Sensor development templates: User's Manual

(Name of the sensor)

Version xx

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[1]Author Affiliation

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Contents

(e.g. measurement interval)

(to other platforms / observing system / communications system / computer etc.)

This section will include recovery procedures: quality control (measuring reference samples and/or standards), demobilising (making safe /storable /transportable, disposal of waste, batteries etc.), downloading raw data, data processing and calibration/validation.

(includes scope of document and target audience)

4. How the sensor works

5. Sensor specification

This section lists requirements for marine environment sensors for the same sensor model.

NOTE: If a sensor model is significantly different from another model, or undergoes a design revision, a manufacturer is required to consider and re-test all specifications that may be affected.

Parameter	Data	Test methods (following ISO 22013)
Calibration		Prior to undergoing a test to determine a specification in this section, a sensor must have been calibrated in accordance with Section 5.2
Range: Calibrated range		The calibrated range must be determined during calibration, according section 5.2
Range: Measuring range		The measuring range must be determined during the assessment of accuracy, according to section 5.3.4.2
Range: Maximum range		The maximum range must be determined, but the calculation is left up to the manufacturer.
Accuracy		The reproducibility standard deviation and bias mist be determined according to section 5.3
Resolution		The noise resolution of the sensor must be determined according section 5.4
Response time		The time of the sensor must be determined according to section 5.5
Depth and pressure: Maximum depth rating.		The maximum depth rating and safety factor must be determined in accordance with section 5.6.1
Depth and pressure: Crush depth rating		The tested safety factor shall de at minimum 1.1 x equivalent pressure as determined in accordance with section 5.6.2.
Sampling rate		Determine the maximum sampling rate indicated by the sensor and settable by the user.
Mechanical: Wetted materials		Determine all materials in contact with the water during immersion according to section 5.7.1.
Mechanical: Exterior dimensions		The total length, width and height of the instrument shall be listed in m, cm or mm, and may also be listed in customary units (in, ft).
Mechanical: Mass or weight in air		The mass of the instrument in air shall be reported in kg and may additionally be reported in customary units of mass (lbm) or weight (lb).
Mechanical: Weight in freshwater		The total weight of the instrument in freshwater shall be determined in accordance with section 5.7.2.
Mechanical: Weight in seawater		The total weight of the instrument in freshwater shall be determined in accordance with section 5.7.3.

Mechanical: Operational temperature range		The instrument must function over the temperature range published in the datasheet according to section 5.7.4.
Electrical: Input voltage range		The operating range shall be specified in terms of the minimum and maximum recommended supply voltages and verified according to section 5.8.1
Electrical: Operating power consumption		Manufacturer may specify either the current consumption or power consumption of the instrument according to Section 5.8.2
Electrical: Start-up power consumption		Manufacturer may specify the maximum operating power and duration of the startup interval according to Section 5.8.3.
Interface: Electrical connections		The wiring diagram for every exposed connector or cable shall be provided. See section 4.10.1.
Interface: Communications protocol		See section 4.10.2.
Stability		The bias that develops over time due to immersion in seawater and in an on-state must be determined according to section 5.10
Shelf-life		The bias that develops over time while the sensor is in an off state and exposed only to air must be determined according to Section 5.11

Normative references:

ISO 22013:2021 Marine environment sensor performance — Specifications, testing and reporting — General requirements

ISO 5725: 1994 Accuracy (trueness and precision) of measurements methods and results.

JCGM 200:2012 International vocabulary of basic and general terms in metrology.

ISO 17025:2017 General requirements for the competence of testing and calibration laboratories.

ISO/IEC 98-3:2008 Guide to the expression of uncertainty in measurement.

6. Safety Warning
(Safety of user and environment)

7. Precautions for Usage
(How to avoid damage to instrument)

8. Maintenance and Inspection
(Includes routine activities to maintain the correct functioning of the sensors. It's recommended to include photos and videos if possible)

9. Laboratory calibration/validation protocols
(List of all calibration/validation protocols recommended for predeployment, in situ operations and postrecovery)

10. Troubleshooting

(Includes a list of knows problems and recommendations of how to proceed. It's important to include examples, photos or videos if possible)

11. Estimated cost

OBPS Metadata table (non-journal contribution)

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