



Recommendation ITU-R M.2002
(03/2012)

**Objectives, characteristics and functional
requirements of wide-area sensor and/or
actuator network (WASN) systems**

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



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Foreword

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Series of ITU-R Recommendations

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Series	Title
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BT	Broadcasting service (television)
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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.2002

Objectives, characteristics and functional requirements of wide-area sensor and/or actuator network (WASN) systems

(Question ITU-R 250/5)

(2012)

Scope

This Recommendation provides the objectives, system characteristics, functional requirements, service applications and fundamental network functionalities for mobile wireless access systems (WAS) providing communications to a large number of ubiquitous sensors and/or actuators scattered over wide areas in the land mobile service. The key objective of wide area sensor and/or actuator network (WASN) systems is to support machine-to-machine service applications irrespective of machine location.

Related ITU Recommendations and Reports

Recommendation ITU-R M.1079	Performance and quality of service requirements for International Mobile Telecommunications-2000 (IMT-2000) access networks.
Recommendation ITU-R M.1890	Intelligent transport systems – Guidelines and objectives.
Recommendation ITU-R P.372	Radio noise.
Recommendation ITU-R P.1406	Propagation effects relating to terrestrial land mobile and broadcasting services in the VHF and UHF bands.
Recommendation ITU-R P.1812	A path-specific propagation prediction method for point-to-area terrestrial services in the VHF and UHF bands.
Recommendation ITU-R SM.329	Unwanted emissions in the spurious domain.
Recommendations ITU-T H.235	H.323 security: Framework for security in H-series (H.323 and other H.245-based) multimedia systems.
Recommendation ITU-T X.805	Security architecture for systems providing end-to-end communications.
Report ITU-R M.2224	System design guidelines for wide area sensor and/or actuator network (WASN) systems.

Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AS	Application server
BS	Base station
DB	Database
IMT	International Mobile Telecommunication
M2M	Machine-to-machine
QoS	Quality of service
WAS	Wireless access system

WASN Wide area sensor and/or actuator network

WT Wireless terminal

The ITU Radiocommunication Assembly,

considering

- a) that rapid advances are being made in wireless communications to link sensors and/or actuators associated with humans and objects in various environments;
- b) that sensors and/or actuators for wireless communications should be simple, small, inexpensive and have low power consumption to realize the ubiquitous network society;
- c) that there are emerging applications that handle small amounts of data, such as measurement data, location information and object control signals;
- d) that the application of wireless sensor and/or actuator communications may provide service to a large cell coverage and large variety of objects on a cell-by-cell basis due to the traffic characteristics of such applications stated in item c) above;
- e) that mobility should be offered for wireless sensor and/or actuator communications;
- f) that wireless sensor and/or actuator communications can take place in non-line-of-sight conditions;
- g) that it is desirable to identify the typical characteristics for the mobile wireless access systems (WAS) used for sensor and/or actuator communications in the land mobile service;
- h) that WAS used for sensor and/or actuator communications may also be used in nomadic wireless access or fixed wireless access applications,

recommends

- 1** that, for mobile WAS providing communications to a large number of sensors and/or actuators scattered over wide areas, the objectives in Annex 1 may be used;
- 2** that the characteristics and functional requirements provided in Annex 2 should be used for design of wide area sensor and/or actuator network (WASN) systems.