



Recommendation ITU-R M.2003-2
(01/2018)

**Multiple Gigabit Wireless Systems in
frequencies around 60 GHz**

M Series
**Mobile, radiodetermination, amateur
and related satellite services**



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Series	Title
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M	Mobile, radiodetermination, amateur and related satellite services
P	Radiowave propagation
RA	Radio astronomy
RS	Remote sensing systems
S	Fixed-satellite service
SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	Spectrum management
SNG	Satellite news gathering
TF	Time signals and frequency standards emissions
V	Vocabulary and related subjects

Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.

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RECOMMENDATION ITU-R M.2003-2

Multiple Gigabit Wireless Systems in frequencies around 60 GHz

(Question ITU-R 212-3/5)

(2012-2015-2018)

Scope

This Recommendation provides general characteristics and radio interface standards for Multiple Gigabit Wireless Systems in frequencies around 60 GHz.

Keywords

MGWS, WLAN, RLAN, Wireless Local Access, Networks, Radio Local Area Networks, Close Proximity Mobile System (CPMS)

The ITU Radiocommunication Assembly,

considering

- a) that Multiple Gigabit Wireless Systems (MGWS) are widely used for fixed, semi-fixed (transportable) and portable computer equipment for a variety of broadband applications;
- b) that MGWS are expected to encompass applications for wireless digital video, audio, and control applications, as well as multiple gigabit wireless local area networks (WLAN) and point-to-point close proximity mobile system;
- c) that MGWS standards have been developed for operation in the 60 GHz frequency range;
- d) that MGWS should be implemented with careful consideration to compatibility with other radio applications;
- e) that many administrations permit MGWS including radio local area networks (RLANs) and personal area networks (WPANs) devices to operate in the 60 GHz frequency range on a license-exempt basis;
- f) that harmonized frequencies in the 60 GHz frequency range for the mobile service would facilitate the introduction of MGWS including RLANs,

recognizing

- a) that both consumers and manufacturers will benefit from global harmonization of the 60 GHz spectrum for MGWS;
- b) that although MGWS systems have been predominantly used for indoor applications there are administrations which allow outdoor use of these systems,

noting

that several standards provide options for MGWS implementation,

recommends

that the MGWS standards and their system characteristics contained in Annex 1 should be used.

Annex 1

General characteristics of 60 GHz Multiple Gigabit Wireless Systems

1 Overview

Multiple Gigabit Wireless System (MGWS) radiocommunication networks can be used in short-range, line-of-sight and non-line-of-sight circumstances with traditional WLAN topologies. MGWS systems can also be used in very short range high rate proximity communications where the radio range is a few centimetres with devices pairing point-to-point in close proximity of each other.

For WLAN, total communication range and performance will vary depending on system design (e.g. number of antenna elements) as well as the environment, but multiple gigabit performance is typically expected at ranges around 10 m for in-room use when devices typically possess a few (≤ 3) dozen antenna elements, to a few hundred meters for outdoor use when devices can be equipped with several (≥ 6) dozen antenna elements. These networks can be deployed with an access point as in existing WLAN deployments or without such an infrastructure such as in both WLAN in ad hoc mode and wireless personal area network (WPAN).

For close proximity communication topology is a pair of devices (also known as a pairnet) with performance up to 100 Gbits is expected with range of 10 cm or less (devices nearly touching) with transient connections (rapid setup and teardown); Close proximity device typically will use a single antenna element and very low transmit power.

When access points are used, they are mounted indoor with service covering home or an office space with a nomadic user terminal typically also used indoor, i.e. the entire WLAN system would be used in indoor environment. To provide longer ranges and better capacity, the access point is typically equipped with a larger number of antenna elements than the user terminals.

When access points are not used, MGWS devices are allowed to communicate by setting up direct links for data exchange between the devices/equipment. Typical applications include equipment to equipment (e.g. laptop to projector) and a consumer electronics (CE) device to a kiosk¹, and it may be assumed that usage would predominantly be indoors. In some application, nomadic devices connect with stationary devices (i.e. kiosk, doorway, turnstile, vending machine) for very short duration to transfer large amounts of data, e.g. download 2 hours of HD video content in 250 ms while passing through an entry turnstile at a train station or airport. For the close proximity applications, a high density of devices and users may be concentrated in a small space, for example when passing through the entry ticket gates² at train station or airport.

2 Technical characteristics of MGWS

2.1 Spectrum

A minimum of 7 GHz contiguous spectrum in the 57-71 GHz is needed to satisfy the requirements³ of the applications envisioned to be used in this spectrum, such as uncompressed video (e.g. high

¹ In this context, a kiosk is a booth providing distribution of, and providing access to, electronic content such as movies, music, video, e-books, etc.

² In this context, an entry ticket gate has both fare-paying and large-file downloading functions and it is used at railway and subway stations. The large-file contents are video, movies. etc.

³ System requirements are provided in the standards contained in Annex 1.