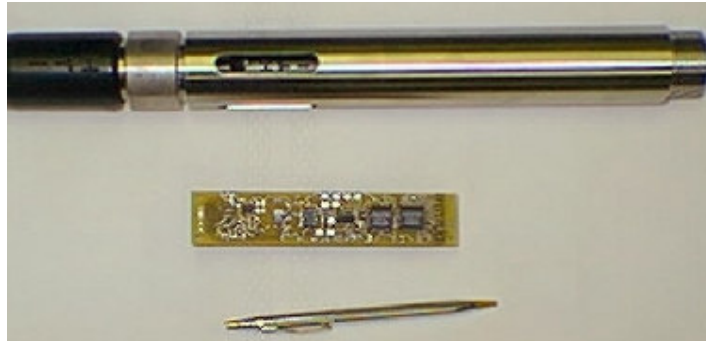


Scorpion Oceanics Limited

HYDROPHONES

HTI DIGITAL ARRAY SYSTEM



The HTI Digital Array System is designed for use in 3-D, 4-C, 4-D, and bottom cable surveys. The system operates in water depths up to 3000 m. The system can accommodate up to 64 channels at a sample rate of 2 msec. The total system consists of a vertical hydrophone cable anchored to the sea floor and connected by an S-tether to the autonomous recording buoy. The recording buoy communicates with the shipboard interface via radio telemetry.

Each of the nodes, or channels, in the digital vertical cable is made up of a hydrophone and a Delta-Sigma A/D converter electronics module. Nodes are interchangeable and designed to be easily replaced in the field.



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An acoustic positioning system is integrated into each node. The spacing between nodes and overall cable length is determined by the user. Power consumption by each node has been minimized to facilitate power transmission down the cable from the buoy battery pack.

The buoy system electronics supplies all the power for the system. The buoy system battery can power the system continuously for up to 72 hours. The buoy electronics receives and executes commands from the shipboard control system and transmits QC data and status information back to the ship. The buoy can either record continuously or accept time break from a shipboard navigation system and record shot records.

EMPHASIS ON:

- Systems approach
- Light weight mooring system
- 1 to 64 channels configurable, at a 2 msec sample interval
- 24-bit A/D converter at each hydrophone channel
- Identical node modules
- Operationally identical to existing analog HTI autonomous buoy systems
- Motion-insensitive (acceleration-canceling) hydrophones
- Downlink telemetry to nodes
- Integral acoustic positioning at each node
- Expandable to four sensors per station
- Optional GPS time synchronization



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Hydrophone

model HTI-98-PCA
sensitivity 20 V/bar (-194 dB re: 1V/uPa)
self-noise 0.07 uBar RMS
dynamic range 117 dB
frequency response 2 Hz to 3000 Hz
total harmonic distortion <-90 dB
directivity omni-directional (to 10 kHz in XY and XZ)
operating depth 10,000 feet
acceleration sensitivity <-50 dB re: 1 V/g

Cable Node

converter 24 bit Delta-Sigma
instantaneous dynamic range >118 dB
total dynamic range >132 dB
converter input level +/- 4.5 V
low cut filter (-3 dB) 4 Hz, -12 dB/octave
high cut filter (-3 dB) 205.9 Hz
preamplifier gain selectable via downlink: 0, 12, 24, or 48 dB
channel gain matching +/- 1%
sample interval 2 milliseconds
total harmonic distortion -90 dB at -3 dB input
number of data channels 1 to 64



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HYDROPHONES

Environmental

operating temperature 0 degrees C to 40 degrees C
storage temperature -40 degrees C to 85 degrees C
shock (operating) 3 g @ 5 milliseconds, 2 g @ 11 milliseconds, 1 g @ 20 milliseconds
shock (non-operating) 40 g @ 30 milliseconds
humidity 5% to 95%, non-condensing

Buoy Electronics

record length 1 to 15 seconds
data recorder Exabyte 8505
tape capacity 5 Gbytes
data recorder interface SCSI
power supply rechargeable lead-acid gel cell pack
battery capacity 3000 watt-hours
battery life 72 hours record, 15 day standby
communication link VHF FM, 1200 baud receive, 9600 baud xmit
radio power 4 watts



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