Instruction manual

Multibeam Stave Display

Base version

Multibeam stave display

Raw data logger

Instruction manual - Base version

Contact information

Support: hydrographic.support@kongsberg-simrad.com

Sales: horten.sales@kongsberg-simrad.com

24 hrs support telephone: +47 99 20 38 01

Sections

This book is the Instruction manual manual for the Multibeam Stave Display.

Remarks

References

Further information about the EM Series multibeam echo sounders may be found in the following manuals:

- EM Series Operator manuals

Table of contents

Document logistics

Rev	Date	Written	Checked	Approved
A	28.03.03	RBR	BHL	BHL
B				
C				
D				
E				
F				
G				

(The original signatures are recorded in the company's logistic database.)

Rev	Comments
A	Original issue.
B	
C	
D	

To assist us in making improvements to the product and to this manual, we would welcome comments and constructive criticism. Please send all such - in writing or by e-mail - to:

Kongsberg Simrad AS
Documentation Department
P.O.Box 111
N-3191 Horten
Norway

or e-mail:

simrad.documentation@simrad.com

1 INSTALLATION

The Kongsberg Simrad Multibeam Stave Display is a PC device for recording and displaying raw data from the Kongsberg Simrad EM Series multibeam echo sounders.

The stave display program requires a PC running Windows 95 or later, with minimum 64 Mbytes of RAM. It must also contain a slot for a full length ISA board.

1   Install the BSP card (Kongsberg Simrad order no. 381-112390) with no links.

2   Install the program files and folders;

```
C:\LOGGER
\PC\PC.EXE
\PC\BSP.VXD
\BSP\C44A.OUT
\BSP\C44C.OUT
\BSP\C44D.OUT
\DATA
```

- **\data** is the default directory for logger files

2 OPERATION

2.1 Starting the program

Start the program by running the file **PC.EXE**.

In the startup process the program looks for a BSP card. After a few seconds the program is ready.

The open window contains the following elements:

- Toolbar
- Report field
- Logging start/stop button with information field
- Playback start/stop button with information field
- Stave display with control and information fields
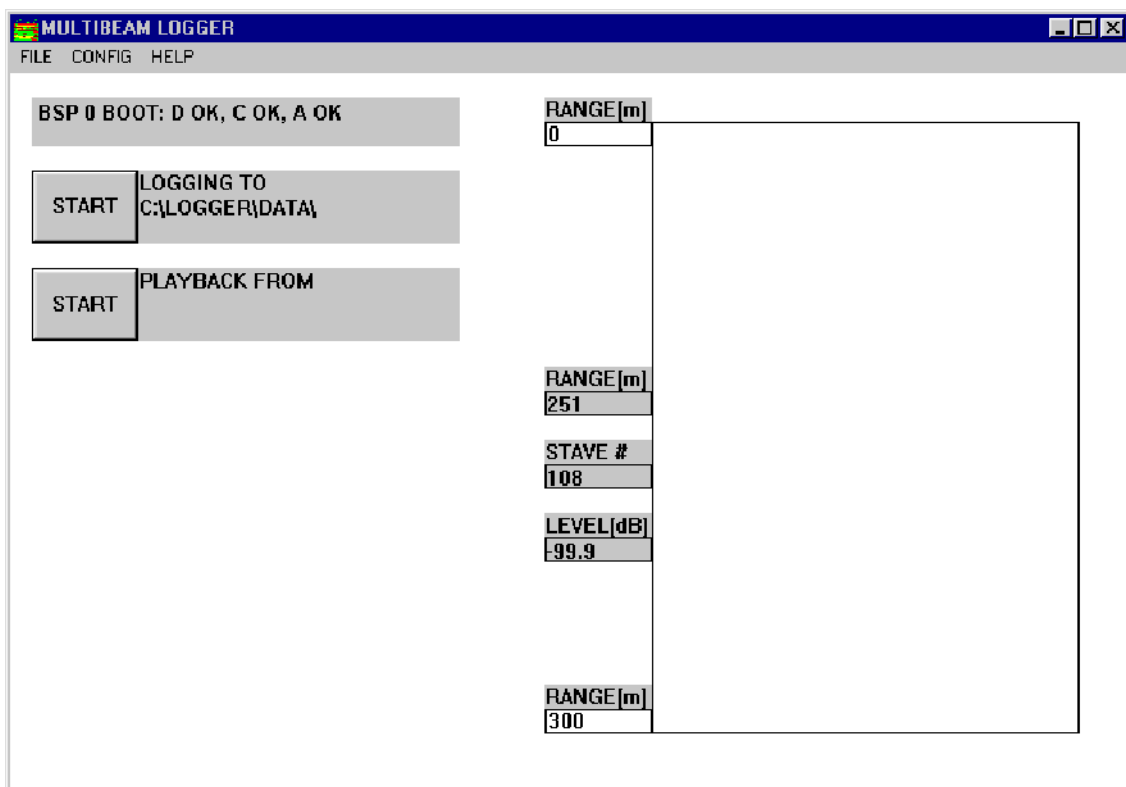
Figure 1 Stave display application window

Note

The report field will diaplay BSP 0 BOOT: D OK, C OK, A OK, *or otherwise report which errors occurred.*

2.2 The menus

The menu contains the following options:

- File
- Config
- Help

File

Operations related to file processing are located in this sub-menu.

Log Folder - This dialogue selects the folder where the log files are stored.

Playback File - This dialogue selects the file for next playback.

Exit - This operation exits the program.

Config

Parameters for the program operation are located in this dialogue.
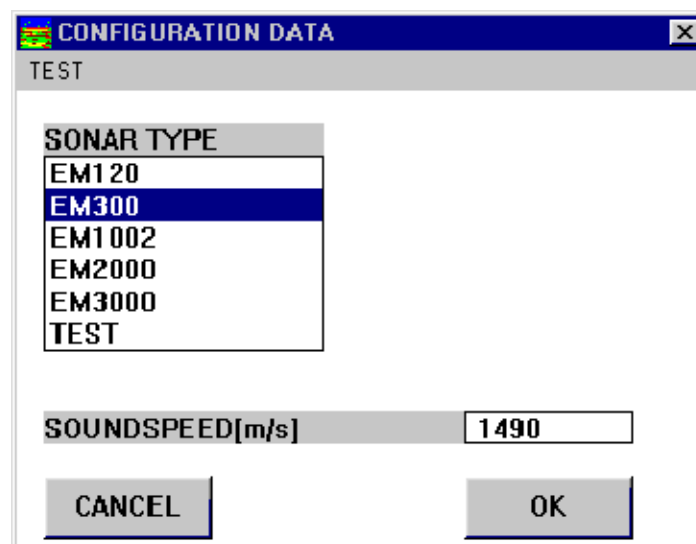
Figure 2   Configuration data window

Sonar Type - This is a list where the appropriate multibeam echo sounder is selected. The logging process is independent of multibeam type, whereas the stave display must make some assumptions on data format that may be different for each type. A TEST entry may be chosen, where the various parameters are programmable. These parameters are set in the TEST menu.

Sound Speed - This parameter entry is used in the range scale for the stave display.

Test - This menu item is a dialogue where parameters for the TEST multibeam type are programmable. These parameters include:

- Size of ping header

- Size of sample header

- Number of staves

- Time from ping start to ping end

- Time between two samples

- Time delay from ping end to next ping start

In addition, there is a check box for enabling simulated input to the logger.
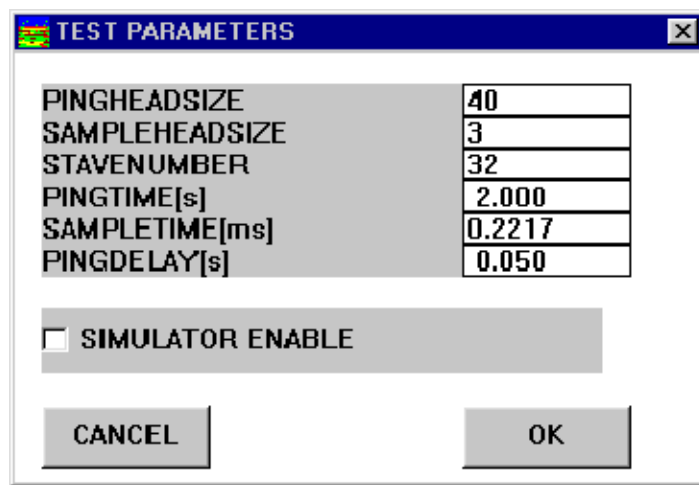
Figure 3   Test parameters window

Help

About - This submenu gives information on the program version.

2.3   The start/stop buttons

The logging and playback functions are given separate start/stop buttons. This allows both functions to be off, or only one to be running. Initially, both buttons show START when none are running. When one is started, this button changes to STOP, while the other is blanked. Thus the running function must be stopped to allow the other to be started.

The information field at the logging start/stop button shows where the logging is directed, and also reports on the progression.

The information field at the playback start/stop button shows the source of the playback, and also reports errors that may occur. At present playback is supported for only one file for each start.

2.4   The stave display

The stave display shows the signal level received from each stave in a selectable range span. The signal levels are given in colour code inside a stave number (horizontal) by range (vertical) rectangle.

The near and far limits of the range span are set in the number entry fields at the top and bottom of the stave display. When the near range is entered, the far range is also moved to keep the span constant, wheras this does not happen when the far range is entered. In both cases however, the entries may be adjusted so that the span does not go below 10 meters and a reasonable maximum range is not exceeded.

When more than one sample step cover one (vertical) pixel step, the strongest sample of each stave is shown.

Along the left side of the stave display are three information fields. When the cursor points inside the stave display these fields show the range, the stave number, and the signal level at that point. The signal level is given in dB relative 1 volt.

3 DATA FILE FORMAT

The stave data are collected in files, one file for each ping. The files are named in the format:

`SThhmmss.nn`

where:

ST = staves

hh = hour 0....23

mm = minute 0....59

ss = seconds 0....59

nn = 0....99 sequence number within one second

The stave data file contains blocks of 16 bit words as follows:

```
raw data header
First sample block
....
Last sample block
```

The ping header is specific for each sonar.

→ *Refer to the applicable specifications chapter for details on the ping header.*

The raw data header contains the sonar parameter settings for the current ping. There is also a ping sequence number which is vital for connecting this file to other log files made on the operation station (that is vessel attitude data).

The stave data sample block contains the following 16 bit words:

```
Sample header
Sample values (2 words for each stave)
```

The sample header is specific for each sonar.

→ *Refer to the applicable specifications chapter for details on the sample header.*

The sample header starts with the sample counter which is used for checking the data integrity and also gives the range of that sample. It may be followed by word(s) specifying current gain(s), both wanted and actually used.

4 SPECIFICATIONS FOR EM 300

Raw data header

1   Total length of this header = **42**

2   Multibeam type = **300**

3   16 bit unsigned ping counter: **0 to 65535**

4   Mode: **0 to 9**
(Off, Normal, BIST, Sim, RxlobeC, RxlobeA, Txlobe)

5   PGA receive gain (dB): **0 to 30**

6   Absorbtion coefficient (0.01 dB/km): **100 to 999**

7   Range to normal incidence (samples): **1 to 65535**

8   BS, normal incidence (dB): **-50 to 0**

9   BS, oblique (dB): **-60 to 0**

10   TVG start: **0 to 65535**
(Resolution: sample number, 0 = no limit)

11   TVG stop: **0 to 65535**
(Resolution: sample number, 0 = no limit)

12   RX bandwidth (Hz): **1 to 9999**

13   Sound velocity (dm/s): **14000 to 16000**

14   RX system (0.1 dg): **10 to 40**

15   RX beamwidth (0.1 dg): **10 - 40**

16   RX start module: **0 to 6**

17   TX system (0.1 dg): **10 to 20**

18   TX beamwidth (0.1 dg): **10 to 40**

19   TX start module: **0 - 6**

20   TX power: **0 to 3**
(Max, -10 dB, -20 dB, Off)

21   TX mode: **0 to 4**
(Very shallow, Shallow, Medium, Deep, Very deep)

22   TX sector: **1 to 9**

23   Max range in samples: **1 to 65535**

24   Start range in samples: **1 to 65535**

25   TX pulse length (0.1 ms): **0 to 99**

26   TX time roll (0.01 dg): **-3000 to 3000**

27   TX tilt <9> (0.01 dg): **-1500 to 1500**

28   Not used

29   Not used

30   Not used

31   Not used

32   Not used

33   Not used

34   Not used

35   Not used

36   Source level (0.01 dB): **0 to 25000**

37   Delay between TX pulse (sample): **0 to 50**

38   Online BITE status: **16 bit**

39   Number of staves: **0 - 128**

40   Spare

41   Spare

42   Checksum: **-32768 to 32767**

Sample header

1   Sample counter: **0 to 65535**

2   TVG calculated (0.01 dB): **–5000 to 9999**

3   TVG used (0.01 dB): **–5000 to 9999**

Sample values

The two words for each of the (32,64,128) staves have range **–2048 to 2047**.

5 SPECIFICATIONS FOR EM 120

Raw data header

This is the data sent from the SPRX circuit board in the Transceiver Unit to the EM 120 Processing Unit.

There is one data file for each ping. This file contains a header and a number of data samples.

Data format: 16 bit signed integer

1   Total length of this header = **42**

2   Multibeam type= **120**

3   16 bit unsigned ping counter: **0 to 65535**

4   Mode: **0 to 9**
(Off, Normal, BIST, Sim, RxlobeC, RxlobeA ,Txlobe)

5   PGA receive gain (dB): **0 to 30**

6   Absorbtion coefficient (0.01 dB/km): **50 to 199**

7   Range to normal incidence (samples): **1 to 65535**

8   BS, normal incidence (dB): **-50 to 0**

9   BS, oblique (dB): **-60 to 0**

10   TVG start: **0 to 65535**
(res: sample number, 0 = no limit) (See Note 1)

11   TVG stop: **0 to 65535**
(res: sample number, 0 = no limit) (See Note 1)

12   RX bandwidth (Hz): **1 to 9999**

13   Sound velocity for beamforming (dm/s): **14000 to 16000**

14   RX system (0.1 dg): **10 to 40**

15   RX beamwidth (0.1 dg): **10 to 40**

16   RX start module: **0 to 12**

17   TX system (0.1 dg): **10 to 20**

18   TX beamwidth (0.1 dg): **10 to 40**

19   TX start module: **0 to 36**

20   TX power: **0 to 3**
(Max, -10 dB, -20 dB, Off)

21   TX mode: **0 to 4**
(Very shallow, Shallow, Medium, Deep, Very deep)

22   Number of TX sectors: **1 to 9**
(3 or 9)

23   Max range in samples: **1 to 65535**

24   Start range in samples: **1 to 65535**
(Refers to start of TX pulse)

25   TX pulse length (0.1 ms): **0 to 250**

26   TX time roll (0.01 dg): **-3000 to 3000**

27   TX tilt for all sectors <9> (0.01 dg): **-1500 to 1500**

28   Not used

29   Not used

30   Not used

31   Not used

32   Not used

33   Not used

34   Not used

35   Not used

36   Source level (0.01 dB): **0 to 25000**

37   TX pulse repetition rate: **0 to 50**
(time from start of one pulse to start of next pulse)

38   On-line BIST status: **16 bits** *(See Note 3)*

39   N = Number of staves in range data: **0 to 128**

40   Spare: **-32768 to 32767**

41   Spare: **-32768 to 32767**

42   Checksum: **-32768 to 32767** *(See Note 2)*

Note 1: From previous ping. The header is also sent after the sample data, then with updated TVG and ping status data.

Note 2: Accumulated 16-bit sum of the above 16-bit signed integers

Note 3: BIST ststus codes:

       0 = 1= Tx power error

       1 = 1= TRU power error

       2 = 1= Over voltage from HVTP

       3 = 1= Datagram limit error

       4 = 1= Datagram checksum error

       5 = 1= Datagram ETX error

Sample header

The TVG gain included below is the total receiver gain minus the PGA gain.

RX Data for all array elements used (one sample)

1   16-but unsigned sample counter: **0 to 65535**

2   TVG calculated (0.01 dB): **–5000 to 9999**

3   TVG used (0.01 dB): **–5000 to 9999**

4   N times:
Element data, real part (16 bit): **-2048 to 2047**
Element data, imaginary part (16 bit): **-2048 to 2047**

N depends of RX_Beamwidth:

- N= 32 if 4 deg.

- N= 64 if 2 deg.

- N= 128 if 1 deg.

Elements are sequentially stored, starting from port side.

The element spacing is 0.056 m.

Sample values

The two words for each of the (32,64,128) staves have range –2048 to 2047.

6 SPECIFICATIONS FOR EM 1002

Raw data header

Data format: 16 bit signed integer

1   Total length of this header = **24**

2   Multibeam type= **1002**

3   16-bit unsigned ping counter: **0 to 65535**

4   Tx Mode: **0 to 5**

5   PGA receive gain (dB): **0 to 30**

6   Absorbtion coefficient (0.01 dB/km): **0 to 999**

7   Range to normal incidence (samples): **1 to 65535**

8   BS, normal incidence (dB): **-50 to 0**

9   BS, oblique (dB): **-60 to 0**

10   TVG start: **0 to 8000**
     (minimum possible TVG, resolution 1/100 dB)

11   TVG stop: **0 to 8000**
     (minimum possible TVG, resolution 1/100 dB)

12   Sound velocity for beamforming (dm/s): **14000 to 16000**

13   A/D level (resolution 1 dB): **-50 to 50**

14   TX power: **0 - 3**
     (Max, -10 dB, -20 dB, Off)

15   Max range in samples: **1 to 65535**

16   TX pulse length (0.1 ms): **0 to 99**

17   TX time roll (0.01 dg): **-3000 to 3000**

18   Source level (0.01 dB): **0 to 2500**

19   TX pulse repetition rate: **0 to 100**
     (time from start of one pulse to start of next pulse)

20   On-line BIST status: **16 bits** *(See Note 2)*

21   Start sample numbers (Resolutin. sample): **0 to 100**

22   Spare: **-32768 - 32767**

23   Spare: **-32768 - 32767**

24   Checksum: **-32768 - 32767** *(See Note 1)*

Note 1: Accumulated 16-bit sum of the above 16-bit signed integers.

Note 2: BIST ststus codes:

0 = 1= Tx power error

1 = 1= TRU power error

2 = 1= Over voltage from HVTP

3 = 1= Datagram limit error

4 = 1= Datagram checksum error

5 = 1= Datagram ETX error

Sample header

1   16-bit unsigned sample counter (ref Rx start): **0 to 65535**

2   16-bit calculated TVG value (1/100 dB): **0 to 9000**

3   128 times:
Element data, real part (16-bit): **-2048 to 2047**
Element data, imaginary part (16-bit): **-2048 to 2047**

Sample values

The two words for each of the (32,64,128) staves have range **–2048 to 2047**.

KONGSBERG