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Spectrum Management and Telecommunications

Interference-Causing Equipment Standard

General Requirements for Compliance of Interference-Causing Equipment

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Canada

Preface

Interference-Causing Equipment Standard ICES-Gen, Issue 1, *General requirements for compliance of interference-causing equipment*, sets out general requirements that are common and applicable to all categories of interference-causing equipment, unless stated otherwise in the corresponding ICES standard.

This issue of the ICES-Gen standard will come into force upon publication on Innovation, Science and Economic Development Canada website.

Inquiries may be submitted by one of the following methods:

1) Online, using the General Inquiry form at www.ic.gc.ca/res_general. (In the form, the Regulatory Standards Branch radio button should be selected and "ICES-Gen" should be specified in the General Inquiry field.)

2) By mail to the following address:

   Innovation, Science and Economic Development Canada
   Engineering, Planning and Standards Branch
   235 Queen Street
   Ottawa, Ontario, K1A 0H5 Canada
   Attention: Regulatory Standards Directorate

3) By e-mail to ic.consultationradiostandards-consultationnormesradio.ic@canada.ca

Comments and suggestions for improving this standard may be submitted online using the Standard Change Request form at www.ic.gc.ca/res_change, or by mail or e-mail to the above addresses.

All Spectrum Management and Telecommunications publications are available on the following website: http://www.ic.gc.ca/spectrum.

Issued under the authority of
the Minister of Innovation, Science and Economic Development Canada

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Director General
Engineering, Planning and Standards Branch

Contents

1. Scope

This Interference-Causing Equipment Standard (ICES) sets out the general requirements applicable to interference-causing equipment.

2. General

2.1 Purpose and application

An interference-causing equipment is a device, machinery or equipment, other than radio apparatus or terminal equipment, that causes or is capable of causing interference to radiocommunication.

This ICES standard shall be used in conjunction with the ICES standard applicable to the specific type of interference-causing equipment, for assessing the equipment's compliance with the Innovation, Science, and Economic Development Canada (ISED) requirements, provided the applicable standard has been updated to refer to ICES-Gen for the common requirements.

Where requirements in this standard are different from those in the applicable ICES standard, the latter shall take precedence.

2.2 Supplier's Declaration of Conformity

The Supplier's Declaration of Conformity (SDoC) is the conformity assessment scheme used for Category II radio, broadcasting, and interference-causing equipment. The responsible party tests the Category II equipment and ensures that it meets the appropriate technical standards. The responsible party also labels the equipment as required by the standards. Equipment testing does not have to be performed by a recognized ISED testing laboratory. Category II equipment is exempt from certification and registration.

See https://www.ic.gc.ca/eic/site/mra-arm.nsf/eng/h_nj00055.html#conformity.

2.3 Definitions

A glossary of terms and associated definitions is available in section 5 of this document.

2.4 Determination of Interference

As per paragraphs 5(1)(l) and 6(1)(i) of the Radiocommunication Act, the following applies to any unit of interference-causing equipment.

Where the Department determines that a model or several models of equipment cause or are likely to cause interference to radiocommunication or suffer from or are likely to suffer from adverse effects of electromagnetic energy, the Department shall give notice of this determination to persons who are likely to be affected by it. No person shall manufacture, import, distribute, lease, offer for sale, sell, install or use equipment for which such a notice has been given.

If the Department determines that a unit of equipment causes or suffers from interference or adverse effects of electromagnetic energy, the Department may order the person(s) in possession or control of the equipment to cease or modify operation of the equipment until such time as it can operate without causing or being affected by such interference or such adverse effects.

2.5 Transition period

When an ICES standard (including this one) is re-issued, the transition period stated within the new issue of that standard shall apply. In general, within the transition period, compliance with both the existing issue and the new issue is acceptable. After the transition period expires, the equipment, if still manufactured, imported, distributed, leased, offered for sale, or sold in Canada, shall comply with the new issue of the applicable ICES standard.

2.6 Classification of equipment

2.6.1 General

Where the applicable ICES standard differentiates between Class A and Class B equipment, the definition in this section shall apply.

2.6.2 Class A equipment

Equipment that is, by virtue of its characteristics, highly unlikely to be used in a residential environment, including a home business shall be classified as Class A and shall comply with the Class A limits specified in the applicable ICES standard.

Characteristics considered in this assessment include price, marketing and advertising methodology, the degree to which the functional design inhibits applications suitable to residential environments, or any combination of features that would effectively preclude the use of such equipment in a residential environment.

2.6.3 Class B equipment

Equipment that cannot be classified as Class A shall comply with the Class B limits specified in the applicable ICES standard.

2.7 Category I radio apparatus integration within interference-causing equipment

This section only applies to interference-causing equipment that incorporates one or more Category I radio apparatus modules or subassemblies/subcircuits.

Radio apparatus is classified as either Category I or Category II equipment (see section 5). Pursuant to subsections 4(2) of the *Radiocommunication Act* and 21(1) of the *Radiocommunication Regulations*, Category I radio apparatus requires a technical acceptance certificate (TAC) issued by the Certification and Engineering Bureau of ISED, or a certificate issued by a recognized certification body (see Radio Standards Specification RSS-Gen, *General Requirements for Compliance of Radio Apparatus*).

The certification procedures are set out in Radio Standards Procedure RSP-100, *Certification of Radio Apparatus*. The following requirements apply:

- If the interference-causing equipment incorporates an already certified Category I radio apparatus module, then the equipment (host) does not require certification. However, the combination of interference-causing equipment (host) and radio module(s) (i.e. complete product model) shall meet the RF exposure requirements in RSS-102, *Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)*. The module(s) label shall be clearly visible at all times when installed in the host or the host unit shall be labelled as per the requirements in RSP-100 and RSS-Gen.

- If the interference-causing equipment incorporates Category I radio apparatus modules or subassemblies/subcircuits that have not been previously certified, the combination of interference-causing equipment (host) and radio modules (i.e. complete product model) shall be certified and each unit labelled as per the requirements in RSP-100 and RSS-Gen.

2.8 Special authorization

The requirements of the applicable ICES standard do not apply to interference-causing equipment for which the manufacturer, importer, or owner has been granted a special permission by the Minister. Such a special permission may be granted to exempt from specific requirements in the applicable ICES standard or from demonstrating compliance with the entire applicable ICES standard.

The Minister may grant a special permission where:

(1) the manufacturer, importer or owner has presented a written application giving:

(i) a description of the equipment, including functional description and frequencies of operation;

(ii) the reasons for the request;

(iii) an analysis based on sound engineering principles demonstrating that the equipment will not pose a significant risk to radiocommunication;

(iv) a guarantee of compliance with all the conditions the Minister may set in the special permission; and

(2) the Minister is satisfied that the equipment will not pose a significant risk to radiocommunication.

The special permission is valid only if:

(a) the equipment bears a label, either affixed on each unit or displayed electronically by each unit (see Annex B for e-labelling requirements), stating that it is operating under special permission and setting out the conditions of that special permission; and

(b) the equipment complies with all conditions set out in the special permission.

The Minister may revoke or amend the special permission granted under this section at any time without prior notice.

Please send any inquiries for special permission by e-mail or postal mail to the addresses listed in the Preface.

2.9 Multifunction equipment

If the interference-causing equipment is subject to more than one ICES standard, it shall comply with each applicable ICES standard while the corresponding mode of operation is active.

3. Technical Requirements

3.1 Radio apparatus

If the equipment includes radio apparatus modules or subassemblies/subcircuits, it shall comply with both the applicable ICES standard and with the RSS standard(s) that apply to the specific wireless technology used in the equipment.

The emissions from the radio transmitter shall not be considered when assessing compliance with the limits specified in the applicable ICES standard. This can be done either by:

(a) switching off the radiocommunication function of the equipment (if possible and if it does not change in any way the typical non-radiocommunication emissions); or by

(b) disregarding the emissions due to the fundamental components of modulation of the radio apparatus portion of the equipment and its related unwanted emissions. At these emission frequencies, the equipment shall meet the requirements of the applicable RSS(s). Additionally, the equipment shall meet all the other applicable requirements set out in RSS-Gen (e.g. those related to RF exposure and labelling).

See section 2.7 for other administrative and technical requirements applicable to equipment that incorporates Category I radio apparatus.

3.2 CISPR quasi-peak and CISPR average detectors

The CISPR quasi-peak detector and CISPR average detector shall comply with the characteristics specified in CAN/CSA-CISPR 16-1-1:15.

As an alternative to CISPR quasi-peak or average measurement, compliance with emissions limits may be demonstrated using a measuring instrument employing a peak detector function properly adjusted for factors such as pulse desensitization, as required, with a measurement bandwidth equal to, or greater than, the applicable CISPR quasi-peak bandwidth or 1 MHz bandwidth, for measurement below or above 1 GHz, respectively.

3.3 Validation of the radiated emissions test site

Test sites used for compliance radiated emission measurements shall meet all requirements for construction and site validation specified in the normative test methods listed in the applicable ICES standard.

The test site validation shall be confirmed at regular intervals, according to the normative standard listed in the applicable ICES standard, but at least once in any 3-years period. The date of the most recent successful test site validation shall not be older than 3 years (or the required smaller time period, if so specified in the applicable ICES standard or the normative references listed therein) than the date of any of the radiated emissions tests documented in the test report.

These requirements apply for each frequency range where radiated emissions limits are specified, if site validation requirements exist.

3.4 Battery or AC mains operation

3.4.1 Battery powered without wired recharge capability

The AC mains (power lines) conducted emissions requirements do not apply to interference-causing equipment that is exclusively powered from a battery and that has no capability to (re)charge its battery by means of a wired connection to the AC mains (e.g. through an external AC mains power adapter).

3.4.2 Battery powered with wired recharge capability

Interference-causing equipment that is exclusively powered from a battery, but is capable of recharging its battery while connected to the AC mains (e.g. through an external AC mains power adapter) shall be tested as follows:

(1) If the main function(s) of the equipment is(are) disabled while in battery charging mode of operation, then:

(i) The equipment shall be placed in battery charging mode of operation and tested for conducted emissions at its AC mains terminals (or the AC mains terminals of the external device, as appropriate) and for radiated emissions; and

(ii) The equipment shall be placed in its normal mode(s) of operation and tested for radiated emissions and conducted emissions on interfaces other than AC mains (power line), as required (per the applicable ICES standard).

(2) If the equipment is capable of operating its main function(s) while in battery charging mode of operation, then:

(i) The equipment shall be placed in battery charging mode of operation and tested for conducted emissions at its AC mains terminals (or the AC mains terminals of the external device, as appropriate); and

(ii) The equipment shall be placed in its normal mode(s) of operation and tested for radiated emissions, conducted emissions at its AC mains terminals (or the AC mains terminals of the external device, as appropriate), and conducted emissions on interfaces other than AC mains (power line), as required (per the applicable ICES standard). The equipment shall be connected to AC mains for all test cases.

3.4.3 AC mains powered (exclusively or in addition to battery powered)

Interference-causing equipment that is exclusively powered from AC mains or can be powered from both battery and AC mains shall be tested while powered from AC mains for all test cases.

3.4.4 AC mains powered through another device

If the equipment connects to AC mains through another device (e.g. an external AC mains power adapter) and that external device is not usually supplied with the equipment under test, then it shall be tested with a typical external device, as per the recommendation provided to end users by the manufacturer (e.g. in the user manual of the equipment), or with a device representative of typical applications (where there are no specific manufacturer's instructions).

4. Administrative Requirements

4.1 Equipment used for demonstration, research, or exportation purposes

Interference-causing equipment used solely for purposes of research and development, experimentation, demonstration, assessment of marketability, or intended exclusively for exportation is exempt from the requirement to demonstrate compliance with the applicable ICES standard. Such equipment shall not be leased, sold, or offered for sale in Canada, nor shall it be distributed with the intention to be leased, sold, or offered for sale in Canada.

Except for equipment intended exclusively for exportation, each unit of such equipment shall be labelled and its shipping documentation shall be accompanied by the following declaration:

(1) Marking on the unit itself:

"*Demo unit. Not to be leased, sold or offered for sale in Canada.*"

(2) Declaration accompanying the unit:

"*This equipment is a prototype unit which is intended for purposes of research and development, experimentation, demonstration or assessment of marketability. It cannot be leased, sold, or offered for sale in Canada.*"

Each unit of equipment intended exclusively for exportation shall be labelled and its shipping documentation shall be accompanied by a declaration such as the following:

(a) Marking on the unit itself or on its packaging:

"*For exportation only. Not to be leased, sold or offered for sale in Canada.*"

(b) Declaration accompanying the unit:

"*This equipment is intended exclusively for exportation. It cannot be leased, sold, or offered for sale in Canada.*"

If the equipment incorporates a radio module or subassembly/subcircuit, it may be subject to a developmental licence. Inquiries related to licensing may be made through the ISED district or regional offices or submitted by e-mail at ic.spectrumoperations-operationsduspectre.ic@canada.ca. Contact information for ISED's regional licensing offices is listed in the Radio Information Circular 66 (RIC-66), *Addresses and Telephone Numbers of Regional and District Offices of ISED Canada*.

4.2 Test Report

The test report shall comply with all requirements set out in this document, including those stated in Annex A, as well as with those in the applicable ICES standard. Additionally, for equipment that includes radio apparatus modules or subassemblies/subcircuits that were not separately certified (i.e. uncertified Category I radio apparatus) or that do not require certification (i.e. Category II radio apparatus), the test report shall comply with all requirements set out in RSS-Gen and the specific RSS standard(s), as applicable to the wireless technology and operating frequency used by the equipment.

In case the applicable ICES standard is re-issued and the equipment continues to be manufactured, imported, distributed, leased, offered for sale, or sold in Canada after the transition period expires (see section 2.5), the manufacturer or importer shall update the test report with additional test results or engineering analysis, if required, such that the test report demonstrates compliance with the new issue of the applicable ICES standard.

The manufacturer or importer shall retain a copy of the test report for as long as the interference-causing equipment is manufactured, imported, distributed, leased, offered for sale, or sold in Canada and shall make the test report available to ISED upon request.

4.3 Labelling and User Manual Requirements

The manufacturer, importer or distributor shall meet the labelling and user manual requirements set out in this section for every unit of interference-causing equipment.

4.3.1 Requirements for Equipment not incorporating Radio Apparatus or Terminal Equipment

Each unit of an interference-causing equipment model shall bear a label, which represents the manufacturer's or importer's self-declaration of compliance with ISED's ICES standard applicable to the equipment. This label shall be permanently affixed to each unit of the equipment or displayed electronically as per Annex B and its text must be indelible and clearly legible. However, if the equipment is too small or if it is not otherwise practical to place the label on the equipment and if electronic labelling has not been implemented, upon agreement with ISED, the label shall alternatively be placed in a prominent location in the user manual supplied with the equipment and/or on its packaging. If the label is placed in the user manual and this manual is not supplied with the equipment, the user manual shall be readily available for the entire period in which the equipment is manufactured, imported, distributed, leased, offered for sale, or sold in Canada (e.g. on the manufacturer's website).

The ISED compliance label shall include the word "Canada" (or "CAN") and a reference to the applicable standard, in both English and French. If the applicable ICES standard differentiates between Class A and Class B equipment, the label shall also include the Class of the equipment. An example is given below:

CAN ICES-00x (y) / NMB-00x (y)

Where x is the number of the applicable ICES standard; and
y is either "A" or "B", but not both, to identify the applicable Class of the equipment.

The Class must only be included on the ISED label if the applicable ICES standard has different limits for Class A and Class B equipment. Below is an example of a label for cases where the applicable ICES standard makes no such differentiation:

CAN ICES-00x / NMB-00x

Note: The actual format of the label is left at the manufacturer discretion.

4.3.2 Requirements for Equipment incorporating Radio Apparatus or Terminal Equipment

These requirements are only applicable to equipment that includes *radio apparatus* or *terminal equipment* modules or subassemblies/subcircuits and are applicable to such equipment instead of the requirements set out in Section 4.3.1.

Interference-causing equipment incorporating *radio apparatus* modules or subassemblies/subcircuits shall comply with the labelling and other administrative requirements (e.g. user manual notice, if applicable) set out in RSS-Gen, RSP-100 and the other RSS standard(s) applicable to the specific wireless technology and operating frequency used by the equipment.

Interference-causing equipment incorporating *terminal equipment* modules or subassemblies/subcircuits shall comply with the labelling and other administrative requirements (e.g. user manual notice, if applicable) set out in DC-01, *Procedure for Declaration of Conformity and Registration of Terminal Equipment*.

5. Definitions

The following is a list of terms commonly used in ICES standards, including this one, and associated definitions.

Term	Definition
Category I equipment	Radio apparatus that requires a technical acceptance certificate (TAC), issued by ISED's Certification and Engineering Bureau, or a certificate issued by a recognized Certification Body, pursuant to subsections 4(2) of the Radiocommunication Act and 21(1) of the Radiocommunication Regulations.
Category II equipment	Radio apparatus that is exempt from certification (does not require a TAC or a certificate issued by a CB).
Class A	Equipment that is, by virtue of its characteristics, highly unlikely to be used in a residential environment, including a home business. Characteristics considered in this assessment include price, marketing and advertising methodology, the degree to which the functional design inhibits applications suitable to residential environments, or any combination of features that would effectively preclude the use of such equipment in a residential environment. Also used for denoting the corresponding emission limits applicable to such equipment.
Class B	Equipment that cannot be classified as Class A. Also used for denoting the corresponding emission limits applicable to such equipment.
Emission	Electromagnetic transmission through radiated means by an electric or electronic device, or conducted by such a device through its attached wired interfaces. These emissions can be either intentional or non-intentional.
Intentional radiator	A device that intentionally generates and emits radio frequency energy by radiation, induction or conduction. This can be an interference-causing equipment (e.g. industrial, scientific, or medical equipment) or radio apparatus (of Category I or Category II).
Interference-causing equipment	Any device, machinery or equipment, other than radio apparatus, that causes or is capable of causing interference to radiocommunication
Main function (main operation mode)	Function (operation mode) of a device, as declared by the manufacturer in the product documentation and/or marketing material for that device model
Minister	The Minister of Innovation, Science, and Economic Development
Radiation	The outward flow of electromagnetic energy from any source in the form of radio waves
Radio apparatus	A device or combination of devices intended for, or capable of being used for, radiocommunication

Term	Definition
Radio apparatus module	A radio apparatus that cannot function by itself and instead must be incorporated in another (host) device. Usually such a module is manufactured and marketed by a third party, and, where the radio apparatus is of Category I, it usually is already certified by the module manufacturer.
Radio apparatus subassembly/subcircuit	A circuit or assembly that provides a radio apparatus function to a more complex device (i.e. which also includes other than radiocommunication functions) and which is an integral and inseparable part of that device (e.g. on same PCB as the rest of the device circuitry).
Radiocommunication	Any transmission, emission or reception of signs, signals, writing, images, sounds or intelligence of any nature by means of electromagnetic waves of frequencies lower than 3000 GHz propagated in space without artificial guide
Standard test voltage	The primary voltage applied to the input end of the power cable normally connected to the equipment. It shall be within ± 2% of the value stated by the manufacturer to be the normal working voltage.
Terminal equipment	Equipment that connects to the public switched telecommunications network (PSTN) via physical wire connection to provide telecommunication services
Terminal equipment subassembly/subcircuit	A circuit or assembly that provides a terminal equipment function to a more complex device (i.e. which also includes other than terminal equipment functions) and which is an integral and inseparable part of that device (e.g. on same PCB as the rest of the device circuitry).
Unintentional radiator	A device that generates RF energy which is not intended to be radiated for reception by a radio receiver

Annex A (normative) — Test Report Contents

The test report shall include the following:

(a) Identification of the applicable ICES standard(s), including the issue number and publication date.

(b) The date when the test report was issued.

(c) Identification (e.g. name, address) of the manufacturer of the EUT and of the test laboratory.

(d) Identification of the EUT, including the model number, marketing name, brand name, and unit serial number as used for each applicable test case.

(e) Description of the EUT and its configuration, operation, and arrangement for each specific test case, as applicable.

(f) A record of the tests and results, including engineering analyses (if applicable), demonstrating compliance with the requirements in the applicable ICES standard. The test report shall indicate the date each test was performed.

(g) Where applicable, the test report shall clearly identify which Class of limits (Class A or Class B) was used to demonstrate compliance of the equipment.

(h) Where the applicable ICES standard allows the use of alternative options (e.g. test methods), the test report shall clearly indicate which option was used for measurements, for each test case.

(i) A list of the test equipment used for each test case, including manufacturer or brand name, model number, serial number, and calibration due date.

(j) Identification (e.g. address) and short description of the test site used for radiated emissions, including information on site validation, as follows:

  (i) What standard was used for test site validation assessment, including version / edition and publication date (e.g. ANSI C63.4-2014), for each applicable frequency range;

  (ii) The date of the last successful site validation measurements, for each applicable frequency range.

(k) Required information on measurement instrumentation uncertainty, as applicable.

Annex B (normative) — Electronic Labelling (e-labelling)

Instead of a physical label on the device itself, ISED Canada allows devices with an integrated display screen to present the required label information electronically (e-label). Devices without an integrated display screen are allowed to present the e-labelling information through an audio message or a host device display screen, where such a host device is connected via physical connection, Bluetooth, Wi-Fi, etc., if this connection to a host device that incorporates a display is mandatory for use.

The following requirements shall be met for e-labelling:

1) Information to be displayed:

   (a) The model identification number.

   (b) Any other information required to be provided on the surface of the device unless such information is permitted to be included in the User's Manual or other packaging inserts.

2) Accessibility to the required information:

   (a) Users shall be provided clear instructions on how to access the regulatory information stored electronically without requiring special access codes or accessories or having to go through multiple steps (no more than three) in a device's menu.[1]

   (b) Users shall be provided specific instructions which are easily accessible by the average user and included in the User's Manual, operating instructions, packaging material inserts, or product related website.[2]

   (c) The test report shall include the instructions for accessing information as part of the label exhibit (i.e. in the section demonstrating compliance with the labelling requirements).

3) Labelling for importation and purchasing:

   (a) Products utilizing e-labels are required to have a physical label on the product packaging at the time of importation, offering for sale, and sale.

   (b) For devices imported in bulk (not packaged individually), a removable adhesive label or, for devices in protective bags, a label on the bags is acceptable to meet this requirement.

[1] The information can be in the firmware or software menus provided it is easily accessible and cannot be modified by the user.

[2] Information provided with the packaging material can be provided on the bags in which the device may be packed or with paper leaflets in the packaging material.

(c) Any removable label used shall survive normal shipping and handling and may only be removed by the customer, after purchase. For devices already imported in individual packages ready for sale, the information may alternatively be provided on the package and shall contain:

(i) The model identification number; and

(ii) Any other information required to be provided on the surface of the product unless such information is permitted to be included in the User's Manual or other packaging inserts.

4) Security:

The information specified in 1) above shall be programmed by the responsible party and the information shall be secured in such manner that it cannot be modified or removed during the course of normal activities that a third-party (typical user) might be authorized to perform (e.g. installation of applications, accessing the menus, etc.).

5) User Manual/Packaging:

(a) All the applicable regulatory information required on the packaging or in the User Manual shall be provided, according to the applicable requirements, even if it is displayed electronically.

(b) E-label displays may include regulatory information required to be placed in the User's Manual or on the packaging as per the applicable requirements. The following considerations shall be taken into account for such information distribution:

(i) If the primary User Manual/User Guide is provided by other electronic media (e.g. CD or online) then, as an option, this information may also be provided as part of the e-label; and

(ii) The e-label format shall clearly differentiate between the information required to be on the surface of the device and the information required for the User's Manual or for the packaging.