

Name: SOP for vessel:sonne:smb_sonne:sbe_38_716 (7531)

Version: 1.0

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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_38_716

Long Name: SBE 38 Digital oceanographic thermometer

URN: vessel:sonne:smb_sonne:sbe_38_716

ID: 7531

UUID: 904c8049-ab08-4085-a900-9614b72ef66b

Description: Thermometer with housing for depths up to 10500 m. Used as remote temperature sensor for the SBE 45 Thermosalinograph.

Serial No.: 716

Manufacturer: Sea-Bird Scientific

PID/Handle: <https://hdl.handle.net/10013/sensor.df4eb2a9-5cd3-4c7c-bced-ae2a4a7adad6>

4. Parameter Description

Short Name: water_temperature

Long Name: water temperature

45 **full URN:** vessel:sonne:smb_sonne:sbe_38_716:water_temperature

ID: 87878

UUID: 9c8062e0-e8a6-49fd-82a6-18a3878b20c7

Type: water temperature

Unit: °C

50 **Comment:**

Measurement Properties: none

5. Processing

55 This instrument measures temperature of sea water (Sea-Bird Electronics 2020a). Usually, an additional thermosalinograph SBE45 (Sea-Bird Electronics 2020b) is related to the SBE38. 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.

5.1. Acquisition

60 The SBE38 is installed directly at the sea water inlet in about 4m depth (Bergmann 2022).

Auxiliary Files:

Name: "Sonne" research vessel manual

Type: Manual

Description: General overview on the research vessel Sonne with detailed information on onboard scientific devices

65 **URL:** <https://attachment.rrz.uni-hamburg.de/882d41d5/S0-Handbuch.pdf>

Last Modification: Jan. 2022

Name: SBE45 MicroTSG Thermosalinograph

Type: Manual

70 **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

75 **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 SBE38 parameters are extracted in one-second resolution. Output of the extraction
85 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

90 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 data with independent data (usually CTD data from inlet depth).

95 **Software:** -

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

Filename Convention: -

-

Auxiliary Files:

100 **Name:** -

Type: -

Description: -

URL: -

Last Modification: -

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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.

110 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

Filename Convention: per campaign

115 **Expected Data Interval:** per campaign

Ingest Data Interval: per campaign

Mapping: -

Save Directory: -

json/xml:

120 **Script:** -

Script call:

Repository: -

7. Storage

125 7.1. Raw Data

Location *public version, input cropped*

Backup Policy: does not apply

7.2. Near Real-Time Data

130 **Info:** no NRT for this workflow

Service: [link to near real-time data service](#)

7.3. Publications and further Reading

Publication: Schlundt 2022, Brix et al. 2022, Brix et al. 2021, Berndt and Schlundt 2021, Beck and Schlundt 2022

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

References

- Beck, Aaron and Michael Schlundt (July 2022). "Continuous thermosalinograph oceanography along RV SONNE cruise SO279". en. In: DOI: 10.1594/PANGAEA.946377. URL: <https://doi.pangaea.de/10.1594/PANGAEA.946377> (visited on 09/21/2022).
- 140 Bergmann, Klaus (Jan. 2022). "*Sonne*" research vessel manual. en. URL: <https://attachment.rrz.uni-hamburg.de/882d41d5/S0-Handbuch.pdf> (visited on 11/25/2022).
- Berndt, Christian and Michael Schlundt (Feb. 2021). "Continuous thermosalinograph oceanography along RV SONNE cruise SO277". en. In: DOI: 10.1594/PANGAEA.928567. URL: <https://doi.pangaea.de/10.1594/PANGAEA.928567> (visited on 09/21/2022).
- 145 Brix, Saskia, Michael Schlundt, Simon Tewes, and James Taylor (Nov. 2021). "Continuous thermosalinograph oceanography along RV Sonne cruise SO280". en. In: DOI: 10.1594/PANGAEA.938476. URL: <https://doi.pangaea.de/10.1594/PANGAEA.938476> (visited on 09/21/2022).
- Brix, Saskia, Michael Schlundt, Simon Tewes, and James Taylor (May 2022). "Continuous thermosalinograph oceanography along RV SONNE cruise SO276". en. In: DOI: 10.1594/PANGAEA.943865. URL: <https://doi.pangaea.de/10.1594/PANGAEA.943865> (visited on 09/21/2022).
- 150 Gerchow, Peter, Roland Koppe, Ana Macario, Antonie Haas, Christian Schäfer-Neth, Hans Pfeiffenberger, and Angela Schäfer (Nov. 2017). "O2A - Data Flow Framework from Sensor Observations to Archives". In: *EPIC3 Digital Infrastructures for Research 2017, Brussels, 2017-11-30-2017-12-01Brusselles, DI4R 2017 conference*. Brussels: DI4R 2017 conference. URL: <https://indico.egi.eu/indico/event/3455/session/1/contribution/114/material/slides/1.pdf> (visited on 01/21/2020).
- 155 Koppe, Roland, Peter Gerchow, Ana Macario, Antonie Haas, Christian Schäfer-Neth, and Hans Pfeiffenberger (June 2015). "O2A: A Generic Framework for Enabling the Flow of Sensor Observations to Archives and Publications". In: *OCEANS 2015 Genova*. DOI: 10.1109/OCEANS-Genova.2015.7271657. URL: <https://epic.awi.de/id/eprint/38295/>.
- 160 Schlundt, Michael (May 2022). "Continuous thermosalinograph oceanography along RV SONNE cruise SO278". en. In: DOI: 10.1594/PANGAEA.943794. URL: <https://doi.pangaea.de/10.1594/PANGAEA.943794> (visited on 09/21/2022).

Standard Operating Procedure: vessel:sonne:smb_sonne:sbe_38_716 (7531)

Version: January 13, 2023

165 Sea-Bird Electronics (2020a). *SBE38 Digital Oceanographic Thermometer*. URL: <https://www.seabird.com/asset-get.download.jsa?id=54627862501> (visited on 11/22/2022).

Sea-Bird Electronics (2020b). *SBE45 MicroTSG Thermosalinograph*. URL: <https://www.seabird.com/asset-get.download.jsa?id=54627862504> (visited on 11/22/2022).