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Fleet DataLink Unit (FDLU)

FDLU is a multi participant DataLink for Situation Awareness and Command & Control (C2) data distribution. It interfaces with existing analog HF, VHF, UHF radios and INMARSAT for C2 data communication between fleet members and the shore. The FDLU is built for large number of participants using broadcasting and peer to peer communication techniques. Data rate is up to 14,400 KB/sec via normal radios and up to 625,000 bits per second via dedicated S-Band radios.

Shipboard Command and Control provides ship Commanders with Arena Situation Awareness, decision-making algorithms, access to external information, and data sharing with other ships in the arena and Command posts ashore.

A typical Command and Control is connected to the ship own radar, weapons, Navigation, EW etc' and to external sensors via ship digital DataLink system. The basic requirement of a DataLink is to automate message transfer between members and reduce to minimum, the Voice communication.

BES Systems FDLU, DataLink solution interfaces with the ship Command & Control computer. It is based on using existing standard shipboard voice marine radios (such as ICOM etc') for digital communication of messages in various open marine frequencies (HF, VHF, UHF, and SATCOM). The basic FDLU includes radio modems that convert Voice radios to Digital Radios however, it can be configured to use digital radios if available. The system uses single frequency Time Domain Multiple Access (TDMA) method.

Each radio can support up to 10-12 participants members of the Net.

The FDLU has three main advantages:

- It utilizes standard low cost voice marine radios.
- No license needed, as compared to other DataLinks such as Link 11 or Link 16.
- The FDLU is built as an Open System Architecture, it can be easily customized for special requirements.

BES offers two FDLU models.

- Fully Naval rugged system.
- 19" 4U Rack mounted unit.

Units are made from high reliability hardware and Pentium M CPUs.

Fully Naval rugged system

19" 4U Rack mounted unit

BES Systems has successfully integrated FDLUs on Shipboard Command & Control in various countries. Upon order, BES integrates the FDLU with the ship C2 system for maximum optimization.

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The FDLU control is done from the ship C2 . The C2 protocol must support configuration loading into the SDMU as well as 'On Line' changes. The data transmission rate depends on the frequency band. Typical baud rate depends on radios:

- HF radios - 2700 bits/sec,
- VHF, UHF radios - 9600 bits/sec.
- INMARSAT/SATCOM - 9600 bits/sec

The DataLink enables Net members to exchange data among themselves with optimal update rate . The data transmission rate is according to allocated radio. The system supports any combination of radios HF, VHF, UHF or INMARSAT/SATCOM.

Example

Let's assume HF radio for long range (over the horizon communication), 10 Net members, and 27 bytes to describe each target (using binary messages). A time slot of 6 second is allocated to each member of the Net. Each member transmits 2700bits/sec or 270 bytes per second or 10 targets per second. It means that each member can transmit up to 60 targets in one minute and the throughput of the HF Net is 600 targets per minute.

Environmental

Temperature range:

- Operating -10°C - 55°C;
- Non-operating: -20°C - 71°C;

Relative humidity: Up to 95% relative humidity, non-condensing, MIL-STD-810F

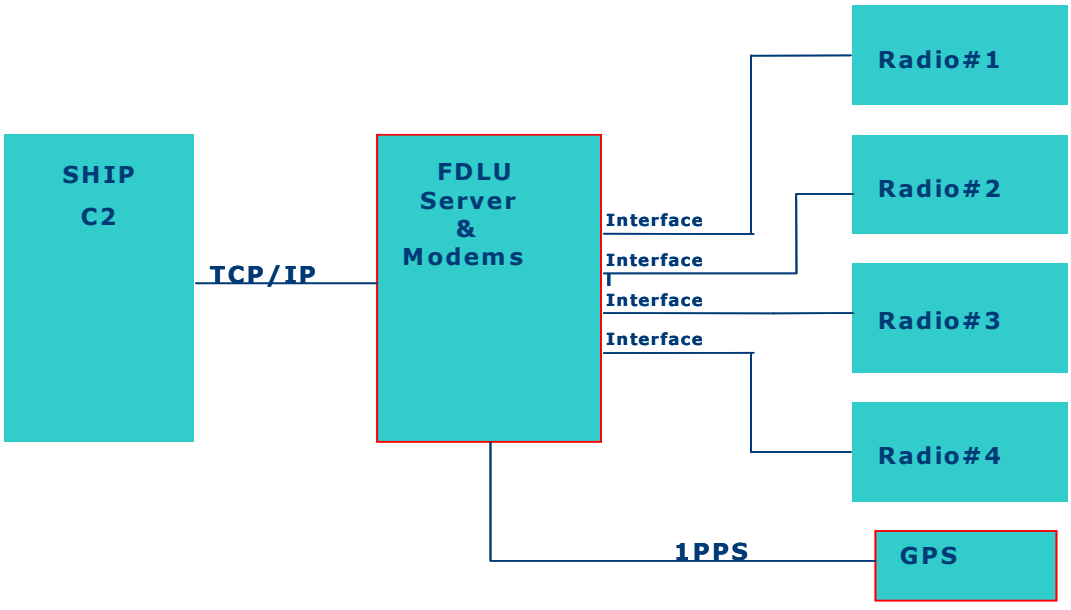
Salt Fog: 5% solution per MIL-STD-810F method 509.3

Rugged Version

Vibrations: Shipboard vibration spectra have a random component induced by the variability of cruising speeds, sea states, maneuvers, etc., and periodic components imposed by propeller shaft rotation and hull resonance. FDLU withstands levels found in MIL-STD-810F, Category 9 according to MIL-STD-167 for Type I (Environmental Vibration).

Shock: MIL-STD-810F, 30g for duration of 9msec.

Reliability: The FDLU has an MTBF of 10,000 hours at 25°C under shipboard conditions. ***Mean Time To Repair (MTTR):*** The MTTR will not exceed 30 minutes.



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