International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

G.9901

Amendment 1

(07/2013)

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

Access networks – In premises networks

Narrow-band orthogonal frequency division multiplexing power line communication transceivers – Power spectral density specification

Amendment 1

Recommendation ITU-T G.9901 (2012) – Amendment 1

International Telecommunication Union

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Recommendation ITU-T G.9901

Narrow-band orthogonal frequency division multiplexing power line communication transceivers – Power spectral density specification

Amendment 1

Summary

Amendment 1 to Recommendation ITU-T G.9901 (2012) contains:

- An ARIB bandplan for ITU-T G.9902 transceivers.
- A CENELEC B bandplan for ITU-T G.9903 transceivers.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T G.9901	2012-11-20	15
1.1	ITU-T G.9901 (2012) Amd. 1	2013-07-12	15

FOREWORD

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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.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

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.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

Recommendation ITU-T G.9901

Narrow-band orthogonal frequency division multiplexing power line communication transceivers – Power spectral density specification

Amendment 1

Modifications introduced by this amendment are shown in revision marks. Unchanged text is replaced by ellipsis (…). Some parts of unchanged text (clause numbers, etc.) may be kept to indicate the correct insertion points.

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2 References

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[EN50065-1] CENELEC EN 50065-1 (2011), *Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz – Part 1: General requirements, frequency bands and electromagnetic disturbances.*

[ARIB STD-T84] ARIB STD-T84, *Power Line Communication Equipment* (10 kHz-450 kHz).

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4 Abbreviations and acronyms

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PLC Power Line Communications

PMSC Permanently Masked Subcarriers

PSD Power Spectral Density

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Annex A

PSD specifications for G.hnem transceivers

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

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A.1.2.3 FCC-2 bandplan

Parameters for FCC-2 bandplan are defined in Table A.8.

Table A.8 – Parameters for FCC-2 bandplan

Notation	Value	Note
F_{START}	150 kHz	Lowest frequency of FCC bandplan (subcarrier number 48)
F_{END}	478.125 kHz	Highest frequency of FCC bandplan (subcarrier number 153)
PMSC indices	0 to 47, 154 to 255	Clause 8.4.2.1 of [ITU-T G.9902]

A.1.3 ARIB bandplan

The ARIB bandplan shall follow the requirements set in section 3.4 of [ARIB STD-T84].

When operating in the ARIB bandplan, a node shall use the parameters specified in clause A.1.2 with the following modification: tones 134-153 are defined as PMSC (see clause 8.4.2.1 of [ITU-T G.9902] for the definition of PMSC tones).

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Annex B

PSD specifications for G3-PLC transceivers

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

NOTE – This annex includes the power spectral density (PSD) specifications relating to [ITU-T G.9903].

B.1 ~~Frequency~~ CENELEC band specifications

When operating ~~o~~in the CENELEC bands (3-148.5 kHz), a node shall use the control parameters specified in Table B.1.

Table B.1 – OFDM modulator control parameters for the CENELEC bands

Number of FFT points	$N = 256$
Number of overlapped samples	$N_O = 8$
Number of cyclic prefix samples	$N_{CP} = 30$
Number of FCH symbols	$N_{FCH} = 13$
Sampling frequency	$F_s = 0.4$ MHz
Number of symbols in preamble	$N_{pre} = 9.5$

B.1.1 CENELEC-A bandplan

When operating ~~o~~in the CENELEC-A bandplan, a node shall use the parameters specified in Table B.2.

Table B.2 – Parameters for CENELEC-A bandplan

	Number of subcarriers	First subcarrier (kHz)	Last subcarrier (kHz)
CENELEC-A	36	35.938	90.625

B.1.2 CENELEC-B bandplan

When operating in the CENELEC-B bandplan, a node shall use the parameters specified in Table B.2bis.

Table B.2bis – Parameters for CENELEC-B bandplan

	Number of subcarriers	First subcarrier (kHz)	Last subcarrier (kHz)
CENELEC-B	16	98.4375	121.875

B.~~1.~~2 FCC band specifications

When operating ~~o~~in the FCC band (9-490 kHz), a node shall use the control parameters specified in Table B.3.

Table B.3 – OFDM modulator control parameters for FCC band

Number of FFT points	$N = 256$
Number of overlapped samples	$N_O = 8$
Number of cyclic prefix samples	$N_{CP} = 30$
Number of FCH symbols	$N_{FCH} = 12$
Sampling frequency	$F_s = 1.2$ MHz
Number of symbols in preamble	$N_{pre} = 9.5$

B.~~1.~~2.1 FCC-1 bandplan

When operating ~~o~~in the FCC-1 bandplan, a node shall use the parameters specified in Table B.4.

Table B.4 – Parameters for FCC bandplan

Bandplans	Number of subcarriers	First subcarrier (kHz)	Last subcarrier (kHz)
FCC-1	72	154.6875	487.5

B.~~1.~~2.2 Optional FCC-1.a and FCC-1.b bandplans

In addition to the main FCC-1 bandplan, a node can optionally support the FCC-1.a and FCC-1.b bandplans with the parameters specified in Table B.5.

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