

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

G.9903

Amendment 1
(08/2015)

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

Access networks – In premises networks

Narrowband orthogonal frequency division
multiplexing power line communication transceivers
for G3-PLC networks

Amendment 1

Recommendation ITU-T G.9903 (2014) – Amendment 1

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Recommendation ITU-T G.9903

Narrowband orthogonal frequency division multiplexing power line communication transceivers for G3-PLC networks

Amendment 1

Summary

Amendment 1 to Recommendation ITU-T G.9903 (2014) adds support for coexistence with other narrowband PLC technologies via the preamble-based coexistence mechanism specified in clause 10 of IEEE 1901.2.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T G.9903	2012-10-29	15	11.1002/1000/11823
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* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

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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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Recommendation ITU-T G.9903

Narrowband orthogonal frequency division multiplexing power line communication transceivers for G3-PLC networks

Amendment 1

1) Scope

This amendment adds support for coexistence with other narrowband PLC technologies via the preamble-based coexistence mechanism specified in clause 10 of [IEEE 1901.2].

2) Modifications to ITU-T G.9903

2.1) References

In clause 2, add the following entry after "[IEEE 802.15.4]".

[IEEE 1901.2] IEEE 1901.2 (2013), *IEEE standard for low-frequency (less than 500 kHz) narrowband power line communications for smart grid applications.*

2.2) Coexistence with other PLC networks

Modify clause 6.2 as indicated by the tracked changes.

6.2 Coexistence with other PLC networks

~~Three~~Two mechanisms are defined to allow coexistence between ITU-T G.9903 devices and other ~~NB-narrowband~~ PLC technologies operating in the same frequency ~~brangeand~~:

- ~~frequency division coexistence;~~
- ~~preamble-based coexistence.~~

~~Frequency division (FD) coexistence mechanism: allows suppressing interference from ITU-T G.9903 devices into a particular frequency band or bands by using non-overlapping ITU-T G.9903 bandplans. Flexible use of different bandplans provides an opportunity to separate systems operating over the same medium in non-overlapping bandplans. The FD coexistence mechanism can provide coexistence with both single and multiple carrier PLC systems.~~

~~Frequency notching coexistence mechanism: shall be used to suppress interference from ITU-T G.9903 devices into a particular (relatively narrow) frequency range by notching out one or more subcarriers (see clause B.3 of [ITU-T G.9901]). Frequency notching allows ITU-T G.9903 devices to coexist with the existing narrowband FSK/PSK systems operating over the same frequency band.~~

~~Preamble-based coexistence mechanism shall be used by ITU-T G.9903 devices to fairly share the medium with other types of PLC technologies operating over the same frequency band (and utilizing this coexistence mechanism). The definition of this coexistence mechanism is for further study. This same coexistence mechanism also facilitates coexistence between ITU-T G.9903 implementations using different overlapping bandplans. This coexistence mechanism shall be mandatory with the exception of when the network is operated in frequency bands restricted to monitoring or controlling the operation of the grid, in which case coexistence is optional.~~

~~The above coexistence mechanisms can be applied simultaneously, enabling ITU-T G.9903 devices to coexist with multiple PLC technologies operating over the same medium.~~

2.3) Frequency division coexistence and preamble-based coexistence

Add clauses 6.2.1 and 6.2.2 after clause 6.2.

6.2.1 Frequency division coexistence mechanism

A first method consists in assigning non-overlapping bandplans to devices complying with this Recommendation in communication range. A second method is to exploit the tone masking (see clause 7.15 and description of macToneMask attribute in Table 9-15) feature to avoid any overlapping frequencies. Frequency division coexistence provides a means to ensure coexistence between devices complying with this Recommendation and both single (e.g., existing narrowband FSK/PSK systems) and multiple carrier PLC systems.

6.2.2 Preamble-based coexistence mechanism (optional)

Devices complying with this Recommendation may support the preamble-based coexistence mechanism specified in clauses 10.2.2 and 10.3 to 10.5 of [IEEE 1901.2] to fairly share the medium with other types of narrowband PLC technologies supporting the same preamble-based coexistence mechanism. Support for this coexistence mechanism is optional in this Recommendation, with the exception given in Annex G.

If devices complying with this Recommendation support the preamble-based coexistence mechanism, then Tables 10-2 and 10-3 of [IEEE 1901.2] shall be revised as specified below.

The IDs (identifiers) listed in Table 10-2 of [IEEE 1901.2] shall be replaced by the identifiers listed in Table 6-1.

Table 6-1 – Attributes for the preamble-based coexistence mechanism

Attribute	Identifier
Beta	0x0117
aMacMaxCoexistenceBackoffs	0x0118
macAlpha	0x0119
K	0x011A
macNdcTime	0x011B

NOTE – The other attributes listed in Table 10-2 of [IEEE 1901.2] (aCEIFS, macLongPreambleDuration, macDCEIFS, macMinChannelIdleTime) do not require an identifier as their values depend exclusively on the values of other attributes which have their own identifier.

The IDs (identifiers) and default values listed in Table 10-3 of [IEEE 1901.2] shall be replaced by the ones listed in Table 6-2.

Table 6-2 – Coexistence control PIB attributes

Attribute	Identifier	Default Value
macCoexPreambleDetectionEnabled	0x011C	FALSE
macCoexPreambleEnabled	0x011D	FALSE

2.4) Annex G

Introduce Annex G after Annex F.

Annex G

Regional requirements for the USA

(This annex forms an integral part of this Recommendation.)

This annex describes the domestic practices, standards and the application method for the preamble-based coexistence mechanism in clause 6.2.2 in the USA.

For devices complying with this Recommendation operating in the USA, the default value of attribute `macCoexPreambleDetectionEnabled` shall be set to TRUE – see Table 6-2.

If the coexistence preamble is detected, then at least one narrowband PLC technology using a native preamble different from the one specified in this Recommendation is present and operating over the same frequency band. In this case, attribute `macCoexPreambleEnabled` (see Table 6.2) shall also be set to TRUE.

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