromagnetic disturbance of radio services

1 Scope

This Recommendation is intended to guide administrations when considering complaints of interference between telecommunication systems. It is not intended to set electromagnetic compatibility (EMC) compliance requirements. All involved parties (including but not limited to network operators, service providers or customers) are recommended to work together for resolving these cases.

The emission levels and test methods presented apply to:

- disturbing emissions from wireline telecommunication networks as defined in clause 3;
- only those frequencies that are launched onto the telecommunication wire-pair as part of the intentional transmission spectrum of the broadband system¹.

It covers, but is not restricted to, target levels regarding radiated disturbing emissions for such telecommunication networks as:

- networks using telecommunication cables and their in-house cabling extensions;
- networks using the low voltage (LV) alternating current (AC) mains network;
- community antenna TV (CATV) distribution networks.

This Recommendation provides an adequate level of protection of the radio spectrum, allowing radio services to operate as intended in the frequency range 9 kHz to 400 GHz. To date, it specifies target levels for radiated disturbance in the frequency range from 9 kHz to 6 GHz.

Application of defined test methods is restricted to the section of the telecommunication network in the vicinity of the radio interference; it is not necessary to apply the test method to all parts of the telecommunication network.

The emission target levels have been selected in order to ensure that disturbances emanating from telecommunication networks do not, in most cases, exceed a level which could prevent radio communication receivers operating in the near vicinity from functioning as intended.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T G.9964] Recommendation ITU-T G.9964 (2011), *Unified high-speed wireline-based home networking transceivers – Power spectral density specification*.

¹ It is possible for other signals to couple into the telecommunication network and for these signals to propagate through the network and cause interference to radio reception. The procedure within this Recommendation addresses this possibility.

[ITU-T K.74]	Recommendation ITU-T K.74 (2015), <i>Electromagnetic compatibility, resistibility and safety requirements for home network devices</i> .
[ITU-T K.137]	Recommendation ITU-T K.137 (2022), <i>Electromagnetic compatibility requirements and measurement methods for wireline telecommunication network equipment</i> .
[IEC CISPR 16-1-1]	IEC CISPR 16-1-1:2019, <i>Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus</i> . < https://webstore.iec.ch/publication/23387 >
[IEC CISPR 16-1-4]	IEC CISPR 16-1-4:2019, A1: 2020, A2:2023, <i>Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Antennas and test sites for radiated disturbance measurements</i> https://webstore.iec.ch/publication/84775
[IEC CISPR 32]	IEC CISPR 32:2015, A1: 2019, <i>Electromagnetic compatibility of multimedia equipment –Emission requirements</i> . < https://webstore.iec.ch/publication/22046 >
[IEC 60050-161]	IEC 60050-161: 1990/AMD10: 2021, <i>International Electrotechnical Vocabulary (IEV). Part 161: Electromagnetic compatibility</i> . < http://webstore.iec.ch/webstore/webstore.nsf/artnum/000397 >

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 disturbance field strength [IEC 60050-161], IEV 161-04-02: The field strength produced at a given location by an electromagnetic disturbance, measured under specified conditions.

3.1.2 electromagnetic disturbance [IEC 60050-161], IEV 161-01-05: Any electromagnetic phenomenon that may degrade the performance of a device, equipment or system, or adversely affect living or inert matter.

NOTE – An electromagnetic disturbance may be an electromagnetic noise, an unwanted signal, or a change in the propagation medium itself.

3.1.3 emission [IEC 60050-161], IEV 161-01-08: The phenomenon by which electromagnetic energy emanates from a source.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 antenna reference point: The geometric centre of the antenna or the reference point referred to in the antenna calibration procedure.

3.2.2 intentional signal: The intentional signal comprises the frequency spectrum required for the communication in and along conductors.

3.2.3 network cable: The cable infrastructure (transmission line) used to connect together telecom installations, systems and telecom terminal equipment. The network cable will normally end at a network termination point (NTP). At this point, telecom terminal equipment or telecom systems or installations are attached. The network cable may also include in-premises extension cables or local area network (LAN) cables.