



# Information Management

FOR EARTH SCIENCE DATA

# DSHIP

## Data and Information Management for Research Vessels

DSHIP is an intelligent and configurable scientific data management and distribution platform. Its development was particularly geared to the specific demands scientific users, ship owners and data centers place on the collection and processing of measured data, their continual availability and distribution.

DSHIP is designed for unattended, long-term operation around the clock while still being easy to administrate and operate.

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## Intelligent and configurable scientific data management

### Proven functionality for scientific users

DSHIP makes it easy to connect an unlimited number of devices (plug, configure & play). It allows continuous gathering of data, which includes timestamping of the data at acquisition. Moreover, it is possible to derive parameters by combining others using arithmetic functions. Their values can then be displayed and stored online in the same way as directly measured data.

The data can be transferred in NMEA and fixed-length ASCII telegrams to distribute them to any devices on the network. E-mails with current sensor data can be sent, e.g. to a scientist's home institute for online quality checks.

DSHIP provides a display framework for online visualization of any parameters available in the system. In addition to a wide range of preconfigured displays, for example for navigational, winch or weather data, there also are capabilities for users to define own displays for their specific parameter selections. Such dialog setups can of course be stored and reloaded for later use.

Other specific displays are provided by the DSHIP Extended Display System module. They show information like ship position, next waypoint or transponder data on a coastline map.

Any activities carried out during an expedition are recorded by the DSHIP Action Log module. Users may view the records online and export them just as well.

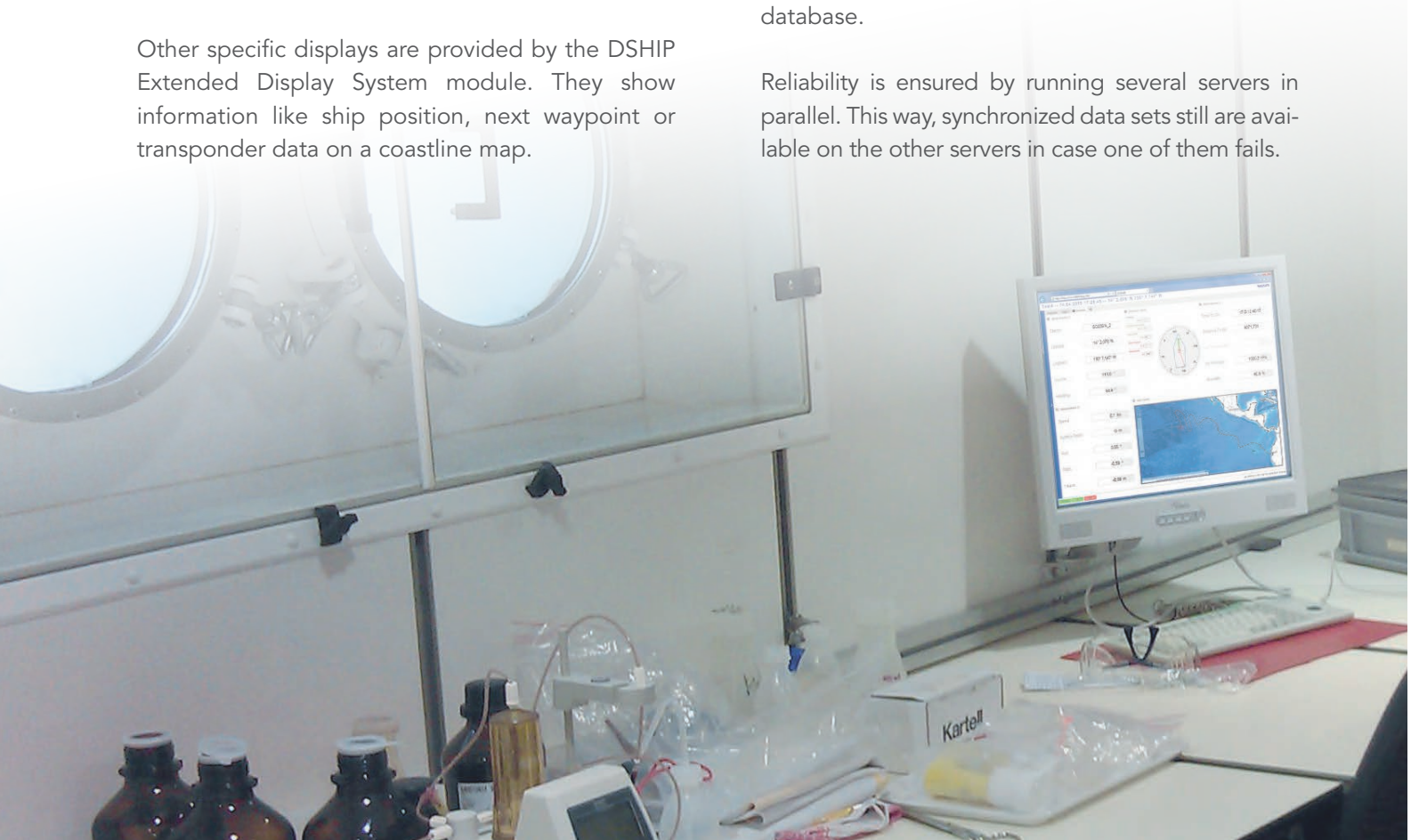
The DSHIP Mass Data Management module enables storage of any kind of bulk data like images, video sequences etc. together with the sensor data collected by DSHIP.

The DSHIP Web Services module provides programming interfaces for external applications to access the system. It offers the possibility to develop drivers for any instruments using proprietary protocols.

### Keep data safely on board with 24/7 operation

All relevant data generated on a research vessel are continuously stored in realtime in a centralized database.

Reliability is ensured by running several servers in parallel. This way, synchronized data sets still are available on the other servers in case one of them fails.



## Take data on board and on shore

### Easy data transfer

DSHIP offers a web-based interface to flexibly export data for scientific activities taking place on shore during and towards the end of an expedition. Export configurations can be saved as templates to reload and modify them some other time. It is also possible to compress the data collected on board in an archive package in order to transfer them to a flash or hard drive or any other kind of customary medium.

Being capable of handling vast amounts of data, the databases of the shore-based DSHIP Archive hold data from various vessels at the same time. Scientists can access the entire data stocks without being dependent on the system on board the vessel.

## Reliable implementation

### References

DSHIP is implemented and has proven successful on various research vessels like FRV Alba Na Mara, RV Alkor, ARA Austral, RV Elisabeth Mann Borgese, RV Heincke, RV Isabu, RV Maria S. Merian, RV Meteor, RV Polarstern, RV Poseidon, FRV Scotia and RV Sonne. With slight adjustments DSHIP is also employed on the Antarctic Neumayer III station, on MARNET buoys and on the research aircrafts Polar 5 and Polar 6.

### Easy to administrate and operate

DSHIP does not require any administrative intervention during operation. It ensures reliable storage of all data collected. Devices can be activated or deactivated by the administrator at any time. An editor enables initial configuration prior to a cruise, i.e. devices can be created, for example, new devices can be added and existing devices can be maintained.

The built-in control functionality and a sophisticated monitoring and logging system supply administrators with any information they need.

DSHIP handles various interfaces, such as serial, network and proprietary interfaces. Administrators can configure multiple NMEA telegrams to be sent to individually defined recipients.



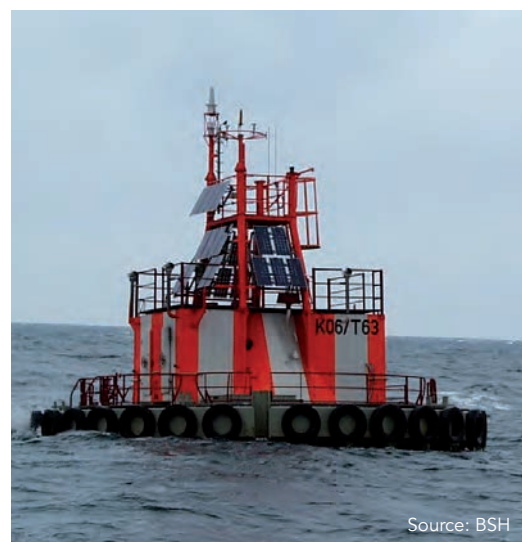
Source: Oliver Zielinski, ICBM, University Oldenburg



Source: Ude Cieluch, Alfred-Wegener-Institut



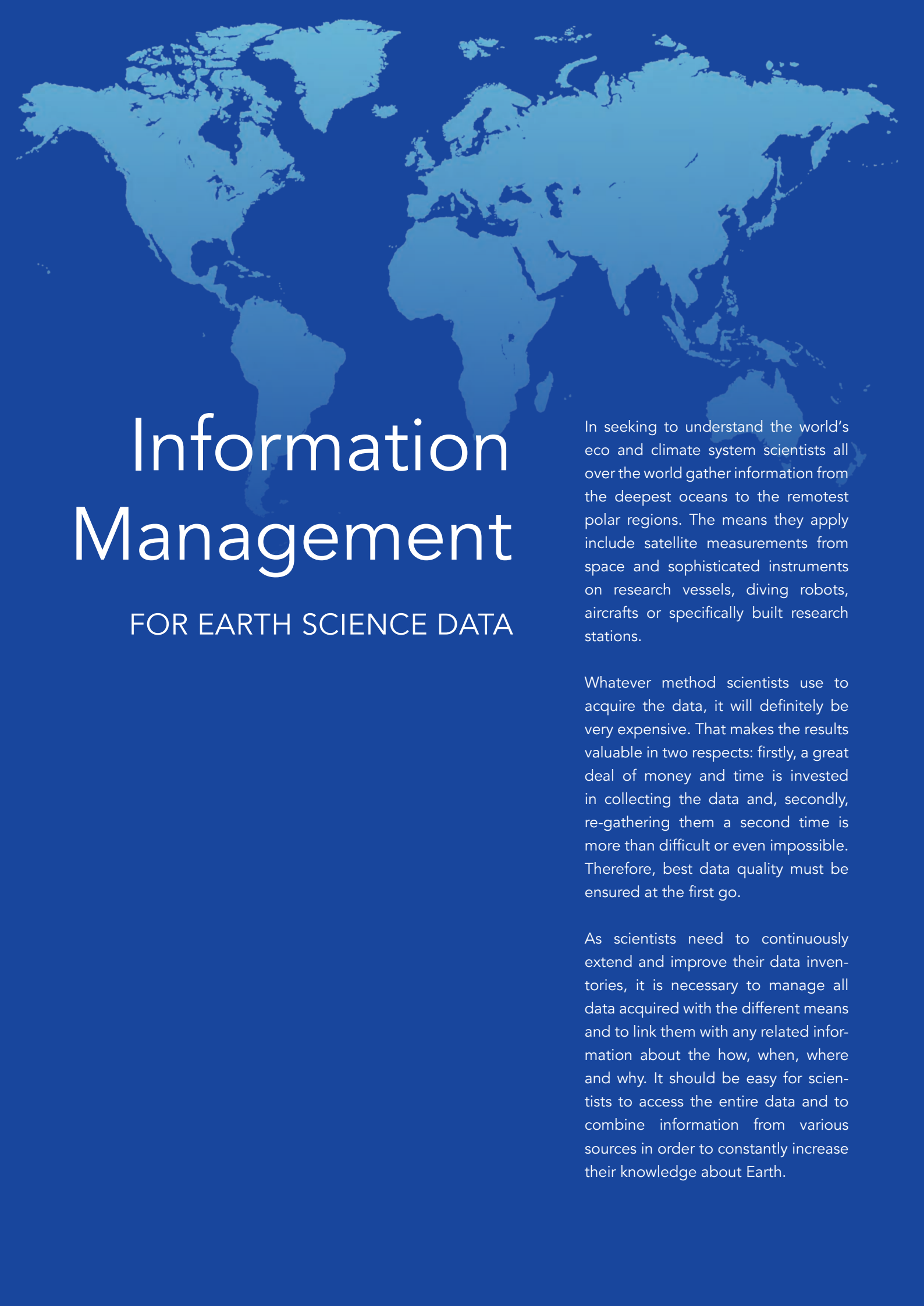
Source: Werum Software & Systems AG



Source: BSH



Source: Marum, Center for Marine Environmental Sciences, University of Bremen



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In seeking to understand the world's eco and climate system scientists all over the world gather information from the deepest oceans to the remotest polar regions. The means they apply include satellite measurements from space and sophisticated instruments on research vessels, diving robots, aircrafts or specifically built research stations.

Whatever method scientists use to acquire the data, it will definitely be very expensive. That makes the results valuable in two respects: firstly, a great deal of money and time is invested in collecting the data and, secondly, re-gathering them a second time is more than difficult or even impossible. Therefore, best data quality must be ensured at the first go.

As scientists need to continuously extend and improve their data inventories, it is necessary to manage all data acquired with the different means and to link them with any related information about the how, when, where and why. It should be easy for scientists to access the entire data and to combine information from various sources in order to constantly increase their knowledge about Earth.

### Easy setup

We carry out the initial installation and configuration of individual customer setups. In the sequel, the customer may modify or enhance configuration and setup as required to meet changing needs.

### Minimized follow-up efforts

DSHIP is designed for continuous and unattended operation. Owing to the generic interface technology, it is easy for administrators to integrate new devices. So, DSHIP minimizes follow-up costs as no additional software or licenses are required to do it.

### Long-term maintenance

Werum provides maintenance and support services covering remote analysis and updates as well as periodic inspections.

## DSHIP features at a glance

- Customer-configurable instrument connection and parameterization
- Data distribution with NMEA telegrams on board
- Data dissemination via e-mail
- Definition of derived parameters
- User-definable display configuration
- Unattended operation and system resilience
- Data export and long-term 24/7 access to shore-based data centers

DSHIP is under continuous development driven by requirements from the scientific community.

## About Werum Software & Systems AG

With a workforce of over 130, Werum Software & Systems AG is one of the largest independent employers for IT professionals in Germany. For more than 50 years, Werum has been implementing sophisticated software and systems for customers all over the world, among them many renowned companies from the automotive and aerospace industry as well as scientific institutions and public authorities.

Werum's activities focus on the support of customer-specific processes in the core areas of test data and information management, earth observation, eGovernment and enterprise information management. The software solutions are based on platforms specially developed for these areas.

Diversity, reliability, flexibility and fairness are part of our philosophy and create the basis for sustainable customer relations. Werum offers its international customers well-founded application know-how as well as the knowledge and experience gained in many years of implementing most diverse projects and IT solutions. Already in the run-up to project implementation Werum assists customers in advisory capacity with regard to any IT-related aspects of the specific task setting. Long-term maintenance and servicing of the solutions supplied are a matter of course for Werum.

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