ISO/IEC 30142-2

Edition 1.0 2022-08

INTERNATIONAL STANDARD

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Internet of Things (IoT) – Underwater acoustic sensor network (UWASN) – Network management system – Part 2: Underwater management information base (u-MIB)



ISO/IEC 30142-2:2022-08(en)



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IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 35.110

ISBN 978-2-8322-4503-3

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CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 7
2 Normative references 7
3 Terms and definitions 7
4 Abbreviated terms 8
5 u-MIB overview and basic concepts 8
5.1 u-MIB definition 8
5.2 Necessity of u-MIB in U-NMS 9
5.3 U-NMS system architecture for using u-MIB 9
5.4 Structure of u-MIB 10
5.4.1 General 10
5.4.2 u-MIB objects 10
5.4.3 u-MIB OIDs 10
5.4.4 u-MIB OID hierarchy 10
5.5 General format of managed objects in u-MIB 11
6 General requirements for constructing u-MIB in U-NMS 12
7 Designing the managed objects of manager and agent u-MIB 14
7.1 Object identifiers of u-MIB 14
7.2 Classification of u-MIB tables 15
7.3 Classification of MOs in the manager and agent u-MIB 15
7.4 MOs of u-MIB Trap 22
8 Integrating MOs of the manager and agent u-MIB 23
Annex A (informative) u-MIB Module 25
A.1 Example of creating u-MIB objects 25
A.2 Example of accessing MOs between manager and agent 28
Bibliography 31

Figure 1 – Elements of u-MIB in U-NMS 8
Figure 2 – U-NMS system architecture for using u-MIB 10
Figure 3 – u-MIB hierarchy structure 11
Figure 4 – General format of u-MIB 12
Figure 5 – MOs of the manager and agent u-MIB 16
Figure 6 – Structure of *event_trap* 22
Figure 7 – Integration of MOs between manager and agent u-MIB 23
Figure 8 – MOs' requests via the network management protocol 24
Figure A.1 – Device battery information requests via u-MIB in U-NMS 29
Figure A.2 – Example of MO value access from u_MIB 30

Table 1 – u-MIB object groups 11
Table 2 – Attributes used for representing MOs in u-MIB 12
Table 3 – Underwater network requirements of u-MIB in U-NMS 12
Table 4 – Mandatory underwater device requirements of u-MIB in U-NMS 13

Table 5 – Mandatory data type requirements of u-MIB in U-NMS 14
Table 6 – OIDs of u-MIB 14
Table 7 – Defining u-MIB tables 15
Table 8 – MOs of *u_networks* 17
Table 9 – MOs of *u_devices* 19
Table 10 – MOs of *u_trap* object in u-MIB 22

INTERNET OF THINGS (IoT) – UNDERWATER ACOUSTIC SENSOR NETWORK (UWASN) – NETWORK MANAGEMENT SYSTEM –

Part 2: Underwater management information base (u-MIB)

FOREWORD

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ISO/IEC 30142-2 has been prepared by subcommittee 41: Internet of Things and Digital Twin, of ISO/IEC joint technical committee 1: Information technology. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
JTC1-SC41/288/FDIS	JTC1-SC41/296/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1, available at www.iec.ch/members_experts/refdocs and www.iso.org/directives.

In order to highlight specifically the managed objects in this document, the managed objects are written in italics throughout this document.

A list of all parts in the ISO/IEC 30142 series, published under the general title *Internet of Things (IoT) – Underwater acoustic sensor network (UWASN) – Network management system*, can be found on the IEC website.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Water covers approximately 70 % of the surface of the Earth. Modern technologies introduce new methods to monitor the body of water, such as pollution monitoring and detection. Underwater data gathering techniques require exploring the water environment, which can be most effectively performed by underwater acoustic sensor networks (UWASNs). Applications developed for the UWASNs can record underwater climate, detect and control water pollution, monitor marine biology, discover natural resources, detect pipeline leakages, monitor and find underwater intruders, perform strategic surveillance, and so on.

To build and apply the UWASN technology, most suitable methods for managing the network have been developed based on the ISO/IEC 30140 series. This document describes the network management outline and requirements appropriate to the UWASN under the constraints of an underwater physical environment.

The ISO/IEC 30142 series provides information such as requirements of an underwater network management system (U-NMS), functions supporting U-NMS, and components required for U-NMS in UWASN.

This document provides the underwater management information base (u-MIB) for the U-NMS. u-MIB is a hierarchical database specifically designed for managing the networks or devices in the underwater network management system of UWASN.

Various technical standards derived from the R&D results of the technical areas under the UWASN and underwater communication fields not covered by the ISO/IEC 30140 series are continuously proposed and developed.

INTERNET OF THINGS (IoT) – UNDERWATER ACOUSTIC SENSOR NETWORK (UWASN) – NETWORK MANAGEMENT SYSTEM –

Part 2: Underwater management information base (u-MIB)

1 Scope

This document provides the underwater management information base (u-MIB) of the underwater network management system (U-NMS). It specifies the following:

– general requirements for constructing u-MIB in U-NMS;
– designing the managed objects of the manager and agent u-MIB;
– integrating the managed objects of the manager and agent u-MIB.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
managed object
abstract representation of an underwater object or resource in u-MIB that is managed using an underwater network management system

3.2
managed objects
collection of underwater objects or resources that are defined in the underwater management information base (u-MIB)

Note 1 to entry: The managed objects (MOs) are the component used for exchanging the information between manager and agent in U-NMS.

3.3
management protocol
protocol used for carrying information between the manager and agent in U-NMS

3.4
TABLE
data type that holds a collection of information related to underwater networks and underwater devices

EXAMPLE The notification record.

3.5
OBJID
data type that holds the unique identity of each managed object

4 Abbreviated terms

MO	managed object
MOs	managed objects
MIB	management information base
OID	object identifier
u-MIB	underwater management information base
U-NMS	underwater network management system
UUV	unmanned underwater vehicle
UWA-CH	underwater acoustic cluster head
UWA-GW	underwater acoustic gateway
UWA-SNode	underwater acoustic sensor node

5 u-MIB overview and basic concepts

5.1 u-MIB definition

Underwater management information base (u-MIB) is a database specifically designed for managing the elements or entities in the underwater network management system (U-NMS). Figure 1 shows the elements of U-NMS where u-MIB is included. The u-MIB is included in the elements such as a manager and an agent.

– In U-NMS, the manager is the program installed in the devices to control the whole functions of underwater networks.
– The agent is the program that is bundled inside the underwater devices such as UWA-GW, UWA-CH, UUV, UWA-SNode, etc.
– Management protocol defines the format of a packet exchange between a manager and an agent in U-NMS.
– u-MIB creates the collection of managed objects (MOs) that uses the structured format for defining the name and objects which are adapted to U-NMS.

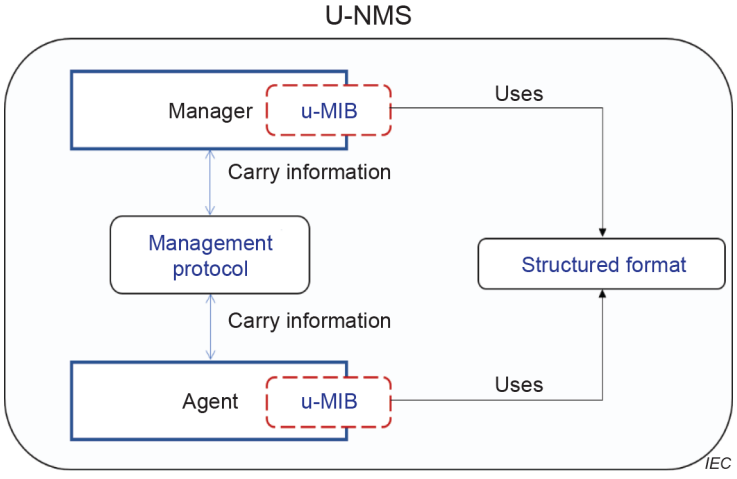


Figure 1 – Elements of u-MIB in U-NMS