

ISO/IEC 30143:2020-06 (E)

Information technology - Underwater acoustic sensor network (UWASN) - Application profiles

Contents	Page
FOREWORD	5
INTRODUCTION	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	7
4 Abbreviated terms	8
5 Overview of UWASN application profiles	8
5.1 Introduction to application profiles	8
5.2 Benefits of application profiles	8
6 Design process of UWASN application profiles	8
6.1 General	8
6.2 Criteria for the design process of UWASN application profiles	9
6.3 Design process steps for UWASN application profiles	9
7 Requirements for the design process of UWASN application profiles	9
7.1 General	9
7.2 User requirements of UWASN application profiles	10
7.3 General requirements of UWASN application profiles	10
7.4 Functional requirements of UWASN application profiles	11
7.5 Constrained requirements of UWASN application profiles	12
7.5.1 General	12
7.5.2 Connectivity	13
7.5.3 UWA-GW	13
7.5.4 UWA-DTN-GW	13
7.5.5 Housing case	13
7.5.6 Fouling cleaner	13
7.5.7 Node deployment	13
7.5.8 Battery	14
8 Modelling techniques for designing UWASN application profiles	14
8.1 General	14
8.2 Use case model	14
8.2.1 General	14
8.2.2 Elements of use case diagram	14
8.2.3 Relationships	15
8.3 Sequence diagram model	16
8.3.1 General	16
8.3.2 Elements of sequence diagram	16
8.4 Class diagram model	18
8.4.1 General	18
8.4.2 Elements of class diagram	18

9	Guidelines for the implementation of UWASN application profiles	19
9.1	Layered design approach for developing UWASN application profiles	19
9.2	Specific architecture for implementing UWASN application profiles	20
9.3	Framework for implementing UWASN application profiles	21
9.3.1	User interface	21
9.3.2	System calculation unit	22
9.3.3	Surface devices	22
9.3.4	Sensor node	22
9.4	Functional operations for implementing UWASN application profiles	23
10	Specialized maintenance for UWASN application profiles	24
	Annex A (informative) Application profile example.....	26
A.1	Fish farming.....	26
A.1.1	General	26
A.1.2	Guidelines for designing UWASN fish farming application.....	26
A.1.3	Requirements for the design process of UWASN fish farming application	27
A.1.4	Modelling techniques for designing UWASN fish farming application	30
A.1.5	Guidelines for the implementation process of UWASN fish farming application	32
	Bibliography.....	38
	Figure 1 – Actor representation examples	14
	Figure 2 – Use case representation examples.....	15
	Figure 3 – System boundary representation example	15
	Figure 4 – Use case model for UWASN application profiles	16
	Figure 5 – Object symbol in a sequence diagram	16
	Figure 6 – Execution box symbol in a sequence diagram	17
	Figure 7 – Lifeline representation in a sequence diagram	17
	Figure 8 – Sequence diagram modelling for UWASN application profiles	17
	Figure 9 – Representation of different sections in class diagram.....	18
	Figure 10 – Class diagram modelling for UWASN application profiles	19
	Figure 11 – Layer design approach.....	20
	Figure 12 – UWASN specific architectural model	21
	Figure 13 – Framework of UWASN application profiles	23
	Figure 14 – Operation design approach	24
	Figure A.1 – Use case model for fish farming application	31
	Figure A.2 – Sequence diagram model for fish farming application	32
	Figure A.3 – Layered design approach of fish farming application.....	33
	Figure A.4 – Specific fish farming architecture	34
	Figure A.5 – Framework for fish farming application.....	35
	Figure A.6 – Operation design process for fish farming application	36
	Table 1 – Steps for the design process of UWASN application profiles	9
	Table 2 – User requirements of UWASN application profiles	10
	Table 3 – General requirements for UWASN application profiles	10
	Table 4 – Functional requirements for UWASN application profiles	11

Table 5 – Constrained requirements for UWASN application profiles	12
Table 6 – Relationship and symbols of use case diagram	15
Table 7 – Components for implementing UWASN application profiles	23
Table 8 – Operation process of UWASN application profiles	24
Table 9 – Key factors for monitoring UWASN application profiles.....	25
Table 10 – Components used for the maintenance of UWASN application profiles	25
Table A.1 – Steps for designing UWASN fish farming application.....	27
Table A.2 – User requirements for the design process of UWASN fish farming application	27
Table A.3 – General requirements for the design process of UWASN fish farming application	28
Table A.4 – Functional requirements for the design process of UWASN fish farming application	29
Table A.5 – Constrained requirements for the design process of UWASN fish farming application	30
Table A.6 – Operation design process of UWASN fish farming application	36
Table A.7 – Key components to monitor in fish farming application	37
Table A.8 – Components used for the maintenance of UWASN fish farming application	37