

Name: SOP for vessel:maria_s_merian:rsws_msm:sbe_45_0334 (7415)

Version:

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Status: This is a **public version**. Certain sensitive information, such as server names, addresses, and exact paths and storage locations that is not meant for others than AWI associates was removed in that document.

Changelog:

1. 2022-10-06

- initial publication

1. Contacts/Responsible Persons

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2. Purpose & Scope

Description: This SOP describes device configuration, parameter characteristics, transmission and processing of its output, ingest procedure, storage, data access possibilities, and publishing. Intended user groups are device owners, technicians, and data managers.

Comment: This item is managed and processed by the Deutsche Allianz Meeresforschung (German Marine Research Alliance), please see www.allianz-meeresforschung.de for further information.

3. Item Description

Short Name: SBE_45_0334

Long Name: SBE 45 Micro thermosalinograph

URN: vessel:maria_s_merian:rsws_msm:sbe_45_0334

ID: 7415

UUID: ec24f17a-b597-4411-b567-9aa9b33f5b78

Description: Thermosalinograph for measurement of temperature and conductivity from underway vessels. Integrates with the optional remote temperature sensor SBE 38.

Serial No.: 0334

Manufacturer: Sea-Bird Scientific

PID/Handle: <https://hdl.handle.net/10013/sensor.c8b6b7a1-f568-479d-a495-1d6e87f331a9>

4. Parameter Description

Short Name: conductivity

Long Name: conductivity

45 **full URN:** vessel:maria_s_merian:rsws_msm:sbe_45_0334:conductivity

ID: 87673

UUID: e5585265-884a-4278-84b3-6623f0d57435

Type: conductivity

Unit: S/m

50 **Comment:**

Measurement Properties: none

Short Name: water_temperature

Long Name: internal water temperature

55 **full URN:** vessel:maria_s_merian:rsws_msm:sbe_45_0334:water_temperature

ID: 87674

UUID: 0ef1a9c5-2a30-495a-a431-16aac7cbd40f

Type: water temperature

Unit: °C

60 **Comment:**

Measurement Properties: none

Short Name: salinity

Long Name: salinity

65 **full URN:** vessel:maria_s_merian:rsws_msm:sbe_45_0334:salinity

ID: 87675

UUID: fe83fcfe-fb10-416f-bfa3-7c245b32a044

Type: salinity

Unit: PSU

70 **Comment:**

Measurement Properties: none

Short Name: sound_velocity

Long Name: internal sound velocity

75 **full URN:** vessel:maria_s_merian:rsws_msm:sbe_45_0334:sound_velocity

ID: 87676

UUID: 51dba74b-b8d9-48fb-940c-1db93f9a3ab9

Type: sound velocity

Unit: m/s

80 **Comment:**

Measurement Properties: none

5. Processing

85 The thermosalinograph measures temperature and electrical conductivity of sea water. Using those two properties salinity (and additionally sound velocity) are estimated (Sea-Bird Electronics 2020b). Usually, an additional temperature sensor SBE38 (Sea-Bird Electronics 2020a) is related to the SBE45. All data are stored through the data management system DAVIS-SHIP (DSHIP). After the cruise all data are transferred to the DSHIP land system. From there data are obtained for further evaluation.

90 5.1. Acquisition

The SBE45 is installed within the Reinseewasseranlage (RSWS) in the Lotgeräterraum (Bergmann et al. 2021). The RSWS is directly flushed with sea water through the two deep inlets in about 6.5m depth. At the two inlets the two additional SBE38 temperature sensors are installed.

Auxiliary Files:

95 **Name:** *"Maria S. Merian" research vessel manual*

Type: Manual

Description: General overview on the research vessel Maria S. Merian with detailed information on onboard scientific devices

URL: <https://www.ldf.uni-hamburg.de/en/merian/technisches/dokumente-tech-merian/handbuch-merian-eng.pdf>

100 **Last Modification:** Jan. 2021

Name: *SBE45 MicroTSG Thermosalinograph*

Type: Manual

105 **Description:** User manual of SBE45 MicroTSG Thermosalinograph

URL: <https://www.seabird.com/asset-get.download.jsa?id=54627862504>

Last Modification: 2020

Name: *SBE38 Digital Oceanographic Thermometer*

110 **Type:** Manual

Description: User manual of SBE38 Digital Oceanographic Thermometer

URL: <https://www.seabird.com/asset-get.download.jsa?id=54627862501>

Last Modification: 2020

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5.2. Extraction

Data are extracted from the DSHIP land system at BSH (dship.bsh.de). The data are stored per cruise and extracted likewise. Together with accompanying system parameters like latitude, longitude, ships speed, and flow rate through the system, all relevant SBE45 parameters are extracted in one-second resolution. Output of the extraction is the usual DSHIP export, consisting of a folder with three files, (1) a *.dat ASCII-data file, (2) a *.xml order-file and (3) a *.sys log-file.

Auxiliary Files: none

5.3. Conversion

125 The aforementioned DSHIP-Export is processed with Python with the following steps: (1) parsing of the data file with the output of a Geodataframe using the time as index, (2) checking for dummy-values, (3) comparison of position data against Mastertrack, (4) checking whether position data are in an EEZ, (5) averaging into one-minute means, (6) several quality tests (global range test, spike test, gradient test, test of adjacent values, flow speed test), and (if applicable) (7) calibration of temperature and salinity data with independent data (direct samples or CTD data from inlet depth).

130 **Software:** -

Network Share Name: - ← *public version, input cropped*

Filename Convention: -

-

135 **Auxiliary Files:**

Name: -

Type: -

Description: -

URL: -

140 **Last Modification:** -

6. Ingest

Ingest is part of the O2A process chain (Koppe et al. 2015, Gerchow et al. 2017) and is the starting point to collect, store, and redistribute data and metadata.

145 There is no automated data transfer available for this workflow. All data must be retrieved manually from BSH.

Protocol: MDM

Project path: *public version, input removed*

Campaign Data: yes

150 **Filename Convention:** per campaign

Expected Data Interval: per campaign

Ingest Data Interval: per campaign

Mapping: -

Save Directory: -

155 **json/xml:**

Script: -

Script call:

Repository: -

160 7. Storage

7.1. Raw Data

Location *public version, input cropped*

Backup Policy: -

165 **7.2. Near Real-Time Data**

Info: -

Service: none

7.3. Publications and further Reading

170 **Publication:** Hölz et al. 2022, Wölfl and Schlundt 2020, Schneider von Deimling and Schlundt 2022, Römer and Schlundt 2021, Krastel and Schlundt 2022, Schoening and Schlundt 2021, Ehrhardt and Schlundt 2022a, Schmidt and Schlundt 2021, Ehrhardt and Schlundt 2022b, Becker and Schlundt 2021, Hainbucher and Schlundt 2021, Zonneveld and Schlundt 2022, Devey and Schlundt 2021

175 **Further Reading:** This device and workflow is part of DAM, please check <https://www.allianz-meeresforschung.de/> for further information.

References

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