

# 2018-2019 Combined Descriptive Report of Seafloor Mapping: Offshore of Saco Bay to Monhegan Island, Gulf of Maine

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Maine Coastal Mapping Initiative, October 2019

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For an overview of the Maine Coastal Mapping Initiative (MCMI) information products, including maps, data, imagery, and reports visit <u>https://www.maine.gov/dmr/mcp/planning/mcmi/index.htm</u>.

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| Maine Coastal Mapping Initiative<br>Maine Coastal Program<br>Department of Marine Resources |   |  |
|---|---|--|
|   | DESCRIPTIVE REPORT                      |  |
| Type of Survey:   | Navigable Area                          |  |
| Registry Number:  |   |  |
|   | LOCALITY                                |  |
| State(s):   | Maine                                   |  |
| General Locality:   | Gulf of Maine                           |  |
| Sub-Locality:   | Offshore of Saco Bay to Monhegan Island |  |
|   |   |  |
|   | 2018-2019                               |  |
| CHIEF OF PARTY<br>Benjamin Kraun, Hydrographer, Contractor to the State of Maine            |   |  |
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|                          | MAINE COASTAL MAPPING INITIATIVE   | REGISTRY NUMBER:         |  |  |
|--------------------------|--|--------------------------|--|--|
| HYDROG                   |  |                          |  |  |
|                          |  |                          |  |  |
| INSTRUCTIONS: The hydrog | INSTRUCTIONS: The hydrographic sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office. |                          |  |  |
| State(s):                | Maine  |                          |  |  |
| General Locality:        | Gulf of Maine  |                          |  |  |
| Sub-Locality:            | Offshore of Saco Bay to Monhegan Island  |                          |  |  |
| Scale:                   |  |                          |  |  |
| Dates of Survey:         | 08/01/2018 to 11/19/2018; and  |                          |  |  |
|                          | 04/12/2019 to 06/20/2019   |                          |  |  |
| Instructions Dated:      |  |                          |  |  |
| Project Number:          |  |                          |  |  |
| Field Unit:              | Amy Gale   |                          |  |  |
| Chief of Party:          | Benjamin Kraun, Hydrographer, Contract   | or to the State of Maine |  |  |
| Soundings by:            | Multibeam Echo Sounder   |                          |  |  |
| Imagery by:              | Multibeam Echo Sounder Backscatter   |                          |  |  |
| Verification by:         |  |                          |  |  |
| Soundings in:            | meters at Mean Lower Low Water   |                          |  |  |
| Remarks:                 |  |                          |  |  |

# **Table of Contents**

| Acknowledgements   | iii |
|--|-----|
| ABSTRACT   | 1   |
| 1.0 Area Surveyed  | 2   |
| 1.1 Survey Purpose   | 4   |
| 1.2 Survey Quality   | 4   |
| 1.3 Survey Coverage  | 4   |
| 2.0 Data Acquisition   | 6   |
| 2.1 Survey Vessel  | 6   |
| 2.2 Acquisition Systems  | 6   |
| 2.3 Vessel Configuration Parameters                                    | 7   |
| 2.4 Survey Operations  | 9   |
| 2.5 Survey Planning  | 9   |
| 2.6 Calibrations   | 9   |
| 3.0 Quality Control  | 10  |
| 3.1 Crosslines   | 10  |
| 3.2 Junctions  | 14  |
| 3.3 Equipment Effectiveness  |     |
| 3.4 Sound Speed Methods  |     |
| 4.0 Data Post-processing   |     |
| 4.1 Horizontal Datum   |     |
| 4.2 Vertical Datum and Water Level Corrections                         |     |
| 4.3 Processing Workflow  | 20  |
| 4.4 Final Surfaces   | 21  |
| 4.5 Backscatter  | 21  |
| 5.0 Results  | 23  |
| 5.1 Charts Comparison  | 23  |
| 6.0 Summary  |     |
| References   |     |
| Appendix A – Specific dates of data acquisition for mainscheme surveys |     |
| Appendix B – Configuration settings for Seapath 330                    |     |
| Appendix C – Template database settings in QINSy (for acquisition)     | 42  |

| Appendix D | - Configuration | settings for | OINSv   | EMcontroller | 2 |
|------------|-----------------|--------------|---------|--------------|---|
| rppenam D  | configuration   | settings for | Zu in j |              | ' |

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# ABSTRACT

During the 2018 survey season (July - November) and part of the 2019 field season (April - June), the Maine Coastal Mapping Initiative (MCMI) conducted hydrographic surveying using a multibeam echosounder (MBES) in the waters off southern and mid-coast Maine. The surveying was conducted in part to support the Federal Bureau of Ocean and Energy Management's (BOEM) efforts to enhance coastal resiliency through identification and characterization of potential sand and gravel resources on the outer continental shelf that may be used for beach nourishment. The surveys also coincide with state efforts to update coastal data sets and increase high resolution bathymetric coverage for Maine's coastal waters. A total of approximately 42 mi<sup>2</sup> (109 km<sup>2</sup>) of high-resolution multibeam data were collected in the surveyed areas. An additional 4.1 mi<sup>2</sup> were collected in nearshore waters for the purposes of assessing nearshore sand movement and mapping eelgrass beds. This work is summarized in separate reports.

# **1.0 Area Surveyed**

The 2018 and 2019 mainscheme survey areas were located off Maine's southern and mid-coast regions in the Gulf of Maine, with a sub-locality of offshore of Saco Bay to west of Monhegan Island as shown in Figure 1. The approximately 42 mi<sup>2</sup> (109 km<sup>2</sup>) mainscheme survey areas adjoin the eastern extent of the areas mapped by MCMI in 2014 (accepted by NOAA, who lists the survey as W00289) and 2017 (currently under review by NOAA, who lists the survey as W00450), as well as by NOAA in 2015 (surveys H12725 and H12736) (Figure 2). These data were not collected in direct accordance with the *NOS Hydrographic Surveys Specifications and Deliverables* and the *Field Procedures Manual* requirements; however, both documents were referenced during acquisition for guidance. The data for both survey seasons were combined, reprocessed, and analyzed for quality control as single 2018-2019 surfaces.

Mainscheme survey limits of each main sub-locality are listed in Table 1. Specific dates of data acquisition for the mainscheme survey are listed in Appendix A.

Table 1 – 2018-2019 mainscheme survey limits

Saco Bay

| Southwest Limit   | Northeast Limit  |
|-------------------|------------------|
| 43° 22' 34.097" N | 43° 26' 8.592" N |
| 70° 13' 56.685" W | 70° 5' 36.456" W |

Monhegan Island

| Southeast Limit    | Northwest Limit   |
|--------------------|-------------------|
| 43° 39' 20.139" N  | 43° 44' 54.888" N |
| 69° 20' 40.623'' W | 69° 23' 52.285" W |



Figure 1 – General localities of 2018 - 2019 mainscheme survey coverage off southern and mid-coast Maine

# **1.1 Survey Purpose**

This survey was conducted by the Maine Coastal Program's Maine Coastal Mapping Initiative (MCMI) as part of a multi-agency cooperative agreement partially funded by the Bureau of Ocean and Energy Management (BOEM). The purpose of this project was to enhance coastal resiliency through identification and characterization of potential sand and gravel resources in waters of federal jurisdiction that may be used for beach replenishment. This project also coincides with state efforts to update coastal data sets for Maine's coastal waters and provides new data in the areas covered by National Oceanic and Atmospheric Administration (NOAA) nautical charts 13286, 13288, and 13301 in mid-coast and southern Maine. Additional objectives included habitat classification for planning purposes. These data were acquired and processed to meet Office of Coast Survey bathymetry standards as best as possible, and were shared with the UNH-NOAA Joint Hydrographic Center / Center for Coastal and Ocean Mapping for review.

# **1.2 Survey Quality**

The entire survey should be adequate to supersede previous data.

# **1.3 Survey Coverage**

Numerous small holidays (gaps in MBES coverage) exist within the surveyed area, and normally occurred as sonic shadows in areas of locally high relief and/or highly irregular bathymetry. Analyses of bathymetric data show that the least depths were achieved over all features, and that holidays have not compromised data integrity.



Figure 2 – 2018-2019 survey coverage relative to MCMI 2014 survey (NOAA survey ID: W00289) and NOAA 2015 surveys (IDs: H12725 and H12726); plotted over RNCs 13288 and 13286, respectively

# 2.0 Data Acquisition

The following sub-sections contain a summary of the systems, software, and general operations used for acquisition and preliminary processing during the 2018 and 2019 survey seasons.

#### 2.1 Survey Vessel

All data were collected aboard the Research Vessel (R/V) Amy Gale (length = 10.7 m, width = 3.81 m, draft = 0.93 m) (Figure 3), a former lobster boat converted to a survey vessel and contracted to the MCMI. The vessel was captained by Caleb Hodgdon of Hodgdon Vessel Services based out of Boothbay Harbor, Maine and South Portland, ME. The EM2040C transducer, motion reference unit (MRU), AML MicroX surface sound speed probe, and dual GNSS antennas were pole-mounted to the bow; pole raised (for transit) and lowered (for survey) via a pivot point at the edge of the bow. The main cabin of the vessel served as the data collection center and was outfitted with four display monitors for real time visualization of data during acquisition.



Figure 3 – R/V Amy Gale shown with pole-mounted dual GPS antennas, Kongsberg EM2040C multibeam sonar, MRU (not visible), and surface sound speed probe (not visible) in acquisition mode

### 2.2 Acquisition Systems

The real-time acquisition systems used aboard the R/V Amy Gale during the 2018 and 2019 surveys are outlined in Table 2. Data acquisition was performed using the Quality Positioning Services (QPS) QINSy (Quality Integrated Navigation System; v.8.18.2) acquisition software. The modules within QINSy integrated all systems and were used for real-time navigation, survey line planning, data time tagging, data logging, and visualization.

Table 2 - Major systems used aboard R/V Amy Gale

| Sub-system                                    | Components  |  |  |
|---|---|--|--|
| Multibeam Sonar                               | Kongsberg EM2040C and processing unit   |  |  |
| Position, Attitude, and Heading Sensor        | Seapath 330 processing unit, HMI unit, dual GPS/GLONASS antennas, MRU 5 motion reference unit (subsea bottle) |  |  |
| Acquisition Software and Workstation          | QINSy software v.8.18.2 and 64-bit Windows 10 PC console  |  |  |
| Surface Sound Velocity (SV) Probe             | AML Micro X with SV Xchange   |  |  |
| Sound Velocity Profiler (SVP)                 | Teledyne Odom Digibar S sound speed profiler  |  |  |
| Ground-truthing/Sediment Sampling<br>Platform | Ponar grab sampler, GoPro Hero 3+ video camera, dive light,<br>dive lasers, YSI Exo I sonde                   |  |  |

#### 2.3 Vessel Configuration Parameters

In 2017, the MCMI contracted Doucet Survey, Inc. to perform high-definition (precision  $\pm$ 5mm) 3D laser scanning of the Amy Gale and all external MBES system components (e.g. MRU, GPS antennas, and EM2040C) (Figure 4). The purpose of the laser scan survey was to refine and or verify the precision of hand-made vessel reference frame measurements for future surveys. All points were referenced to the center point of the base of the MRU (mounted inside the pole and directly atop the EM2040C transducer) (Figure 5), which served as the origin (e.g. 0,0,0), where 'x' was positive forward, 'y' was positive starboard, and 'z' was positive down. The laser scan survey results only differed from hand-made measurements by  $\leq$  3mm for all nodes of interest. Reference measurements for each component were entered into the Seapath 330 Navigation Engine (Table 3) and converted so all outgoing datagrams would be relative to the location of the EM2040C transducer (e.g. EM2040C was used as the monitoring point for all outgoing datagrams being received by QINSy during acquisition). Additional configuration and interfacing of all systems were established during the creation of a template database in the QINSy console.

These offset values were not changed for the 2018 or 2019 survey seasons. See appendices for specific settings as entered in the Seapath 330 Navigation Engine (Appendix B) and for the template database (Appendix C) used during data acquisition while online in QINSy. Configuration settings of the EM2040C were assigned in the EM Controller module of QINSy (Appendix D).

Table 3 – 2017 equipment reference frame measurements for Seapath 330

| Equipment             | <b>x</b> ( <b>m</b> ) | <b>y</b> ( <b>m</b> ) | <b>z</b> ( <b>m</b> ) |
|-----------------------|-----------------------|-----------------------|-----------------------|
| MRU                   | 0.000                 | 0.000                 | 0.00                  |
| Antenna 1 (port)      | 0.158                 | -1.245                | -3.000                |
| Antenna 2 (starboard) | 0.158                 | 1.252                 | -3.035                |
| EM2040C               | 0.036                 | 0.000                 | 0.133                 |





Figure 4 – Amy Gale RGB color images generated from 3D laser scan survey (GPS antennas and external cabling not included in survey) data (.pts file converted to .las for visualization)



Figure 5 – Amy Gale origin (point 201 in RGB images) for vessel reference frame(s); origin is center point within the base of the pole (center point of base within internally-mounted motion reference unit (MRU) point 201 in images above)

#### **2.4 Survey Operations**

The following is a general summary of daily survey operations. Once the survey destination was reached, the sonar pole mount was lowered into survey position and its bracing rods were fastened securely to the hull of the ship via heavy-duty ratchet straps. Electric power to all systems was provided by a 2000-watt Honda eu2000i generator. Occasionally two eu2000i generators were simultaneously used if any auxiliary equipment needed additional electricity. Immediately following power-up, all interfacing instruments were given time to stabilize (e.g. approximately 30-45 minutes for Seapath to acquire time tag for GPS). Next, the desired QINSy project (e.g. mainscheme, inshore, etc.) was selected for data acquisition. All files (e.g. raw sonar files, sound speed profiles, grid files, etc.) were recorded and stored within their respective project subfolders on a local drive. Prior to surveying, a sound speed cast was taken and imported into the 'imports' folder of the current project. After confirming a close match between the upcast and downcast data, the profile was applied to the sonar (EM2040C) in the QINSy Controller module. Data were gridded at 2-meters for real-time visualization. Raw sonar files were logged in the QINSy Controller module in .db format and saved directly onto the hydrographic workstation computer. All data were backed up daily on an external hard drive. At the end of each day's survey, sonar and navigation systems were powered down and the pole mount was raised and fastened for transit back to port. Upon arriving at the dock, all external instruments/hardware were visually inspected and rinsed with freshwater to prevent corrosion.

#### 2.5 Survey Planning

Line planning and coverage requirements were designed to meet the specifications set forth in the BOEM grant, but also met requirements for NOAA hydrographic standards (NOAA Field Procedures Manual, 2014). In the mainscheme area, parallel lines were mostly planned several days prior to surveying and run in a NE-SW or E-W pattern, depending on the location. Lines were spaced at consistent intervals to obtain a minimum of 20% overlap between full swaths. Soundings from beam angles outside of  $\pm 60$  degrees from the nadir were blocked from visualization during acquisition, thus increasing the true minimum full-swath overlap. This online blocking filter was recommended by Quality Positioning Services field engineers with the intent of eliminating noisy outer beams from the final product, thereby increasing the overall contribution of higher quality soundings. All data was acquired at approximately 6 - 6.5 knots, although some areas required slower speeds to ensure safe operation of the vessel around obstructions (e.g. fishing gear, docks, ledges, etc.).

#### 2.6 Calibrations

Several patch tests were conducted aboard the R/V Amy Gale at the beginning of the 2018 and 2019 survey seasons to correct for alignment offsets. A second patch test was run later in each season once verified tide data was available. During the test, a series of lines were run to determine the latency, pitch, roll, and heading offset. The patch test data were processed using the Qimera (v.1.7.2) patch test tool. After calibration was complete, offsets (Tables 4 and 5) were entered in to the template database in QINSy. Roll and pitch offsets calculated for this patch test slightly differed from calibrations from each other, but varied more greatly compared to previous seasons. Full built-in self-tests (BIST) were performed at semi-regular intervals throughout the season to determine if any significant deviations in background noise were present at the chosen survey frequency of 300KHz.

|                   | 7/30/2018 | 8/20/2018 |  |
|-------------------|-----------|-----------|--|
| Latency (seconds) | 0.06      | 0.01      |  |
| Roll (degrees)    | -0.39     | -0.39     |  |
| Pitch (degrees)   | 0.34      | 0.51      |  |
| Heading (degrees) | -0.15     | -0.21     |  |

Table 4 - Initial and updated 2018 patch test calibration offsets for EM2040C

Table 5 - Initial and updated 2019 patch test calibration offsets for EM2040C

|                   | 5/16/2019 | 5/28/2019 |  |
|-------------------|-----------|-----------|--|
| Latency (seconds) | 0.01      | 0.01      |  |
| Roll (degrees)    | -0.35     | -0.43     |  |
| Pitch (degrees)   | 0.72      | 2.27      |  |
| Heading (degrees) | -0.43     | -0.30     |  |

# **3.0 Quality Control**

#### **3.1 Crosslines**

Due to unforeseen scheduling conflicts, crosslines were not run in either mainscheme area during the 2018 field season. A late start to the field season resulting from the hire of a new hydrographer and poor weather conditions during the months of September through October were two major factors in the inability of the MCMI to conduct crosslines in 2018 survey areas.

In order to meet the BOEM requirement, crosslines for both the 2018 and 2019 survey areas were run in 2019 (staggered to save time on turns; in lieu of 900 meters as per BOEM requirement; U.S. Department of the Interior, 2014) to act as a data quality check over both years' coverage (Figure 6). Crosslines were filtered during post-processing to remove soundings greater than 45 degrees from the nadir. After filtering, the two-dimensional surface area of the crossline surfaces totaled approximately 35% of mainscheme acquisition. Crossline sounding agreement with mainscheme data was evaluated by using the crosscheck tool in Qimera v.1.7.2, which performs a beam-by-beam statistical analysis.

The mean difference between soundings was 0.02 meters with a standard deviation of 0.63 meters for the Monhegan Island area and 0.06 meters with a standard deviation of 0.54 meters for the Saco Bay area. Sounding agreement in both areas meet IHO Order 1 survey specifications according to the crosscheck tool.

95% of all differences for both survey areas were less than 1.35 meters from the mean (Figure 7). Summary statistics for this analysis are shown in Table 6 and Table 7. Additional statistical plots generated from this analysis are reported in Appendix E. Raw difference data, reference surfaces, and sonar files used for this analysis were submitted with the data in these surveys.



Figure 6 – Location of crosslines (shown in purple, beams filtered outside  $\pm 45^{\circ}$ ) and mainscheme data



Figure 7 – 2018-2019 crosslines difference histogram; pink areas represent the 95% confidence interval based on normal distribution; yellow dashed lines represent limit of IHO Order 1 test vertical tolerance; gray dashed lines on histogram represent  $\pm$ sigma 1, 2, and 3

| # of Points of Comparison                      | 21977232   |  |
|--|------------|--|
|  | -          |  |
|  | 90.812034  |  |
| Data Mean                                      | m          |  |
|  | -          |  |
|  | 90.755171  |  |
| <b>Reference Mean</b>                          | m          |  |
|  | -0.056863  |  |
| Difference Mean                                | m          |  |
|  | 2.784304   |  |
| Difference Median                              | m          |  |
|  | 0.535966   |  |
| Std. Deviation                                 | m          |  |
|  | -142.95 m  |  |
|  | to -50.18  |  |
| Data Z - Range                                 | m          |  |
| C C  | -135.54 m  |  |
|  | to -50.46  |  |
| Ref. Z - Range                                 | m          |  |
|  | -23.36 m   |  |
| Diff Z - Range                                 | to 29.34 m |  |
|  | 1.128794   |  |
| Mean + 2*stddev                                | m          |  |
|  | 3.856235   |  |
| Median + 2*stddev                              | m          |  |
|  | 1.281393   |  |
| Ord 1 Error Limit                              | m          |  |
|  | 0.031737   |  |
| Ord 1 P-Statistic                              | m          |  |
| Ord 1 - # Rejected                             | 697495     |  |
| - <del>-</del>                                 | ACCEPT     |  |
| <b>Order 1 Survev</b>                          | ED         |  |
| *Order 1 parameters: $a = 0.25$ and $b = 0.01$ | 3          |  |

Table 6 - Saco Bay survey area crossline difference (Qimera crosscheck) summary statistics

Table 7 - Monhegan Island survey area crossline difference (Qimera crosscheck) summary statistics

| # of Points of Comparison | 14052879              |  |
|---------------------------|-----------------------|--|
| Data Mean                 | -95.604400 m          |  |
| <b>Reference Mean</b>     | -95.621417 m          |  |
| <b>Difference Mean</b>    | 0.017017 m            |  |
| <b>Difference Median</b>  | -3.505933 m           |  |
| Std. Deviation            | 0.633622 m            |  |
| Data Z - Range            | -127.39 m to -59.68 m |  |
|                           |                       |  |

| Ref. Z - Range     | -127.92 m to -60.47 m |
|--------------------|-----------------------|
| Diff Z - Range     | -18.09 m to 11.54 m   |
| Mean + 2*stddev    | 1.284260 m            |
| Median + 2*stddev  | 4.773176 m            |
| Ord 1 Error Limit  | 1.339867 m            |
| Ord 1 P-Statistic  | 0.046391              |
| Ord 1 - # Rejected | 651928                |
| Order 1 Survey     | ACCEPTED              |

\*Order 1 parameters: a = 0.25 and b = 0.013

#### **3.2 Junctions**

The junctions shown in Table 8 were made with this survey. Survey W00450 was conducted by the Maine Coastal Program's Mapping Initiative aboard the Amy Gale in 2017. The areas of overlap between the 2018-2019 survey and the junction survey (NOAA survey ID W00450, currently in review) were evaluated for sounding agreement by performing surface (4-meter resolution) difference tests in Fledermaus (v.7.8.6, 64-bit), where the junctioning surface (2017) was subtracted from the new 2018-2019 surface. A summary of surface difference test results is shown in Table 9. The extent of overlap between the 2017 base surface and the corresponding 2018-2019 junction surface is illustrated in Figure 8. The surfaces used for these tests are submitted with the data in these surveys.

Survey W00288 was conducted by the Maine Coastal Program's Mapping Initiative aboard the Amy Gale in 2014. The areas of overlap between the 2018-2019 survey and the junction survey (NOAA survey ID W00288) were evaluated for sounding agreement by performing surface (8-meter resolution) difference tests in Fledermaus (v.7.8.6, 64-bit), where the junctioning surface (2014) was subtracted from the new 2018-2019 surface. A summary of surface difference test results is shown in Table 9. The extent of overlap between the 2014 base surface and the corresponding 2018-2019 junction surface is illustrated in Figure 9. The surfaces used for these tests are submitted with the data in these surveys.

Surveys H12725 and H12726 were conducted by NOAA aboard the Ferdinand R. Hassler in 2015. The areas of overlap between the 2018-2019 survey and the junction surveys (NOAA survey IDs H12725 and H12726) were evaluated for sounding agreement by performing surface (8-meter and 4-meter resolution, respectively) difference tests in Fledermaus (v.7.8.6, 64-bit), where the junctioning surfaces (2015) were subtracted from the new 2018-2019 surface. A summary of surface difference test results is shown in Table 9. The extent of overlap between the 2015 base surfaces and the corresponding 2018-2019 junction surface is illustrated in Figure 9. The surfaces used for these tests are submitted with the data in these surveys.

| Registry<br>Number | Grid Mainscheme<br>Resolution area |          | Year | Field Unit              | Relative<br>Location(s) |
|--------------------|------------------------------------|----------|------|-------------------------|-------------------------|
| W00288             | 8 meters                           | Saco Bay | 2014 | AMY GALE                | W and S                 |
| H12725             | 8 meters                           | Saco Bay | 2015 | FERDINAND R.<br>HASSLER | W                       |

Table 8 – 2018-2019 mainscheme survey junctions

| H12726 | 4 meters | Saco Bay        | 2015 | FERDINAND R.<br>HASSLER | W and N |
|--------|----------|-----------------|------|-------------------------|---------|
| W00450 | 4 meters | Monhegan Island | 2017 | AMY GALE                | W and N |

| Table 9 – | Summary | of surface | difference | test results | for overl | apping | (junction) | surveys |
|-----------|---------|------------|------------|--------------|-----------|--------|------------|---------|
|           | 2       |            |            |              |           |        | V /        | 2       |

|                                  |  | , ,           |             |                     |
|----------------------------------|--|---------------|-------------|---------------------|
| Junction Surface ID              | New Surface ID                                 | Median<br>(m) | Mean<br>(m) | Std.<br>Dev.<br>(m) |
| W00288_MB_8m_MLLW<br>_Combined   | MCMI_2018_2019_mainscheme_Saco_<br>8m_MLLW     | 0.02          | 0.02        | 0.33                |
| H12725_MB_8m_MLLW_<br>Combined   | MCMI_2018_2019_mainscheme_Saco_<br>8m_MLLW     | 0.06          | 0.02        | 0.57                |
| H12726_MB_4m_MLLW_<br>Combined   | MCMI_2018_2019_mainscheme_Saco_<br>4m_MLLW     | 0.10          | 0.11        | 0.41                |
| MCMI_2017_mainscheme_<br>4m_mllw | MCMI_2018_2019_mainscheme_Monh<br>egan_4m_MLLW | 0.06          | 0.05        | 0.75                |

Several factors are thought to contribute to the high standard deviation in the overlapping Monhegan Island area surveys: poor agreement in rocky areas, filtering procedures, and survey conditions (e.g. weather and sea state). The most disagreement between surfaces was in areas with a steep, rocky seabed.



Figure 8 – Junctioning areas between W00450 and 2018-2019 Monhegan Island mainscheme survey (4-meter surfaces) shown as surface difference results; scale is 1:15,000.



Figure 9 – Junctioning areas between H12726 (A), H12725 (B), W00288 (C) and 2018-2019 mainscheme survey; (4-meter and 8-meter surfaces) shown as surface difference results; scale in A is 1:24,000; scale in B through C is 1:10,000

# **3.3 Equipment Effectiveness**

#### Sonar

Sonar data were acquired with a Kongsberg EM2040C set to a survey frequency of 300 kHz, high-density beam forming, with 400 beams per ping. Although the EM2040C allowed full swath widths at this frequency, lines from previous year's survey run at comparable depths contained considerable noise in outer beams (>  $\pm 60$  degrees from the nadir; as identified by QPS engineers). As a result (and as per QPS recommendation), soundings greater than  $\pm 60$  degrees from the nadir were not included in final bathymetric surfaces.

#### Hydrographic Workstation

Prior to October 2018, a BIOS setting related to CPU power throttling on the hydrographic workstation PC created brief (<1 second) and semi-regular losses of QINSy's time sync status (e.g. PPS time tagging of incoming data) while recording data. Troubleshooting of this problem was successful prior to all surveying conducted in and after October 2018.

#### **3.4 Sound Speed Methods**

Sound speed cast frequency: A total of 48 sound speed casts were taken within the boundaries of the 2018 and 2019 mainscheme surveys. All sound speed cast measurements were collected using the Teledyne Odom Digibar S profiler. Sound speed casts were taken as needed throughout the survey, which was generally when the observed surface sound speed (monitored and visualized in real-time using the AML MicroX SV sensor) differed from the surface sound speed in the active profile by more than 2 meters per second. In certain instances, supplemental casts were taken when there was reason to suspect significant changes in the water column (e.g. change in tide, abrupt changes in seafloor relief, etc.). During the collection of sound speed casts, logging was stopped to download and apply the new cast and was resumed when the boat circled around and came back on the survey line. Throughout the duration of the survey, the surface sound speed was observed in real-time (by the AML Micro X SV probe). Although sound speed data were recorded in raw sonar files, the raw sound velocity profiles (.csv) were also submitted with the survey data.

A quality comparison between the AML Micro X SV sensor and the Teledyne Odom Digibar S profiler was not performed. However, real-time comparisons between surface sound speed observed by the AML Micro X SV and the surface sound speed entry in the Digibar S profile suggested these instruments were in agreement.

### 4.0 Data Post-processing

The following is a summary of the procedures used for post-processing and analysis of survey data using Qimera (v.1.7.2, 64-bit edition) and Fledermaus (v.7.8.6, 64-bit edition) software.

#### 4.1 Horizontal Datum

The horizontal datum for these data is WGS 84 projected in UTM zone 19N (meters).

#### 4.2 Vertical Datum and Water Level Corrections

The vertical datum for these data is mean lower-low water (MLLW) level in meters. A tidal zoning file (.zdf; provided by NOAA CO-OPS) containing time and range corrections for verified data referenced from the Wells, ME (8419317) and/or Portland, ME (8418150) tide gauge was applied to all areas surveyed (Figure 10). Time corrections, tide height offsets, and tide scale (range) for each zone are listed in Table 10.



Figure 10 – Tide zones (outlined in red) relative to 2018-2019 mainscheme survey extent. Map scale 1:90,000.

Table 10 – Tide zones and corrections referenced to verified Wells (8419317)

| Zone ID | Time Correction<br>(mins.) | Tide Offset<br>(m) | Tide Scale | Survey Area |
|---------|----------------------------|--------------------|------------|-------------|
| NA4     | -18                        | 0                  | 0.99       | Mainscheme  |
| NA6     | -12                        | 0                  | 0.99       | Mainscheme  |

#### 4.3 Processing Workflow

The general post-processing work flow in Qimera was as follows:

- 1. Create project
- 2. Add raw sonar files (e.g. metadata extracted and processed bathymetry data converted to .qpd, including vessel configuration and sound velocity)
- 3. Add tide zoning file (.zdf) and associated tide data and integrate into raw files
- 4. Create dynamic surface with NOAA\_4m CUBE settings enabled
- 5. Review and edit soundings/clean surface with 3D editor tool
- 6. Export final surface to .BAG file and CUBE surface
- 7. Export processed data in .GSF format for backscatter processing

#### <u>CUBE</u>

A CUBE (Combined Uncertainty and Bathymetry Estimator) surface was created for editing and as a starting point for final products. The 'NOAA\_4m' configuration (Figure 11) was selected for each surface. The mainscheme survey was gridded at 4 meters based on the average depth of the area and in accordance with NOAA's survey recommendations (NOAA, 2014).

| Configuration NOAA_4    | m •            |                   |
|-------------------------|----------------|-------------------|
| UBE Capture Distance: ( | Distance Sca   | le: 5.00          |
| UBE Hypothesis Resoluti | on Algorithm : | Number of Samples |
| stimate Offset:         |                | 4.00              |
| lorizontal Error Scale: |                | 1.96              |
| Advanced < <            |                |                   |
| Distance Exponent:      | 2.00           |                   |
| Queue Length:           | 11             | j                 |
| Quotient Limit:         | 255.00         |                   |
| Discount Factor:        | 1.00           |                   |
| Bayes Factor Threshold: | 0.135          |                   |
|                         | -              |                   |

Figure 11 - CUBE settings parameters window shown with settings for NOAA 4-meter grid resolution

#### 4.4 Final Surfaces

The following surfaces and BAGs were submitted with the survey data.

| Surface Name                               | Resolution<br>(m) | Depth Range<br>(m) | Surface<br>Parameter |
|--|-------------------|--------------------|----------------------|
| MCMI_2018_2019_mainscheme_Saco_4m_MLLW     | 4                 | 48 - 135           | N/A                  |
| MCMI_2018_2019_mainscheme_Monhegan_4m_MLLW | 4                 | 57 - 142           | N/A                  |
| MCMI_2018_2019_mainscheme_Saco_8m_MLLW     | 4                 | 47 - 135           | N/A                  |
| MCMI_2018_2019_mainscheme_Monhegan_8m_MLLW | 4                 | 57 - 142           | N/A                  |

Table 11 – Surfaces submitted with 2018-2019 survey data

#### 4.5 Backscatter

Backscatter was logged in the raw .db files. The .db files also hold the navigation record and bottom detections for all lines of surveys. Processed sonar files containing multibeam backscatter data (snippets and beam-average) were exported from Qimera v.1.7.2. in .GSF format. QPS Fledermaus Geocoder Toolbox (FMGT; v.7.8.6, 64-bit edition) was used to import, process, and mosaic time-series backscatter data. Default backscatter processing settings were used to create the mosaic, except for the Angle Varied Gain (AVG) filter and AVG window size, which were set to 'Adaptive' and '100', respectively. The 4-meter backscatter mosaics of the data is shown in Figure 12. The GSF files containing the extracted were submitted with the data in this survey. Processed mosaics (Table 12) were also saved in geoTiff format and submitted.

Table 12 – Backscatter mosaics submitted with 2018-2019 survey data

| Mosaic Name                                       | Pixel Size (m) |
|---|----------------|
| MCMI_2018_2019_mainscheme_Saco_backscatter_4m     | 4              |
| MCMI_2018_2019_mainscheme_Monhegan_backscatter_4m | 4              |



Figure 12 – Backscatter mosaic (4-meter pixel size) of 2018-2019 mainscheme surveys

## **5.0 Results**

#### **5.1 Charts Comparison**

The hydrographer conducted a qualitative comparison of reclassified bathymetry data and depth contours from the surveyed area to the charted soundings and contours. The largest scale raster navigational charts which cover the survey areas are listed in Table 13. Prior hydrographic surveys in the vicinity were conducted by NOAA between 1888 and 1954 and consisted only of partial bottom coverage. These data were not compared with data collected by the MCMI.

| Chart | Scale    | Source Edition | Source Date | NTM Date  |
|-------|----------|----------------|-------------|-----------|
| 13301 | 1:40,000 | 22             | 12/1/2018   | 12/1/2018 |
| 13288 | 1:80,000 | 44             | 2/1/2016    | 8/22/2019 |
| 13286 | 1:80,000 | 34             | 3/1/2019    | 7/4/2019  |

Table 13 – Largest scale raster charts in survey area

#### Chart 13301

A small portion of the survey area coincides with chart 13301. Surveyed depths have good overall agreement with charted contours and soundings (Figure 13), although individual soundings may disagree at any given location.

#### Chart 13288

Charts with scales 1:80,000 (and smaller) inherently contain very generalized contours. As shown in Figure 14, the agreement between chart contours and new survey data (reclassified at 60 feet intervals; same as chart) is good at depths less than 240 feet (73.1 meters). Agreement becomes poor at depths beyond 240 feet throughout the surveyed area. This disagreement is most likely due to the low resolution and lack of full bottom coverage during prior surveys rather than over generalization. It is recommended that contours within the survey area be revised.

#### Chart 13286

Charts with scales 1:80,000 (and smaller) inherently contain very generalized contours. As shown in Figure 15, the agreement between chart contours and new survey data (reclassified at 60 feet intervals; same as chart) is good at depths less than 420 feet (128 meters). However, since only a very small surface area deeper than 420 feet exists in the survey area, this disagreement could be considered negligible.



Figure 13 – Comparison between surveyed depth (reclassified at 60-feet intervals) and chart 13301 contours (60-feet interval)



Figure 14 – Comparison between surveyed depth (reclassified at 60-feet intervals) and chart 13288 contours (60-feet interval)



Figure 15 – Comparison between surveyed depth (reclassified at 60-feet intervals) and chart 13286 contours (60-feet interval)

#### 6.0 Summary

A total of approximately 42 mi<sup>2</sup> (109 km<sup>2</sup>) of high-resolution multibeam data were collected in the mainscheme survey areas by MCMI from August to November of 2018 and April to June of 2019. Except for numerous small holidays, multibeam coverage was 100% in all areas surveyed. Survey data were processed with 4-meter grid resolution. The consistency of hydrographic data collected aboard the R/V Amy Gale was reflected in the results of the surface difference tests between junction survey data, where mean vertical differences for all tests were less than 0.12 meters. Standard deviations of all tests were relatively low and comparable to those achieved by small NOAA vessels (e.g. *Ferdinand R. Hassler*) for similar surveys in Maine's coastal waters. Comparisons between these survey data and the largest scale nautical charts in the immediate vicinity show good overall agreement except for in surveyed areas at depths greater than 73 meters (locality off Monhegan Island) and 120 meters (locality off Saco Bay). Overall, these data are of sufficient quality to supersede previous data collected in the vicinity. It is recommended that the corresponding charts be updated to reflect these data.

MCMI has utilized final data products for high-resolution backscatter and bathymetry to refine existing seafloor sediment maps and determine the spatial extent of sand deposits within federal water. When combined with existing geophysical (e.g. seismic reflection profiles and side-scan sonar) data, these data may also be used to refine interpretations of coastal/nearshore geomorphology and three-dimensional assessments of potential sediment resources/valley fill in the region. In addition, these data are a critical component of benthic habitat classification and modeling performed by MCMI. Overall, these data have a variety of applications and are an invaluable resource to public and private agencies who wish to more effectively manage and understand coastal and marine resources.

These data were acquired and processed to meet Office of Coast Survey bathymetry standards as best as possible, and were shared with the UNH-NOAA Joint Hydrographic Center / Center for Coastal and Ocean Mapping for review.

Please contact the Maine Coastal Mapping Initiative for additional information or data requests.

## References

NOAA, 2014. NOS hydrographic surveys specifications and deliverables: U.S Department of Commerce National Oceanic and Atmospheric Administration. Page 89.

U.S. Department of the Interior, 2014. Proposed geophysical and geological activities in the Atlantic OCS to identify sand resources and borrow areas north Atlantic, mid-Atlantic, and south Atlantic-Straits of Florida planning areas, *final environmental assessment*. OCS EIS/EA BOEM 2013-219 U.S. Department of the Interior Bureau of Ocean Energy Management Division of Environmental Assessment Herndon, VA, January 2014.

| Mainscheme |
|------------|
| 08/01/18   |
| 08/06/18   |
| 08/16/18   |
| 08/17/18   |
| 09/04/18   |
| 10/01/18   |
| 11/15/18   |
| 11/19/18   |
| 04/17/19   |
| 04/18/19   |
| 04/24/19   |
| 04/30/19   |
| 05/16/19   |
| 05/23/19   |
| 05/28/19   |
| 06/03/19   |
| 06/05/19   |
| 06/07/19   |
| 06/12/19   |
| 06/17/19   |
| 06/18/19   |
| 06/19/19   |
| 06/20/19   |

# Appendix A – Specific dates of data acquisition for mainscheme surveys

# **Appendix B – Configuration settings for Seapath 330**



| NAV Engine Configuration  |                          |   |                  |        |                          |                        |   |      |
|---|--------------------------|---|------------------|--------|--------------------------|------------------------|---|------|
| - APRIV   | Ð                        | antes                                     |                  | Bevert |                          |                        |   |      |
| Vessel     Geometry     Description     Geometry     Description     Generate     Generatee |                          |   |                  |        |                          | <b>}</b> .<br>∠        |   | Reel |
| Geometry     Geometry     Geometry     Heave config     Geometry     Geometry     Geometry     Geometry     Geometry     forum/Dudput     Serial port extender     Network     Data Pool  |                          |   |                  |        | Oligi                    | ×                      |   | cĽ   |
|   | Antenna co<br>Antenna ty | sors 2 Show<br>infiguration<br>be NOV782G | w monitoring poi | ints   | 🛛 Antenna beam           |                        |   |      |
|   | Antenna Io               | ention (from C)                           | rinin1.          | e      | Selanos official (from ) | antanna 1 In antanna 3 |   |      |
|   |                          | Position [m]                              | (Marth)          | 2.0    | Baseline length          | 2 500                  | m |      |
|   | 1                        | X   | Y                | Z      | Heading offset           | 270.000                |   |      |
|   | GPS 1<br>(port)          | 0.158                                     | -1.245           | -3.000 | Height difference        | 0.000                  | m |      |
| Connected to Seapath 330  | GPS 2<br>(starboard)     | 0.158                                     | 1.252            | -3.035 |                          | Calibration wizard     |   |      |

| NAV Engine Configuration  |                              |         |   |   |
|---|------------------------------|---------|---|---|
| Apply   | Preview                      | Revert  |   |   |
| Geometry<br>Description   | Aid mode Off                 | •       | · |   |
| - Sensors - GNSS - Geometry - Processing  | SV masking<br>Elevation mask | 10 🔹 °  |   | I |
| - Attitude Processing - DGNSS - SBAS - HP/XP/G2   | Accuracy level               | 10.00 m |   |   |
| ⊢ BTK<br>□-MRU<br>⊢ Geometry<br>⊢ Heave config  | Ionosphere activity Normal   | ×       |   |   |
| Homitoring points     Generative     Generativ |                              |         |   |   |
| -<br>V  |                              |         |   |   |
| Connected to Secondb 220  |                              |         |   |   |

| Apply     Breview     Bewed       Becoreby     Description       Becoreby     Generaty       Becoreby     Improvements       Benors     15       Constraint     15       Constraint     15       Benors     7       Constraint     7       Benors     7       Benors     7       Benors     7       Constance     7       Benors     7       Benors     7       Constance     7       Benors     7       Benors     7       Constance     7       Benors     7       Constance     7       Benors     7       Benors     7       Benors     8       Benor     8 | NAV Engine Configuration   |  |   |  |
|---|--|--|---|--|
| → Vestel     Geometry       → Geometry     Description       → Constrained     15 * (default 15)       → Gains     → Verage pitch and roll angles     7 * (default 17)       → Geometry     → Geometry       → Processing     T       → Processing     T       → BASS     → Processing       → HPAP/RG2     ← RTK       → Maxordig points     → Geometry       → Geometry     → Geometry       → Maxordig points     → Geometry       → Geometry     → Geometry       → Maxordig     → First-Ordigat       → Serial point extender     → Nework       → Data Pool     Data Pool   | Apply  | Preview  | <u>R</u> evert  |  |
|   | P-Vessel     Geometry     Description     Geometry     Geometry     Geometry     Processing     DANAGE Processing     Geometry     Processing     DANAGE Processing     Geometry     Data Pool | GNSS attitude processing setti<br>Max pitch and roll angles<br>Average pitch and roll angles<br>Glonass option | Ings<br>15 * (default 15)<br>7 * (default 7)<br>RTK and Float |  |
| ionnecled to Seapath 330  | Connected to Seapath 330   |  |   |  |



| NAV Engine Configuration |   |        |  |
|--------------------------|---|--------|--|
| Apply                    | Preview   | Revert |  |
|                          | Enabled     XP/G2 processing     ONavigation mode     Survey mode     Use Gionass |        |  |
|                          |   |        |  |
| □ - H40                  |   |        |  |
| Connected to Seapath 330 |   |        |  |

| NAV Engine Configuration |                             |                |                 | 1 |
|--------------------------|-----------------------------|----------------|-----------------|---|
| Δρρίγ                    | Preview                     | <u>R</u> evert |                 |   |
| Apply                    | RTK<br>Search mode NORMAL - | Bovert         | RTK and Float + |   |
| Connected to Seapath 330 |                             |                |                 |   |







| , I | NAV Engine Configuration   |  |   |   |  |   |               |
|-----|--|--|---|---|--|---|---------------|
| 5   |  |  |   |   | Revert   |   |               |
|     | CPPP)  |  |   |   | Teacit   |   |               |
| 1   | Geometry   | Interface  | Type  | Direction   | 1/0 Properties   | Description   |               |
| 1   | Description  | 🗹 🔍 GnssRec1   | Serial  | In/Out  | GNSSA1 57600 n 8 1   | Receiver #1   |               |
|     | E- Sensors   | GnssRec2   | Serial  | In/Out  | GNSSB1 57600 n 8 1   | Receiver #2   |               |
|     | Geometry   | MRU MRU  | Serial  | In/Out  | MRU 115200 n 8 1 rs-422  | IMU #1  |               |
|     | Processing   | DanssLink1   | Serial  | In  | COMP1 38400 n 8 1 rs-232   | Link #1   |               |
|     | Attitude Processing     DGNSS  |  |   |   |  | Disabled   OK   OWar  |               |
|     | - SBAS   |  |   |   |  |   |               |
|     | BTK  | Configuration details  |   |   | market and   |   |               |
|     |  | Interface  | c1  |   | Description Receiver #1  |   |               |
| Λ   | Geometry   | Type Serial  |   |   |  |   |               |
|     |  | Cable ID   |   |   |  |   |               |
| 4   | Geometry   | V I/O properties   |   |   |  |   |               |
|     | Communication interface Input/Output   | Port GNSS&1  |   | Baud rate 53  | 1600 Ors-232 Or  | re-400  |               |
|     | Serial port extender   | V Advanced   |   |   | 010202 01  | U The   |               |
|     | Network  | Parity None  |   | Data bita   | Stop hits 4  |   |               |
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|     | NAV Engine Configuration   |  |   |   |  |   |               |
|     | NAV Engine Configuration   | Preview  |   | 1   | Revert   |   |               |
|     | NAV Engine Configuration   | Preview<br>Input/Output list   |   |   | Severt   |   |               |
|     | NAV Engine Configuration Apply  B-Vessel Geometry Description  | Preview<br>Input/Output list<br>Interface  | Туре  | Direction   | Revert   | Description   |               |
|     | NAV Engine Configuration Apply  - Geometry - Description - Sensors   | Preview  | Type<br>Serial  | Direction<br>In/Out   | Revert   | Description<br>Receiver #1<br>Paronee #2  |               |
|     | NAV Engine Configuration Apply  Usual Description B-Sensors D-SNSS   | Preview<br>Input/Output list<br>Interface<br>♥ ● GnssRec1<br>♥ ● GnssRec2<br>♥ ● MRU   | Type<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In/Out   | I/O Properties<br>GNSSA1 57500 n 8 1<br>GNSSB1 57500 n 8 1<br>MRU 115200 n 8 1 re-422  | Description<br>Receiver #1<br>Receiver #2<br>IMU #1   |               |
|     | NAV Engine Configuration  Apply  Vessel Geometry Description Geometry Geometry Geometry Geometry Geometry Procession   | Preview<br>⊂Input/Output list<br>Interface<br>♥ ● GnssRec1<br>♥ ● GnssRec2<br>♥ ● GnssRec2<br>♥ ● GnssRec2<br>♥ ● GnssRec2   | Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In/Out<br>In   | I/O Properties           GNSSA1 57600 n 8 1           GNSS81 57500 n 8 1           MRU 115200 n 8 1 ts-232   | Description<br>Receiver #1<br>Receiver #2<br>IMU #1<br>Gyto #1  |               |
|     | NAV Engine Configuration  Apply  Ussal G-Vessel Geometry Description G-Sensors G-GRNSS G-GRNSS G-Geometry Horocessing Horitude Processing  | Ereview Input/Output list Interface GnssRec1 GnssRec2 GnssRec2 Gyo1 Gyo1 DgnssLink1  | Type<br>Serial<br>Serial<br>Serial<br>Serial<br>Serial                                      | Direction<br>In/Out<br>In/Out<br>In<br>In   | I/D Properties           GNSSA1 57600 n 8 1           GNSSA1 57600 n 8 1           COM1 9 800 n 8 1 rs-422           COM1 9 800 n 8 1 rs-232   | Description<br>Receiver #1<br>Receiver #2<br>MU #1<br>Gyro #1<br>Link #1                                      |               |
|     | NAV Engine Configuration  Apply  Usessel Geometry Description  Sensors Geometry Processing Geometry Description Geometry Construited Processing Con | Ereview Input/Output list Interface  GrassRec1  GrassRec2  MRU GrassRec2  GrassRec1  GrassRec2  Gra | Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In/Out<br>In<br>In   | I/D Properties           GNSSA1 57600 n 8 1           GNSSA1 57600 n 8 1           FXSSB1 57600 n 8 1           MRU 115200 n 8 1 rs-422           COM1 18600 n 8 1 rs-232           COM3 84400 n 8 1 rs-232  | Description<br>Receiver #1<br>Receiver #2<br>MU #1<br>Gyro #1<br>Link #1<br>@ Disabled   @ OK   @ Warn        | ing   © Error |
|     | NAV Engine Configuration  Apply  Usual Geometry Description Sensors GeoRSS GeoRS GeoRSS GeoRS | Preview Input/Output list Interface GinssRec1 GinssRec2  | Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In/Out<br>In<br>In   | I/O Properties           GNSSA1 57500 n 8 1           GNSSB1 57500 n 8 1           MRU 115200 n 8 1 rs-232           COM1 98400 n 8 1 rs-232   | Description<br>Receiver #1<br>Receiver #2<br>IMU #1<br>Gyro #1<br>Link #1<br>W Disabled   @ OK   @ Warn       | ing   • Error |
|     | NAV Engine Configuration  Apply  Generative Geometry Description B-Sensors GeoRSS GeoRS GeoRSS GeoRS G | Preview Input/Output list Interface  GrassRec2  GrassRec2  GrassRec2  GrassRec1  GrassRec2  GrassRe | Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In/In<br>In  | I/D Properties           GNSSA1 57500 n 81           GNSSA1 57500 n 81           MRU 115200 n 81 rs-232           COM13 9600 n 81 rs-232           COM3 39400 n 81 rs-232           escription           Receiver #2   | Description<br>Receiver #1<br>Receiver #2<br>MU #1<br>Gyro #1<br>Link #1<br>@ Disabled   @ OK   @ Warn        | ing   • Error |
|     | NAV Engine Configuration  Apply  Vessel Geometry Description Geometry Geometry Geometry Attbude Processing GeodGNSS Geometry HPAP/62 HPAP/62 HTK Geometry Ge | Preview Input/Output list Interface   Configuration details  Configuration details   | Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In<br>In   | I/D Properties           GNSSA1 57600 n 8 1           GNSSB1 57600 n 8 1           COM1 15600 n 8 1 rs-232           COM1 9800 n 8 1 rs-232           escription           Receiver #2   | Description<br>Receiver #1<br>Reseiver #2<br>MU #1<br>Gyro #1<br>Link #1<br>Disabled   OK   OW Warn           | ing   • Error |
|     | NAV Engine Configuration   | Ereview Interface  GinsRec1  GinsRc2  GinsRc2  GinsRc2  GinsRc3  GinsRc4  GinsRc2  GinsRc4  GinsRc5  G | Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In<br>In<br>D  | I/D Properties           GNSSA1 57600 n 8 1           GNSSB1 57600 n 8 1           COM1 9800 n 8 1 rs-422           COM9 38400 n 8 1 rs-232           escription           Receiver #2   | Description<br>Receiver #1<br>Receiver #2<br>IMU #1<br>Gyro #1<br>Link #1<br>@ Disabled   @ OK   @ Warn       | ing   • Error |
|     | NAV Engine Configuration  Apply  Uessel Geometry | Ereview Input/Output list Interface GrissRec1 GrissRec2 GrissRec2 GristRec1 GristRec2 GristRec1 GristRec2  | Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In/Out<br>In<br>In   | I/D Properties           GNSSA1 57600 n 8 1           GNSSA1 57600 n 8 1           GNSSA1 57600 n 8 1           COM11 5000 n 8 1 tr-232           COM13 800 n 8 1 tr-232           COM9 38400 n 8 1 tr-232           escription           Receiver #2  | Description<br>Receiver #1<br>Receiver #2<br>MU #1<br>Gyro #1<br>Link #1<br>@ Disabled   @ OK   © Warn        | ing   • Error |
|     | NAV Engine Configuration  Apply  Service Geometry Description Geometry Description Geometry Description Geometry Def Service Attitude Processing Def DGNSS Def DGNS D | Preview Input/Output list Interface GrassRec1 GrassRec2 GrassRec1 GrassRec1 GrassRec1 GrassRec1 GrassRec1 GrassRec1 GrassRec1 Type Gable ID VD properties=   | Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In/In<br>In<br>In  | I/O Properties           GNSSA1 57600 n 8 1           CMS5B1 57600 n 8 1           MRU 115200 n 8 1 rs-422           COM1 9800 n 8 1 rs-232           COM3 98400 n 8 1 rs-232           escription           Receiver #2   | Description<br>Receiver #1<br>Receiver #2<br>MU #1<br>Gyro #1<br>Link #1<br>Disabled   OK   O Warn            | ing   • Error |
|     | NAV Engine Configuration  Apply  Ussal Geometry Description B- Seniors G- GROWER Attitude Processing D- DRNS G- DRNS G | Preview Input/Output list Interface  | Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In/Out<br>In<br>In<br>In<br>aud rate 571   | I/D Properties           GNSSA1 57600 n 8 1           GNSSA1 57600 n 8 1           GNU INTECON 8 1 re-422           COM1 19600 n 8 1 re-232           COM3 38400 n 8 1 re-232           escription           Receiver #2   | Description<br>Receiver #1<br>Receiver #2<br>IMU #1<br>Gyo #1<br>Link #1<br>Disabled   OK   OWarr             | ing   • Error |
|     | NAV Engine Configuration       Apply      Jesconety     Description     Geomety     Geomety     Geomety     Geomety     Attitude Processing     DGNSS     GONSS     GNSS     GONSS     GONSS     GONSS     GONSS     Geometry     HPAP/R2     HRAP/R2     HRI     Geometry     Heave config     Gometry     Heave config     Communication interface     Input/Dutput     Geometry     Geometry     Geometry     Gond textender  | Preview  Input/Output list Interface  ✓ GnssRec1  ✓ GnssRec2  ✓ MRU  Gyo1  Configuration details Interface  Type Serial Cable ID  V I/O properties  V I/O properties  V Advanced   | I ype<br>Serial<br>Serial<br>Serial<br>Serial   | Direction<br>In/Out<br>In/Out<br>In<br>In<br>In<br>In<br>In   | Bevert           I/D Properties           GNSSA1 57500 n 8 1           GNSSB1 57500 n 8 1           COM1 9800 n 8 1 re-222           COM9 39400 n 8 1 re-232           escription           Receiver #2           G00  | Description<br>Receiver #1<br>Receiver #2<br>MU #1<br>Gyro #1<br>Link #1<br>Disabled   OK   OWarr             | ing   • Error |
|     | NAV Engine Configuration   | Ereview Interface Sport Sport Construct Description Description Description Configuration details Interface Description Descri | Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In/Out<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In | Bevert         I/D Properties           GNSSA1 57600 n 8 1         GNSSA1 57600 n 8 1           GNSSA1 57600 n 8 1         GNSSA1 57600 n 8 1           GOM1 9 800 n 8 1 rs-232         COM9 38400 n 8 1 rs-232           COM9 38400 n 8 1 rs-232         COM9 38400 n 8 1 rs-232           escription         Receiver #2           GOU         O rs-232         O rs | Description<br>Receiver #1<br>Receiver #2<br>IMU #1<br>Gyo #1<br>Link #1<br>Disabled   OK   OWarn             | ing   • Error |
|     | NAV Engine Configuration  Apply  Service Geometry Description Geometry Description Geometry Def Service Attitude Processing Def OSNSS Def OSNS Def OS | Preview Input/Output list Interface ✓ ● GnssRec1 ✓ ● GnssRec2 ✓ ● MRU ● Gyro1 ● Ogno1 ● OgnosLink1 ✓ Configuration details- Interface GnssRec Type Serial Cable ID ✓ U0 properties Port GNSSB1 ♥ Advanced Parity None  | 22  | Direction<br>In/Out<br>In/Out<br>In<br>In<br>aud rate 571<br>ata bits 8   | Bevert         I/D Properties           GNSSA1 57600 n 8 1         GNSSA1 57600 n 8 1           COM115200 n 8 1 rs-422         COM119600 n 8 1 rs-232           COM938400 n 8 1 rs-232         COM938400 n 8 1 rs-232           escription         Receiver #2           500         O rs-232         O rs           Stop bits         1                               | Description<br>Receiver #1<br>Receiver #2<br>MU #1<br>Gyro #1<br>Link #1<br>Disabled   OK   O Warn            | ing   • Error |
|     | NAV Engine Configuration  Apply  Sensors  Concepts Concep | Preview Input/Output list Interface  | Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In/Out<br>In<br>In<br>In<br>aud rate 571   | I/O Properties           GNSSA1 57600 n 8 1           GNSSA1 57600 n 8 1           MRU 115200 n 8 1 re-422           COM1 3 800 n 8 1 re-232           COM3 98400 n 8 1 re-232           escription           Receiver #2           500           Stop bits  | Description Receiver #1 Receiver #2 IMU #1 Gyro #1 Link #1  Disabled   • OK   • Warn                          | ing   • Error |
|     | NAV Engine Configuration  Apply  Vessel Geometry Description Geometry Geometry Attitude Processing Debots HP/AP/62 HP/AP/62 HP/AP/62 HP/AP/62 Geometry Heave config Geometry Heave config Communication interface Injout/00ptoit Serial pot extender Network Data Pool   | Preview  | 2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2 | Direction<br>In/Out<br>In/Out<br>In/In<br>In<br>In<br>aud rate 571<br>ata bits 8                                      | Bevert         I/O Properties           GNSSA1 57000 n 8 1         GNSSA1 57000 n 8 1           COM1 5800 n 8 1 rs-222         COM1 9800 n 8 1 rs-222           COM9 39400 n 8 1 rs-232         COM9 39400 n 8 1 rs-232           escription         Receiver #2           Stop bits         1   | Description Receiver #1 Reserver #2 MU #1 Gyro #1 Link #1 Disabled   OK   OW Warn                             | ing   • Error |
|     | NAV Engine Configuration   | Preview  Interface   | 2   | Direction<br>In/Out<br>In/Out<br>In/Out<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In | Severt         I/D Properties           GNSSA1 57600 n 8 1         GNSSB1 57600 n 8 1           GNSSB1 57600 n 8 1         Fx422           COM1 9800 n 8 1 rs-232         COM9 38400 n 8 1 rs-232           escription         Receiver #2           S00         O rs-232         rs           Stop bits         1   | Description Receiver #1 Receiver #2 IMU #1 Gyo #1 Link #1 Disabled   OK   OW Warn                             | ing   • Error |
|     | NAV Engine Configuration  Apply  Service Geometry Description Geometry Description Geometry Def  | Preview Input/Output list Inferface  GrassRec1  GrassRec2  GrassRec1  GrassRec1  Configuration details Interface GrassRec Type Serial Cable ID  V/0 properties Port GNSSB1  Advanced Parity None   | 2   | Direction<br>In/Out<br>In/Out<br>In/In<br>In<br>aud rate 570<br>ata bits 8  | Bevert         I/D Properties           GNSSA1 57600 n 8 1         GNSSA1 57600 n 8 1           GNSSA1 57600 n 8 1         GNSSA1 57600 n 8 1           COM1 9800 n 8 1 rs-232         COM1 9800 n 8 1 rs-232           COM9 38400 n 8 1 rs-232         COM9 38400 n 8 1 rs-232           escription         Receiver #2           Stop bits         1                 | Description Receiver #1 Receiver #2 MU #1 Disabled    OK    Warn  | ing   • Error |
|     | NAV Engine Configuration  Apply  Sensors  Constraints  Attraction  | Preview Input/Output list Inferiace  GinsRec2  GinsRec2  GinsRec2  GinsRec2  GinsRec2  GinsRec2  GinsRec2  GinsRec2  GinsRec2  GinsRec  Interface GinsRec  Type Serial  Cable ID  VIO properties Port VIO system Parity None   | I Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In/Out<br>In<br>In<br>In<br>aud rate 57  | I/O Properties           GNSSA1 57600 n 8 1           GNSSA1 57600 n 8 1           GNSSA1 57600 n 8 1           COM1 3600 n 8 1 re-232           COM3 98400 n 8 1 re-232           escription           Receiver #2           Stop bits           Stop bits  | Description     Receiver #1     Receiver #2     INU #1     Gyro #1     Link #1     O Disabled   O K   O Warn  | ing   • Error |
|     | NAV Engine Configuration  Apply  Second Seco | Preview  | Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction<br>In/Out<br>In/Out<br>In<br>In<br>In<br>aud rate 571<br>ata bits 8   | Bevert         I/O Properties           GNSSA1 57000 n 8 1         GNSSA1 57000 n 8 1           COM1 5800 n 8 1 rs-222         COM1 9800 n 8 1 rs-222           COM9 39400 n 8 1 rs-222         COM9 39400 n 8 1 rs-222           escription         Receiver #2           500         O rs-232         O rs           Stop bits         1                             | Description Receiver #1 Receiver #2 MU #1 Gyto #1 Link #1 Disabled   OK   OW Warn                             | ing   • Error |
|     | NAV Engine Configuration  Apply  Vessel Geometry Description Geometry Hereinian Herein | Preview   ProutOutput list  Interface  | 2   | Direction<br>In/Out<br>In/Out<br>In<br>In<br>In<br>aud rate 571   | 30vert         I/O Properties           GNSSA1 57500 n 8 1         GNSSB1 57500 n 8 1           CDM1 19600 n 8 1 re-232         COM9 39400 n 8 1 re-232           escription         Receiver #2           S00         O rs-232         O rs           Stop bits         1   | Description Receiver #1 Receiver #2 MU #1 Gyo #1 Link #1 Disabled   OK   OK Warn                              | ing   • Error |
|     | NAV Engine Configuration  Apply  Service Geometry Description Geometry Description Geometry Def Service Antitude Processing Def OSNSS Def OSNS Def O | Preview Input/Output list Inferface  GrassRec1  GrassRec2  GrassRec1  GrassRec1  GrassRec1  GrassRec1  Configuration details Interface Inferface   | 2   | Direction<br>In/Out<br>In/Out<br>In<br>In<br>In<br>aud rate 574   | Bevert         I/D Properties           GNSSA1 57600 n 8 1           GNSSB1 57600 n 8 1           GNSSB1 57600 n 8 1           GOM1 9800 n 8 1 rs-222           COM9 38400 n 8 1 rs-232           escription           Receiver #2           Stop bits           Stop bits   | Description Receiver #1 Receiver #2 IMU #1 Gyo #1 Link #1 Disabled   OK   Warn                                | ing   • Error |
|     | NAV Engine Configuration  Apply  Sensor  Growenty Description  Sensor  Growenty Description  Attitude Processing De ORNS Description Descr | Preview Input/Output list Inferface  Ginserec1  Ginserec2  Ginserec2  Ginserec2  Ginserec1  Ginserec2  Ginserec1  Ginserec2  Ginser  | 2 Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction   | Bevert         I/O Properties           GNSSA157600 n 8 1         GNSSA157600 n 8 1           GNSS8157500 n 8 1         MRU 115200 n 8 1 tr-222           CDM1 15600 n 8 1 tr-232         CDM1 3600 n 8 1 tr-232           escription         Receiver #2           500         O rs-232         rs           Stop bits         1                                      | Description     Receiver #1     Receiver #2     Mul #1     Gyro #1     Link #1     @ Disabled   @ OK   @ Warn |               |
|     | Average         - Geometry         - Geometry         - Description         B- NRSS         IIII - Geometry         - Geometry         - Processing         - Athlude Processing         - BASS         IIIII - SPACE         - HP/XP/G2         - HRU         - Geometry         - Beometry         - Boometry         - SBAS         - HP/XP/G2         - HRU         - Geometry         - Beometry         - Data Pool  | Preview Input/Output list Interface  | I Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction   | Bevert         I/O Properties           GNSSA1 57600 n 8 1         GNSSA1 57600 n 8 1           COM1 5800 n 8 1 re-232         COM9 38400 n 8 1 re-232           com9 38400 n 8 1 re-232         COM9 38400 n 8 1 re-232           escription         Receiver #2           500         O rs-232         rs           Stop bits         1                              | Description     Receiver #1     Receiver #2     MU #1     Gyto #1     Link #1     Disabled   • OK   • Warn    | ing   • Error |
|     | Ave Engine Configuration         Apply         - Geometry<br>- Description         B- Sensors         G- GNSS         - Althude Processing         - DGNSS         - HP/AP/62         - HRU         - Geometry         - HP/AP/62         - HRU         - Geometry         - Heave config         B- MRU         - Geometry         - Heave config         B- MRU         - Geometry         - Heave config         B- MRU         - Geometry         - How config         B- MRU         - Geometry         - Have config         B- MRU         - Geometry         - How config         B- May configuration interface         - Input/Dubpit         - Data Pool  | Preview  | 2   | Direction<br>In/Out<br>In/Out<br>In<br>In<br>aud rate 571<br>ata bits 8   | Bevert         I/O Properties           GNSSA1 57000 n 8 1         GNSSB1 57500 n 8 1           COM1 9800 n 8 1 re-222         COM9 98400 n 8 1 re-222           escription         Receiver #2           Stop bits         1  | Description Receiver #1 Receiver #2 MU #1 Gyro #1 Link #1 Disabled   OK   Warn                                | ing ] • Error |
|     | NAV Engine Configuration  Apply  Servors Genety Description Genety Description Genety Description Genety Description Genety Description Genety Description Genety G | Preview Input/Output list Inferface  GrassRec1  GrassRec2  GrassRec1  GrassRec1  Configuration details Interface Type Serial Cable ID  V/0 properties Port ONSSB1  Advanced Parity None  | 2   | Direction<br>In/Out<br>In/Out<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In<br>In           | Bevert         I/D Properties           GNSSA1 57600 n 8 1           GNSSB1 57600 n 8 1           GNSSB1 57600 n 8 1           GOM1 9800 n 8 1 rs-222           COM9 38400 n 8 1 rs-232           escription           Receiver #2           Stop bits           Stop bits   | Description Receiver #1 Receiver #2 MU #1 Gyo #1 Link #1 Disabled    OK    Warn                               | ing O Error   |
|     | Apply         - Geometry         - Geometry         - Geometry         - Geometry         - Geometry         - Geometry         - Processing         - Attitude Processing         - ONSS         - BARS         - HPARP/G2         - HRU         - Geometry         - Bornorita         - Geometry         - Bornorita         - Geometry         - Decometry         - Bernorita         - Geometry         - Data Pool   | Preview Input/Output list Inferface  GinstRec1  GinstRec2  GinstRec2  GinstRec2  GinstRec2  GinstRec2  GinstRec2  GinstRec3  Configuration details- Interface GinstRec Type Berial Cable ID  V/D properties Port GinstBe1  Advanced Partly None  | 2   | Direction   | Bevert           I//D Properties           GNSSA1 57600 n 8 1           GNSS81 57500 n 8 1           GNSS81 57500 n 8 1           MRU 115200 n 8 1 tr-232           CDM1 1 Sb00 n 8 1 tr-232           CDM3 98400 n 8 1 tr-232           escription           Receiver #2           500           Stop bits           1  |   |               |
|     | Average         - Geometry         - Particle         - MRU         - Geometry         - BASS         - HP/XP/G2         - RTK         B-MRU         - Geometry         - Beometry         - Beometry         - Beometry         - Beometry         - Brit         B-MRU         - Geometry         - Beometry         - Bool   | Preview Input/Output list Interface  ✓ GrissRec2  ✓ MRU Giprofile  ✓ Configuration details Interface Type Serial Cable ID VIO properties Port (NNSB1)  ✓ Advanced Parity None  | I Type<br>Serial<br>Serial<br>Serial<br>Serial  | Direction   | Bevert         I/D Properties           GNSSA1 57600 n 8 1         GNSSA1 57600 n 8 1           CDM1 19600 n 8 1 re-232         CDM1 9800 n 8 1 re-232           common 8 1 re-232         CDM9 38400 n 8 1 re-232           escription         Receiver #2           Stop bits         1  | Description     Receiver #1     Receiver #2     MU #1     Gyo #1     Link #1     Disabled   • OK   • Warn     | ing   • Error |

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| E-Vessel  | Input/Output list   |  | D:  | 1000  |  |  |
| Description   | Interface   | Type   | Direction   | I/U Properties  | Description  |  |
| - Sensors   | GnssBec2  | Serial   | In/Out  | GNSSB1 57600 n 8 1  | Beceiver #2  |  |
| □ GNSS  | MRU   | Serial   | In/Out  | MRU 115200 n 8 1 rs-422   | IMU #1   |  |
| Processing  | Gyro1   | Serial   | In  | COM11 9600 n 8 1 rs-232   | Gyro #1  |  |
| Attitude Processing   | DgnssLink1  | Serial   | In  | COM9 38400 n 8 1 rs-232   | Link #1  |  |
| DGNSS   |   |  |   |   | 🚇 Disabled   🕒 OK   🍛 V  | /arning   🥥 Erroi  |
| - HP/XP/G2  | Configuration details   |  |   |   |  |  |
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| Ė-MRU   | Internation Internation   |  |   | inter |  |  |
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| Ionitoring points   | Cable ID  |  |   |   |  |  |
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| nunication interrace  | Port MRU  | Ba   | aud rate 116  | 5200 Ore-232 @re-   | (22  |  |
| al port extender  | mitto   |  |   | 013-232 013-  | +22  |  |
| k.  | Advanced  |  |   |   |  |  |
| Pool  | Parity None   | Da   | ata bits 8  | Stop bits 1   |  |  |
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| cted to Seapath 330   |   |  |   |   |  |  |
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| aino Configuration  |   |  |   |   |  |  |
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| metry   | Input/Output list   | Tupe   | Direction   | Vert  | Description  | Г  |
| y<br>on   | Input/Output list   | Type   | Re<br>Direction   | I/O Properties<br>COM9 9500 n 8 1 rs-232  | Description  | -  |
| y<br>ion  | Interface   | Type<br>Serial<br>Serial   | Direction<br>Out<br>Out   | Vert<br>1/0 Properties<br>COM9 9500 n 81 rs-232<br>COM10 19200 n 81 rs-232  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C   |  |
| etry  | Input/Output list<br>Interface<br>♥ ● TelegramDut1<br>♥ ● TelegramDut2<br>♥ ● TelegramDut3  | Type<br>Serial<br>Serial<br>Ethernet   | Direction<br>Out<br>Out<br>Out  | Vert<br>1/0 Properties<br>COM9 9600 n 8 1 rs-232<br>COM10 19200 n 8 1 rs-232<br>UDP LAN3 3001 BR0ADCAST   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2   | [  |
| retry<br>ription<br>\$<br>eometry<br>rocessing  | Interface<br>✓ ● TelegramDut1<br>✓ ● TelegramDut2<br>✓ ● TelegramDut3<br>✓ ● TelegramDut3   | Type<br>Serial<br>Serial<br>Ethernet<br>Serial   | Direction<br>Out<br>Out<br>Out<br>Out   | Vert<br>1/0 Properties<br>COM9 9800 n 8 1 rs-232<br>COM10 19200 n 8 1 rs-232<br>UDP LAN3 3001 BROADCAST<br>COM2 9600 n 8 1  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO GINSY  | [  |
| y<br>ion<br>metry<br>essing<br>ide Processina   | Interface<br>V ClegramDut<br>V TelegramDut<br>V TelegramDut<br>V TelegramDut<br>V TelegramDut<br>V TelegramDut<br>V TelegramDut   | Type<br>Serial<br>Serial<br>Ethernet<br>Serial<br>Ethernet   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out   | Vert  I/O Properties  COM9 9900 n 81 ns-232  COM10 19200 n 81 ns-232  UOP LAN3 3001 BR0ADCAST  UDP LAN4 13001 BR0ADCAST   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO GINSY<br>ATTITUDE VELOCITY TO GINSY  |  |
| y<br>ion<br>metry<br>essing<br>ide Processing   | Input/Output list<br>Interface<br>Comparison<br>TelegramOut2<br>Comparison<br>TelegramOut3<br>Comparison<br>TelegramOut4<br>Comparison<br>TelegramOut5<br>Comparison<br>TelegramOut5<br>Comparison<br>TelegramOut5<br>Comparison<br>TelegramOut5<br>Comparison<br>TelegramOut5<br>Comparison<br>TelegramOut5<br>Comparison<br>TelegramOut5<br>Comparison<br>TelegramOut5<br>Comparison<br>TelegramOut5<br>Comparison<br>TelegramOut5<br>Comparison<br>TelegramOut5<br>Comparison<br>TelegramOut5<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Comparison<br>Compari | Type<br>Serial<br>Serial<br>Ethernet<br>Serial<br>Ethernet   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out  | Vort<br>I/O Properties<br>COM9 9900 n 8 1 rs-232<br>COM10 19200 n 8 1 rs-232<br>UOP LAN3 3001 BROADCAST<br>COM2 9900 n 8 1<br>UOP LAN4 13001 BROADCAST  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>Disabled Q OK Q Wat   | ning   🕒 Error   |
| y<br>on<br>netry<br>essing<br>de Processing   | Input/Output list<br>Interface  | Type<br>Serial<br>Serial<br>Ethernet<br>Serial<br>Ethernet   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out  | Vort VD Properties C0M9 9500 m 61 rs-232 C0M10 15200 n 81 rs-232 UDP LAN3 200 BR0ADCAST C0M2 9500 n 81 UDP LAN3 001 BR0ADCAST   | Description<br>POSITION TO EM2040C<br>SIMRAD EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO GINSY<br>ATTITUDE VELOCITY TO GINSY<br>© Disabled   © OK   © War   | ning   🕒 Error   |
| ry<br>iion<br>metry<br>sessing<br>ude Processing<br>S<br>XP/G2<br>:   | Input/Output list<br>Interface  | Type<br>Serial<br>Serial<br>Ethernet<br>Serial<br>Ethernet   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out  | Vort VD Properties COM9 9600 n 81 rs-232 COM10 19200 n 81 rs-232 UDP LAN3 3001 BROADCAST COM2 9600 n 81 UDP LAN4 13001 BROADCAST  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QIMSY<br>ATTITUDE VELOCITY TO QIMSY<br>Disabled   OK   War   | rning   🎱 Error  |
| try<br>tion<br>ometry<br>tude Processing<br>tude Processing<br>\$<br>\$<br>\$<br>\$<br>\$<br>\$<br>\$<br>\$<br>\$<br>\$<br>\$<br>\$<br>\$   | Interface     Configuration details     Interface     Configuration details     Interface     Configuration details   | Type<br>Serial<br>Serial<br>Ethernet<br>Serial<br>Ethernet   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Des  | I/O Properties           COM9 9900 n 91 rs-232           COM10 19200 n 81 rs-232           UDP LAN3 3001 BROADCAST           COM2 9900 n 81           UDP LAN4 13001 BROADCAST           cription           POSITION TO EM204000  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO GINSY<br>ATTITUDE VELOCITY TO QINSY<br>Disabled   OK   OWA   | ring   • Error   |
| ety<br>pilon<br>i<br>cocessing<br>titude Processing<br>S<br>SAS<br>PAP/7G2<br>TK<br>eometry   | Input/Output list<br>Interface<br>InfegramOut2<br>IntegramOut2<br>IntegramOut3<br>Configuration details -<br>Interface<br>Type Serial   | Type<br>Serial<br>Serial<br>Ethernet<br>Serial<br>Ethernet   | Direction Out Out Out Out Out Out Out Out   | I/O Properties           COM9 9900 n 91 n+232           COM10 19200 n 81 n+232           UOP LAN3 3001 BR0ADCAST           COM2 9900 n 81           UDP LAN4 13001 BR0ADCAST           cription           POSITION TO EM2040C   | Description<br>PDS/TICN TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO GINSY<br>ATTITUDE VELOCITY TO GINSY<br>Disabled   OK   War   | ring   🍳 Error   |
| ty<br>ption<br>sometry<br>scessing<br>tude Processing<br>S<br>S<br>S<br>MP/G2<br>K<br>K<br>connetry<br>ave config   | Input/Output list     Interface     ✓ ● TelegramOut2     ✓ ● TelegramOut3     ✓ ● TelegramOut3     ✓ ● TelegramOut4     ✓ ● TelegramOut5     ✓ Configuration details     Interface Telegram     Type Serial   | Type<br>Serial<br>Serial<br>Ethernet<br>Serial<br>Ethernet   | Direction Out Out Out Out Out Out   | I/O Properties           COM9 5600 n 61 rs:232           COM19 5600 n 81 rs:232           UOP LAN3 300 BROADCAST           COM2 9600 n 81           UOP LAN3 4010 BROADCAST           control to the second seco   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>© Disabled   © OK   © War   | ring   • Error   |
| ety<br>phon<br>sometry<br>occessing<br>titude Processing<br>S<br>JAS<br>2/XP//G2<br>TK<br>sove config<br>points<br>and  | Input/output list     Interface     ✓ ● TelegramOut2     ✓ ● TelegramOut3     ✓ ● TelegramOut4     ✓ ● TelegramOut4     ✓ ● TelegramOut4     ✓ ● TelegramOut5      ✓ Configuration details -     Interface     Telegram     Type     Serial     Cable ID  | Type<br>Serial<br>Ethernet<br>Serial<br>Ethernet   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out  | I/O Properties           COM9 9600 n 81 rs-232           COM19 10200 n 81 rs-232           UDP LAN3 3001 BROADCAST           COM2 9600 n 81           UDP LAN4 13001 BROADCAST           cription           POSITION TO EM20400   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO GINSY<br>ATTITUDE VELOCITY TO GINSY<br>Disabled   OK   Wat   | ning   • Error   |
| ety<br>iption<br>isometry<br>occessing<br>iso<br>SAPAP/G2<br>PAP/G2<br>TK<br>sometry<br>save config<br>points<br>ety<br>alon interface  | Input/Output list     Infort/Output list     Interface     ✓ ● TelegramOut1     ✓ ● TelegramOut3     ✓ ● TelegramOut3     ✓ ● TelegramOut4     ✓ ● TelegramOut5     ✓ Configuration details -     Interface     TelegramOut     ✓ Vo properties   | Type<br>Serial<br>Serial<br>Ethernet<br>Serial<br>Ethernet   | Direction Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out   | I/O Properties           I/O Properties           COM9 9800 n 81 re-232           COM1 19200 n 81 re-232           UDP LAN3 3001 BROADCAST           COM2 9600 n 81           UDP LAN4 13001 BROADCAST           cription           POSITION TO EM2040C   | Description     POSITION TO EM2040C     SIMRAD EM3000 to EM2040C     ATTITUDE VELOCITY TO EM2     POSITION TO QINSY     ATTITUDE VELOCITY TO QINSY     Disabled   • OK   • Wat                                     | Fring   O Error  |
| ety<br>pion<br>somety<br>occessing<br>thude Processing<br>S<br>3AS<br>APAP/G2<br>TK<br>sometry<br>save config<br>points<br>ston interface<br>Quiput   | Input/Output list     Interface     ✓ TelegramDut2     ✓ TelegramDut2     ✓ TelegramDut3     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut5     ✓ Configuration details     Interface     Telegram     Type     Serial     Cable ID     ✓ VO properties     Port     COM9   | Type<br>Serial<br>Ethernet<br>Serial<br>Ethernet   | Direction Out   | Vort           I/O Properties           COM/9 5600 m 61 rs-232           COM/0 19200 n 81 rs-232           UOP LAN3 2001 BROADCAST           COM/2 5600 n 81           UOP LAN3 2010 BROADCAST           cription           POSITION TO EM20400           • Ors-232         Ors-232   | Description PD951TION TO EM2040C SIMPAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO GINSY ATTITUDE VELOCITY TO QINSY Disabled   • OK   • War  | ring   🌒 Error   |
| ometry<br>poion<br>sessing<br>hude Processing<br>S<br>AS<br>MCP/G2<br>K<br>ometry<br>ave config<br>points<br>try<br>tion interface<br>hubput<br>onic extender   | Input/Output list     Interface     ✓   | Type<br>Serial<br>Serial<br>Ethernet<br>Out1   | Direction Out   | I/O Properties           COM9 5600 n 51 rs:232           COM19 5600 n 81 rs:232           UOP LAN3 3001 BROADCAST           COM2 9600 n 81           UOP LAN3 3001 BROADCAST           cription           POSITION TO EM20400           To rs:-232           0 rs:-232  | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO QINSY ATTITUDE VELOCITY TO QINSY Disabled   OK   • War   | ining   • Error  |
| esonoty<br>phon<br>sometry<br>occessing<br>thude Processing<br>S<br>SAS<br>PXP/G2<br>TK<br>sometry<br>sometry<br>sometry<br>sometry<br>sometry<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>points<br>ety<br>ety<br>ety<br>ety<br>ety<br>ety<br>ety<br>ety  | Input/output list     Interface     ✓ ● TelegramOut2     ✓ ● TelegramOut3     ✓ ● TelegramOut3     ✓ ● TelegramOut4     ✓ ● TelegramOut4     ✓ ● TelegramOut5     ✓ Configuration details -     Interface     TelegramOut5     ✓ Configuration details     ✓ Or figuration details  | Type<br>Serial<br>Ethernet<br>Serial<br>Ethernet   | Direction Out   | I/O Properties           COM9 9600 n 81 rs-232           COM19 10200 n 81 rs-232           UDP LAN3 3001 BROADCAST           COM2 9600 n 81           UDP LAN4 13001 BROADCAST           cription           POSITION TO EM20400           Image: Position in the second seco   | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO QINSY ATTITUDE VELOCITY TO QINSY Disabled   • OK   • Wat Disabled   • OK   • Wat                                     | ining   • Error  |
| economic<br>metry<br>cription<br>SS<br>Geometry<br>Processing<br>Attitude Processing<br>ISS<br>SBAS<br>SBAS<br>HPX/PV02<br>RTK<br>J<br>Geometry<br>Heave config<br>ng points<br>metry<br>icitation interface<br>t/Dutput<br>al pot extender<br>work<br>a Pool   | Input/output list     Interface     Interface     Interface     Interface     Interface     TelegramOut2     Interface  | Type<br>Serial<br>Ethermet<br>Serial<br>Ethermet   | Direction Out   | I/O Properties           I/O Properties           COM9 9800 n 81 re-232           COM19 10200 n 81 re-232           UDP LAN3 3001 BROADCAST           COM2 9600 n 81           UDP LAN4 13001 BROADCAST           cription           POSITION TO EM2040C           • Ors-232 Ors-42           • Stop bits 1   | Description     POSITION TO EM2040C     SIMRAD EM3000 to EM2040C     ATTITUDE VELOCITY TO EM2     POSITION TO GINSY     ATTITUDE VELOCITY TO QINSY     Disabled   • OK   • Wat 2 2                                 | rning   🎱 Error  |
| economic and a second s  | Input/Output list     Interface     ✓ TelegramDut1     ✓ TelegramDut2     ✓ TelegramDut3     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut5     ✓ Configuration details     ✓ Interface     ✓ Telegram     ✓ Telegram     ✓ Yope Serial     ✓ Cable ID     ✓ VO properties     Port     ✓ COM9     ✓ Advanced     Parity     ✓ None     ✓ Telegram out properties   | Type<br>Serial<br>Serial<br>Ethernet<br>Out1<br>Out1<br>Bau<br>Datis   | Direction Dut Out Out Out Out Out Out Out Out Out O   | Vort           I/O Properties           COM9 5600 m 61 rs-232           COM10 15200 n 81 rs-232           UDP LAN3 2001 BROADCAST           COM2 9600 n 81           UDP LAN3 2010 BROADCAST           cription           POSITION TO EM204000           • O rs-232 O rs-42           • Stop bits 1   | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO QINSY ATTITUDE VELOCITY TO QINSY O Disabled   O OK   O War   | ring   • Error   |
| metry<br>cription<br>SS<br>Geometry<br>Processing<br>Mtitude Processing<br>ISS<br>SBAS<br>HP/XP/G2<br>TTK<br>J<br>Seometry<br>Heave config<br>g points<br>metry<br>iscation interface<br>V/Dudput<br>iscation interface<br>V/Dudput<br>iscation interface<br>V/Dudput   | Input/Output list     Interface     ✓ TelegramDut2     ✓ TelegramDut3     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut5     ✓ Configuration details     Interface Telegram     Type Serial     Cable ID     ✓ I/O properties     Port     COM9     ✓ Advanced     Parity None     ▼ Telegram out propertie     Format NM   | Type<br>Serial<br>Serial<br>Ethernet<br>Out1<br>Out1<br>Bau<br>Dat:<br>s   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out   | Wert           I/O Properties           COM9 5600 n 61 rs:232           COM19 5600 n 61 rs:232           UDP LAN3 3001 BR0ADCAST           COM2 6600 n 61           UDP LAN4 13001 BR0ADCAST           cription           POSITION TO EM20400           • Stop bits 1           Datum         WGS84   | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO QINSY ATTITUDE VELOCITY TO QINSY Disabled   OK   War Disabled   OK   War toring point EM2040C                        | ning   • Error   |
| economic<br>metry<br>cription<br>SS<br>Geometry<br>Processing<br>Altitude Processing<br>VSS<br>SBAS<br>SBAS<br>HPACP/02<br>RTK<br>J<br>Geometry<br>Heave config<br>ng points<br>metry<br>inceton interface<br>a/Duppit<br>al port extender<br>work<br>a Pool  | InputVoltput list     Inferface     ✓ TelegramOut1     ✓ TelegramOut2     ✓ TelegramOut3     ✓ TelegramOut3     ✓ TelegramOut4     ✓ TelegramOut5     ✓ Configuration details     Interface Telegram     Type Serial     Cable ID     ✓ I/O properties     Port COM9     ✓ Advanced     Parity None     ✓ Telegram out propertie     Format Num   | Type<br>Serial<br>Ethernet<br>Serial<br>Ethernet<br>Out1<br>UT<br>Bau<br>Datts<br>S<br>EA  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>d rate 9600<br>a bits 8   | I/O Properties           I/O Properties           COM9 9600 n 81 re-232           COM1 9300 n 81 re-232           UDP LAN3 3001 BROADCAST           COM2 9600 n 81           UDP LAN4 13001 BROADCAST           cription           POSITION TO EM2040C                • Ors-232 Ors-42            • Stop bits 1           Datum         WGS84 • Monit   | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO QINSY ATTITUDE VELOCITY TO QINSY O Disabled   O OK   O Wat Disabled   O OK   O Wat toring point EM2040C              | rning   • Error  |
| Control<br>Sometry<br>Sescription<br>Is<br>SS<br>Geometry<br>– Rocessing<br>– Attitude Processing<br>INSS<br>– SBAS<br>– HPX/P/G2<br>– RTK<br>RU<br>– Geometry<br>– Heave config<br>ming points<br>sometry<br>unication interface<br>sud/Output<br>rial port extender<br>stwork<br>sta Pool   | Input/Output list       Interface       ✓ ● TelegramOut1       ✓ ● TelegramOut2       ✓ ● TelegramOut3       ✓ ● TelegramOut4       ✓ ● TelegramOut5       ● Telegram out properties       ● Port     COM9       ▼ Advanced       ● Parity     None       ▼ Telegram out propertie       Format     NM       NMEA selection     ● G   | Type<br>Serial<br>Serial<br>Ethernet<br>Out1<br>Out1<br>Bau<br>Dat:<br>s<br>EA<br>A ZDA HDT  | Direction Out   | Vort           I/O Properties           COM/9 5600 m 61 rs-232           COM/10 1200 n 81 rs-232           UOP LAN3 3001 BROADCAST           COM/2 5600 n 81           UOP LAN3 4001 BROADCAST           cription           POSITION TO EM2040C   | Description     POSITION TO EM2040C     SIMRAD EM3000 to EM2040C     ATTITUDE VELOCITY TO EM2     POSITION TO GINSY     ATTITUDE VELOCITY TO QINSY     Disabled   • OK   • Wat  2 toring point EM2040C     •     • | rning   🎱 Error  |
| control<br>society<br>scription<br>is<br>Geometry<br>Processing<br>Atitude Processing<br>NNSS<br>-SBAS<br>-BAS<br>-HPXP/G2<br>-RTK<br>NU<br>-Geometry<br>-REX<br>-Geometry<br>-Geometry<br>-Geometry<br>-Geometry<br>-Heave config<br>-ing points<br>-sometry<br>-display<br>- State<br>- Stat | Input/Output list     Interface     ✓ TelegramDut2     ✓ TelegramDut3     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut5     ✓ Configuration details     ✓ Interface     ✓ TelegramDut5     ✓ TelegramDut5     ✓ Configuration details     ✓ TelegramDut5     ✓ Telegram out properties     ✓ Port     ✓ CoM9     ✓ Advanced     ✓ Parity     ✓ None     ✓ Telegram out propertie     ✓ Format     ✓ NMEA selection     ✓ OG     ✓ Options  | Type<br>Serial<br>Serial<br>Ethernet<br>Out1<br>Out1<br>Bau<br>Dats<br>S<br>EA<br>A ZDA HDT  | Direction Out   | Wert           I/O Properties           COM9 5600 n 61 rs-232           COM10 15200 n 81 rs-232           UOP LAN3 3001 BROADCAST           COM2 9600 n 81           UOP LAN4 13001 BROADCAST           cription           POSITION TO EM20400C           • Ors-232 Ors-42           • Stop bits 1           Datum         WGS84 • Monit  | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO DINSY ATTITUDE VELOCITY TO QINSY DIsabled   OK   • War Disabled   OK   • War toring point EM2040C •                  | ning   • Error   |
| metry<br>secretary<br>SS<br>Seconetry<br>Processing<br>Athtude Processing<br>NSS<br>SBAS<br>HP/ACP/G2<br>RTK<br>U<br>Geometry<br>Heave config<br>ing points<br>metry<br>nication interface<br>AZ/Output<br>ial port extender<br>work.<br>a Pool   | Input/Output list     Interface     ✓ TelegramDut2     ✓ TelegramDut3     ✓ TelegramDut3     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut4     ✓ TelegramDut5      ✓ Configuration details     Interface Telegram     Type Serial     Cable ID     ✓ I/O properties     Port COM9     ✓ Advanced     Parity None     ▼ Telegram out propertie     Format NMEA selection GG     Options     NMEA selection GG   | Type<br>Serial<br>Serial<br>Ethernet<br>Out1<br>• Bau<br>• Dat:<br>s<br>EA<br>A ZDA HDT  | Direction Out   | Wert           I/O Properties           COM9 9500 n 81 rs232           COM19 1500 n 81 rs232           UDP LAN3 3001 BROADCAST           COM2 9500 n 81           UDP LAN4 13001 BROADCAST           cription           POSITION TO EM2040C           • Stop bits 1           Datum         WGS84           Time precision  | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO DINSY ATTITUDE VELOCITY TO DINSY Disabled   OK   War Disabled   OK   War toring point EM2040C                        | ning   • Error   |
| elevel<br>rely<br>siption<br>S<br>acometry<br>Yoccessing<br>ISS<br>SBAS<br>HPACP/02<br>TTK<br>J<br>Acometry<br>teave config<br>ty points<br>metry<br>teaver config<br>ty points<br>metry<br>Pool  | InputVoluput list     Interface     ✓ TelegramOut1     ✓ TelegramOut2     ✓ TelegramOut3     ✓ TelegramOut3     ✓ TelegramOut4     ✓ TelegramOut5     ✓ Configuration details –     Interface TelegramOut5     ✓ Configuration details     ✓ Interface TelegramOut5     ✓ Telegra  | Type<br>Serial<br>Ethernet<br>Serial<br>Ethernet<br>Out1<br>U<br>Bau<br>Date<br>S<br>EA<br>A ZDA HDT   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out   | I/O Properties           I/O Properties           COM9 9600 n 81 re-232           COM19 10200 n 81 re-232           UDP LANA 3001 BROADCAST           COM2 9600 n 81           UDP LANA 13001 BROADCAST           cription           POSITION TO EM2040C  | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO QINSY ATTITUDE VELOCITY TO QINSY O Disabled   O OK   Wat Disabled   OK   Wat toring point EM2040C                    | rning   • Error  |
| elever<br>refuy<br>irption<br>S<br>acometry<br>Yoccessing<br>Xtitude Processing<br>SS<br>SBAS<br>SBAS<br>SBAS<br>HPXCP/G2<br>2<br>TTK<br>J<br>acometry<br>teave config<br>ty<br>points<br>metry<br>ication interface<br>V/Uubut<br>al point stender<br>work<br>Pool   | Input/output list     Interface     Interface     Interface     Configuration details     Interface     TelegramDut3     Configuration details     Interface     Interface     TelegramDut5     Vonproperties     Port     COM9     Advanced     Parity     None     Telegram out propertie     Format     NMEA selection     Options     NMEA taiker ID     IN     Telegram timing   | Type<br>Serial<br>Serial<br>Ethernet<br>Out1<br>Out1<br>S<br>Bau<br>Dats<br>S<br>EA<br>A ZDA HDT   | Direction<br>Dut<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>O  | Vort           I/O Properties           COM/9 5600 n 61 rs-232           COM/0 19200 n 81 rs-232           UOP LAN3 2001 BROADCAST           COM/2 5600 n 81           UOP LAN3 2010 BROADCAST           cription           POSITION TO EM2040C           • Ors-232           • Stop bits           Datum           WGS84           Time precision  | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO QINSY ATTITUDE VELOCITY TO QINSY O Disabled   O OK   O War Disabled   O OK   O War toring point EM2040C              | ring   • Error   |
| ety ippion<br>setty inputs<br>is consently<br>tracessing<br>titlade Processing<br>SS<br>BAS<br>BAS<br>BAS<br>BAS<br>INFACF/G2<br>ITK<br>ieometry<br>leave config<br>g points<br>uely<br>leave config<br>g points<br>uely<br>cation interface<br>ZOULput<br>Ipot extender<br>ork<br>Pool   | Input/Output list     Interface     ✓ TelegramDut2     ✓ TelegramDut2     ✓ TelegramDut4     ✓ Telegram out properties     ✓ Port COM9     ✓ Advanced     ✓ Parity None     ✓ Telegram out properties     ✓ NMEA talker ID IN     ✓ Telegram timing     ✓ Interval [s]   | Type<br>Serial<br>Serial<br>Ethernet<br>Out1<br>Out1<br>Data<br>S<br>EA<br>A ZDA HDT   | Direction Out   | I/O Properties           I/O Properties           COM9 5600 n 61 rs:232           COM19 5600 n 81 rs:232           UOP LAN3 3001 BROADCAST           COM2 9600 n 81           UOP LAN3 3001 BROADCAST           cription           POSITION TO EM2040C           • Stop bits 1           Datum         WGS84           Time precision         2 😇           Event driven         © Timer driven   | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO QINSY ATTITUDE VELOCITY TO QINSY Disabled   OK   • War toring point EM2040C •  | ning   • Error   |
| retry<br>metry<br>ciption<br>SS<br>Seometry<br>Processing<br>SS<br>SSAS<br>SSAS<br>HP/CP/S2<br>RTK<br>J<br>December<br>Heave config<br>ng points<br>metry<br>Dupput<br>J port extender<br>vork<br>Pool  | Input/Output list     Infertace   | Type<br>Serial<br>Serial<br>Ethernet<br>Out1<br>Bau  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out   | I/O Properties           COM9 9500 n 81 rs:232           COM9 9500 n 81 rs:232           UDP LAN3 3001 BROADCAST           COM2 9500 n 81           UDP LAN4 13001 BROADCAST           cription           POSITION TO EM2040C           • Ors-232 Ors-42           • Stop bits 1           Datum         WGS84 • Monit           Time precision         2 •           Event driven         © Timer driven   | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO DINSY ATTITUDE VELOCITY TO QINSY Disabled   OK   War Disabled   OK   War toring point EM2040C                        | ning   • Error   |
| ety<br>ety<br>ipilon<br>i<br>constity<br>occessing<br>State<br>SAS<br>PAP/762<br>TK<br>eemety<br>eave config<br>points<br>ety<br>points<br>ety<br>Dutput<br>Pool  | Input/Output list         Interface         Interface         Image: State S  | Type<br>Serial<br>Serial<br>Ethernet<br>Serial<br>Ethernet<br>Out1<br>S<br>S<br>A ZDA HDT<br>1.1   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>drate<br>9600<br>a bits<br>8<br>.og to file                          | I/O Properties           I/O Properties           COM9 5600 n 81 re-232           COM1 13000 n 81 re-232           UDP LANA 3001 BROADCAST           COM2 5600 n 81           UDP LANA 13001 BROADCAST           cription           POSITION TO EM2040C           Stop bits           Time precision           Time precision           Event driven  | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO QINSY ATTITUDE VELOCITY TO QINSY O Disabled   O OK   Wat Disabled   O K   Wat toring point EM2040C                   | ning   • Error   |
| economic dependence of the second dependence o  | Input/output list         Interface         Image: Second   | Type<br>Serial<br>Serial<br>Ethernet<br>Out1<br>Out1<br>Datiss<br>EA<br>A ZDA HDT  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out   | Wert           I/O Properties           COM9 5600 n 61 rs-232           COM10 15200 n 81 rs-232           UDP LAN3 2001 BROADCAST           COM2 9600 n 81           UDP LAN4 13001 BROADCAST           cription           POSITION TO EM2040C                • O rs-232 O rs-42            • Stop bits 1           Datum           WGS84 • Moni           Time precision 2:•           Event driven  | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO QINSY ATTITUDE VELOCITY TO QINSY O Disabled   O OK   O War toring point EM2040C                                      | [<br>  [<br>  [<br>  [<br>  [<br>  [<br>  [<br>  [<br>  [<br>  [ |
| etry iption<br>S<br>comety<br>trocessing<br>titude Processing<br>SS<br>BAS<br>PAC/FG2<br>TK<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry<br>cometry  | Input/Output list         Interface         Interface         Image: State S  | Type Serial Serial Ethernet Out1  Type Serial Ethernet Bau Type Bau System Bau System Bau System System Bau | Direction Out   | I/O Properties           I/O Properties           COM9 5600 n 61 rs:232           COM19 5600 n 81 re:232           UOP LANS 3001 BROADCAST           COM2 9600 n 81           UOP LANS 3001 BROADCAST           Complexity           Cription           POSITION TO EM2040C           Stop bits           1           Stop bits           Time precision           2:::           Event driven  | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO QINSY ATTITUDE VELOCITY TO QINSY Disabled   OK   War toring point EM2040C  | ning   • Error   |
| economic<br>metry<br>cription<br>SS<br>Geometry<br>Processing<br>Athitude Processing<br>ISS<br>SBAS<br>J<br>Sametry<br>Heave config<br>g points<br>metry<br>iscation interface<br>U/Durput<br>al port extender<br>volk<br>I Pool  | Input/output list         Interface         Image: State of the   | Type<br>Serial<br>Serial<br>Ethernet<br>Out1<br>Out1<br>Bau<br>Data<br>s<br>EA<br>A ZDA HDT  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>A Des<br>Out<br>A rate 9600<br>a bits 8<br>Out<br>Cog to file | I/O Properties         COM9 9500 n 81 rs232         COM9 9500 n 81 rs232         UDP LAN3 3001 BROADCAST         COM2 9500 n 81         UDP LAN3 3001 BROADCAST         COM2 9500 n 81         UDP LAN4 13001 BROADCAST         cription         POSITION TO EM2040C <ul> <li>Stop bits 1</li> <li>Datum</li> <li>WGS84</li> <li>Moni</li> <li>Time precision 2:</li> <li>Event driven</li> <li>Timer driven</li> </ul>   | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO GINSY ATTITUDE VELOCITY TO GINSY Disabled   OK   War Disabled   OK   War toring point EM2040C                        | ning   • Error   |
| Lennu<br>social<br>social<br>sis<br>SS<br>– Geometry<br>– Processing<br>– Atitude Processing<br>– Atitude Processing<br>– SBAS<br>– SBAS<br>– SBAS<br>– HP/XP/G2<br>– RTK<br>RU<br>– Geometry<br>– Heave config<br>miral points<br>sometry<br>unication interface<br>sut/Dutput<br>stork<br>sta Pool  | Input/output list         Interface         Interface         Image: Second Secon  | Type Serial Serial Ethernet Out1 U Bau Bau AZDA HDT 1.1  | Direction Out   | Wert           I/O Properties           COM/9 5600 m 61 rs-232           COM/0 19200 n 81 rs-232           UOP LAN3 2001 BROADCAST           COM/2 5600 n 81           UOP LAN3 2010 BROADCAST           cription           POSITION TO EM2040C   | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO GINSY ATTITUDE VELOCITY TO QINSY Disabled   • OK   • War  Disabled   • OK   • War  toring point EM2040C • •          | ning   • Error   |
| Vessel     Geometry     Description     Description     Geometry     Description     Geometry     Processing     Attlude Processing     Attlude Processing     Attlude Processing     HPACP/G2     RTK     HPACP/G2     RTK     Heave config     Geometry     Geometry     Geometry     Geometry     Geometry     Station interface     Insput/Dubut     Station interface     Network     Data Pool  | Input/output list         Interface         ✓       TelegramOut2         ✓       TelegramOut3         ✓       TelegramOut4         ✓       TelegramOut5         Vi/O properties       Port         COM9       Advanced         Parity       None         Telegram out propertie       Format         NMEA selection       Go         Options       INMEA talker ID         NMEA talker ID       IN         Telegram timing       Interval [s]  | Type Serial Serial Ethernet Out1 Out1 Bau AZDA HDT 1.1   | Direction Out   | Wert           I/O Properties           COM9 5600 n 61 rs-232           COM10 15200 n 81 rs-232           UOP LAN 300 BROADCAST           COM2 9600 n 81           UOP LAN 3001 BROADCAST           cription           POSITION TO EM2040C           • Ors-232 Ors-42           • Stop bits 1           Datum           Time precision           2 • O Timer driven   | Description POSITION TO EM2040C SIMRAD EM3000 to EM2040C ATTITUDE VELOCITY TO EM2 POSITION TO DINSY ATTITUDE VELOCITY TO QINSY DIsabled   OK   War toring point EM2040C  | ming (   |

| NAV Engine Configuration   |  |   |   |  |   |                   |
|--|--|---|---|--|---|-------------------|
| Apply  | Preview  |   | Revert  |  |   |                   |
| E-Vessel   | _Input/Output list   |   |   |  |   |                   |
| Geometry   | Interface  | Type Di   | rection I/O Propertie:  | s  | Description   |                   |
| I Description  | TelegramOut1   | Serial Ou   | at COM9 9600 r  | n 8 1 rs-232   | POSITION TO EM2040C   |                   |
| - Sensors  | 🗹 🌑 TelegramOut2   | Serial Ou   | at COM10 1920   | 10 n 8 1 rs-232  | SIMRAD EM3000 to EM2040C  |                   |
| Geometry   | TelegramOut3   | Ethernet Ou   | It UDP LAN3 3   | 001 BROADCAST  | ATTITUDE VELOCITY TO EM2  |                   |
| - Processing   | V V TelegramOut4   | Ethernet Ou   | at UDP LAN4 1   | 3001 BROADCAST   | ATTITUDE VELOCITY TO DINSY  |                   |
| Attitude Processing  |  |   |   |  |   |                   |
| SBAS   |  |   |   |  |   | wanning   UEno    |
| HP/XP/G2   | Configuration details  |   |   |  |   |                   |
| E-MRU  | Interface Telegram   | 10ut2   | Description SI  | MRAD EM3000 to EI  | M2040C  |                   |
| Geometry   | Type Serial  |   |   |  |   |                   |
| I Heave config   |  |   | 1   |  |   |                   |
| i Geometry   | Cable ID   |   | ]   |  |   |                   |
| Communication interface  | ▼ I/O properties   |   |   |  |   |                   |
| Input/Output<br>Serial port extender   | Port COM10   | Baud ra   | ate 19200 👻   | ⊙rs-232 Ors-4  | 422   |                   |
| - Network  | Advanced   |   |   |  |   |                   |
| Data Pool  | Parity None  | <ul> <li>Data bi</li> </ul>   | ts 8 💌  | Stop bits 1  | •   |                   |
|  | ▼ Telegram out propertie   | s   |   |  |   |                   |
|  | Format   | nrad EM3000/Hip   | ap 💌 🗖 Log to file  | e Mo   | nitoring point EM2040C  | -                 |
|  |  |   |   |  |   |                   |
|  | Options  |   |   |  | <u></u>   | •                 |
|  | ▼ Telegram timing  |   | -   |  |   |                   |
|  | Interval [s]   | 0.010   | O Event driven  | <ul> <li>Timer driven</li> </ul>   |   |                   |
|  |  |   |   |  |   |                   |
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| onnected to Seapath 330  |  |   |   |  |   |                   |
| onnected to Seapath 330  |  |   |   |  |   |                   |
| onnected to Seapath 330  |  |   |   | <b>.</b>   | 0   |                   |
| onnected to Seapath 330  |  |   |   | <b>.</b>   | 0   |                   |
| onnected to Seapath 330  |  |   |   | <b>V</b> -   |   |                   |
| ennected to Seapath 330 Engine Configuration Apply   | Eleview  |   | Bevert  | <b>V</b> -   |   |                   |
| Engine Configuration   | Preview  |   | Revert  |  |   |                   |
| Engine Configuration<br>Apply<br>- Geometry  | Preview<br>- Input/Output list<br>Interface  | Type Dire   | Revert  |  | Description   |                   |
| Engine Configuration<br>Apply<br>- Geometry<br>- Description   | Preview<br>←Interfoot<br>Interfoot<br>✓ ● TelegramOut1   | Type Dire<br>Serial Out   | Eevert<br>ction 1/0 Properties<br>COM9 9600 n   | 81 rs-232  | Description<br>POSITION TO EM2040C  |                   |
| Engine Configuration Apply essel Geometry Description encores L GNSS   | Preview<br>- Input/Output list<br>Interface<br>☑ TelegramOut1<br>☑ TelegramOut2  | Type Dire<br>Serial Out<br>Serial Out   | Eevent<br>ction 1/0 Properties<br>COM9 9500 n<br>COM10 19200  | 81 rs-232<br>0 n 81 rs-232   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C  |                   |
| Engine Configuration Apply essel Geometry Description entry L GRSS L Geometry  | Preview<br>Interface   | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out   | Eevert<br>ction 1/0 Properties<br>COM9 5600 n<br>COM10 13200<br>UDP LAN3 50   | 8 1 rs-232<br>Dn 8 1 rs-232<br>Dn 8 1 rs-232<br>D01 BROADCAST  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2  |                   |
| Engine Configuration<br>Apply<br>Sessel<br>- Geometry<br>- Description<br>micros<br>- GROS<br>- Geometry<br>- Processing   | Preview<br>Interface<br>TelegramOut1<br>C TelegramOut2<br>TelegramOut3<br>TelegramOut3<br>TelegramOut4   | Type Dire<br>Serial Out<br>Serial Out<br>Serial Out<br>Serial Out   | Eevert<br>ction I/O Properties<br>COM9 9600 n<br>COM10 13200<br>UOP LAN3 90<br>COM2 9600 n  | 81 r⊳232<br>Dn81 rs≥32<br>Dn81 rs≥32<br>N01 BR0ADCAST<br>181   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO QINSY  |                   |
| Engine Configuration Apply essel Geometry GNSS Geometry GNSS Grocessing Attlude Processing   | Preview     Interface     ✓ TelegramOut1     ✓ TelegramOut2     ✓ TelegramOut3     ✓ TelegramOut4     ✓ TelegramOut4     ✓ TelegramOut5  | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Serial Out<br>Ethernet Out   | Eevert<br>COM9 9600 n<br>COM9 9600 n<br>COM10 19200<br>UDP LAN3 30<br>COM2 9600 n<br>UDP LAN4 13  | 8 1 rs-232<br>Dn 81 rs-232<br>Dn 81 rs-232<br>Dr0 BROADCAST<br>81<br>8001 BROADCAST  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY   |                   |
| annected to Seapath 330  annected to Seapath   | Preview<br>Interface<br>♥ TelegramOut1<br>♥ TelegramOut2<br>♥ TelegramOut2<br>♥ TelegramOut4<br>♥ TelegramOut4   | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Ethernet Out   | Eevent           ction         I/O Properties           COM9 9600 n         COM10 19200           UOP LAN3 30         COM2 9600 n           UOP LAN3 30         COM2 9600 n           UOP LAN4 13         UOP LAN4 13   | 8 In-232<br>Dn 8 In-232<br>Dn 8 In-232<br>DN BROADCAST<br>8 1<br>8001 BROADCAST  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO GINSY<br>IDISabled   I OK   I                                | Warning   🍚 Er    |
| Innected to Seapath 330 Innect   | Proview<br>Input/Output list<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Inter | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Ethernet Out   | Eevert<br>ction I/O Properties<br>COM9 9500 n<br>COM10 19200<br>UOP LAN3 30<br>COM2 9500 n<br>UDP LAN4 13   | 81 rs-232<br>Dn 81 rs-232<br>Dn 81 rs-232<br>Dn 81 rs-232<br>Dn 81 rs-232<br>B1 rs-232<br>B1 rs-232<br>B1 rs-232<br>B1 rs-232<br>B1 rs-232<br>B1 rs-232<br>B1 rs-232<br>Dn 81 rs-232<br>Dn   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>@ Disabled   @ OK   @                                | Warning   • Er    |
| annected to Seapath 330  annected to Seapath   | Ereview<br>Interface<br>TelegramOut<br>TelegramOut<br>TelegramOut<br>TelegramOut<br>TelegramOut<br>Configuration details   | Type Drie<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Ethernet Out   | Revert<br>ction I/O Properties<br>CDM9 9600 n<br>CDM10 13200<br>UDP LAN3 90<br>CDM2 9600 n<br>UDP LAN3 91<br>CDM2 9600 n<br>UDP LAN4 13   | 81 rs-232<br>Dn 81 rs-232<br>Dn 81 rs-232<br>NOI BROADCAST<br>81<br>BOUI BROADCAST   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO GM2.<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>DIsabled   • OK   •<br>TO EM00400                   | Warning   🎱 Er    |
| annected to Seapath 330     | Preview     Interface     TelegramOut     TelegramOut     TelegramOut     TelegramOut     TelegramOut     TelegramOut     TelegramOut     TelegramOut     TelegramOut     Interface     TelegramOut  | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Ethernet Out   | Revert<br>COM 9 5600 n<br>COM 9 5600 n<br>COM 10 13000<br>UDP LAN3 80<br>COM 2 5600 n<br>UDP LAN3 81<br>DP LA | 8 In-232<br>Dir 8 In-232<br>Dir 8 In-232<br>Dir 8 RADADCAST<br>18 I<br>BIODI BROADCAST<br>TITTUDE VELOCITY   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>Disabled   • OK   •<br>TO EM2040C                   | 9 Warning   🕒 Er  |
| Innected to Seapath 330 Innect   | Preview<br>Input/Output list<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>TelegramOut3<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>In | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Serial Out<br>Ethernet Out   | Com 1/0 Properties<br>COM 9 S000 n<br>COM 10 1200<br>UOP LAN3 30<br>COM 2 5000 n<br>UOP LAN4 13<br>Description AT   | 8 1 rs-232<br>001 8 ro-232<br>001 8 ROADCAST<br>18 1<br>2001 8 ROADCAST<br>11 TUDE VELOCITY  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>O Disabled   • OK   •<br>TO EM2040C                  | Warning   • Er    |
| Innected to Seapath 330 Ingine Configuration Apply See Geometry Description Toors GNSS Processing Oknys SNS SNS SNS SNS SNS SNS SNS SNS SNS SN   | Preview<br>Input/Output list<br>Interface<br>✓ ● TelegramOut1<br>✓ ● TelegramOut2<br>✓ ● TelegramOut3<br>✓ ● TelegramOut4<br>✓ ● TelegramOut4<br>♥ ● Tele  | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Ethernet Out   | Revert<br>ction I/O Properties<br>COM9 9600 n<br>COM10 15200<br>UOP LAN3 30<br>COM2 9600 n<br>UDP LAN4 13<br>Description AT   | 81 rs-232<br>Dn 81 rs-232<br>Dn 81 rs-232<br>OUT BROADCAST<br>81<br>S001 BROADCAST<br>TITUDE VELOCITY'   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO GINSY<br>ATTITUDE VELOCITY TO GINSY<br>OIsabled   OK   O<br>TO EM2040C   | Warning   🥥 Err   |
| Innected to Seapath 330 Ingine Configuration Apply Sel Geometry Description Stors GNSS GNSS GNSS GNSS GNSS GNSS GNSS GNS   | Ereview<br>Interface<br>TelegramOut<br>TelegramOut<br>TelegramOut<br>TelegramOut<br>TelegramOut<br>TelegramOut<br>TelegramOut<br>TelegramOut<br>TelegramOut<br>TelegramOut<br>Type<br>Ethernet<br>Cable ID   | Type Drie<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Ethernet Out<br>Iut3   | Revert<br>ction I/O Properties<br>COM9 9600 n<br>COM10 15200<br>UOP LAN3 90<br>COM2 9600 n<br>UOP LAN3 91<br>COM2 9600 n<br>COM2 9600 n<br>COM9 9600 n<br>COM2 9600 n<br>UOP LAN3 91<br>COM2 9600 n<br>COM9 9600 n<br>C  | 81 rb-232<br>01 81 rb-232<br>010 BROADCAST<br>181<br>001 BROADCAST<br>TITUDE VELOCITY'   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO GM2.<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>© Disabled   • OK   •<br>TO EM2040C                 | Warning   🥥 En    |
|  | Preview     Interface     ✓ TelegramOut  | Type Dire<br>Serial Out<br>Serial Out<br>Ethemet Out<br>Ethemet Out<br>Ithemet Out  | Ction I/O Properties<br>COM9 9600 n<br>COM10 13200<br>UDP LAN3 80<br>COM2 9600 n<br>UDP LAN4 13<br>Description AT   | 8 In-232<br>Di 8 In-232<br>Di 8 In-232<br>DI BROADCAST<br>8 I<br>8 I<br>8 I<br>8 I<br>8 I<br>9 IN-232<br>DI BROADCAST<br>TITUDE VELOCITY'  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C                             | Warning   • En    |
| annected to Seapath 330  annected to Seapath   | Preview<br>Input/Output list<br>Interface<br>♥ TelegramOut1<br>♥ TelegramOut2<br>♥ TelegramOut3<br>♥ TelegramOut4<br>♥ TelegramOut5<br>♥ Configuration details<br>Interface TelegramO<br>Type Ethernet<br>Cable ID<br>♥ V/O properties<br>● Broadcast © Unic   | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Serial Out<br>Ethernet Out   | COM 9500 n<br>COM 9500 n<br>COM 10 13200<br>UDP LAN3 30<br>COM 2 5600 n<br>UDP LAN4 13<br>Description AT  | 8 1 rs-232<br>00 BROADCAST<br>8 1<br>8001 BROADCAST<br>TITUDE VELOCITY'  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>O Disabled   • OK   •<br>TO EM2040C                  | 9 Warning   📿 Err |
| Innected to Seapath 330  Engine Configuration  Apply See Geometry Description Insots GRSS Geometry Processing DRSS GRSS GRSS GRSS GRSS GRSS GRSS GRSS  |  | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Nut3   | Revert<br>ction I/0 Properties<br>COM9 9600 n<br>COM10 13200<br>UOP LAN3 80<br>COM2 9600 n<br>UDP LAN3 413<br>Description AT<br>t   | 81 rs-232<br>Dn 81 rs-232<br>Dn 81 rs-232<br>001 BROADCAST<br>81<br>TITUDE VELOCITY'   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO UNSY<br>ATTITUDE VELOCITY TO QINSY<br>OIsabled   OK   O<br>TO EM2040C                      | Warning   🥥 Er    |
| Annected to Seapath 330  Engine Configuration  Apply  seel Geometry Oescription nors GNSS Geometry Attitude Processing Attitude Processing GSAS GEOMEtry Heave config mitivity points Geometry Heave config mitivity points Geometry Geometry Geometry Geometry Geometry Seamatication interface Input/Output Seamatication Seamati  |  | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Uut3   | Revert<br>ction I/O Properties<br>CDM9 9600 n<br>COM10 13200<br>UOP LAN3 90<br>COM2 9600 n<br>UOP LAN3 91<br>COM2 9600 n<br>COM2 9600 n<br>UOP LAN3 91<br>COM2 9600 n<br>COM2 9600 n<br>C  | 8 1 rb-232<br>10 8 1 rb-232<br>10 8 PROADCAST<br>81<br>1001 BROADCAST<br>TITTUDE VELOCITY'   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C                            | Warning   • Er    |
| Engine Configuration  Apply  seel Geometry Oescription Foots Given State Geometry Given State Given St   | Proview     Interface     ✓ TelegramOut  | Type Dire<br>Serial Out<br>Serial Out<br>Serial Out<br>Ethemet Out<br>Iserial Out<br>Ethemet Out<br>ast OMulticas<br>(192.188.2.10)   | Clon I/O Properties<br>COM9 5600 n<br>COM10 13200<br>UDP LAN3 60<br>COM2 5600 n<br>UDP LAN4 13<br>Description AT  | 8 I In-232<br>8 1 In-232<br>101 BROADCAST<br>8 1<br>8 1<br>101 BROADCAST<br>111 UDE VELOCITY   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C                            | Warning   • En    |
| Engine Configuration Apply  Seed Geometry - Description msors - Geometry - Processing - Aftitude Processing - DGNSS - Geometry - SBAS - MRU - Geometry - SBAS - MRU - Geometry - Geometry - Geometry - Geometry - Several on textender - Network - Data Pool   |  | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Serial Out<br>Ethernet Out   | Eevert<br>ction I/O Properties<br>COM9 9500 n<br>COM10 13200<br>UDP LAN3 30<br>COM2 9500 n<br>UDP LAN4 13<br>Description AT<br>t  | 8 1 n=232<br>00 n=81 n=232<br>00 n=80AbCAST<br>81<br>800 n=80AbCAST<br>TITUDE VELOCITY'  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>O Disabled   • OK   •<br>TO EM2040C                  | 9 Warning   📿 Err |
| Engine Configuration Apply  Sesel Geometry Description narors GRNSS Geometry Processing Altitude Processing DBNSS GEOMEtry Frocessing Altitude Processing Construct Secondary Heave config Processing Heave config Processing Construct Secondary Secondary Construct Secondary Seco   |  | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>UI3  | Revert<br>ction I/O Properties<br>COM9 9600 n<br>COM10 13200<br>UOP LANS 30<br>COM2 9600 n<br>UDP LANS 413<br>Description AT<br>t<br>t<br>T   | 81 rs-232<br>Dn 81 rs-232<br>D0 18 R0ADCAST<br>81<br>0001 BR0ADCAST<br>TITUDE VELOCITY'<br>TITUDE VELOCITY'  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO GINSY<br>ATTITUDE VELOCITY TO GINSY<br>OIsabled   OK   O<br>TO EM2040C   | Warning   • Err   |
| Engine Configuration Apply Engine Configuration Configurat   | Ereview     Input/Output list     Interface     ✓ TelegramOut     ✓ TelegramOu   | Type Drie<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Uut3<br>   | COM 9600 n<br>COM 9600 n<br>COM 9600 n<br>COM 10 12000<br>UOP LANS 30<br>COM 2 9600 n<br>UOP LANS 30<br>COM 2 9600 n  | 8 In-232<br>0 8 In-232<br>0 8 In-232<br>001 BROADCAST<br>8 I<br>8001 BROADCAST<br>TITTUDE VELOCITY'<br>33884 • Mo  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C                            | Warning   • Err   |
| Engine Configuration  Apply  Essel Geometry Oescription FGNSS Geometry Given Configuration Geometry FORSS Geometry FORSS FIX HP/xP/G2 FIX HRU Geometry Heave config onitoring points Geometry Heave config Onitoring  | Proview     Interface     ✓ TelegramOut  | Type Dire<br>Serial Out<br>Serial Out<br>Serial Out<br>Ethernet Out<br>2013<br>2013<br>2014<br>2015<br>2015<br>2015<br>2015<br>2015<br>2015<br>2015<br>2015   | Com 1/0 Properties<br>COM 9 S000 n<br>COM 10 12200<br>UDP LAN3 30<br>COM 2 5000 n<br>UDP LAN4 13<br>Description AT  | 8 1 rs-232<br>00 8 1 rs-232<br>00 8 1 rs-232<br>00 1 8 ROADCAST<br>8 1<br>18 1<br>18 1<br>18 1<br>18 1<br>18 1<br>18 2<br>18 1<br>18 2<br>18 1<br>18 1<br>18 2<br>18 1<br>18 2<br>18 | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO QINSY<br>TO ISabled   OK   O<br>TO EM2040C<br>NITOTING point EM2040C                       | Warning   • Err   |
| Engine Configuration Apply Sessel Geometry Description Friors Geometry Frioresing Afthude Processing OGNSS Geometry HNU Geometry HAV/D/22 RTK HMU Geometry Heave config Onition points Geometry Geometry Heave config Onition points Geometry State Configuration Second Sec   | Preview     Input/Output list     Interface     ✓ TelegramOut1     ✓ TelegramOut2     ✓ TelegramOut3     ✓ TelegramOut3     ✓ TelegramOut4     ✓ TelegramOut4     ✓ TelegramOut4     ✓ TelegramOut5     ✓ Configuration details     Interface TelegramOut     Type Ethernet     Cable ID     ✓ Vi0 properties     Ø Broadcast OUnic     Local Interface LAN3     Remote port 3001     ✓ Telegram out properties     Format Sear     Options     □ Log to file  | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Sulta<br>Serial Out<br>Interference<br>Serial Out<br>Serial Out<br>Se    | Eevert<br>ction I/O Properties<br>COM9 9500 n<br>COM10 9500 n<br>COM2 9500 n<br>UDP LAN3 30<br>COM2 9500 n<br>UDP LAN4 13<br>Description AT<br>t<br>t<br>T<br>Description V<br>t  | 8 1 rs-232<br>00 18 Ho 232<br>00 18 Ho 24<br>00 18 Ho 24<br>18   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C                             | Warning   • Err   |
| Engine Configuration Apply  Sessel Geometry Description Processing Attitude Processing Discrete Configuration From Statude Processing Fr   | Preview     Preview     Interface     ✓ TelegramOut     ✓ Te   | Type Dire<br>Serial Out<br>Serial Out<br>Ethernst Out<br>Ull3   | Revert<br>ction I/O Properties<br>COM9 9600 n<br>COM10 13200<br>UOP LANI 50<br>COM2 9600 n<br>UOP LANI 50<br>COM2 9600 n<br>COM2 9600 n<br>C  | 81 rs-232<br>Dn 81 rs-232<br>Dn 81 rs-232<br>0001 BROADCAST<br>81<br>TITTUDE VELOCITY'<br>35884 • Mo   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C<br>Initoring point EM2040C | Warning   • Err   |
| Engine Configuration Apply Engine Configuration Configurat   | Erevidese     Input/Output list     Interface     ✓ TelegramOut3     ✓ TelegramOut3     ✓ TelegramOut3     ✓ TelegramOut3     ✓ TelegramOut4     ✓ TelegramOut4     ✓ TelegramOut5     ✓ Configuration details     Interface TelegramOut     ✓ TelegramOut5     ✓ TelegramOut5     ✓ TelegramOut5     ✓ TelegramOut4     ✓ TelegramOut5     ✓ Telegram telegramOut5     ✓ Telegr   | Type Dire<br>Serial Out<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Iserial Out<br>Ethernet Out<br>attained out<br>Iserial   | Con I/O Properties<br>COM9 5600 n<br>COM10 13200<br>UDP LAN3 80<br>COM2 5500 n<br>UDP LAN4 13<br>Description AT   | 8 1 rs-232<br>Dn 8 1 rs-232<br>Dn 8 1 rs-232<br>D01 BROADCAST<br>8 1<br>8 1<br>TITTUDE VELOCITY<br>35884 • Mo  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C<br>Initoring point EM2040C  | Warning   • Err   |
| Engine Configuration<br>Apply<br>assel<br>— Geometry<br>— Description<br>ensors<br>— Geometry<br>— Processing<br>— Athlude Processing<br>— Processing<br>— Athlude Processing<br>— DENSS<br>— HP/XP/G2<br>— RTK<br>— HRU<br>— Geometry<br>— Geomet | Preview  Preview  Preview  Interface  Configuration details  Interface  Configuration details  Interface  Cable ID  Vo properties  OBroadcast OUnic  Local Interface  Local Interface  Cable ID  Vo properties  Cable ID  Vo  | Type Dire<br>Serial Out<br>Serial Out<br>Serial Out<br>Ethernet Out<br>1013<br>1013<br>1013<br>1013<br>1013<br>1013<br>1013<br>101  | Eevert  toon I/O Properties COM9 9500 n COM10 13200 UDP LAN3 30 COM2 9500 n UDP LAN4 13 Description AT  t  t  C Description AT  O Event driven  | 8 1 rs-232<br>001 8 R0ADCAST<br>8 1<br>2001 8 R0ADCAST<br>8 1<br>2001 8 R0ADCAST<br>11TUDE VELOCITY<br>33584 ▼ Mo  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C<br>Initoring point EM2040C  | Warning   • Err   |
| Engine Configuration Apply  Sessel Geometry Description Processing Attbude Processing OKSS Geometry Processing Attbude Processing OKSS Geometry Heave config oritoting points Geometry Heave config oritoting points Segmetry Heave config Output Selial point extender Network Data Pool  | Preview     Interface     ✓ TelegramOut     ✓ Telegram timing     ✓  | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Ut3<br>  | Revert<br>ction 1/0 Properties<br>COM9 9600 n<br>COM10 13200<br>UOP LANS 30<br>COM2 9600 n<br>UDP LANS 413<br>Description AT<br>t<br>t<br>v<br>Description V<br>COMP Comparison<br>COMP Comparison<br>Description AT<br>COMP Comparison<br>COMP COMP Comparison<br>COMP COMP COMP COMP COMP COMP COMP COMP   | 81 rs-232<br>Dn 81 rs-232<br>001 BROADCAST<br>81<br>001 BROADCAST<br>TITUDE VELOCITY'<br>35884 • Mo  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C<br>Initoring point EM2040C | Warning   • Err   |
| ennected to Seapath 330  Engine Configuration  Apply  Description ensors  Geometry  Processing Athtude Processing  SASS HPXRV G2 RTK  MRU Geometry Heave config ornitating points Geometry Geome   | Erevidesv     Input/Output list     Interface     ✓ TelegramOut     ✓ Telegram out properties     ✓ Telegram out properties     ✓ Telegram out properties     ✓ Telegram out properties     ✓ Telegram I Sear     ✓ Options     □ Log to file     ✓ Telegram Iming     Interval [s]  | Type Dire<br>Serial Out<br>Serial Out<br>Serial Out<br>Ethemet Out<br>Dut3<br>ast O Multicas<br>(192.168.2.10)<br>ath binary 11<br>0.010  | Competition 1/0 Properties<br>COM9 5600 n<br>COM10 1300<br>UDP LAN3 80<br>COM2 5600 n<br>UDP LAN4 13<br>Description AT<br>t<br>T<br>Description AT  | 8 I In-232<br>D 18 I I In-232<br>D 18 I I In-232<br>D 18 I I IN-232<br>D 18 I IN-232<br>D   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C                             | Warning   • Err   |
| Engine Configuration<br>Apply<br>Sesel<br>Geometry<br>Description<br>encors<br>- GRSS<br>- Geometry<br>- Processing<br>- Atbude Processing<br>- Proc   | Provlaw  Interface  Configuration details Interface  Configuration details Interface  Configuration details Interface TelegramOut3  Configuration details Interface TelegramOut4  Coble ID  VO properties  O Broadcast Ounic Local Interface Local Interface Local Interface Local Interface Format Sear Options  Log to file  Telegram timing Interval [s]  | Type Dire<br>Serial Out<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Nut3<br>(192.168.2.10)<br>)<br>nath binary 11<br>0.010   | COMPOSITION AT CONTRACT CONTRA  | 8 1 rs-232<br>001 8 H rs-232<br>00   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO GINSY<br>TO EM2040C<br>TO EM2040C<br>Initoring point EM2040C  | Warning   • Err   |
| Engine Configuration Apply Sessel Geometry Description FORSS Geometry Procesting Athbude Processing Athbude Processing Athbude Processing FORSS Geometry Heave config oritoring points Geometry Heave config oritoring points Seas FUPAV702 Serial pot extender Network Serial pot extender Network Serial pot extender Network  | Preview<br>Input/Output list<br>Interface<br>✓ TelegramOut<br>✓ TelegramOut<br>✓ TelegramOut<br>✓ TelegramOut<br>✓ TelegramOut<br>✓ TelegramOut<br>✓ Configuration details<br>Interface TelegramOut<br>✓ Configuration details<br>Interface TelegramOut<br>✓ Vo properties<br>O Broadcast Unic<br>Local Interface LAN3<br>Remote port 3001<br>✓ Telegram out properties<br>Format Sear<br>Options<br>Log to file<br>✓ Telegram timing<br>Interval [s]  | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>UI3<br>  | Eevert<br>clion I/O Properties<br>COM9 9600 n<br>COM10 15200<br>UOP LAN3 30<br>COM2 9600 n<br>UDP LAN3 40<br>COM2 9600 n<br>UDP LAN3 40<br>COM2 9600 n<br>UDP LAN3 40<br>COM2 9600 n<br>COM2 9600 n<br>C  | 81 rs-232<br>Dn 81 rs-232<br>Dn 81 rs-232<br>BI 1 rs-33<br>BI 1 r  | Description<br>POSITION TO EM2040C<br>SIMRAD EM2000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C                             | Warning   • Err   |
| Engine Configuration Apply  Sessel Geometry Description Sessel Foresting Attitude Processing Foresting Attitude Processing Foresting Geometry Heave config Oritoring points Geometry Heave config Oritoring points Geometry Sessel Foresting   | Preview     Preview     Interface     ✓ TelegramOut     ✓ Telegram out properties     ✓ Format     ✓ Sear     ✓ Options     ✓ Log to file     ✓ Telegram timing     ✓ Interval [s]   | Type Dir<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Jul3<br>ast OMulticas<br>(192.168.2.10)   | Revert<br>ction 1/0 Properties<br>COM9 9600 n<br>COM10 13200<br>UOP LANI 50<br>COM2 9600 n<br>UOP LANI 50<br>COM2 9600 n<br>COM2 9600 n<br>C  |  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C<br>Ito EM2040C             | Warning   • Err   |
| Engine Configuration Apply  see Geometry Obscription resors Geometry Geometry Geometry Geometry Geometry Heave config mitoring points Geometry Heave config Mitoria Points Geometry Geo   | Erevidese     Input/Output list     Interface     ✓ TelegramOut     ✓ Telegram   | Type Dire<br>Serial Out<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Ithernet Out<br>ast Onuticas<br>(192.168.2.10)   | Con 1/0 Properties<br>COM 9 5000 n<br>COM 13200<br>UDP LAN3 30<br>COM 2 5000 n<br>UDP LAN4 13<br>Description AT<br>Description AT   | 8 1 In-232<br>001 BROADCAST<br>8 1 001 BROADCAST<br>8 1<br>101 BROADCAST<br>111 UDE VELOCITY<br>35884 • Mo   | Description<br>POSITION TO EM2040C<br>SIMRAD EM2000 to EM2040C<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>TO EM2040C<br>TO EM2040C<br>Initoring point EM2040C  | Warning   • Err   |
| Innected to Seapath 330  Ingine Configuration  Apply  See Geometry Obscription Constant Obscription Constant Obscription Obscr   | Preview  Interface  Configuration details Interface  Configuration details Interface  Configuration details Interface  Cable ID  Vio properties  OBroadcast OUnic Local Interface Interfa  | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>Tull<br>Tull<br>Serial Out<br>Ethernet Out<br>Tull<br>Serial Out<br>Serial Out<br>Seri | Eevert  toon 1/0 Properties COM9 9500 n COM10 13200 UDP LAN3 30 COM2 9500 n UDP LAN4 13  Description AT  t  C Description AT  C Datum WCC C Event driven  | 8 1 rs-232<br>001 81 rs-232<br>001 80 ADCAST<br>8 1<br>18 232<br>18 1<br>18 232<br>18 1 rs-232<br>18 1 rs-232<br>1   | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO GINSY<br>TO EM2040C<br>TO EM2040C<br>Initoring point EM2040C | Warning   • Err   |
| ennected to Seapath 330  Engine Configuration  Apply  Geometry Description ensors Geometry Frocessing Attitude Processing Characterize Hexe config ornitoring points Geometry Heave config ornitoring points Description Context Description   | Preview     Interface     ✓ TelegramOut     ✓ Telegram out properties     ✓ Format     ✓ Sear     ✓ Options     □ Log to fille     ✓ Telegram timing     Interval [s]  | Type Dire<br>Serial Out<br>Serial Out<br>Ethernet Out<br>UI3<br>uI3<br>uI3<br>ast O Multicas<br>(192.168.2.10)<br>aath binary 11  | Revert<br>ction 1/0 Properties<br>COM9 9600 n<br>COM10 13200<br>UOP LANS 30<br>COM2 9600 n<br>UDP LANS 413<br>Description AT<br>t<br>T<br>Description AT<br>O Event driven  |  | Description<br>POSITION TO EM2040C<br>SIMRAD EM3000 to EM2040C<br>ATTITUDE VELOCITY TO EM2.<br>POSITION TO QINSY<br>TO EM2040C<br>TO EM2040C<br>Ito EM2040C   | Warning   • Err   |

|  | Praview  |   |  | event   |  |                        |
|--|--|---|--|---|--|------------------------|
| essel  | / Input/Output list  |   | 10   |   |  |                        |
| - Geometry   | Interface  | Туре  | Direction  | 1/0 Properties  | Description  |                        |
| Description  | TelegramOut3   | Ethernet  | Out  | UDP LAN3 3001 BROADCAST   | ATTITUDE VELOCITY TO EM2   |                        |
| 1-GNSS   | TelegramOut4   | Serial  | Out  | COM2 9600 n 8 1   | POSITION and TIME TO QINSY   |                        |
| - Geometry   | V V TelegramUut5   | Ethernet  | Out  | UOP LAN4 13001 BRUADCAST  | ATTITUDE VELUCITY TO UNSY  |                        |
| - Processing   | TelegramOut7   |   | Out  | NONE  | Telegram Out #7  |                        |
| DGNSS  |  |   |  |   | Disabled L      OK L   | Warning I 🥥 Erro       |
| - SBAS   |  |   |  |   |  | wanning   Ut           |
| - HP/XP/G2   | Configuration detail   | ls  | -  |   |  |                        |
| - MRU  | Interface Teleg  | ramOut4   | Des  | scription POSITION and TIME TO  | D QINSY  |                        |
| - Geometry   | Type Serial  | ř.  |  |   |  |                        |
| Heave config   |  |   | 1000   |   |  |                        |
| Geometry   | Cable ID   |   |  |   |  |                        |
| munication interface   | ▼ I/O properties   |   |  |   |  |                        |
| Input/Uutput<br>Serial port extender   | Port COM2  | • Ba  | ud rate 9600   | • • rs-232 • O rs-4   | 22   |                        |
| Network  | Advanced   | 12  |  |   |  |                        |
| Data Pool  | Telegram out prope   | erties  |  |   |  | _                      |
|  | Format   | NMEA  | -  | Datum WGS84 • Mor   | hitoring point EM2040C   | •                      |
|  | NMEA selection   | GGA GLL ZDA H   | HDT  |   |  | -                      |
|  | Ontions  | -   |  |   |  | -                      |
|  | Options  |   |  |   |  |                        |
|  | NMEA talker ID   | IN 🛛  | Log to file  | Time precision 2  |  |                        |
|  | ▼ Telegram timing  |   |  |   |  |                        |
|  | Interval [s]   | 1   | 1.000 C  | Event driven  |  |                        |
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| ected to Seapath 330   |  |   |  |   |  |                        |
| ected to Seapath 330   |  |   |  |   |  |                        |
| ected to Seapath 330   |  |   |  | nint  |  |                        |
| ected to Seapath 330   | Proview  |   | B  | event   |  |                        |
| ected to Seapath 330   | Preview<br>Input/Output list   | Ture  | Direction  | avert   | Description  |                        |
| ected to Seapath 330<br>ingine Configuration<br>Apply<br>sel<br>Geometry<br>Description  | Input/Output list  | Type<br>Fibernet  | Direction  | event   | Description  |                        |
| cted to Seapath 330<br>ngine Configuration<br>Apply<br>sel<br>Geometry<br>Description<br>sets<br>sets<br>sets<br>sets<br>sets<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Second<br>Sec | Preview<br>⊂Input/Output list<br>Interface<br>✓ ● TelegramDut3<br>✓ ■ TelegramDut3   | Type<br>Ethernet<br>Serial  | Direction<br>Out<br>Out  | I/D Properties<br>U/D Properties<br>U/DP LAN3 3011 BR0ADCAST<br>COM2 9300 A 81  | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO GINSY  |                        |
| cted to Seapath 330 ngine Configuration <u>Apply</u> sel Geometry Description Soss GNSS L Secondary  | Etestiew<br>-Input/Output list<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Int | Type<br>Ethernet<br>Serial<br>Ethernet  | Direction<br>Out<br>Out<br>Out   | I/O Properties<br>U/D Properties<br>U/D PLAN3 3001 BROADCAST<br>COM295000 n 61<br>U/D PLAN4 13001 BROADCAST   | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO CINSY<br>ATTITUDE VELOCITY TO QINSY  |                        |
| ted to Seapath 330  ngine Configuration  Apply sel Geometry Description Sovie GNSS I- Geometry - Processing  | Preview     -Input/Output list     Interface     ✓ ● TelegramDut3     ✓ ● TelegramDut4     ✓ ● TelegramDut4     ✓ ● TelegramDut4     ✓ ● TelegramDut4     ✓ ● TelegramDut6   | Type<br>Ethernet<br>Serial<br>Ethernet  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out   | Vert<br>I/O Properties<br>UDP LAN3 3001 BROADCAST<br>COM28600 n 81<br>UDP LAN4 13001 BROADCAST<br>NONE  | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>Telegram Out #6   |                        |
| ted to Seapath 330<br>Ingine Configuration<br>Apply<br>el<br>Beometry<br>Description<br>cos<br>SNSS<br>Beometry<br>Processing<br>Athtude Processing  | Ereview<br>-input/Output list  | Type<br>Ethernet<br>Señal<br>Ethernet   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out  | I/O Properties<br>UDP LAN3 3001 BR0ADCAST<br>I COM2 8000 n 8 1<br>UDP LAN4 13001 BR0ADCAST<br>NONE  | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>Telegram Out #8<br>Telegram Out #8  |                        |
| cted to Seapath 330<br>ngine Configuration<br>Apply sel Georety Description sots GNSS GNSS GNSS GNSS Coccessing Anthude Processing DGNSS Coccessing Cocc   | Ereview<br>-Input/Output list<br>Interface<br>Ø TelegramOut3<br>Ø TelegramOut5<br>O TelegramOut6<br>O TelegramOut6<br>TelegramOut7   | Type<br>Ethernet<br>Serial<br>Ethernet  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out   | I/O Properties<br>U/O Properties<br>U/O PLAN3 3001 BROADCAST<br>COM2-89500 A 81<br>U/O PLAN4 13001 BROADCAST<br>NONE<br>NONE  | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO GINSY<br>ATTITUDE VELOCITY TO QINSY<br>Telegam Out #5<br>Telegam 0ut #7<br>@ Disabled   @ OK   @   | Warning   🍳 Er         |
| cted to Seapath 330  ingine Configuration  Apply  see Geometry Description Soss GNSS GNSS GNSS Fracessing Attude Processing DNSS SNS SNS SNS UPPOCP2   | Etestew<br>-Input/Output list<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Interface<br>Inte | Type<br>Ethernet<br>Serial<br>Ethernet  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out   | I/O Properties<br>U/D Properties<br>U/D PLAN3 3001 BROADCAST<br>COM295007 61<br>U/D PLAN4 13001 BROADCAST<br>NONE<br>NONE   | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO CINSY<br>Telegram Out #6<br>Telegram Out #7<br>Disabled   • OK   •   | Warning   \varTheta Er |
| acted to Seapath 330  angine Configuration  Geomety  Description  soss GNSS  HORESS  Attract Processing DONSS  SS  HORESS  BRK   | Preview     Input/Output list     Interface     ✓ ● TelegramDut3     ✓ ● TelegramDut4     ✓ ● TelegramDut4     ✓ ● TelegramDut4     ✓ ● TelegramDut4     ✓ ● TelegramDut5     ● Te   | Type<br>Ethernet<br>Senial<br>Ethernet  | B<br>Direction<br>Out<br>Out<br>Out<br>Out   | Vert<br>I/D Properties<br>UDP LAN3 3001 BROADCAST<br>IODM 28000 # 81<br>UDP LAN4 13001 BROADCAST<br>NONE<br>NONE  | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO QINSY<br>Telegram Out #6<br>Telegram Out #6<br>Telegram Out #7<br>Disabled   • OK   •  | Warning   🕥 Er         |
| ected to Seapath 330   | Ereview<br>Input/Output list-<br>Interface<br>PelegramOut3<br>TelegramOut3<br>TelegramOut7<br>Configuration detai<br>Interface Telegram  | Type<br>Ethemet<br>Serial<br>Ethernet<br>Is<br>ramOut4  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out   | I/U Properties<br>UDP LAN3 3001 BR0ADCAST<br>COM24800 n 8 1<br>UDP LAN4 13001 BR0ADCAST<br>NONE<br>NONE<br>scription  | Description<br>ATTITUDE VELOCITY TO EM2<br>20STITUDE VELOCITY TO QINSY<br>ATTITUDE VELOTY TO QINSY<br>Telegram Qut #7<br>Disabled   • OK   •<br>QINSY  | Warning   🥥 Er         |
| Anticle to Seapath 330   | Preview<br>Input/Output list<br>Interface<br>♥ ● TelegramOut3<br>♥ ● TelegramOut6<br>● TelegramOut6<br>● TelegramOut7<br>♥ Configuration detail<br>Interface TelegramOut7<br>♥ Serial  | Type<br>Ethernet<br>Serial<br>Ethernet<br>Is<br>ramOut4   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out   | event I/O Properties UDP LANA 3001 BROADCAST COM249800 A01 UDP LANA 13001 BROADCAST NONE NONE Scription POSITION and TIME TO  | Description<br>ATTITUDE VELOCITY TO EM2<br>20STITON and TIME TO GINSY<br>ATTITUDE VELOCITY TO GINSY<br>Telegram Out #5<br>@ Disabled   @ OK   @<br>QINSY   | Warning   🍳 Er         |
| sel Geometry<br>Processing<br>Construction<br>Geometry<br>Processing<br>Children Processing<br>Children P   | Ereview Input/Output list Interface  | Type<br>Ethernet<br>Ethernet<br>Is<br>ramOut4   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out  | I/O Properties<br>UDP LAN3 3001 BROADCAST<br>COM285500 A 81<br>UDP LAN4 13001 BROADCAST<br>NONE<br>NONE<br>Scription POSITION and TIME TO   | Description<br>ATTITUDE VELOCITY TO EM2,<br>POSITION and TIME TO CINSY<br>Telegram Out #6<br>Telegram Out #7<br>Disabled   • OK   •<br>QINSY   | Warning   \varTheta Er |
| Antiper Configuration  Apply  State  Geomety  Construction  Apply  State  Geomety  Construct  Const   | Ereview<br>Input/Output list<br>Interface<br>Interface<br>IntegramOut3<br>IntegramOut3<br>Configuration detail<br>Interface TelegramOut7<br>Configuration detail<br>Interface TelegramOut7<br>Seria<br>Cable ID  | Type<br>Ethernet<br>Serial<br>Ethernet<br>Is<br>ramOut4   | Direction<br>Out<br>Out<br>Out<br>Out<br>Dut<br>Det  | I/O Properties UDP LAN3 3001 BROADCAST COM29600 n 81 UDP LAN4 13001 BROADCAST NONE NONE Scription POSITION and TIME TO  | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO CINSY<br>ATTITUDE VELOCITY TO QINSY<br>Telegram Out #5<br>Telegram Out #7<br>Disabled   • OK   •<br>QINSY  | Warning   🥥 Er         |
| cted to Seapath 330  | Ereview<br>Input/Output list-<br>Interface<br>Interface<br>IntegramOut3<br>IntegramOut3<br>Configuration detail<br>Interface TelegramOut7<br>Configuration detail<br>Interface TelegramOut7<br>Interface TelegramOut7<br>Int   | Type<br>Ethernet<br>Serial<br>Ethernet<br>Is<br>ramOut4   | Direction<br>Out<br>Out<br>Out<br>Out  | I/U Properties<br>UDP LAN3 3001 BROADCAST<br>COM2 9500 n 81<br>UDP LAN4 13001 BROADCAST<br>NONE<br>NONE<br>scription<br>POSITION and TIME TO  | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO GINSY<br>ATTITUDE VELOCITY TO GINSY<br>Telegram Out #5<br>Telegram Out #7<br>Disabled   • OK   •<br>QINSY  | Warning   🍳 Er         |
| cted to Seapath 330  ingine Configuration  Apply sel Geometry Description soss GNSS GNSS GNSS GNSS GNSS GNSS GNSS GN   | Preview     Input/Output list     Interface     ✓ TelegramOut3     ✓ TelegramOut3     ✓ TelegramOut6     ✓ TelegramOut7     ✓ Configuration detai     Interface Telegram     Type Seria     Cable ID     ✓ VO properties     Port COM2   | Is<br>ramOut4   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Ut<br>Det<br>Nut<br>Aut<br>aud rate 9600   | event I/O Properties UDP LAN3 3001 BR0ADCAST COM249800 A 81 UDP LAN4 13001 BR0ADCAST NONE Scription POSITION and TIME TO 0 • @rs-232 Ors-4  | Description<br>ATTITUDE VELOCITY TO EM2<br>20STITUN and TIME TO CINSY<br>ATTITUDE VELOCITY TO QINSY<br>Telegram Out #5<br>Disabled   • OK   •<br>QINSY   | Warning   • Er         |
| Attilde Processing<br>Attilde Processing<br>Attilde Processing<br>Attilde Processing<br>Attilde Processing<br>DGNSS<br>SBAS<br>SBAS<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD2<br>HPX/PXD   | Ereview Input/Output list Interface  | Is ramOut4  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out  | event I/O Properties UDP LAN3 3001 BR0ADCAST COMA29800 n 61 UDP LAN4 13001 BR0ADCAST NONE Scription POSITION and TIME TO 0 ••• •••••••••••••••••••••••••••••••  | Description<br>ATTITUDE VELOCITY TO EM2,<br>POSITION and TIME TO CollASY<br>ATTITUDE VELOCITY TO ONSY<br>Telegram Out #7<br>Disabled   • OK   •<br>QINSY   | Warning   • Er         |
| cted to Seapath 330  Ingine Configuration  Secondary  Description  Soos  GNSS  Processing  Attitude Processing  DGNSS  Secondary  Attitude Processing  DGNSS  Geometry  Heave config  Heave config  Heave config  Nating coints  Geometry  Heave config  Secondary  Heave config  Secondary  Secondary  Heave config  Dotot setender  Network  Data Pool   | Ereview Input/Output list Interface IntegramOut Interface IntegramOut Interface IntegramOut Interface IntegramOut Interface In   | Is<br>ramOut4   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Aud<br>Tate 9600<br>ata bits 8  | Vert VD Properties UDP LAN3 3001 BROADCAST COM295000 81 UDP LAN4 3001 BROADCAST NONE Scription POSITION and TIME TO 0 • Stop bits 1   | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO CINSY<br>Telegram Out #6<br>Telegram Out #7<br>Disabled   OK   Q<br>QINSY  | Warning   🥥 Er         |
| Acted to Seapath 330   | Ereview Input/Output list- Interface Interface Interface IntegramOut3 Interface IntegramOut3 Interface Int   | Is<br>ramOut4   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Aud rate<br>9600<br>ata bits<br>8   | I/U Properties       U/D P LAN3 3001 BR0ADCAST       COM2 6800 A61       U/D P LAN4 13001 BR0ADCAST       NONE       scription       POSITION and TIME TO       0       • Gra-232       O       • Stop bits   | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO CINSY<br>ATTITUDE VELOCITY TO QINSY<br>Telegram Out #8<br>Telegram Out #8<br>QINSY<br>222  | Warning   🥥 Er         |
| Acted to Seapath 330  Angine Configuration  Apply  See Geometry  Description  Soss  GNSS  GRNSS  GRNSS  GRNSS  HP/AcP/Ac2  Attitude Processing  DGNSS  HP/AcP/Ac2  RTK  MRU  Geometry Heave config  nitoring points  Geometry Heave config  nitoring points  Geometry  Heave config  Network  Data Pool  | Preview     Input/Output list     Interface     ✓      TelegramOut3     ✓      TelegramOut3     ✓      TelegramOut6     ✓      TelegramOut7     ✓      Configuration detail     Interface     Type     Seria     Cable ID     VIO properties     Port     COM2     Advanced     Parity     None     Telegram out properties  | Is<br>ramOut4   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>   |   | Description<br>ATTITUDE VELOCITY TO EM2<br>20STITON and TIME TO CINSY<br>ATTITUDE VELOCITY TO QINSY<br>Telegram Out #6<br>@ Disabled   @ OK   @<br>QINSY<br>222<br>  | Warning   • Er         |
| Attice to Seapath 330  Apply   | Ereview Input/Output list Interface  | Type<br>Ethernet<br>Serial<br>Ethernet<br>Is<br>ramOut4<br>I<br>ethes<br>NMEA   | Direction<br>Out<br>Out<br>Out<br>Out<br>Der<br>Per<br>Per<br>Per<br>Per<br>Per<br>Per<br>Per<br>Per<br>Per<br>P   | event I/O Properties UDP LAN3 3001 BR0ADCAST UDP LAN3 3001 BR0ADCAST ODM28900 A 81 UDP LAN4 13001 BR0ADCAST NONE scription POSITION and TIME TO 0 • • Stop bits 1 Datum VV0S84 • Mo   | Description<br>ATTITUDE VELOCITY TO EM2,<br>POSITION and TIME TO OINSY<br>Telegram Out #5<br>Telegram Out #7<br>OINSY<br>222<br>Initoring point EM2040C  | •                      |
| cted to Seapath 330  | Ereview Input/Output list Interface IntegramOut IntegramOut IntegramOut IntegramOut Interface IntegramOut Interface IntegramOut Interface Interfac   | Is<br>ramOut4   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Def<br>T<br>T<br>Aud rate 9600<br>ata bits 8   | event<br>I/O Properties<br>UDP LAN3 3001 BR0ADCAST<br>IOM2 BR0ADCAST<br>IOM2 BR0ADCAST<br>IOM2 BR0ADCAST<br>NONE<br>NONE<br>Scription<br>POSITION and TIME TO<br>0 • @ rs-232 O rs-4<br>• Stop bits 1<br>Datum WGS84 • Mo   | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO CINSY<br>Telegram Out #6<br>Telegram Out #7<br>Disabled   • OK   •<br>QINSY<br>122<br>122<br>122<br>122<br>122   | Warning   • En         |
| cted to Seapath 330  Ingine Configuration  Anply sel Geomety Description wors GNSS GNSS GSS GNSS GNSS GNSS GNSS GNSS   | Ereview Input/Output list Interface Interface Interface IntegramOut3 Interface IntegramOut3 Interface IntegramOut7 Interface I   | Is<br>ramOut4<br>erties<br>NMEA<br>GGA GLL ZDA  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>T<br>Der<br>Der<br>T<br>Der<br>Der<br>T<br>Der<br>T   | I/U Properties       U/D PLAN3 3001 BROADCAST       COMM SECON 61       U/D PLAN4 13001 BROADCAST       NONE       scription       POSITION and TIME TO       0       • Gre-232       0       • Stop bits       1       Datum   | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO GINSY<br>ATTITUDE VELOCITY TO GINSY<br>Telegram Out #6<br>Telegram Out #7<br>OINSY<br>QINSY<br>122<br>122<br>122<br>122<br>122<br>122<br>122<br>12   | Warning   G En         |
| cted to Seapath 330  | Preview<br>Input/Output list<br>Interface<br>♥ ● TelegramOut3<br>♥ ● TelegramOut3<br>● TelegramOut6<br>● TelegramOut7<br>♥ Configuration detail<br>Interface TelegramOut7<br>♥ Serial<br>Cable ID<br>♥ I/O properties<br>Port COM2<br>♥ Advanced<br>Parity None<br>♥ Telegram out prope<br>Format<br>NMEA selection<br>Options   | Is<br>ramOut4   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Aud rate 9600<br>ata bits 8<br>HDT  | Viet  I/O Properties UDP LAN3 3001 BROADCAST COM25800 A61 UDP LAN4 13001 BROADCAST NONE  scription POSITION and TIME TO  0  • Stop bits 1 Datum WGS84 • Mo  | Description<br>ATTITUDE VELOCITY TO EM2<br>20STITON and TIME TO CINSY<br>ATTITUDE VELOCITY TO QINSY<br>Telegram Out #8<br>Telegram Out #8<br>QINSY<br>222<br>Initoring point EM2040C   | Warning   • En         |
| cted to Seapath 330  Ingine Configuration  Apply ase Geometry Description stors GNSS Processing DGNSS SS HP7AP762 RTK MRU Heave config vitoing points Geometry Heave config vitoing points Geometry Senia Jon extender Network Data Pool   | Ereview Input/Output list Interface  | IS<br>ramOut4<br>I<br>enties<br>NMEA<br>GGA GLL ZDA   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out  | event I/O Properties UDP LAN3 3001 BR0ADCAST UDP LAN3 3001 BR0ADCAST ODM28900 A 81 UDP LAN4 13001 BR0ADCAST NONE scription POSITION and TIME TO 0 •• @ rs-232 @ rs-4 •• Stop bits 1 Datum VV0584 •• Mo Time precision 2::   | Description<br>ATTITUDE VELOCITY TO EM2,<br>POSITION and TIME TO CINSY<br>Telegram Out #5<br>Telegram Out #7<br>QINSY<br>IZE<br>INTERPORT EM2040C  | Warning   • En         |
| ected to Seapath 330   | Ereview Input/Output list Interface Interface IntegramOut3 Image: Image   | Is<br>ramOut4   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>De:<br>De:<br>De:<br>De:<br>De:<br>De:<br>De:<br>De:<br>De:<br>De:   | I/O Properties       U/DP LAN3 3001 BR0ADCAST       IODM28000 81       U/DP LAN3 13001 BR0ADCAST       IOME       Scription       POSITION and TIME TO       0     • @ rs-232 O rs-4       • Stop bits       1       Datum     VK0584 • Mo       Time precision     2 • •   | Description<br>ATTITUDE VELOCITY TO EM2<br>POSTION and TIME TO CINSY<br>ATTITUDE VELOCITY TO UNSY<br>Telegram Out #7<br>Disabled   • OK   •<br>OUNSY   | Warning   • En         |
| Acted to Seapath 330   | Ereview Input/Output list Interface Interface Interface IntegramOut3 Interface IntegramOut3 Interface IntegramOut7 IntegramOut7 Interface Interfac   | IS<br>ramOut4<br>serial<br>Ethernet<br>IS<br>ramOut4<br>serial<br>Ba<br>of the serial<br>MMEA<br>GGA GLL ZDA<br>IN<br>C   | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Der<br>I Der<br>I DE<br>I DE<br>I DE<br>I DE<br>I DE<br>I DE<br>I DE<br>I DE   | event   | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO GINSY<br>ATTITUDE VELOCITY TO GINSY<br>Telegram Out #6<br>Telegram Out #7<br>OINSY<br>QINSY<br>122<br>122<br>122<br>122<br>122<br>122<br>122<br>12   | Warning   G Er         |
| Acted to Seapath 330   Angine Configuration  Apply  See  Geometry  Description  Soss  GNSS  Geometry  Processing  Attitude Processing  DGNSS  HP/AP/G2  RTK  MRU  Geometry Heave config  Intoing points  Geometry  Heave config  Intoing points  Geometry  Network  Data Pool  | Preview<br>Input/Output list<br>Interface<br>♥ ● TelegramOut3<br>♥ ● TelegramOut3<br>● ● TelegramOut7<br>♥ Configuration detail<br>Interface TelegramOut7<br>♥ Droperties<br>Port COM2<br>♥ Advanced<br>Parity None<br>♥ Telegram out proper<br>Format<br>NMEA selection<br>Options<br>NMEA talker ID<br>♥ Telegram timing-<br>Interval [s]  | IS<br>ramOut4<br>Series<br>NMEA<br>GGA GLL ZDA I<br>IN  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Aud rate 9600<br>ata bits 8<br>HDT<br>Log to file<br>1.000 C  | Vert  I/O Properties UDP LAN3 3001 BROADCAST COM25800 A61 UDP LAN4 13001 BROADCAST NONE  scription POSITION and TIME TO  0  • Stop bits 1 Datum WGS84 • Mo  Time precision 2 Event driven O Time driven   | Description<br>ATTITUDE VELOCITY TO EM2<br>20STITON and TIME TO OINSY<br>ATTITUDE VELOCITY TO QINSY<br>Telegram Out #6<br>QINSY<br>222<br>Initoring point EM2040C  | Warning   • En         |
| cted to Seapath 330  | Preview Input/Output list Interface  | Is ramOut4  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Aut<br>Aut<br>Aut<br>Aut<br>Aut<br>Aut<br>Aut<br>Aut<br>Aut<br>A   | event<br>I/O Properties<br>UDP LAN3 3001 BROADCAST<br>UDP LAN3 3001 BROADCAST<br>ODM2 8900 81<br>UDP LAN4 13001 BROADCAST<br>NONE<br>scription<br>POSITION and TIME TO<br>0 ● @ rs-232 O rs-4<br>● Stop bits 1<br>Datum WOS84 ● Mo<br>Time precision 2 ●<br>D Event driven ④ Timer driven   | Description<br>ATTITUDE VELOCITY TO EM2<br>POSTITO AND TIME TO CINSY<br>ATTITUDE VELOCITY TO QINSY<br>Telegram Out #7<br>QINSY<br>222<br>Image: Image: Im  | Warning   • Er         |
| cted to Seapath 330  | Ereview Input/Output list Interface Interface IntegramOut3 Image: IntegramOut3 Image: IntegramOut3 Image: IntegramOut3 Configuration detail Interface Image: IntegramOut7 Configuration detail Interface Image: IntegramOut7 Image: Image   | Is<br>aramOut4<br>Senial<br>Ethernet<br>Is<br>aramOut4<br>Control Control | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out  | I/O Properties       U/DP LAN3 3001 BR0ADCAST       IOM2 IOM2 BR0ADCAST       IOM2 BR0ADCAST       IOM2 BR0ADCAST       IOM2 BR0ADCAST       IOM3 BR0ADCAST | Description<br>ATTITUDE VELOCITY TO EM2<br>POSTION and TIME TO CINSY<br>ATTITUDE VELOCITY TO UNSY<br>Telegram Out #7<br>Disabled Ot #7<br>QINSY<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>ILLE<br>I | Warning   • Er         |
| ected to Seapath 330   | Ereview Input/Output list Interface Interface Interface IntegramOut3 Interface IntegramOut3 Interface IntegramOut7 Interface I   | IS<br>ramOut4<br>serial<br>Ethernet<br>IS<br>ramOut4<br>serial<br>Ba<br>Da<br>parties<br>NMEA<br>GGA GLL ZDA<br>NMEA  | Direction<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>Out<br>T<br>Der<br>Der<br>T<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>T<br>Der<br>Der<br>Der<br>Der<br>Der<br>Der<br>Der<br>Der<br>Der<br>Der | event   | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION and TIME TO CINSY<br>ATTITUDE VELOCITY TO QINSY<br>Telegram Out 86<br>Telegram Out 86<br>QINSY<br>QINSY<br>122<br>122<br>122<br>122<br>122<br>122<br>122<br>12   | Warning   • Er         |

| NAV Engine Configuration  |  |   |                                       |  |   |                   |
|---|--|---|---------------------------------------|--|---|-------------------|
| Apply   | Preview  |   |                                       | Revert   |   |                   |
| P-Vessel  | Input/Output list  |   |                                       |  |   |                   |
|   | Interface<br>TelegramOut3<br>TelegramOut3<br>TelegramOut5<br>TelegramOut5<br>TelegramOut7<br>TelegramOut7  | Type<br>Ethernet<br>Serial<br>Ethernet                        | Direction<br>Out<br>Out<br>Out<br>Out | 1/0 Properties<br>UDP LAN3 3001 BROADCAST<br>COM2 9500 n 8 1<br>UDP LAN4 13001 BROADCAST<br>NONE<br>NONE | Description<br>ATTITUDE VELOCITY TO EM2<br>POSITION TO QINSY<br>ATTITUDE VELOCITY TO QINSY<br>Telegram Out #8<br>Telegram Out #7<br>Disabled   • OK   • | Varning   O Error |
| <ul> <li>Geometry         <ul> <li>Geometry</li> <li>Geometry</li> <li>Geometry</li> <li>Geometry</li> <li>Geometry</li> <li>Communication interface</li> <li>Input/Dubput</li> <li>Serial port extender</li> <li>Network</li> <li>Data Pool</li> </ul> </li> </ul> | Type Ethernet<br>Cable ID<br>♥ I/O properties<br>● Broadcast ○ UI<br>Local Interface IAI<br>Remote port 130<br>♥ Telegram out properti<br>Format Se<br>Options<br>Log to file<br>♥ Telegram timing<br>Interval [s] | nicast O Mu<br>N4 (192.168.3<br>101 es<br>es<br>eapath binary | 11 ×                                  | Datum WOS84 • Mo   | nitoring point EM2040C  |                   |

|   | NAV Engine Configuration  |                       |                    |  |
|---|---|-----------------------|--------------------|--|
|   | Apply   | Preview               | Revert             |  |
| 1 | Geometry  | Address 192.168.1.150 | Open configuration |  |
|   | Description     Sensors     Description     Sensors     Description     Sensors     Description     Descr | Type Disabled •       |                    |  |
|   | Connected to Seapath 330  |                       |                    |  |

# Appendix C – Template database settings in QINSy (for acquisition)

Template database name: AmyGale\_2019.db

QINSy uses the following reference frame conventions (these differ from those used by Seapath 330):

Pitch rotation: + bow up Roll rotation: + heeling to starboard Heave: + upwards

X: + to starboard Y: + towards bow Z: + up

| Survey  | Information: General  |
|---|---|
| Geodetic<br>Datums<br>Chart Datum<br>Chart Datum / Vertical Datum<br>Chart Datum / Vertical Datum<br>Digital Terrain Models<br>Projections<br>Chart Datum / Vertical Datum<br>Chart Datum / Vertical Datum / Vertical Datum<br>Chart Datum / Vertical Datum / Vertical Datum<br>Chart Datum / Vertical Datum / Vertical Datum / Vertical Datum<br>Chart Datum / Vertical | Line name: No line name<br>Line sequence number: 1<br>Line description: |
| UTC to GS Correction     Object     Obj   |   |
| Syro     Syro     Syro     Yorkube Node     Syno   |   |
| Fixed Node  |   |

| AmyGale_2019.db - Database Setup Program   |   |     |
|--|---|-----|
| File Edit View Options Help  |   |     |
|  | Geodetic  | -   |
| Geodetic   | Predefined system: Not Defined  | -   |
| G WGS84  | Survey unit name: Meters  | -   |
| ⊖ ⊉ Heights<br>→⊉ Chart Datum / Vertical Datum   | Conversion factor to metres: 1.0000000000000  | -   |
| Mean Water Level Model   |   |     |
| Trojections     Trojections     Universal Transverse Mercator (North Hemisphere)   |   |     |
| UTE to GPS Correction  |   |     |
| Sound Velocity Profile     Object  |   |     |
| AMY Gale   |   |     |
| Sound Velocity   |   |     |
| ⇒ Φ <sup>2</sup> Gyro  |   |     |
| →  |   |     |
| P→↓ Variable Node  |   |     |
| - • RX<br>• TX   |   |     |
| B Link     Auxiliary Systems   |   |     |
| Ğ Time Sync<br>EM2040C Controller  |   |     |
| → D→ ASCII Logger  |   |     |
| (e-fig   |   |     |
|  |   |     |
|  |   |     |
|  |   |     |
|  |   |     |
| For Help, press F1   |   | 112 |
|  |   |     |
| AmyGale_2019.db - Database Setup Program   |   |     |
| AmyGale_2019.db - Database Setup Program   |   |     |
| AmyGale_2019.db - Database Setup Program<br>File Edit View Options Help<br>Setup 2019 20 20 20 20 20 20 20 20 20 20 20 20 20   | Image: Contract of the second seco             |     |
| Image: Struck of the struck  | Image: Survey datum:     W0584  |     |
| Image: Second secon   | Image: Servey datum:     W6584       Chert datum:     W6584       Chert datum:     W6584  |     |
| Image: String Setup Program         File Edit View Options Help         Image: String Setup Program         Image: String Program  | Image: Second                           |     |
| File Edit View Options Help         File Edit View Options Help         Secondary         Secondary <td< td=""><td>Image: Control of Contro</td><td></td></td<>   | Image: Control of Contro                           |     |
| File Edit View Options Help         Image: Survey  | Image: Survey datum:       W6584         Chart datum:       W6584         Chart datum:       W6584         Height file:       N/A         Height file:       N/A         Height file:       N/A         Height offset:       0.000 m  |     |
| File Edit View Options Help         File Edit View Options Help         Source         General         Ge  | Image: Second State Sta                           |     |
| File Edit View Options Help         File Edit View Options Help         Survey         General         General         General         Chart Datum / Vertical Datum         Digital Terrain Models         Digital Terrain Models         Survey         Image: Universal Transverse Mercator (North Hemisphere)         Survey         Image: Universal Transverse Mercator (North Hemisphere)         Sund Velocity Profile         Object   | Image: Second                           |     |
| File Edit View Options Help         File Edit View Options Help         Supervised Status         Image: Status <td>Control Control C</td> <td></td> | Control C |     |
| File Edit View Options Help         File Edit View Options Help         Source         General         General         Codetic         W0584         Chart Datum / Vertical Datum         W0584         Chart Datum / Vertical Datum         W0584         Chart Datum / Vertical Datum         W0584         Projections         Projections         Court Options         Model         W0584         Elevents         Model         Source         Projections         Color Construction Grid         Source         Model         Source         W0584         Model         Projections         Source         Model         Model <t< td=""><td>Image: Second Second</td><td></td></t<>  | Image: Second                           |     |
| File Edit View Options Help         Image: Survey  | Image: Second                           |     |
| File       Edit       View       Options       Help         Image: Survey       Image: S   | Control C |     |
| File       Edit       View       Options       Help         File       Edit       View       Options       Help         Survey       Survey       Survey       Survey       Survey         Survey       Survey       Survey       Survey       Survey       Survey         Survey<   | Chart datum: W0584 Chart datum: W0584 Height file: N/A Height file: N/A Height offset: 0.000 m  |     |
| File Edit View Options Help         Image: Survey  | Control C |     |
| File Edit View Options Help         Image: Second   | Ortuns: Datums   Survey datum: WGS84   Height file: NA   Height file: NA   Height file: NA  |     |
| File Edit View Options Help         File Edit View Options Help         Survey         General         General         General         Chart Datum / Vertical Datum         Wisse         Digital Terrin Models         Digital Terrin Models         Wisses         Wisses         System         Social Controller         Anvillary Systems         Stand         System         Social Contr  | Contraction of the second |     |
| File       Edit       View       Options       Help         File       Edit       View       Options       Help         Survey       General       General       General         General       Model       General       General         General       General       General       General <t< td=""><td>Orbital State State</td><td></td></t<>  | Orbital State |     |
| File       Edit       View       Options       Help         File       Edit       View       Options       Help         Survey       Survey       Survey       Survey       Survey         Survey       Survey       Survey       Survey       Survey       Survey         Survey <td>Image: Contract of the second seco</td> <td></td>                          | Image: Contract of the second seco                           |     |
| File Edit View Options Help         Image: Survey         General         Man Wate Level Model         Digital Terrain Models         General         Many Gale         Sund Velocity Profile         Soud Velocity Profile         Soud Velocity Profile         Songet Valable Node         Poision Navigation System         Many Gale MRU         Navigation System         Many Gale MRU         Navigation System         Link         Audiany Sy  | Image: Contraction with the system         Survey datum:       W6584         Chart datum:       W6584         Height file:       NA         Height offset:       0.000 m  |     |
| File       Edit       View       Options       Help         Image: Survey       General       Image: Survey       Image: Survey       Image: Survey         Image: Survey  | Image: Contract of the second seco                           |     |
| File       Edit       View       Options       Help         Image: Survey       Image: S   | Control C |     |
| File Edit View Options Help         Image: Second   | Very datum:       WOSA         Survey datum:       WOSA         Chard datum:       WOSA         Height free:       No. Height free:         Height free:       No. ODO m  |     |

| J AmyGale_2019.db - Database Setup Program   | And Address of the Owner of the |  |
|--|--|--|
| I Re 201 View Options neip   |  |  |
| Survey   | Datum: WGS84   |  |
| Geodetic   | Datum name:  | WG584                                  |
| ₩GS84<br>□-☆ Heights   | Prime meridian:  | Greenwich                              |
|  | Prime meridian:<br>Conversion factor to metres:  | 0;00;00:000 E<br>1.0000000000000       |
| ☐ Digital Terrain Models<br>☐ - [5] Projections  | Semi-major axis (a):   | 6378137.000 m                          |
| Construction     Construction     Construction   | Inverse flattening (1/f):  | 298.2522359000                         |
| Sound Velocity Profile   | First eccentricity (e):  | 0.081819190842621                      |
| Amy Gale   | First eccentricity squared (e**2):<br>Second eccentricity (e'):  | 0.006694379990141<br>0.082094437949696 |
| AML SV probe   | Second eccentricity squared (e'**2):   | 0.006739496742276                      |
| ∰ EM2040C<br>⊖∯ Gyro   |  |  |
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| → Position Navigation System<br>→ Variable Node  |  |  |
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| Ö Time Sync<br>■- EM2040C Controller   |  |  |
| ASCII Logger   |  |  |
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| ₩6584<br>⊕-∰ Heights   | Conversion factor to metres:         | 1.000000000000  |
| Chart Datum / Vertical Datum   | UTM zone number:                     | 19  |
| Digital Terrain Models   | UTM central meridian:                | 69;00;00.00000 W<br>0:00:00.00000 N   |
| Universal Transverse Mercator (North Hemisphere)   | Longitude of grid origin:            | 69;00;00:00000 W  |
|  | Grid Easting at grid origin:         | 50000.000 m   |
| Sound Velocity Profile   | Scale factor at longitude of origin: | 0.99960000000   |
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| General  | Object: Amy O   | Gale  |  |
| Geodetic   | Object reference number:  | 1   |  |
| WGS84  | Object type:<br>Description of reference point  | Ve<br>nt: Ar  | sel<br>ny Gale MRU   |
| Chart Datum / Vertical Datum   | Height above draft reference:   | e 0.0   | 00 m   |
| Mean Water Level Model   | Squat model:  | No  | t Defined  |
| Projections  | SD draft:   | 0.0   | 50 m   |
|  | SD squat:<br>SD load:   | 0.0   | 50 m   |
| - O UTC to GPS Correction  | SD tide:  | 0.1   | 00 m   |
| - Diject   | Time latency navigation:  | 0.0   | 25 s   |
| Amy Gale   | Time correction to GiviT (UTC<br>Time correction to master ves  | c): 0.0<br>essel's time: 0.0  | 00 s   |
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| EM2040C  |   |   |  |
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| - III General   | Observation: Sound Velocity   |  |  |  |  |
| General     Gedetic     Datums     Guyosal     Gu | Observation description:<br>Observation type:<br>'At' node:<br>System description:<br>(C-O) option:<br>Sicale factor:<br>Fixed system (C-O):<br>Variable (C-O):<br>A-priori SD: | Sound Velocity Sound Velocity Amy Gale MRU Meters / Second AML SY probe (C-O) offset applied first 1.000000000 0.0000000 0.0000000 0.000000 0.000000 |  |  |  |
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| □- <b>III</b> General                            | System: EM2040C  |   |   |
| E Geodetic                                       | Description:   | EM2040C   |   |
| Datums   | Type:  | Multibeam Echosounder   |   |
| Heights  | Driver:  | Kongsberg EM2040/EM710/EM302/EM122  |   |
| 🚽 Chart Datum / Vertical Datum                   | Executable and Cmdline:  | DrvKongsbergEM.exe  |   |
|  | Driver specific settings:  | MANUFACTURER=2;MODEL=2045;RAW_BATHY=1;RAW_SNIP=1;RAW_WCD=1;   |   |
| 🖉 Digital Terrain Models                         | Port:  | 2001  |   |
| Universal Transverse Mercator (North Hemisphere) | Update rate:   | 0.000 s   |   |
| Local Construction Grid                          | Acquired by:   | [Directly into QINSy] (No additional time tags)   |   |
| 👸 UTC to GPS Correction                          | Observation time from:   | N/A   |   |
| Sound Velocity Profile                           | Number of slots:   | 1   |   |
| Diject   | Manufacturer:  | Konasbera   |   |
| System   | Model:   | EM2040C   |   |
| AML SV probe                                     | Object location:   | Amy Gale  |   |
| Sound Velocity                                   | Node name:   | RX  |   |
| EM2040C  | X (Stbd = Positive)::  | 0.000 m   |   |
| E gro  | Y (Bow = Positive)::   | -0.045 m  |   |
| Pitch Roll Heave Sensor                          | Z (Up = Positive)::  | 0.006 m   |   |
| L Position Navigation System                     | A-priori SD:   | 0.010 m   |   |
| Variable Node                                    | Roll offset:   | -0.430  |   |
| Amy Gale MRU                                     | Pitch offset:  | 2.270   |   |
|  | Heading offset:  | -0.300  |   |
| 🖁 Link   | Unit is roll stabilized:   | No  |   |
| Auxiliary Systems                                | Unit is pitch stabilized:  | No  |   |
| Ime Sync   | Unit is heave compensated:   | No  |   |
| D+ ASCII Logger                                  | Beam steering (flat transducer):   | No  |   |
| Fixed Node                                       | Beam angle width along:  | 1.500 m   |   |
|  | Beam angle width across:   | 1.500 m   |   |
|  | Maximum number of beams per ping:  | 800   |   |
|  | Use sound velocity from unit:  | Yes   |   |
|  | Slot:  | 1   |   |
|  | Sound velocity for beam angle:   | Sound Velocity  |   |
|  | SD type:   | Pulse, Sampling   |   |
|  | SD pulse length:   | 0.150 ms  |   |
|  | SD sampling length:  | 0.050 m   |   |
|  | SD roll offset:  | 0.050 °   |   |
|  | SD pitch offset:   | 0.050 °   |   |
|  | SD heading offset:   | 0.500 *   |   |
|  | SD roll stabilization:   | 0.000 °   |   |
|  | SD pitch stabilization:  | 0.000 *   |   |
|  | SD heave compensation:   | 0.000 m   |   |
|  | SU sound velocity:   | 0.050 m/s   |   |
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| Survey   | System: Gyr              | ro  |     |
| 🕞 🖝 Geodetic                                     | Description              | Gyro  |     |
| 🖨 🚱 Datums                                       | Type:                    | Gyro Compass  |     |
|  | Driver                   | Network - Seanath Binary Format 11 (Hdo) (With UTC) |     |
| Chart Datum / Vertical Datum                     | Executable and Condline: | DrvDPSC ounted IDP eve SFAPATH FMT11 PPS            |     |
| Mean Water Level Model                           | Peets                    | 12001   |     |
| 🚽 🚽 Digital Terrain Models                       | Undato rator             | 0000-   |     |
| Projections                                      | latence.                 | 0.000 s   |     |
| Universal Transverse Mercator (North Hemisphere) | Latency:                 | 0.0103  |     |
| Local Construction Grid                          | Acquired by:             | [Directly into QINSy] (No additional time tags)     |     |
| Sound Velocity Profile                           | Observation time from:   | N/A   |     |
| Dbject   | Number of slots:         | 0   |     |
| 🖶 🛄 Amy Gale                                     |                          |   |     |
| E System   |                          |   |     |
| i AML SV probe                                   |                          |   |     |
| Sound Velocity                                   |                          |   |     |
| EVIZO40C   |                          |   |     |
| Gyro   |                          |   |     |
| 🚽 Pitch Roll Heave Sensor                        |                          |   |     |
| Position Navigation System                       |                          |   |     |
| ia ↓ Variable Node                               |                          |   |     |
| Amy Gale MRU                                     |                          |   |     |
| e Tx   |                          |   |     |
| Link   |                          |   |     |
| 🚍 🔠 Auxiliary Systems                            |                          |   |     |
| — 👌 Time Sync                                    |                          |   |     |
| EM2040C Controller                               |                          |   |     |
| LD⇒ ASCII Logger                                 |                          |   |     |
| l⊶et Fixed Node                                  |                          |   |     |
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| Survey  | Observation              | n: Gyro                     |  |  |
| e 🗸 Geodetic  | Observation description: | Gyro                        |  |  |
| G WGS84   | Observation type:        | Bearing (True)              |  |  |
| 🖶 🚖 Heights   | 'At' node:               | Amy Gale MRU                |  |  |
| Chart Datum / Vertical Datum     Mean Water Level Model                 | Measurement unit code:   | Degrees                     |  |  |
| Digital Terrain Models  | (C-O) ontion:            | (C-O) offsets applied first |  |  |
| Key Projections     William Stransverse Mercator (North Hemisphere)     | Scale factor:            | 1.00000000000               |  |  |
| Local Construction Grid   | Fixed system (C-O):      | 0.000000000                 |  |  |
|   | Variable (C-O):          | 0.0000000                   |  |  |
| Diject  | A-priori SU:             | 0.5000                      |  |  |
| 🖨 🛄 Amy Gale  |                          |                             |  |  |
| AML SV probe  |                          |                             |  |  |
| Sound Velocity  |                          |                             |  |  |
| EM2040C   |                          |                             |  |  |
|   |                          |                             |  |  |
| Yerking Sensor     Yerking Sensor     Yerking Sensor     Yerking Sensor |                          |                             |  |  |
| 🖶 🏹 Variable Node   |                          |                             |  |  |
| Amy Gale MRU  |                          |                             |  |  |
| ● TX  |                          |                             |  |  |
| B Link  |                          |                             |  |  |
| - Ö Time Sync   |                          |                             |  |  |
| EM2040C Controller  |                          |                             |  |  |
| Fixed Node  |                          |                             |  |  |
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| AmyGale_2019.db - Database Setup Program                |  | All and a second se |  |
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|   |  |  |  |
| E-W Survey  | System: Pitch Roll                     | Heave Sensor   |  |
| Gendetic  |  |  |  |
| Datums  | Description:                           | Pitch Roll Heave Sensor  |  |
| WG584   | Type:                                  | Pitch Roll Heave Sensor  |  |
| 🖶 🤹 Heights   | Driver:                                | Network - Seapath MRU Binary Format 11 (With UTC)  |  |
| 🚓 Chart Datum / Vertical Datum                          | Executable and Cmdline:                | DrvQPSCountedUDP.exe SEAPATH_FMT11 PPS   |  |
| Mean Water Level Model                                  | Port:                                  | 13001  |  |
| Digital Terrain Wodels                                  | Update rate:                           | 0.000 s  |  |
| Universal Transverse Mercator (North Hemisphere)        | Latency:                               | 0.010 s  |  |
| Local Construction Grid                                 | Acquired by:                           | [Directly into QINSy] (No additional time tags)  |  |
| 💍 UTC to GPS Correction                                 | Observation time from:                 | N/A  |  |
| Sound Velocity Profile                                  | Number of slots:                       | 0  |  |
| Dipect  | Object:                                | Amy Gale   |  |
| Amy Gale  | PRH sensor reference number:           | 1  |  |
| AML SV probe  | Botation convention pitch:             | Positive how up  |  |
| Sound Velocity  | Botation convention roll:              | Positive beeling to starboard  |  |
|   | Angular variable measured:             | HPR (roll first)   |  |
| ian (byro   | Angular measurement units:             | Degrees  |  |
|   | Sign convention heave:                 | Positive upwards   |  |
| There we setson     There we setson     There we setson | Measurement unit heave:                | Meters   |  |
| → Y Variable Node                                       | Conversion factor to degrees decimal:  | N/A  |  |
| 🕂 🕀 Amy Gale MRU  | Conversion factor to metres:           | N/A  |  |
| @ RX  | Quality indicator type pitch and roll: | No quality info recorded   |  |
| e TX  | Quality indicator type heave:          | No quality info recorded   |  |
| - 16 Link   | Description of quality indicator type: |  |  |
| & Time Sync   | Object location:                       | Amy Gale   |  |
| EM2040C Controller                                      | Node name:                             | Amy Gale MRU   |  |
| D+ ASCII Logger   | X (Sthd - Positive)                    | 0.000 m  |  |
| i ↓ Fixed Node  | V (Bow - Positive):                    | 0.000 m  |  |
|   | 7 (Up = Positive)::                    | 0.000 m  |  |
|   | A-priori SD:                           | 0.000 m  |  |
|   |  | 0.000 %  |  |
|   | (C-O) roll offset                      | 0.000  |  |
|   | (C-O) betwe offset                     | 0.000  |  |
|   | (e o) neave onset                      | 0.000  |  |
|   | Heave time delay:                      | 0.000 s  |  |
|   | Heave filter length:                   | N/A  |  |
|   | SD roll and pitch:                     | 0.050 *  |  |
|   | SD heave (fixed):                      | 0.050 m  |  |
|   | SU heave (variable):                   | 5.000 %  |  |
|   | SU roll offset:                        | 0.00   |  |
|   | SU pitch offset:                       | 0.050 *  |  |
|   | SD heave offset:                       | 0.050 m  |  |
|   |  |  |  |
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| For Help, press F1                                      |  |  |  |
| i or ricip, press i z                                   |  |  |  |

| AmyGale_2019.db - Database Setup Program  |                         |   | the second s | × |
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| Survey  | System: Pos             | ition Navigation System                         |  |   |
| General Control of the second | System. POS             | nion Navigation System                          |  |   |
| Geodetic  | Description:            | Position Navigation System                      |  |   |
| WGS84   | Туре:                   | Position Navigation System                      |  |   |
| E 4 Heights   | Driver:                 | Network - Seapath Binary Format 11 (With UTC)   |  |   |
| 🚽 Chart Datum / Vertical Datum  | Executable and Cmdline: | DrvQPSCountedUDP.exe SEAPATH_FMT11 PPS          |  |   |
| Mean Water Level Model  | Port:                   | 13001   |  |   |
| 🖉 Digital Terrain Models  | Update rate:            | 0.000 s   |  |   |
| Projections   | Latency:                | 0.010 s   |  |   |
| Local Construction Grid   | Acquired by:            | [Directly into QINSy] (No additional time tags) |  |   |
| - 👸 UTC to GPS Correction   | Observation time from:  | N/A   |  |   |
| Sound Velocity Profile  | Number of slots:        | 0   |  |   |
| 📄 🔂 Object  | Catallita and an        | -   |  |   |
| E Mary Gale   | Satellite system name:  | VV(3004   |  |   |
| System  | Horizontal datum:       | WGS84   |  |   |
| Sound Velocity  | Vertical datum:         | WGS84   |  |   |
|   | Height file:            | N/A   |  |   |
| 🖨 🛱 Gyro  | Height level:           | No Level Correction                             |  |   |
| Gyro  | Height file:            | N/A   |  |   |
| Pitch Roll Heave Sensor   | Height offset:          | 0.000 m   |  |   |
| Variable Node   | SD latitude:            | 0.500 m   |  |   |
| Amy Gale MRU  | SD longitude:           | 0.500 m   |  |   |
| @ RX  | SD height:              | 1.000 m   |  |   |
| u © TX  | Measurement unit:       | Meters  |  |   |
|   | Receiver description:   | Position Navigation System                      |  |   |
| E→ III Auxiliary Systems  | Receiver number:        | 0   |  |   |
| EM2040C Controller  | Object location:        | Amy Gale  |  |   |
| D→ ASCII Logger   | Node name:              | Amy Gale MRU                                    |  |   |
| Fixed Node  | X (Stbd = Positive)::   | 0.000 m   |  |   |
|   | Y (Bow = Positive)::    | 0.000 m   |  |   |
|   | Z (Up = Positive)::     | 0.000 m   |  |   |
|   | A-priori SD:            | 0.000 m   |  |   |
|   |                         |   |  |   |
| For Help, press F1  |                         |   |  |   |

| AmyGale_2019.db - Database Setup Program         |                                       |              | and the second s | X- |
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| Survey   | Node: Am                              | y Gale MRU   |  |    |
| Geodetic   | Object location:                      | - Amy Gale   |  |    |
| Datums   | Node name:                            | Amy Gale MRU |  |    |
| Heights  | X (Stbd = Positive)::                 | 0.000 m      |  |    |
| 🕂 🛓 Chart Datum / Vertical Datum                 | Y (Bow = Positive)::                  | 0.000 m      |  |    |
| Mean Water Level Model                           | Z (Up = Positive)::                   | 0.000 m      |  |    |
|  | A-priori SD:                          | 0.000 m      |  |    |
| Universal Transverse Mercator (North Hemisphere) |                                       |              |  |    |
| Local Construction Grid                          |                                       |              |  |    |
| Sound Velocity Profile                           |                                       |              |  |    |
| Dbject   |                                       |              |  |    |
| Amy Gale   |                                       |              |  |    |
| AML SV probe                                     |                                       |              |  |    |
| Sound Velocity                                   |                                       |              |  |    |
| EM2040C  |                                       |              |  |    |
| Gyro   |                                       |              |  |    |
| Pitch Roll Heave Sensor                          |                                       |              |  |    |
| Variable Node                                    |                                       |              |  |    |
|  |                                       |              |  |    |
| I G RX   |                                       |              |  |    |
| B Link   |                                       |              |  |    |
| 🔁 🏭 Auxiliary Systems                            |                                       |              |  |    |
| Time Sync     EM2040C Controller                 |                                       |              |  |    |
| D→ ASCII Logger                                  |                                       |              |  |    |
| Fixed Node                                       |                                       |              |  |    |
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| AmyGale_2019.db - Database Setup Program         |                       |          | States - |  |
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| Survey   | Node: RX              |          |          |  |
| Geodetic   |                       |          |          |  |
| 🖶 🚯 Datums                                       | Object location:      | Amy Gale |          |  |
|  | Node name:            | RX       |          |  |
| 🖻 🧟 Heights                                      | X (Stbd = Positive):: | 0.000 m  |          |  |
| Chart Datum / Vertical Datum                     | Y (Bow = Positive)::  | -0.045 m |          |  |
| Digital Terrain Model                            | Z (Up = Positive)::   | 0.006 m  |          |  |
| Projections                                      | A-prion SD:           | 0.010 m  |          |  |
| Universal Transverse Mercator (North Hemisphere) |                       |          |          |  |
| Local Construction Grid                          |                       |          |          |  |
|  |                       |          |          |  |
| Sound velocity Profile                           |                       |          |          |  |
| Amy Gale   |                       |          |          |  |
| System   |                       |          |          |  |
| AML SV probe                                     |                       |          |          |  |
| Sound Velocity                                   |                       |          |          |  |
|  |                       |          |          |  |
| Gyro   |                       |          |          |  |
| →  |                       |          |          |  |
| Position Navigation System                       |                       |          |          |  |
| G → Yariable Node                                |                       |          |          |  |
| Amy Gale MRU                                     |                       |          |          |  |
| E TX   |                       |          |          |  |
| Link   |                       |          |          |  |
| Auxiliary Systems                                |                       |          |          |  |
| - Ö Time Sync                                    |                       |          |          |  |
| Me ASCILLER                                      |                       |          |          |  |
| Fixed Node                                       |                       |          |          |  |
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| Survey   | Node: TX             |           |  | 10    |
| Geodetic   | Object le estient    | Anno Cala |  |       |
| 🖨 🐠 Datums                                       | Node name:           | Any date  |  |       |
|  | V (Cabul Desition)   | 0.040     |  |       |
| E 2 Heights                                      | X (Stou = Positive): | 0.004 m   |  |       |
| Mean Water Level Model                           | 7 (Up = Positive)::  | 0.004 m   |  |       |
| Digital Terrain Models                           | 2 (op = Positive)    | 0.000 m   |  |       |
| Projections                                      | A-phon 30.           | 0.010 111 |  |       |
| Universal Transverse Mercator (North Hemisphere) |                      |           |  |       |
| Local Construction Grid                          |                      |           |  |       |
| Sound Velocity Profile                           |                      |           |  |       |
| Diject   |                      |           |  |       |
| 🖶 🏧 Amy Gale                                     |                      |           |  |       |
| 📴 🏭 System                                       |                      |           |  |       |
| - AML SV probe                                   |                      |           |  |       |
| FM2040C  |                      |           |  |       |
| j gyro   |                      |           |  |       |
| L. Jar Gyro                                      |                      |           |  |       |
| Pitch Roll Heave Sensor                          |                      |           |  |       |
| Position Navigation System                       |                      |           |  |       |
| Amy Gale MRU                                     |                      |           |  |       |
|  |                      |           |  |       |
|  |                      |           |  |       |
| Link   |                      |           |  |       |
| E Auxiliary Systems                              |                      |           |  |       |
| EM2040C Controller                               |                      |           |  |       |
| □→ ASCII Logger                                  |                      |           |  |       |
| Fixed Node                                       |                      |           |  |       |
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| General  | System: Time Sync                    |   |   |
| 🛱 🐺 Geodetic                                     | Description:                         | Time Sync                                       |   |
| 🖨 🐨 Datums                                       | Type:                                | Time Synchronization System                     |   |
| Cr WGS84   | Driver                               | NMEA ZDA  |   |
| Heights     Chart Datum / Vertical Datum         | Executable and Cmdline:              | DrvPositionNMEA.exe                             |   |
| Mean Water Level Model                           | Port                                 | 3   |   |
| 🖉 Digital Terrain Models                         | Baud rate:                           | 9600  |   |
| Projections                                      | Data bits:                           | 8   |   |
| Universal Transverse Mercator (North Hemisphere) | Stop bits:                           | 1   |   |
| UTC to GPS Correction                            | Parity:                              | None  |   |
| Sound Velocity Profile                           | Byte frame length (time):            | 10 bits (1.042 ms)                              |   |
| 📴 🛃 Object                                       | Maximum data transfer rate:          | 960 bytes / second                              |   |
| Amy Gale   | Update rate:                         | 0.000 s   |   |
| System   | Latency:                             | 0.000 s   |   |
| Sound Velocity                                   | Acquired by:                         | [Directly into OINSy] (No additional time tags) |   |
|  | Observation time from:               | N/A   |   |
| j Ø Gyro   | Number of slots:                     | 0   |   |
| Pitch Roll Heave Sensor                          | Lire ODS DDS Adapter                 | 0= COM  |   |
| L. Position Navigation System                    | PPS time tag nulse matching          | Automatic Matching                              |   |
| Hariable Node                                    | Windows System Time Synchronization: | Synchronization is enabled                      |   |
|  | , ,                                  | 2   |   |
| © TX   |                                      |   |   |
| Link   |                                      |   |   |
| e- 🞆 Auxiliary Systems                           |                                      |   | 1 |
| O Time Sync                                      |                                      |   |   |
|  |                                      |   |   |
| - Fixed Node                                     |                                      |   |   |
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| AmyGale_2019.db - Database Setup Program         |                         |  |  |
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| Survey   | System: EM              | 2040C Controller                                       |  |
| e 🔏 Geodetic                                     | Description:            | EM2040C Controller                                     |  |
| WGS84  | Туре:                   | Miscellaneous System                                   |  |
| 🕀 🚁 Heights                                      | Driver:                 | Kongsberg EM2040 Compact (Single) Multibeam Controller |  |
| 🚽 🛱 Chart Datum / Vertical Datum                 | Executable and Cmdline: | DrvKongsbergEMCtrl.exe 2040C                           |  |
| Mean Water Level Model                           | Update rate:            | 0.000 s  |  |
|  | Latency:                | 0.000 s  |  |
| Universal Transverse Mercator (North Hemisphere) | Acquired by:            | [Directly into QINSy] (No additional time tags)        |  |
| Local Construction Grid                          | Observation time from:  | N/A  |  |
| OUTC to GPS Correction                           | Number of slots:        | 0  |  |
| 🗇 🚰 Object                                       |                         |  |  |
| 📄 🏧 Amy Gale                                     |                         |  |  |
| Building System                                  |                         |  |  |
| Sound Velocity                                   |                         |  |  |
|  |                         |  |  |
| ⊡ Ø Gyro   |                         |  |  |
| → Hitch Roll Heave Sensor                        |                         |  |  |
| Position Navigation System                       |                         |  |  |
| □ · · · · · Variable Node                        |                         |  |  |
| Amy Gale MKU                                     |                         |  |  |
|  |                         |  |  |
| Link   |                         |  |  |
| Auxiliary Systems                                |                         |  |  |
| Mile Sync  |                         |  |  |
| □ D→ ASCII Logger                                |                         |  |  |
| Ly Fixed Node                                    |                         |  |  |
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| E-III General                            | System: ASC             | II Logger                                       |  |  |
| 😑 🦝 Geodetic                             | Description:            | ASCII Logger                                    | -  |  |
| Datums                                   | Type:                   | Output System                                   |  |  |
| Heights                                  | Driver:                 | Generic ASCII Data Logger (Controller)          |  |  |
| Chart Datum / Vertical Datum             | Executable and Cmdline: | DrvGenericLogger.exe                            |  |  |
| - 💑 Mean Water Level Model               | Update rate:            | 1.000 s   |  |  |
| 👷 Digital Terrain Models                 | Latency:                | 0.000 s   |  |  |
| Projections                              | Data output setting:    | Enabled   |  |  |
| Local Construction Grid                  | Acquired by:            | [Directly into OINSy] (No additional time tags) |  |  |
|  | Observation time from:  | N/A   |  |  |
| Sound Velocity Profile                   | Number of slots:        | 0   |  |  |
| 🖨 🚼 Object                               |                         | ·····   |  |  |
| Amy Gale                                 |                         |   |  |  |
| AML SV probe                             |                         |   |  |  |
| Sound Velocity                           |                         |   |  |  |
|  |                         |   |  |  |
| i Gyro                                   |                         |   |  |  |
| Pitch Boll Heave Sensor                  |                         |   |  |  |
| Position Navigation System               |                         |   |  |  |
| - ↓ Variable Node                        |                         |   |  |  |
|  |                         |   |  |  |
| e TX                                     |                         |   |  |  |
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| Auxiliary Systems                        |                         |   |  |  |
| 👌 Time Sync                              |                         |   |  |  |
| EM2040C Controller                       |                         |   |  |  |
| ASCII Logger                             |                         |   |  |  |
| - t Fixed Node                           |                         |   |  |  |
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# **Appendix D – Configuration settings for QINSy EM controller**

| Status   | Active   |  | ton   |
|--|--|--|-------|
| Pinging  | 28848 @ 33.  | .60 Hz   | top   |
| Clock Status   | Ok   | Pu I   | nfo   |
| Errors   | All Ok   |  |       |
|  |  | Opt  | ions. |
| ettings  |  |  |       |
| Transmit Ang   | le (dea)   | 0.0  |       |
| Minimum De   | pth  | 1.00   |       |
| Maximum De   | pth  | 500.00   |       |
| Detector Mod   | le   | Normal   | -     |
| Slope Filter   |  | On   | -     |
| Areation Filte   | r,   | Off  | -     |
| interference F   | ilter  | Off  | -     |
| Range Gate Si  | ze   | Normal   | -     |
| Spike Filter St  | rength   | Medium   | -     |
| Phase Ramp   |  | Normal   | -     |
| Special Amp I  | Detect   | Off  | -     |
| Special TVG  |  | Off  | *     |
| Vormal Inci. 9   | Sector Angle   | 10   |       |
| Ping Mode  |  | 300 KHz  | -     |
| Pulse Type   |  | Auto   | -     |
| Fransmit Pow   | ver Level  | Maximum  | •     |
| M Enable   |  | FM Enabled   | -     |
| BD Scanning  | - Scan Step  | 0.0  |       |
| 3D Scanning  | Min Angle  | -5   |       |
| 3D Scanning  | - Max Angle  | 5  |       |
| Dual Swath M   | lode   | Off  | -     |
| Min. Swath D   | istance  | 0.0  |       |
| Yaw Stabilizat   | ion Mode   | Off  | -     |
| Yaw Manual A   | Angle  | 0.0  | _     |
| Heading Filte  | r  | Medium   | -     |
| Apply  | Settings 🔻   | Force 🔽 Log Events   |       |
| vents  |  |  |       |
| 11:02:11.135<br>11:02:11.135<br>11:02:11.405<br>11:05:39.685 | Connection t<br>Set Initial Set<br>Command Ac<br>New Sound V | o PU Established<br>ttings<br>ccepted<br>/elocity (1476.6 m/s) |       |

| Pu Ip Address  | Environment and a second s | Single Transducer  | 7    |
|--|--|--|------|
|  | 157.237.2  | 20.40  |      |
| Simulation Mode  | Off  |  | -    |
| External Triggering  | Off  |  | -    |
| Control Port   | 2000   |  |      |
| Enabled Output Ports   | Output P   | Port 1,2,3   | •    |
| Output Port 1 (Bathy)  | 2001   | 19100 54   |      |
| Output Port 2 (Bathy)  | 2002   |  |      |
| Output Port 3 (Sidescan)   | 2003   |  |      |
| ZDA/GGA Serial Port  | Port 1 (d  | efault)  | •    |
| Use GGA  | On   |  | *    |
| Baudrate ZDA/GGA   | 9600   |  | -    |
| Motion Serial Port   | Port 2 (d  | efault)  | +I ' |
| Program Options  |  |  |      |
| Start Pinging when OINSy Starts  |  | Pinging On Startup   |      |
|  |  | ringing on startap   |      |
| Synchronize Clock Interval(min.)   |  | 60   |      |
| Synchronize Clock Interval(min.)   |  | 60<br>From SoundVelocity   | C .  |
| Synchronize Clock Interval(min.)<br>Sound Velocity Mode<br>Sound Velocity Observation  |  | 60<br>From SoundVelocity<br>Sound Velocity   | c -  |
| Sound Velocity Mode<br>Sound Velocity Observation<br>Popup window when error occurs  |  | 60<br>From SoundVelocity<br>Sound Velocity<br>On   | C •  |
| Synchronize Clock Interval(min.)<br>Sound Velocity Mode<br>Sound Velocity Observation<br>Popup window when error occurs<br>Allow HD beamspacing with Water Colun   | nn Data  | 60<br>From SoundVelocity<br>Sound Velocity<br>On<br>Not Allowed  | C -  |
| Synchronize Clock Interval(min.)<br>Sound Velocity Mode<br>Sound Velocity Observation<br>Popup window when error occurs<br>Allow HD beamspacing with Water Colun   | nn Data  | 60<br>From SoundVelocity<br>Sound Velocity<br>On<br>Not Allowed  | C -  |
| Synchronize Clock Interval(min.)<br>Sound Velocity Mode<br>Sound Velocity Observation<br>Popup window when error occurs<br>Allow HD beamspacing with Water Colun<br>Installation Parameters<br>RX1 Gain Offet  | nn Data  | 60<br>From SoundVelocity<br>Sound Velocity<br>On<br>Not Allowed  | c -  |
| Synchronize Clock Interval(min.)<br>Sound Velocity Mode<br>Sound Velocity Observation<br>Popup window when error occurs<br>Allow HD beamspacing with Water Colun<br>Installation Parameters<br>RX1 Gain Offet<br>RX2 Gain Offet  | nn Data  | 60<br>From SoundVelocity<br>Sound Velocity<br>On<br>Not Allowed  | C -  |
| Synchronize Clock Interval(min.)<br>Sound Velocity Mode<br>Sound Velocity Observation<br>Popup window when error occurs<br>Allow HD beamspacing with Water Colun<br>Installation Parameters<br>RX1 Gain Offet<br>RX2 Gain Offet<br>Head1 Installation angles from  | nn Data<br>0<br>0<br>EM204   | 60<br>From SoundVelocity<br>Sound Velocity<br>On<br>Not Allowed  | C -  |
| Synchronize Clock Interval(min.)<br>Sound Velocity Mode<br>Sound Velocity Observation<br>Popup window when error occurs<br>Allow HD beamspacing with Water Colun<br>Installation Parameters<br>RX1 Gain Offet<br>RX2 Gain Offet<br>Head1 Installation angles from<br>Head2 Installation angles from  | nn Data<br>0<br>0<br>EM204<br>Not U  | 60<br>From SoundVelocity<br>Sound Velocity<br>On<br>Not Allowed  | C -  |
| Synchronize Clock Interval(min.)<br>Sound Velocity Mode<br>Sound Velocity Observation<br>Popup window when error occurs<br>Allow HD beamspacing with Water Colun<br>Installation Parameters<br>RX1 Gain Offet<br>RX2 Gain Offet<br>Head1 Installation angles from<br>Head2 Installation angles from<br>Velocity Sensor Number  | nn Data<br>0<br>0<br>EM204<br>Not U<br>Motio   | 60<br>From SoundVelocity<br>Sound Velocity<br>On<br>Not Allowed<br>40C<br>sed<br>n Sensor 1                    | C •  |
| Synchronize Clock Interval(min.)<br>Sound Velocity Mode<br>Sound Velocity Observation<br>Popup window when error occurs<br>Allow HD beamspacing with Water Colun<br>Installation Parameters<br>RX1 Gain Offet<br>RX2 Gain Offet<br>Head1 Installation angles from<br>Head2 Installation angles from<br>Velocity Sensor Number<br>Velocity Sensor UDP Port  | nn Data<br>0<br>0<br>EM204<br>Not U<br>Motio<br>3001   | 60<br>From SoundVelocity<br>Sound Velocity<br>On<br>Not Allowed<br>40C<br>sed<br>n Sensor 1                    | C •  |
| Synchronize Clock Interval(min.)<br>Sound Velocity Mode<br>Sound Velocity Observation<br>Popup window when error occurs<br>Allow HD beamspacing with Water Colur<br>Installation Parameters<br>RX1 Gain Offet<br>RX2 Gain Offet<br>Head1 Installation angles from<br>Head2 Installation angles from<br>Velocity Sensor Number<br>Velocity Sensor UDP Port<br>Velocity Sensor Ethernet Port                               | nn Data<br>0<br>0<br>EM204<br>Not U<br>Motio<br>3001<br>Etherr   | 60<br>From SoundVelocity<br>On<br>Not Allowed<br>0C<br>sed<br>n Sensor 1<br>et Port 2 (if available)           | C •  |
| Synchronize Clock Interval(min.)<br>Sound Velocity Mode<br>Sound Velocity Observation<br>Popup window when error occurs<br>Allow HD beamspacing with Water Colun<br>Installation Parameters<br>RX1 Gain Offet<br>RX2 Gain Offet<br>Head1 Installation angles from<br>Head2 Installation angles from<br>Velocity Sensor Number<br>Velocity Sensor UDP Port<br>Velocity Sensor Ethernet Port<br>Ethernet Port 2 IP Address | nn Data<br>0<br>0<br>EM204<br>Not U<br>Motio<br>3001<br>Etherr<br>192.16   | 60<br>From SoundVelocity<br>On<br>Not Allowed<br>40C<br>sed<br>n Sensor 1<br>et Port 2 (if available)<br>8.1.1 | C •  |