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INTERFACE SPECIFICATIONS

Simrad Sonar Systems

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SIMRAD
By KONGSBERG

PUBLIC

KONGSBERG

Simrad
Sonar systems
Interface specifications

The purpose of this manual is to provide the descriptions required to communicate effectively with the sonar system.

Caution

You must never permit the sonar system to transmit (ping) when the ship is in a dry dock. The transducer can be damaged if it transmits in the open air.

Additional end-user documents related to the sonar system can be found on our website. This includes publications that are translated into other languages. Selected publications are also provided in IETM (*Interactive Electronic Technical Manual*) formats.

- https://www.kongsberg.com/fisherysonar

SIMRAD
By KONGSBERG

110-0007577/C

Document information

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Copyright

Warning

The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. You must be familiar with the contents of the appropriate manuals before attempting to operate or work on the equipment.

Kongsberg Maritime disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

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Kongsberg Maritime AS endeavours to ensure that all information in this document is correct and fairly stated, but does not accept liability for any errors or omissions.

Support information

If you require maintenance or repair, contact your local dealer. You can also contact us using the following address: simrad.support@simrad.com. If you need information about our other products, visit https://www.kongsberg.com/simrad. On this website you will also find a list of our dealers and distributors.

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www.kongsberg.com

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About this manual

The purpose of this manual is to provide the descriptions required to communicate effectively with the sonar system.

Target audience

This manual is intended for users that need to set up communication between the sonar system and peripheral systems and/or sensors. Due to the nature of the descriptions and the level of detail provided by this publication, it is well suited for those who are - or wish to be - expert users.

This manual is a reference book, and as such it is *not* intended for sequential reading. Use the table of content, the index, the search functionality as well as the interactive links to seek out the information you need when you need it.

A good understanding of system functions and controls is essential to fully take advantage of the functionality provided.

Software version

This publication was created for the following software version: N/A.

Online information

All end-user manuals provided for operation and installation of your sonar system can be downloaded from our website. This includes publications that are translated into other languages. Selected publications are also provided in IETM (*Interactive Electronic Technical Manual*) formats. Our website also provides information about other products from Kongsberg Maritime.

- https://www.kongsberg.com/fisherysonar

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Significant changes to the product or this publication

We have implemented the following significant changes in this publication:

NetCDF file format

The requirement for data storage is from 15 to 50 Gb per hour, depending on your operating modes and settings.

We want your feedback

We always want to improve our products. We also want our end-user documentation to be comprehensive and relevant. You can help. Please provide comments, suggestions or constructive criticism to any of our support offices.

Support information

If you need technical support for your sonar system you must contact your local dealer, or one of our support offices. A list of all our offices and dealers is available on our website. You can also contact our main support office in Norway.

Norway (main office)

- **Company name**: Kongsberg Maritime AS / Simrad
- **Address**: Strandpromenaden 50, N3190 Horten, Norway
- **Telephone**: +47 33 03 40 00
- **Telefax**: +47 33 04 29 87
- **Website** : www.kongsberg.com/simrad
- **Email address**: simrad.support@simrad.com

Spain

- **Company name**: Kongsberg Maritime Spain S.L.U
- **Address**: Partida Atalayes 20, 03570 Villajoyosa, Spain
- **Telephone**: +34 966 810 149
- **Telefax**: +34 966 852 304
- **Website** : www.kongsberg.com/simrad
- **Email address**: simrad.spain@simrad.com

France

- **Company name**: Simrad France
- **Address**: 5 rue de Men Meur, 29730 Guilvinec, France
- **Telephone**: +33 298 582 388
- **Telefax**: +33 298 582 388

- **Website** : www.kongsberg.com/simrad
- **Email address**: simrad.france@simrad.com

USA

- **Company name**: Kongsberg Underwater Technology LLC (KUTL) / Simrad Fisheries
- **Address**: 19210 33rd Ave W, Suite A, Lynnwood, WA 98036, USA
- **Telephone**: +1 425 712 1136
- **Telefax**: +1 425 712 1193
- **Website** : www.kongsberg.com/simrad
- **Email address**: fish.usa.support@simrad.com

Canada

- **Company name**: Kongsberg Mesotech Ltd.
- **Address**: 1598 Kebet Way, Port Coquitlam, BC, V3C 5M5, Canada
- **Telephone**: +1 604 464 8144
- **Telefax**: +1 604 941 5423
- **Website** : www.kongsberg.com/simrad
- **Email address**: simrad.canada@simrad.com

Malaysia

- **Company name**: Kongsberg Maritime Malaysia Sdn. Bhd
- **Address**: Unit 27-5 Signature Offices, The Boulevard, Mid Valley City, Lingkaran Syed Putra, 59200 Kuala Lumpur, Malaysia
- **Telephone**: +65 6411 7488
- **Telefax**: +60 3 2201 3359
- **Website** : www.kongsberg.com/simrad
- **Email address**: simrad.asia@simrad.com

Korea

- **Company name**: Kongsberg Maritime Korea Ltd
- **Address**: #1101 Harbor Tower, 113-1, Nampodong 6-Ga, Jung-Gu, Busan 600-046, Korea
- **Telephone**: +82 51 242 9933
- **Telefax**: +82 51 242 9934

- **Website** : www.kongsberg.com/simrad
- **Email address**: simrad.korea@simrad.com

China

- **Company name**: Kongsberg Maritime China Ltd
- **Address**: 555 Chuanqiao Road, China (Shanghai) Pilot Free Trade Zone, 201206, China
- **Telephone**: +86 21 3127 9888
- **Telefax**: +86 21 3127 9555
- **Website** : www.kongsberg.com/simrad
- **Email address**: simrad.china@simrad.com

Supported datagram formats

Topics

Inputs

Topics

Supported datagram formats for annotation data

When you study an echogram, it is often useful to add personal comments to it. Comments can be used to identify specific events such as specific echoes, unusual bottom conditions, or simply for keeping track of time or distance. You can add annotations manually, or import information as datagrams using a serial or LAN (Ethernet) communication port.

The following datagram format is supported:

ATS Annotation

ATS Annotation is a proprietary datagram format created by Kongsberg Maritime. It allows you to import text annotations from external devices.

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Supported datagram formats for external depth input

The sonar system can receive depth information from en external echo sounder.

The following datagram formats are supported:

NMEA DBS

The NMEA DBS datagram provides the current depth from the surface. The datagram is no longer recommended for use in new designs. It is frequently replaced by the NMEA DPT datagram format.

NMEA DBT

The NMEA DBT datagram provides the current depth under the transducer. In new designs, this datagram format is frequently used to replace the DBK and DBS formats.

NMEA DPT

The NMEA DPT datagram provides the water depth relative to the transducer, and the offset of the measuring transducer.

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Supported datagram formats for GPS (position) information

Accurate and reliable information from navigation systems are useful for the sonar operation.

When enabled, the vessel's current geographical position is shown on the top bar. The following datagram formats are supported:

NMEA GLL

The NMEA GLL datagram transfers the latitude and longitude of vessel position, the time of the position fix and the current status from a global positioning system (GPS).

NMEA GGA

The NMEA GGA datagram transfers time-, position- and fix-related data from a global positioning system (GPS).

NMEA GGK

The NMEA GGK datagram is used to decode the PTNL, Time, Position, Type and DOP (Dilution of Precision) string of the NMEA 0183 output.

PTNL,GGK

PTNL ,GGK is a proprietary datagram from Trimble (https://www.trimble.com). The PTNL, GGK datagram is longer than the NMEA-0183 standard of 80 characters. The PTNL, GGK datagram is used to decode the time, position, type and dilution of precision of the current position.

NMEA RMC

The NMEA RMC datagram transfers the time, date, position, course and speed data from a global navigation satellite system (GNSS) receiver.

NMEA VTG

The NMEA VTG datagram contains the actual course and speed relative to the ground.

NMEA ZDA

The NMEA ZDA datagram contains the universal time code (UTC), day, month, year and local time zone.

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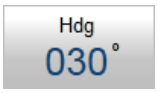
Supported datagram formats for heading and gyro information

The heading sensor provides the sonar with the vessel's current heading.

When enabled, the vessel's current heading is shown on the top bar. The following datagram formats are supported:



NMEA HDT

The NMEA HDT datagram provides the true vessel heading. The information is normally provided by a course gyro.

NMEA HDM

The NMEA HDM datagram provides vessel heading in degrees magnetic. The datagram is no longer recommended for use in new designs. It is often replaced by the NMEA HDG telegram.

NMEA HDG

The NMEA HDG datagram provides heading from a magnetic sensor. If this reading is corrected for deviation, it produces the magnetic heading. If it is offset by variation, it provides the true heading.

NMEA THS

The NMEA THS datagram provides the true vessel heading. The datagram includes a mode indicator field providing critical safety-related information about the heading data. The THS datagram replaces the deprecated HDT.

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Supported datagram formats for trawl information

The data communication from an external trawl system is based on proprietary data formats.

The following datagram formats are supported:

Simrad DAD

Simrad DAD is a proprietary datagram format created by Kongsberg Maritime to provide the ascending or descending depth rate of the trawl sensor.

Simrad DBS

Simrad DBS is a proprietary datagram format created by Kongsberg Maritime to provide the current depth of the trawl sensor.

Simrad GLL

Simrad GLL is a proprietary datagram format created by Kongsberg Maritime to provide the current geographical position of the trawl sensor.

Simrad HB2

Simrad HB2 is a proprietary datagram format created by Kongsberg Maritime. It provides the vertical distance from the headrope to the footrope (opening), and from

the headrope to the bottom (height). It is used for the second trawl in a dual trawl system.

Simrad HFB

Simrad HFB is a proprietary datagram format created by Kongsberg Maritime. It provides the vertical distance from the headrope to the footrope (opening), and from the headrope to the bottom (height). If you use two height sensors, the information from the second sensor is provided in the Simrad HB2 datagram.

Simrad MTW

Simrad MTW is a proprietary datagram format created by Kongsberg Maritime to provide the water temperature measured by the trawl sensor.

Simrad TDS

Simrad TDS is a proprietary datagram format created by Kongsberg Maritime to provide the door spread.That is the distance between the two trawl doors. In a dual trawl system, the distance between the second door set is provided in the Simrad TS2 datagram.

Simrad TFI

Simrad TFI is a proprietary datagram format created by Kongsberg Maritime to provide the status information from maximum three catch sensors.

Simrad TPC

Simrad TPC is a proprietary datagram format created by Kongsberg Maritime to provide the trawl position in Cartesian coordinates.

Simrad TPR

Simrad TPR is a proprietary datagram format created by Kongsberg Maritime. It provides the relative bearing and water depth of the trawl sensor, as well as its distance from the vessel. The bearing resolution is 1 degree.

Simrad TPT

Simrad TPT is a proprietary datagram format created by Kongsberg Maritime to provide the true bearing and water depth of the trawl sensor, as well as its distance from the vessel. The bearing resolution is 1 degree.

Simrad TS2

Simrad TS2 is a proprietary datagram format created by Kongsberg Maritime to provide the door spread in a dual trawl system. That is the distance between the two trawl doors. The distance between the first door set is provided in datagram Simrad TDS.

Simrad TTS

Simrad TTS is a proprietary datagram format created by Kongsberg Maritime. It provides the distance between the trawl sensor and the shoal.

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Supported datagram formats for catch monitoring information

The data communication from an external catch monitoring system is based on proprietary data formats.

The following datagram formats are supported:

Simrad PSIMP,C

Simrad PSIMP,C a proprietary datagram format created by Kongsberg Maritime to provide sensor configuration data.

Simrad PSIMP,D

Simrad PSIMP ,D is a proprietary datagram format created by Kongsberg Maritime to provide the type and configuration of PS and PI sensors used by a Simrad catch monitoring system.

Simrad PSIMP,D1

Simrad PSIMP D1 is a proprietary datagram format created by Kongsberg Maritime to provide the type and configuration of PS, PI and PX sensors used by a Simrad catch monitoring system.

Simrad PSIMP,F

Simrad PSIMP,F is a proprietary datagram format created by Kongsberg Maritime to provide the type and configuration of PS and PI sensors used by a catch monitoring system.

Simrad PSIMP,F1

Simrad PSIMP,F1 is a proprietary datagram format created by Kongsberg Maritime to provide definition data from catch monitoring sensors.

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Supported datagram formats for sound speed sensors

The **Profile** page in the **Environment** dialog box shows the current sound speed profile. You can select a new profile provided by a CTD (Conductivity, Temperature, Depth) sensor.

The following datagram format is supported:

AML Sound speed

AML is a third-party proprietary datagram format created by AML Oceanographic (http://www.amloceanographic.com) for use with their sound velocity probes. The sound velocity probe output is configurable. The code is searching for a value between 1300 and 1800 and uses it as the sound speed.

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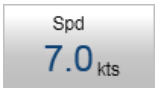
Supported datagram formats for speed log information

An external speed sensor is typically a global positioning system (GPS) or a dedicated speed log.

When enabled, the vessel's current speed is shown on the top bar. The following datagram formats are supported:



NMEA VTG

The NMEA VTG datagram contains the actual course and speed relative to the ground.

NMEA VBW

The NMEA VBW datagram contains water- and ground-referenced vessel speed data.

NMEA VHW

The NMEA VHW datagram contains the compass heading to which the vessel points, and the speed of the vessel relative to the water.

NMEA CUR

The NMEA CUR datagram contains multi-layer water current data. This includes the depth and speed of the current.

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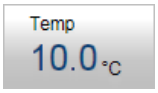
Supported datagram formats for temperature information

A temperature sensor can be connected to the sonar system.

If a suitable sensor is connected to the sonar system, the top bar may show you the current temperature. The function is offered to allow you to monitor the water temperature, but it will display any temperature reading that is made by the sensor.

The following datagram format is supported:

NMEA MTW



The NMEA MTW datagram provides the current water temperature.

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Supported datagram formats for wind information

A wind sensor can be connected to the sonar system. The sensor provides the direction and speed of the wind

The following datagram formats are supported:

NMEA MWD

The NMEA MWD datagram provides the direction from which the wind blows across the earth's surface. The wind direction is related to north. The datagram also offers the wind speed.

NMEA MWV

The NMEA MWV datagram provides the direction from which the wind blows relative to the vessel's centre line.

NMEA VWR

The NMEA VWR datagram provides the wind angle in relation to the vessel's heading, and the wind speed measured relative to the moving vessel. This datagram format is not recommended for use in new designs. It has been replaced by the MWV datagram format.

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Supported datagram formats for external objects

The following datagram formats are supported:

NMEA TLL

The NMEA TLL datagram contains target information; number, name, position and time tag. The TLL datagram allows the sonar system to receive information about targets that are tracked by other systems.

Serpe BSC

Serpe BSC is a proprietary datagram format created by Serpe. It is supplied with buoys and provides the geographical location of the buoy as well as the water temperature the buoy measures.

Ryokusei RBY

Ryokusei RBY is a proprietary datagram format created by Ryokusei. It is supplied with buoys and provides the geographical location of the buoy as well as the water temperature the buoy measures. The datagram also provides echo sounder information.

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Supported datagram formats for palette control

On some vessels, the sonar is used as an integrated part of a large information system. In such cases, the host system may offer a common palette control. This allows you to select a common colour scheme ("skin") used in all the presentations.

The following datagram format is supported:

NMEA DDC

The NMEA DDC (Display Dimming and Control) datagram format allows you to remotely control the colour palette and brightness of the sonar display presentations.

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Supported datagram formats for motion information

The sonar system interfaces peripheral systems and sensors using standard and/or proprietary datagram formats.

The sonar system supports the following datagram formats from a motion sensor:

When enabled, the navigational information on the top bar includes the vessel's current roll, pitch and heave movements. The following datagram formats are supported:

KM Binary

KM Binary is a generic datagram format defined by Kongsberg Maritime. This format has very high resolution on timing and sensor parameters.

Kongsberg EM Attitude 3000

The Kongsberg EM Attitude 3000 is a proprietary datagram format created by Kongsberg Maritime for use with digital motion sensors. It holds roll, pitch, heave and heading information.

Furuno GPatt

Furuno GPatt is a proprietary datagram format created by Furuno (http://www.furuno.jp) to contain pitch, roll and yaw information.

Furuno GPhve

Furuno GPhve is a proprietary datagram format created by Furuno (http://www.furuno.jp) to contain heave information.

Hemisphere GNSS GPHEV

GPHEV is a proprietary datagram format created by Hemisphere GNSS (https://hemispheregnss.com) to contain heave information.

Teledyne TSS1

Teledyne TSS1 is a proprietary datagram format created by Teledyne TSS Navigation Systems for heave, roll and pitch compensation. When you select this protocol, the number of sensor variables is fixed, and there is no token associated with it.

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Outputs

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Supported datagram formats for target marker outputs

Use the **Output Marker** page to export target markers to a communication port. Each marker is identified with its geographical location. This marker location can be very useful for other instruments For example, you can export this information to a chartplotter.

The following datagram formats are supported:

MDS

Simrad MDS is a proprietary datagram format created by Kongsberg Maritime. It contains the location, bearing and depth of a tracked target. All information is presented relative to your own vessel. All data are related to the tracked target.

TPP

Simrad TPP is a proprietary datagram format created by Kongsberg Maritime. It exports the horizontal range, bearing and depth of a tracked target. All data are related to the tracked target.

NMEA TLL

The NMEA TLL datagram contains target information; number, name, position and time tag. The TLL datagram allows the sonar system to export information about the currently tracked targets.

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Datagram formats

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About NMEA and standard datagram formats

Topics

About the NMEA datagram formats

The sonar system can send and receive information to and from several different peripherals. All transmissions take place as *datagrams* with data sentences. Each datagram has a defined format and length.

The NMEA 0183 standard is the most common protocol used to receive and transmit data to and from peripheral sensors. A parametric sentence structure is used for all NMEA data.

The sentence starts with a “$” delimiter and represents the majority of approved sentences defined by the standard. This sentence structure with delimited and defined data files, is the preferred method for conveying information.

For more information about the NMEA standard, the format and the data sentences, refer to NMEA’s official publications. The *NMEA 1083 - Standard for Interfacing Marine Electronic Devices* document explains the formats in detail. The document can be obtained from NMEA.

Note

The terms "Datagram" and "telegram" are generally used to describe the basic transfer unit associated with a packet-switched network. The term "sentence" is also used. In this publication, we use the term "datagram".

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NMEA

The National Marine Electronics Association (NMEA) has defined communication standards for maritime electronic equipment. The sonar system supports these standards for communication with external sensors and peripheral devices.

The most common standard is NMEA 0183. The National Marine Electronics Association describes it as follows:

> The NMEA 0183 Interface Standard defines electrical signal requirements, data transmission protocol and time, and specific sentence formats for a 4800-baud serial data bus. Each bus can have only one talker but many listeners.
>
> *National Marine Electronics Association*

For more information about the National Marine Electronics Association and the NMEA 0183 standard, refer to the organization's web site at:

- http://www.nmea.org

Related topics

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NMEA sentence structure

A sentence structure is defined by NMEA to establish the communication between two units. Most other datagram formats are designed using the same, or a similar, structure.

The following provides a summary explanation of the approved parametric sentence structure:

`$aaccc,c-c*hh<CR><LF>`

$

This character (Hex: 24) is used to identify the start of a sentence.

aaccc

This is the address field. The first two characters (aa) identify the *talker ID*, while the last three characters are the *sentence formatter* mnemonic code identifying the data type and the string format of the successive fields.

,

The comma (Hex: 2C) is used as a *field delimiter*. This character starts each field except the address and checksum fields. If it is followed by a null field, it is all that remains to indicate that there are no data in the field.

c-c

This is the *data sentence block*. This is a series of data fields containing all the data to be transmitted. The data field sentence is fixed and identified by the sentence formatter in the address field. Data fields may be of variable length, and they are preceded by the field delimiter.

*****

This character (Hex: 2A) is the *checksum delimiter*. This delimiter follows the last field of the sentence and indicates that the following two alphanumerical characters contain the checksum.

hh

This is the *checksum*.

<CR><LF>

The carriage return and line feed characters terminate the datagram sentence.

Note

In some proprietary datagrams received from other Kongsberg Maritime equipment, the $ character is replaced by the @ character. The checksum field may then not be in use.

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Standard NMEA 0183 communication parameters

The sonar system uses both NMEA and proprietary datagram formats to communicate with peripheral systems and sensors. The majority of the datagrams used by the sonar system are defined by the National Marine Electronics Association (NMEA). NMEA has defined a fixed set of transmission parameters.

The communication parameters defined for NMEA 0183 are:

- **Baud rate**: 4800 bit/s
- **Data bits**: 8
- **Parity**: Even
- **Stop bits**: 1

Some instruments may provide other parameters and/or options. You must always check the relevant technical documentation supplied by the manufacturer.

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NMEA datagram formats

Topics

NMEA CUR datagram format

The NMEA CUR datagram contains multi-layer water current data. This includes the depth and speed of the current.

Format

```
$--CUR,A,x,d,l.l,m.m,x.x,a,k.k,r.r,h.h,a,a,*hh<CR><LF>
```

Description

This description is not complete. For additional details, refer to the NMEA standard.

1 **$—**: Talker identifier

2 **CUR**: Datagram identifier

3 **A**: Validity

- **A** = The data are valid.
- **V** = The data are not valid.

4 **d**: Data set number (1 - 9)

5 **l.l**: Layer number

6 **m.m**: Depth (Metres)

7 **x.x**: Sea current direction in degrees

8 **a**: Direction reference in use

- **T** = True
- **R** = Relative

9 **k.k**: Sea current speed in knots

10 **r.r**: Reference layer depth in metres

11 **h.h**: Heading

12 **a**: Heading reference

- **T** = True
- **M** = Magnetic

13 **a**: Speed reference

- **B** = Bottom track
- **W** = Water track
- **P** = Positioning system

14 ***hh**: Checksum

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NMEA DBS datagram format

The NMEA DBS datagram provides the current depth from the surface. The datagram is no longer recommended for use in new designs. It is frequently replaced by the NMEA DPT datagram format.

Format

```
$--DBS,x.x,f,y.y,M,z.z,F*hh<CR><LF>
```

Description

All depths are measured from below the sea surface.

1 **$—**: Talker identifier

2 **DBS**: Datagram identifier

3 **x.x,f**: Depth (Feet)

4 **y.y,M**: Depth (Metres)

5 **z.z,F**: Depth (Fathoms)

6 ***hh**: Checksum

Tip

If you need the depth below the keel, use the NMEA DBK datagram. If you need the depth below the transducer, use the NMEA DBT datagram.

Related topics
Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA DBT datagram format

The NMEA DBT datagram provides the current depth under the transducer. In new designs, this datagram format is frequently used to replace the DBK and DBS formats.

Format

```
$--DBT,x.x,f,y.y,M,z.z,F*hh<CR><LF>
```

Description

All depths are measured from below the transducer face.

1 **$—**: Talker identifier

2 **DBT**: Datagram identifier

3 **x.x,f**: Depth (Feet)

4 **y.y,M**: Depth (Metres)

5 **z.z,F**: Depth (Fathoms)

6 ***hh**: Checksum

Tip

If you need the depth below the keel, use the NMEA DBK datagram. If you need the depth below the surface, use the NMEA DBS datagram.

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA DDC datagram format

The NMEA DDC (Display Dimming and Control) datagram format allows you to remotely control the colour palette and brightness of the sonar display presentations.

Format

```
$--DDC,a,xx,b,c*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **DDC**: Datagram identifier

3 **a**: Display dimming

- **D** = Daytime setting
- **K** = Dusk setting
- **N** = Nighttime setting
- **O** = The display backlight is turned off.

4 **xx**: Brightness (Percentage)

5 **a**: Colour palette

- **D** = Daytime setting
- **K** = Dusk setting
- **N** = Nighttime setting
- **O** = The display backlight is turned off.

6 **a**: Status

- **R** = The datagram is provided as a status report.
- **C** = The datagram is provided as a command to change settings.

This datagram description is not complete. For more information, refer to the source specifications issued by National Marine Electronics Association (NMEA).

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA DPT datagram format

The NMEA DPT datagram provides the water depth relative to the transducer, and the offset of the measuring transducer.

Format

```
$--DPT,x.x,y.y,z.z*hh<CR><LF>
```

Description

This description is not complete. For additional details, refer to the NMEA standard.

1 **$—**: Talker identifier

2 **DPT**: Datagram identifier

3 **x.x**: Depth (Metres) Relative to the transducer

4 **y.y**: Offset (Metres) Relative to the transducer

- Positive offset numbers provide the distance from the transducer to the water line.
- Negative offset numbers provide the distance from the transducer to the part of the keel of interest.

5 **z.z**: This is the maximum range scale in use.

6 ***hh**: Checksum

Tip

If you need the depth below the keel, use the NMEA DBK datagram. If you need the depth below the surface, use the NMEA DBS datagram. If you need the depth below the transducer, use the NMEA DBT datagram.

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA GGA datagram format

The NMEA GGA datagram transfers time-, position- and fix-related data from a global positioning system (GPS).

Format

```
$--GGA,hhmmss.ss,llll.ll,a,yyyyy.yy,a,x,zz,d.d,a.a,M,g.g,M,r.r,cccc*hh
```

Description

1 **$—**: Talker identifier

2 **GGA**: Datagram identifier

3 **hhmmss.ss**: Coordinated Universal Time (UTC) of the current position

4 **lll.ll,a**: Latitude, North/South (Degrees, minutes and hundredths)

- **N** = North
- **S** = South

5 **yyyyy.yy,a**: Longitude, East/West (Degrees, minutes and hundredths)

- **E** = East
- **W** = West

6 **x**: Quality indicator for the GPS (Global Positioning System) (Refer to the NMEA standard for further information about the GPS quality indicator.)

7 **zz**: Number of satellites in use: (00 - 12) (The number of satellites may be different from the number in view.)

8 **d.d**: HDOP (Horizontal dilution of precision)

9 **a.a,M**: Altitude related to mean sea level (geoid) (Metres)

10 **g.g,M**: Geoidal separation (Metres)

11 **r.r**: Age of GPS (Global Positioning System) data

12 **cccc**: Identification of differential reference station: (0000 - 1023)

13 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA GGK datagram format

The NMEA GGK datagram is used to decode the PTNL, Time, Position, Type and DOP (Dilution of Precision) string of the NMEA 0183 output.

Format

```
$--GGK,hhmmss.ss,ddmmyy,nnnnn.nnnnnnnn,a,yyyyy.yyyyyyyy,a,x,zz,w.w,EHTeeeeee,u*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **GGK**: Datagram identifier

3 **hhmmss.ss**: Coordinated Universal Time (UTC) of the current position

4 **ddmmyy**: Day, month and year

5 **nnnnn.nnnnnnnn,a**: Latitude, North/South (Degrees, minutes and hundredths)

- **N** = North
- **S** = South

6 **yyyyy.yyyyyyyy,a**: Longitude, East/West (Degrees, minutes and hundredths)
   - **E** = East
   - **W** = West
7 **x**: Quality indicator for the GPS (Global Positioning System) (Refer to the NMEA standard for further information about the GPS quality indicator.)
8 **zz**: Number of satellites in use (00 - 12) (The number of satellites may be different from the number in view.)
9 **w.w**: PDOP (Position dilution of precision)
10 **EHTeeeeee**: Ellipsoidal height of fix
11 **u**: Unit of height measurement
12 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA GLL datagram format

The NMEA GLL datagram transfers the latitude and longitude of vessel position, the time of the position fix and the current status from a global positioning system (GPS).

Format

```
$--GLL,llll.ll,a,yyyyy.yy,a,hhmmss.ss,A,a*hh<CR><LF>
```

Description

1 **$—**: Talker identifier
2 **GLL**: Datagram identifier
3 **llll.ll,a**: Latitude, North/South (Degrees, minutes and hundredths)
   - **N** = North
   - **S** = South
4 **yyyyy.yy,a**: Longitude, East/West (Degrees, minutes and hundredths)
   - **E** = East
   - **W** = West

5 **hhmmss.ss**: Coordinated Universal Time (UTC) of the current position

6 **A**: Status

- **A** = The data are valid.
- **V** = The data are not valid.

7 **a**: Mode indicator

8 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA HDG datagram format

The NMEA HDG datagram provides heading from a magnetic sensor. If this reading is corrected for deviation, it produces the magnetic heading. If it is offset by variation, it provides the true heading.

Format

```
$--HDG,x.x,z.z,a,r.r,a*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **HDG**: Datagram identifier

3 **x.x**: (Degrees (Magnetic))

4 **z.z,a**: Deviation (Degrees (Magnetic)), East/West

- **W** = West
- **E** = East

5 **r.r,a** Variation (Degrees (Magnetic)), East/West

- **W** = West
- **E** = East

6 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA HDM datagram format

The NMEA HDM datagram provides vessel heading in degrees magnetic. The datagram is no longer recommended for use in new designs. It is often replaced by the NMEA HDG telegram.

Format

```
$--HDM,x.x,M*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **HDM**: Datagram identifier

3 **x.x,M**: (Degrees, Magnetic)

4 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA HDT datagram format

The NMEA HDT datagram provides the true vessel heading. The information is normally provided by a course gyro.

Format

```
$--HDT,x.x,T*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **HDT**: Datagram identifier

3 **x.x,T**: Heading (Degrees, True)

4 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA MTW datagram format

The NMEA MTW datagram provides the current water temperature.

Format

```
$--MTW,x.x,C*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **MTW**: Datagram identifier

3 **x.x,C**: Temperature (Degrees, Celsius)

4 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA MWD datagram format

The NMEA MWD datagram provides the direction from which the wind blows across the earth's surface. The wind direction is related to north. The datagram also offers the wind speed.

Format

```
$--MWD,x.x,T,y.y,M,z.z,N,s.s,M*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **MWD**: Datagram identifier

3 **x.x,T**: Wind direction (True) (0 to 359 degrees)

4 **y.y,M**: Wind direction (Magnetic) (0 to 359 degrees)

5 **z.z,N**: Wind speed (knots)

6 **s.s,M**: Wind speed (metres/second)

7 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA MWV datagram format

The NMEA MWV datagram provides the direction from which the wind blows relative to the vessel's centre line.

Format

```
$--MWV,x.x,a,y.y,b*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **MWV**: Datagram identifier

3 **x.x**: NMEA MWV (0 to 359 degrees)

4 **a**: Reference

- **R** = Relative
- **T** = Theoretical

5 **y.y**: Wind speed

6 **b**: Wind speed unit (K/M/N/S)

7 ***hh**: Checksum

Related topics
Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA RMC datagram format

The NMEA RMC datagram transfers the time, date, position, course and speed data from a global navigation satellite system (GNSS) receiver.

Format

```
$--RMC,hhmmss.ss,A,llll.ll,a,yyyyy.yy,a,x.x,z.z,ddmmyy,r.r,a,a*hh
```

Description

1 **$—**: Talker identifier

2 **RMC**: Datagram identifier

3 **hhmmss.ss**: Coordinated Universal Time (UTC) of the current position

4 **A**: Status

- **A** = The data are valid.
- **V** = The data are not valid.

5 **llll.ll,a**: Latitude, North/South (Degrees, minutes and hundredths)

- **N** = North
- **S** = South

6 **yyyyy.yy,a**: Longitude, East/West (degrees, minutes and hundredths)

- **W** = West
- **E** = East

7 **x.x**: Speed over ground (knots)

8 **z.z**: Course over ground (degrees (True))

9 **ddmmyy**: Date

10 **r.r,a**: Magnetic variation, East/West (degrees)

- **E** = East
- **W** = West

11 **a**: Mode indicator

12 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA THS datagram format

The NMEA THS datagram provides the true vessel heading. The datagram includes a mode indicator field providing critical safety-related information about the heading data. The THS datagram replaces the deprecated HDT.

Format

```
$--HETHS,x.xx,a*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **HETHS**: Datagram identifier

3 **x.xx**: Heading (Degrees)

4 **a**: Mode

- **A**: Autonomous
- **V**: The data are not valid.

5 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA TLL datagram format

The NMEA TLL datagram contains target information; number, name, position and time tag. The TLL datagram allows the sonar system to receive information about targets that are tracked by other systems.

Format

```
$--TLL,xx,llll.ll,a,yyyyy.yy,a,c--c,hhmmss.ss,a,b*hh <CR><LF>
```

Description

1 **$—**: Talker identifier

2 **TLL**: Datagram identifier

3 **xx**: Target number

4 **llll.ll,a**: Target latitude

- **N** = North
- **S** = South

5 **yyyyy.yy,a**: Target longitude

- **E** = East
- **W** = West

6 **c--c**: Target name

7 **hhmmss.ss**: Coordinated Universal Time (UTC)

8 **a**: Target status

- **L** = Lost
- **Q** = Query
- **T** = Tracking

9 **b**: Value is set to "R" if target is a reference used to determined own-ship position or velocity.

10 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA VBW datagram format

The NMEA VBW datagram contains water- and ground-referenced vessel speed data.

Format

```
$--VBW,x.x,z.z,A,r.r,q.q,A,p.p,A,c.c,A*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **VBW**: Datagram identifier

3 **x.x**: Speed relative to water, Longitudinal (knots)

4 **z.z**: Speed relative to water, Transverse (knots)

5 **A**: Speed relative to water, Status

- **A** = The data are valid.
- **V** = The data are not valid.

6 **r.r**: Speed relative to ground, Longitudinal (knots)

7 **q.q**: Speed relative to ground, Transverse (knots)

8 **A**: Speed relative to ground, Status

- **A** = The data are valid.
- **V** = The data are not valid.

9 **p.p**: Speed relative to water, Stern, Transverse (knots)

10 **A**: Speed relative to water, Stern, Status

- **A** = The data are valid.
- **V** = The data are not valid.

11 **c.c**: Speed relative to ground, Stern, Transverse (knots)

12 **A**: Speed relative to ground, Stern, Status

- **A** = The data are valid.
- **V** = The data are not valid.

13 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA VHW datagram format

The NMEA VHW datagram contains the compass heading to which the vessel points, and the speed of the vessel relative to the water.

Format

```
$--VHW,x.x,T,x.x,M,x.x,N,x.x,K*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **VHW**: Datagram identifier

3 **x.x,T**: Heading (Nautical miles)

4 **x.x,M**: Heading (Degrees (Magnetic))

5 **x.x,N**: Speed relative to water (knots), Resolution = 0.1 knots

6 **x.x,K**: Speed relative to water (km/h), Resolution = 0.1 km/h

7 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA VTG datagram format

The NMEA VTG datagram contains the actual course and speed relative to the ground.

Format

```
$--VTG,x.x,T,y.y,M,z.z,N,g.g,K,a*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **VTG**: Datagram identifier

3 **x.x,T**: Course over ground (Degrees, True)

4 **y.y,M**: Course over ground (Degrees, Magnetic)

5 **z.z,N**: Speed over ground (knots)

6 **g.g,K**: Speed over ground (km/h)

7 **a**: Mode indicator

- A = Autonomous
- D = Differential
- N = The data are not valid.

8 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA VWR datagram format

The NMEA VWR datagram provides the wind angle in relation to the vessel's heading, and the wind speed measured relative to the moving vessel.

Note

This datagram format is not recommended for use in new designs. It has been replaced by the MWV datagram format.

Format

```
$--VWR,x.x,a,y.y,N,z.z,M,s.s,K*hh<CR><LF>
```

Description

1 **$—**: Talker identifier

2 **VWR**: Datagram identifier

3 **x.x**: Wind angle (0 to 180 degrees)

4 **a**: Reference

- **L** = Left
- **R** = Right

5 **y.y,N**: Wind speed (knots)

6 **z.z,M**: Wind speed (metres/second)

7 **s.s,K**: Wind speed (kilometres/hour)

8 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

NMEA ZDA datagram format

The NMEA ZDA datagram contains the universal time code (UTC), day, month, year and local time zone.

Format

```
$--ZDA,hhmmss.ss,xx,yy,zzzz,hh,mm*hh<CR><LF>
```

Description

This description is not complete. For additional details, refer to the NMEA standard.

1 **$—**: Talker identifier

2 **ZDA**: Datagram identifier

3 **hhmmss.ss**: Coordinated Universal Time (UTC) of the current position

4 **xx**: Day (01 - 31) (Part of UTC)

5 **yy**: Month (01 - 12) (Part of UTC)

6 **zzzz**: Year (Part of UTC)

7 **hh**: Local time zone, (00 - ±13)

8 **mm**: Local time zone, (00 - 59)

9 ***hh**: Checksum

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
NMEA datagram formats, page 30

Proprietary datagram formats

Topics

ATS Annotation datagram format

ATS Annotation is a proprietary datagram format created by Kongsberg Maritime. It allows you to import text annotations from external devices.

Format

```
$??ATS,tttt<CR><LF>
```

Description

1 **??**: talker identifier

2 **ATS**: datagram identifier

3 **tttt**: free text

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad PSIMP,C datagram format

Simrad PSIMP,C a proprietary datagram format created by Kongsberg Maritime to provide sensor configuration data.

Format

```
$PSIMP,C,tt,dd,M,U,DT,VS,FF,SWuC,SWDSP,cal,find,agc,mgain,mpf,mpfl,if,ifl*chksum<CR><LF>
```

Description

Note

This datagram description is not complete. For more information, contact Kongsberg Maritime.

1 **PS**: Talker identifier

2 **IMP**: Datagram identifier

3 **C**: Sentence specifier

4 **tt**: Time

5 **dd**: Date

6 **M**: Unit of measurement; Depth

- **M** = metres
- **f** = feet
- **F** = fathoms
- **P** = Passi braccio

7 **U**: Unit of measurement; Temperature

- **C** = Celsius
- **F** = Fahrenheit

8 **TD**: Detection threshold, Receiver, 3 to 20 dB

9 **VS**: Vessel speed, 1 to 20 knots (This is the maximum speed of the vessel during the pursuing operations.)

10 **FF**: This is a 2-character field with filter settings for the digital, analogue and hybrid sensors. The left character identifies the filter setting for the digital sensors. The right character identifies filter setting for the analogue and hybrid sensors.

- **0** = Off
- **1** = Weak
- **2** = Medium
- **3** = Strong

11 **SWuC**: Software version, Microcontroller

12 **SWDSP**: Software version, Digital Signal Processor (DSP)

13 **cal**: Value ="1" to initiate depth sensor calibration

14 **find**: Value ="1" to initiate sensor finder (not implemented)

15 **agc**: AGC (Automatic Gain Control)

- **0** = Off
- **1** = Active

16 **mgain**: Manual gain (AGC (Automatic Gain Control) = Off)

- 0 dB
- 20 dB
- 40 dB

17 **mpf**: Multipath filter

- **0** = Off
- **1** = Active

18 **mpfl**: Multipath filter (Value)

- **0** = Test
- **1** = Fresh
- **2** = Salt

19 **if**: Interference filter

- **0** = Off
- **1** = Active

20 **ifl**: Interference filter level = 0 - 9

21 **chksum**: Checksum (The checksum field consists of a "*" and two hex digits representing the exclusive OR of all characters between, but not including, the "$" and "*" characters.)

Note

This datagram format is obsolete.It is no longer in use on new designs.

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad PSIMP,D datagram format

Simrad PSIMP ,D is a proprietary datagram format created by Kongsberg Maritime to provide the type and configuration of PS and PI sensors used by a Simrad catch monitoring system.

Format

```
$PSIMP,D,tt,dd,M,U,S,C,V,Cr,Q,In,SL,NL,G,Cb,error*chksum<CR><LF>
```

Description

Note

This datagram description is not complete. For more information, contact Kongsberg Maritime.

1 **PS**: Talker identifier

2 **IMP**: Datagram identifier

3 **D**: Sentence specifier

4 **tt**: Time

5 **dd**: Date

6 **M**: Type of measurement

- **D** = Depth
- **T** = Temperature
- **C** = Catch
- **B** = Bottom
- **N** = No sensor
- **M** = Marker

7 **U**: Unit of measurement

- **M** = Depth measurements (metres)
- **f** = Depth measurements (feet)
- **F** = Depth measurements (fathoms)
- **C** = Temperature measurements (Celsius)
- **F** = Temperature measurements (Fahrenheit)

8 **S**: Sensor number (1, 2, 3)

9 **C**: Channel (This is the number of the communication channel for the current data source. (1 - 30))

10 **V**: Value (This is the magnitude of the measurement made by the sensor.)

11 **Cr**: Change rate

12 **Q**: Quality

- **0** = There is no connection between the sensor and the receiver.
- **1** = One or two telemetry pulses are lost. The measured value is predicted.
- **2** = The measured data is reliable.

13 **In**: Interference

- **0** = Interference is not detected.
- **1** = Interference is detected.

14 **SL**: Signal level (dB // 1 µPa)

15 **NL**: Noise level (dB // 1 µPa)

16 **G**: Gain (0, 20 or 40 dB)

17 **Cb**: Cable quality

- **0** = The cable is not connected.
- **1** = The cable is in good working order.
- **2** = The cable is short-circuited, or the hydrophone current is too large.

18 **error**: Error (**0** means that no errors ares detected. Any other value indicates an error condition.)

19 **chksum**: Checksum (The checksum field consists of a "*" and two hex digits representing the exclusive OR of all characters between, but not including, the "$" and "*" characters.)

Note

This datagram format is obsolete. It is no longer in use on new designs. It has been replaced by datagram PSIMP ,D1.

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad PSIMP,F datagram format

Simrad PSIMP,F is a proprietary datagram format created by Kongsberg Maritime to provide the type and configuration of PS and PI sensors used by a catch monitoring system.

Format

```
$PSIMP,F,S1,S2,S3,T1,T2,T3,F1,F2,F3*chksum<CR><LF>
```

Description

Note

This datagram description is not complete. For more information, contact Kongsberg Maritime.

1 **PS**:Talker identifier

2 **IMP**: Datagram identifier

3 **F**: Sentence specifier

4 **S1,S2,S3**: Sensor types
   - **D** = Depth (300 metres)
   - **E** = Depth (600 metres)
   - **T** = Temperature
   - **C** = Catch (Slow)
   - **F** = Catch (Fast)
   - **B** = Bottom
   - **N** = No sensor
5 **T1,T2,T3**: Channel
6 **F1,F2,F3**: Offset
7 **chksum**: Checksum (The checksum field consists of a "*" and two hex digits representing the exclusive OR of all characters between, but not including, the "$" and "*" characters.)

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad DAD datagram format

Simrad DAD is a proprietary datagram format created by Kongsberg Maritime to provide the ascending or descending depth rate of the trawl sensor.

Format

```
@IIDAD,x.x,M,y.y,M<CR><LF>
```

Description

1 **II**: Talker identifier
2 **DAD**: Datagram identifier
3 **x.x,M**: Depth (Metres)
4 **y.y,M**: Depth changes (Metres/Minutes) The value is negative when the depth is ascending.

Related topics
Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad DBS datagram format

Simrad DBS is a proprietary datagram format created by Kongsberg Maritime to provide the current depth of the trawl sensor.

Format

```
@IIDBS,,,x.x,M,,<CR><LF>
```

Description

1 **II**: Talker identifier

2 **DBS**: Datagram identifier

3 **x.x,M**: Depth (Metres) (0 - 2000)

Related topics
Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad GLL datagram format

Simrad GLL is a proprietary datagram format created by Kongsberg Maritime to provide the current geographical position of the trawl sensor.

Note

The GLL datagram may be received from integrated instruments using the "ii" talker identifier. The Simrad ITI system uses the same talker identifier "ii", and this has caused some confusion. In order to rectify this, the ITI GLL datagram has been deactivated.

Format

```
$IIGLLddmm.hh,N,dddmm.hh,W,hhmmss.ss,A<CR><LF>
```

Description

1 **II**: Talker identifier

2 **GLL**: Datagram identifier

3 **ddmm.hh,N**: Latitude (degrees, minutes and hundredths)

- **N** = North
- **S** = South

4 **ddmm.hh,W**: Longitude (degrees, minutes and hundredths)

- **W** = West
- **E** = East

5 **A**: Status

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad HB2 datagram format

Simrad HB2 is a proprietary datagram format created by Kongsberg Maritime. It provides the vertical distance from the headrope to the footrope (opening), and from the headrope to the bottom (height). It is used for the second trawl in a dual trawl system. The heights are measured by an ITI TrawlEye or a height sensor.

Format

```
@IIHB2,x.x,M,y.y,M<CR><LF>
```

Description

1 **II**: Talker identifier

2 **HB2**: Datagram identifier

3 **x.x,M**: This is the distance (height) from the headrope to the footrope. (0 - 100 m)

4 **y.y, M**: This is the distance (height) from headrope to bottom (seabed). (0 - 100 m)

Tip

The information from the sensor on the first trawl is provided in the Simrad HFB datagram.

Related topics
Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad HFB datagram format

Simrad HFB is a proprietary datagram format created by Kongsberg Maritime. It provides the vertical distance from the headrope to the footrope (opening), and from the headrope to the bottom (height). The heights are measured by an ITI TrawlEye or a height sensor.

Format

```
@IIHFB,x.x,M,y.y,M<CR><LF>
```

Description

1 **II**: Talker identifier

2 **HFB**: Datagram identifier

3 **x.x,M**: This is the distance (height) from the headrope to the footrope. (0 - 100 m)

4 **y.y, M**: This is the distance (height) from headrope to bottom (seabed). (0 - 100 m)

Tip

If you use two height sensors, the information from the second sensor is provided in the Simrad HB2 datagram.

Related topics
Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad MTW datagram format

Simrad MTW is a proprietary datagram format created by Kongsberg Maritime to provide the water temperature measured by the trawl sensor.

Format

```
$IIMTW,xx.x,C<CR><LF>
```

Description

1 **II**: Talker identifier

2 **MTW**: Datagram identifier

3 **xx.x,C**: Water temperature (Degrees, Celsius)

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad TDS datagram format

Simrad TDS is a proprietary datagram format created by Kongsberg Maritime to provide the door spread. That is the distance between the two trawl doors.

Format

```
@IITDS,x.x,M<CR><LF>
```

Description

1 **II**: Talker identifier

2 **TDS**: Datagram identifier

3 **x.x,M**: Distance (metres)

Note

In a dual trawl system, the distance between the second door set is provided in the Simrad TS2 datagram.

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad TFI datagram format

Simrad TFI is a proprietary datagram format created by Kongsberg Maritime to provide the status information from maximum three catch sensors.

Format

```
@IITFI,x,y,z<CR><LF>
```

Description

1 **II**: Talker identifier

2 **TFI**: Datagram identifier

3 **x**: Status #1

- **0** = Off
- **1** = On
- **2** = No answer

4 **y**: Status #2

- **0** = Off
- **1** = On
- **2** = No answer

5 **z**: Status#3

- **0** = Off
- **1** = On
- **2** = No answer

Related topics

Supported datagram formats, page 12
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Proprietary datagram formats, page 49

Simrad TPC datagram format

Simrad TPC is a proprietary datagram format created by Kongsberg Maritime to provide the trawl position in Cartesian coordinates.

Format

```
@IITPC,x,M,y,M,z,M<CR><LF>
```

Description

1 **II**: Talker identifier

2 **TPC**: Datagram identifier

3 **x,M**: This is the horizontal distance in metres from the vessel's centre line.

4 **y,M**: This is the horizontal distance in metres from the transducer to the trawl along the vessel's centre line.

5 **z,M**: This is the depth in metres of the trawl below the water surface.

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad TPR datagram format

Simrad TPR is a proprietary datagram format created by Kongsberg Maritime. It provides the relative bearing and water depth of the trawl sensor, as well as its distance from the vessel. The bearing resolution is 1 degree.

Format

```
@IITPR,x,M,y,P,z.z,M<CR><LF>
```

Description

Note

All data relate to the trawl sensor (target).

1 **II**: Talker identifier

2 **TPR**: Datagram identifier

3 **x,M**: Horizontal range (Metres) (0 – 4000)

4 **y,P**: Bearing (degrees) (Relative to vessel heading)

5 **z,z,M**: Depth (Metres) (0 - 2000)

Note

The Simrad ITI measures the depth differently from the range and the bearing. If the ITI only knows the range and the bearing, the depth field is empty.

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad TPT datagram format

Simrad TPT is a proprietary datagram format created by Kongsberg Maritime to provide the true bearing and water depth of the trawl sensor, as well as its distance from the vessel. The bearing resolution is 1 degree.

Format

```
@IITPT,x,M,y,P,z.z,M<CR><LF>
```

Description

Note

All data relate to the trawl sensor (target).

1 **II**: Talker identifier

2 **TPT**: Datagram identifier

3 **x,M**: Horizontal range (Metres) (0 - 4000)

4 **y,P**: Bearing (degrees) (True)

5 **z,z,M**: Depth (Metres) (0 - 2000)

Note

The Simrad ITI measures the depth differently from the range and the bearing. If the ITI only knows the range and the bearing, the depth field is empty.

Related topics
Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad TS2 datagram format

Simrad TS2 is a proprietary datagram format created by Kongsberg Maritime to provide the door spread in a dual trawl system. That is the distance between the two trawl doors.

Format

```
@IITS2,x.x,M<CR><LF>
```

Description

1 **II**: Talker identifier

2 **TS2**: Datagram identifier

3 **x.x,M**: Distance (Metres)

Note

The distance between the first door set is provided in datagram Simrad TDS.

Related topics
Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad TTS datagram format

Simrad TTS is a proprietary datagram format created by Kongsberg Maritime. It provides the distance between the trawl sensor and the shoal.

Format

```
@IITTS,x,M,y,M,z,M<CR><LF>
```

Description

1 **II**: Talker identifier

2 **TTS**: Datagram identifier

3 **x,M**: This is the horizontal distance in metres from the trawl to the shoal in a direction normal to the vessel's centre line.

4 **y,M**: This is the horizontal distance in metres from the trawl to the shoal in the direction of the vessel's centre line.

5 **z,M**: This is the vertical distance (height) in metres from the trawl to the shoal.

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
Proprietary datagram formats, page 49

Simrad MDS datagram format

Simrad MDS is a proprietary datagram format created by Kongsberg Maritime. It contains the location, bearing and depth of a tracked target. All information is presented relative to your own vessel. All data are related to the tracked target.

Format

```
$PSIMMDS,hh:mm:ss,dd:mm:yy,aaaa,A,llll.lll,a,
yyyyy.yyy,a,xxx(+),M,ppp,P,zzz(+),M,vvv.v,N,
ttt,D,www(+),A,ddd(+),A*hh<CR><LF>
```

Description

1 **$PSIM**: Talker identifier

2 **MDS**: Datagram identifier

3 **hh:mm:ss**: Coordinated Universal Time (UTC)

4 **dd:mm:yy**: Date (Day, month and year)

5 **aaaa**: Target identification

These four characters contain the target identifier on the format AT X, where X is an integer defining the target number. The sonar system will export information from maximum three tracked targets simultaneously.

- If one target is tracked, one datagram is exported.
- If two targets are tracked, two consecutive datagrams are exported.
- If three targets are tracked, three consecutive datagrams are exported.
- If a fourth target is selected, the information about the first (oldest) target is disabled.

6 **A**: Status

- **V**: The information is valid.
- **N**: The information is not valid.

7 **llll.lll,a**: Latitude (Degrees, minutes and hundredths)

- **N**: North
- **S**: South

8 **yyyyy.yyy,a**: Longitude (Degrees, minutes and hundredths)

- **W**: West
- **E**: East

9 **xxx(+),M**: Horizontal range (Metres)

An empty denomination field indicates an invalid value. This field has a variable length that must contain minimum three digits.

10 **ppp,P**: Direction to target in degrees, relative to north

An empty denomination field indicates an invalid value.

11 **zzz(+),M**: Depth (Metres)

An empty denomination field indicates an invalid value. This field has a variable length that must contain minimum three digits.

12 **vv.v,N**: Speed (knots)

An empty denomination field indicates an invalid value.

13 **ttt,D**: Course (degrees)

An empty denomination field indicates an invalid value.

14 **www(+),A**: Area in square metres

An empty denomination field indicates an invalid value. This field has a variable length that must contain minimum three digits.

15 **ddd(+),A**: Volume in tonnes

An empty denomination field indicates an invalid value. This field has a variable length that must contain minimum three digits.

16 ***hh**: Checksum

Related topics

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Simrad TPP datagram format

Simrad TPP is a proprietary datagram format created by Kongsberg Maritime. It exports the horizontal range, bearing and depth of a tracked target. All data are related to the tracked target.

Format

```
@SSTPP,xxxx,M,yyy,P,zzzz,M,nn<CR><LF>
```

Description

1 **SS**: Talker identifier

2 **TPP**: Datagram identifier

3 **xxxx,M**: Horizontal range (Metres)

4 **yyy,P**: Bearing (degrees) (Relative to vessel heading)

5 **zzzz,M**: Depth (Metres)

6 **nn**: Target identification

- **00**: An echo target is tracked.
- **10**: A position is tracked.
- **20 – 29**: Markers 0 to 9 are tracked.

Position datagrams for markers are not exported.

Related topics

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Kongsberg EM Attitude 3000 datagram format

The Kongsberg EM Attitude 3000 is a proprietary datagram format created by Kongsberg Maritime for use with digital motion sensors. It holds roll, pitch, heave and heading information. The datagram contains a 10-byte message.

Format

Data description	Example	Format	Valid range
Sync byte 1 / Sensor status **[1]**	90h to Afh = sensor status	1U	00h, 90h to Afh
Sync byte 2	Always 90h	1U	144
Roll LSB **[2]**		1U	

Data description	Example	Format	Valid range
Roll MSB **[2]**		1U	
Pitch LSB **[2]**		1U	
Pitch MSB **[2]**		1U	
Heave LSB **[2]**		1U	
Heave MSB **[2]**		1U	
Heading LSB **[2]**		1U	
Heading MSB **[2]**		1U	

Description

LSB = least significant byte

MSB = most significant byte.

1 **Sync byte 1 / Sensor status**

- **00h**: This value is sync byte 1.
- **90h**: This value indicates valid measurements with full accuracy.
- Any value from **91h** to **99h** indicates valid data with reduced accuracy (decreasing accuracy with increasing number).
- Any value from **9Ah** to **9Fh** indicates non-valid data but normal operation (for example configuration or calibration mode).
- Any value from **A0h** to **AFh** indicates a sensor error status.

2 **All data are in 2's complement binary.**

Resolution is 0.01 degrees for roll, pitch and heading, and 1 cm for heave.

- Roll is positive with port side up with valid range ±179.99 degrees.
- Pitch is positive with bow up with valid range ±179.99 degrees.
- Heave is positive up with valid range ±9.99 m.
- Heading is positive clockwise with valid range 0 to 359.99 degrees.

If a value is outside the valid range, it is assumed to be non-valid, and rejected.

Note

Heave is logged as positive downwards (the sign is changed) including roll and pitch induced lever arm translation to the transmit transducer.

You can define how roll is assumed to be measured, either with respect to the horizontal plane (the *Hippy 120* or *TSS* convention), or to the plane tilted by the given pitch angle (i.e. as a rotation angle around the pitch tilted forward pointing x-axis).

The latter convention (called *Tate-Bryant* in the POS/MVdocumentation) is used inside the system in all data displays and in the logged data. A transformation is applied if the roll is given with respect to the horizontal.

Note

This format was originally designed for use with the early multibeam echo sounders manufactured by Kongsberg Maritime. In the original version of the format (Kongsberg EM Attitude 1000), the first synchronisation byte was always assumed to be zero. The sensor manufacturers were then requested to include sensor status in the format using the first synchronisation byte for this purpose.

Related topics

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KM Binary datagram format

KM Binary is a proprietary datagram format created by Kongsberg Maritime for general use.

Format

Data description	Unit of measurement	Format	No. of bytes
Start ID	#KMB	char	4U
Datagram length		uint16	2U
Datagram version (=1)		uint16	2U
UTC seconds	s	uint32	4U
UTC nanoseconds	ns	uint32	4U
Status		uint32	4U
Latitude	deg	double	8F
Longitude	deg	double	8F
Ellipsoid height	m	float	4F
Roll	deg	float	4F
Pitch	deg	float	4F
Heading	deg	float	4F
Heave	m	float	4F
Roll rate	deg/s	float	4F
Pitch rate	deg/s	float	4F

Data description	Unit of measurement	Format	No. of bytes
Yaw rate	deg/s	float	4F
North velocity	m/s	float	4F
East velocity	m/s	float	4F
Down velocity	m/s	float	4F
Latitude error	m	float	4F
Longitude error	m	float	4F
Height error	m	float	4F
Roll error	deg	float	4F
Pitch error	deg	float	4F
Heading error	deg	float	4F
Heave error	m	float	4F
North acceleration	m/s^2	float	4F
East acceleration	m/s^2	float	4F
Down acceleration	m/s^2	float	4F
Delayed heave:			
UTC seconds	s	uint32	4U
UTC nanosecond	ns	uint32	4U
Delayed heave	m	float	4F

Description

Data format	Little endian (the least significant byte is transmitted first). Float is according to IEEE - 754.
Datagram length	The total number of bytes in the datagram
Datagram version	The version is incremented if the datagram format is changed.
Timestamp format	Epoch 1970-01-01 UTC time
Position and height	At user-defined sensor reference point. Position in decimal degrees. • Latitude: Negative on Southern hemisphere • Longitude: Negative on Western hemisphere • Height: Positive above ellipsoid
Positive roll	Port side up
Positive pitch	Bow up
Positive heave	Downwards, at user-defined sensor reference point

	True north
Error fields	Sensor data quality: RMS -1= not implemented

Status

One bit per status info, 1= active

Bit	
	Invalid data:
0	Horizontal position and velocity
1	Roll and pitch
2	
3	Heave and vertical velocity
4	Acceleration
5	Delayed heave
Reduced performance:	
16	Horizontal position and velocity
17	Roll and pitch
18	
19	Heave and vertical velocity
20	Acceleration
21	Delayed heave

Related topics

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Third-party datagram formats

Topics

AML Sound speed datagram format

AML is a third-party proprietary datagram format created by AML Oceanographic (http://www.amloceanographic.com) for use with their sound velocity probes.

Note

The datagram format described here remains the property of the organization that defined it. If you need more information, contact the owner.

The sound velocity probe output is configurable. The code is searching for a value between 1300 and 1800 and uses it as the sound speed.

The following input data formats are supported by the AML sound velocity probe:

Format

```
xxxx.x<CR><LF>
```

Description

- **xxxx.x**: Sound speed

Format

```
±xxx.xx yyyy.y<CR><LF>
```

Description

1 **±xxx.xx**: Not used

2 **yyyy.y**: Sound speed

Format

```
dd/mm/yy hh:mm:ss:ms yyy.yy xxxx.xx
```

Description

1 **dd/mm/yy**: Not used

2 **hh:mm:ss:ms**: Not used

3 **yyy.yy**: Not used

4 **xxxx.xx**: Sound speed

Format

```
dd/mm/yy hh:mm:ss:ms xxxx.xx nn.nnn
```

Description

1 **dd/mm/yy**: Not used

2 **hh:mm:ss:ms**: Not used

3 **xxxx.xx**: Sound speed

4 **nn.nnn**: Temperature

Format

```
dd/mm/yy hh:mm:ss:ms yyy.yy xxxx.xx nn.nnn
```

Description

1 **dd/mm/yy**: Not used

2 **hh:mm:ss:ms**: Not used

3 **yyy.yy**: Not used

4 **xxxx.xx**: Sound speed

5 **nn.nnn**: Temperature

Related topics
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Trimble PTNL,GGK datagram format

PTNL ,GGK is a proprietary datagram from Trimble (https://www.trimble.com). The PTNL, GGK datagram is used to decode the time, position, type and dilution of precision of the current position.

Format

```
$PTNL,GGK,hhmmss.ss,ddmmyy,dddmm.mmmmmmmm,a,dddmm.mmmmmmmm,a,x,zz,w.w,EHTaaa.bbb,M*hh
```

Description

Note

The datagram format described here remains the property of the organization that defined it. This datagram description is not complete. If you need more information, contact the owner.

1 **$PTNL**: Talker identifier

2 **GGK**: Datagram identifier

3 **hhmmss.ss**: Coordinated Universal Time (UTC) of the current position

4 **ddmmyy**: Day, month and year

5 **dddmm.mmmmmmmm**: Latitude (degrees)

6 **a**: Direction of latitude

- **N** = North
- **S** = South

7 **dddmm.mmmmmmmm**: Longitude (degrees)

8 **a**: Direction of longitude

- **E** = East
- **W** = West

9 **x**: GPS quality indicator ()

10 **zz**: Number of satellites in use (00 - 12) (The number of satellites may be different from the number in view.)

11 **w.w**: PDOP (Position dilution of precision)

12 **EHTaaa.bbb**: Ellipsoidal height of fix

13 **M**: Ellipsoid height (metres)

14 ***hh**: Checksum

Note

The PTNL, GGK datagram is longer than the NMEA-0183 standard of 80 characters. The latitude and longitude are in the datum and ellipsoid of the selected reference frame.

GPS quality indicator

Quality indicator 0 (zero) means that fix is not available or invalid. Other values:

1 Autonomous GPS fix

2 Differential, floating carrier phase integer-based solution, RTK (float)

3 Differential, fixed carrier phase integer-based solution, RTK (fixed)

4 Differential, code phase only solution (DGPS)

5 WAAS corrected differential position

6 RTK network position (float solution)

7 RTK network position (fixed solution)

Related topics

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Furuno GPhve datagram format

Furuno GPhve is a proprietary datagram format created by Furuno (http://www.furuno.jp) to contain heave information.

Note

The datagram format described here remains the property of the organization that defined it. If you need more information, contact the owner.

Format

```
$PFEC,GPhve,xx.xxx,A*hh<CR><LF>
```

Description

1 **$PFEC**: Talker identifier

2 **GPhve**: Datagram identifier

3 **xx.xxx**: Heave (Metres)

4 **A**: Status

5 ***hh**: Checksum

Related topics

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Furuno GPatt datagram format

Furuno GPatt is a proprietary datagram format created by Furuno (http://www.furuno.jp) to contain pitch, roll and yaw information.

Note

The datagram format described here remains the property of the organization that defined it. If you need more information, contact the owner.

Format

The datagram is available in two versions.

Version 1.5

```
$PFEC,GPatt,xxx.x,yy.y,zz.z<CR><LF>
```

Version 2.0

```
$PFEC,GPatt,xxx.x,yy.y,zz.z*hh<CR><LF>
```

Description

1 **$PFEC**: Talker identifier

2 **GPatt**: Datagram identifier

3 **xxx.x**: Yaw (degrees)

4 **yy.y**: Pitch (degrees)

5 **zz.z**: Roll (degrees)

6 ***hh**: Checksum

Related topics

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Hemisphere GNSS GPHEV datagram format

GPHEV is a proprietary datagram format created by Hemisphere GNSS (https://hemispheregnss.com) to contain heave information.

Note

The datagram format described here remains the property of the organization that defined it. If you need more information, contact the owner.

Format

```
$GPHEV,H,*hh<CR><LF>
```

Description

1 **$**: Talker identifier

2 **GPHEV**: Datagram identifier

3 **H**: Heave (Metres)

4 ***hh**: Checksum

Related topics

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Teledyne TSS1 datagram format

Teledyne TSS1 is a proprietary datagram format created by Teledyne TSS Navigation Systems for heave, roll and pitch compensation. When you select this protocol, the number of sensor variables is fixed, and there is no token associated with it.

Format

```
:aabbbb shhhhx srrrr spppp<CR><LF>
```

Description

The format is based on ASCII characters, the datagram has a fixed length, and it is terminated with a carriage return and line feed. Baud rate and output rate may be adjusted to fit your needs. The definition of the attitude angles in this format is different from the *Euler* angles definition used elsewhere. The difference appears in the roll angle, where:

$$Roll_{echo\ sounder} = \arcsin [\sin(Roll_{Euler}) \times \cos(Pitch_{Euler})]$$

1 **aa**: Sway acceleration

This is a dual-character hex number. The value is provided as 0.03835 m/ss units.

2 **bbbb**:Heave acceleration

This is a four-character hex number. The value is provided as 0.000625 m/ss units.

3 **s**: This is a single character.

If the value is positive, a "space" character is provided.

If the value is negative, a "–" character is provided.

4 **hhhh**: Heave position

This is a four-character decimal number. The value is given in centimetres. Positive value is Up.

5 **x**: Status

- **U**: Unaided mode/Stable data

  The sensor operates without external input data.

- **u**: Unaided mode/Unstable data

  The sensor operates without external input data. However, the data from the sensor is unstable. A probable cause for this is the lack of alignment after the sensor has been switched on or restarted. The alignment period from a power recycle is normally approximately five minutes.

- **G**: Speed aided mode/Stable data

  The sensor operates with external input of speed data.

- **g**: Speed aided mode/Unstable data

  The sensor operates with external input of speed data. However, the data from the sensor is unstable. A probable cause for this is the lack of alignment after the sensor has been switched on or restarted. It can also be a failure in the data input.

- **H**: Heading aided mode/Stable data

  The sensor operates with external input of heading data.

- **h**: Heading aided mode/Unstable data

  The sensor operates with external input of heading data. However, the data from the sensor is unstable. A probable cause for this is the lack of alignment after the sensor has been switched on or restarted. It can also be a failure in the data input.

- **F**: Full aided mode/Stable data

  The sensor operates with external input of both speed and heading data.

- **f**: Full aided mode/Unstable data

  The sensor operates with external input of both speed and heading data. However, the data from the sensor is unstable. A probable cause for this is the lack of alignment after the sensor has been switched on or restarted. It can also be a failure in the data input.

6 **s**: This is a single character.

If the value is positive, a "space" character is provided.

If the value is negative, a "–" character is provided.

7 **rrrr**: Roll angle

This is a four-character decimal number. The value is given in hundredths of a degree.

8 **s**: This is a single character.

If the value is positive, a "space" character is provided.

If the value is negative, a "–" character is provided.

9 **pppp**: Pitch angle

This is a four-character decimal number. The value is given in hundredths of a degree.

Related topics

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Serpe BSC datagram format

Serpe BSC is a proprietary datagram format created by Serpe. It is supplied with buoys and provides the geographical location of the buoy as well as the water temperature the buoy measures.

Note

The datagram format described here remains the property of the organization that defined it. If you need more information, contact the owner.

Format

```
$??BSC,bbbb,llll.ll,n,wwwww.ww,W,
tt.t,vv,dd.dd.hh,xx.xx.xx<CR><LF>
```

Description

1 **??**: Talker identifier

2 **BSC**: Datagram identifier

3 **bbbb**: This is the number (identification) of the buoy.

4 **llll.ll,n**: Latitude

- **N** = North
- **S** = South

The information is provided in degrees with decimals. 0222.17 corresponds to 2º13.302'. 0220.50 corresponds to 2º12.3'.

5 **wwwww.ww,W**: Longitude

- **W** = West
- **E** = East

The information is provided in degrees with decimals.

6 **tt.t**: Water temperature (Degrees Celsius)

7 **vv**: Battery voltage

8 **dd.dd.hh**: Day, month and year

9 **xx.xx.xx**: Not used

Related topics
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Ryokusei RBY datagram format

Ryokusei RBY is a proprietary datagram format created by Ryokusei. It is supplied with buoys and provides the geographical location of the buoy as well as the water temperature the buoy measures. The datagram also provides echo sounder information.

Note

The datagram format described here remains the property of the organization that defined it. If you need more information, contact the owner.

Format

```
$PRBY,xxx,hhmmss,llll.ll,a,yyyyy.yy,a,
yymmdd,tt.t,a0b0c0d0e0f0g0h0i0,BB.B<CR><LF>
```

Description

1 **$P**: Talker identifier

2 **RBY**: Datagram identifier

3 **xxx**: This is the number (identification) of the buoy.

4 **hhmmss**: Time (Hours, minutes and seconds)

5 **llll.lll,a**: Latitude (Degrees, minutes and hundredths)

- **N** = North
- **S** = South

6 **yyyyy.yyy,a**: Longitude (Degrees, minutes and hundredths)

- **W** = West
- **E** = East

7 **yymmdd**: Date (Year, month and day)

8 **tt.t**: Water temperature (Degrees Celsius) (0 – 35.5 °C)

9 **a0b0c0d0e0f0g0h0i0**: Echo sounder data

10 **BB.B**: Battery voltage

Related topics

Supported datagram formats, page 12
Datagram formats, page 25
Third-party datagram formats, page 71

File formats

Topics

NetCDF file format

NetCDF (Network Common Data Form) is a data model, API library (application programming interface) and a file format. It is used for storing and managing data. NetCDF is developed and maintained by Unidata. Unidata is part of the US University Corporation for Atmospheric Research (UCAR) Community Programs (UCP). Unidata is funded by the US National Science Foundation.

SONAR-NetCDF4 is a data and metadata convention for storage of data from active sonars in NetCDF4 formatted files, defined by The International Council for the Exploration of the Sea (ICES). Sonar-NetCDF4 consists primarily of a naming convention and a data structure within the NetDCF4 data model.

NetCDF output requires a dedicated software license.

See our website for more information.

- https://www.kongsberg.com/fisherysonar

Note

The data files will normally become very large. If you wish to record large amounts of data, make sure that you have enough space on your hard disk. Unless your computer is equipped with a very large disk, we recommend that you save the data to an external storage device.

The requirement for data storage is from 15 to 50 Gb per hour, depending on your operating modes and settings.

Related functionality

Processed Data to File page

The sonar system can export several types of processed data file formats. Use **Processed Data to File** to define which processed data formats to save, and where to place the files. This page is located in the **Output** dialog box. To open, select it on the **Operation** menu.

Software License page

The sonar system does not need any software licenses to operate. However, specific software license codes "unlocks" additional functionality. The **Software License** settings allow you to type a license code (text string) to unlock these optional functions.

This page is located in the **Installation** dialog box. To open the page, select **Installation** on the **Setup** menu.

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KONGSBERG

KONGSBERG MARITIME
SIMRAD
Strandpromenaden 50
P.O.Box 111
kongsberg.com/simrad

Switchboard: +47 815 73 700

E-mail sales: simrad.sales@simrad.com
E-mail support: simrad.support@simrad.com