

The OceanWorks Subsea Distribution Node

The OceanWorks Subsea Distribution Node provides highly reliable subsea distribution for power and communications to instruments, either directly or through the Junction Box. The Node is typically powered from a shore station up to several hundred kilometers away but can also be powered from a locally moored buoy.

The electronics are housed in a recoverable 'pod' linked to the base via optical and electrical underwater matable connectors. The recoverable pod allows for easy servicing and upgrades of the Node electronics.

Applications

- Environmental/Scientific Cabled Observatories
- Oil Field Instrumentation
- Tsunami Warning
- Renewable Energy
- Ocean Bottom Seismic
- Port and Coastal Security



Features

The Node supports up to six instrument and SIIM ports. Up to four of these ports can be configured to provide both a high power 375 VDC interface (for junction boxes, extension cables and high power instruments) and a low power interface that can have a voltage software configured between 12V and 48VDC at up to 5Amps. The 375 VDC high power ports includes a smart breaker to allow a wide range of softstart configurations.

Line Isolation Monitors (LIM) are included on each low port and on the 375VDC bus. The LIM will detect if a fault to seawater occurs in a connected cable or instrument. If required, the LIM can be disconnected from the seawater reference via software.

To protect the Node against faults in equipment connected to Node ports, the Node continuously and autonomously monitors port voltage, current and LIM measurements. If a pre-determined value is exceeded, the port is automatically turned off and the outputs are galvanically isolated.

Reliability

- Redundant power, communications and control of all core systems.
- Class ISO0 clean room assembly of High Voltage components and pressure boundaries
- 62000 hours MTBF (MIL-HDBK-217) at 25°C

Input (from Shore Station or Buoy)

- SL21 Cable
- 400VDC to 2kVDC (depending on step out distance)
- Over-voltage protection to 3kVDC
- 1000 BaseEZX Gigabit Fiber (redundant links)

Networking (to other Nodes)

- Fiber Optic Repeater
- Two Direct Connections
- Two additional communications links for 'skip-a-node' functionality'

Features

- Recoverable electronic pod for easy service and upgrades
- Uninterruptible Power Supply (UPS) for core equipment

Telemetry

- TCP/IP Telnet command interface
- TCP/IP 10Hz Telemetry including port voltage current and line isolation

Standard Testing

- Pressure boundary hydro-static test
- 120 hour operational salt water immersion test

Environment

- 3000 msw operating depth
- 0 degree C to +50°C Transport; Optional -20°C to +5- °C Transport
- -3° C to +20° C Operational

Options

- Trawl resistant frames
- Hybrid ROV underwater matable interfaces, custom interfaces, port voltages, communication protocols and connectors can all be incorporated into a Node design if required.
- The UPS can be extended to critical instruments
- Dry mate instrument interfaces can be added to the Node pod
- Extended burn-in testing
- SIIS and ISO 13628-6 Standard

Output (to Junction Box & Instruments)

- 2kW total instrument power
- Six Ports
 - 12-Pin ROV underwater matable connector per port
 - Dual 100 BaseT Ethernet
 - Smart 375VDC breaker at 1kW with soft start (software configurable)
 - Smart Variable Voltage Power Supply from 12 to 48VDC at 5A (software configurable)

Mechanical

- 2m wide, 4.5m long (excluding SL21 tails); 1.2m high
- Fits inside a standard ISO shipping container
- 1200 kg Recoverable Pod (in air)
- In-water weight can be reduced with buoyancy
- 2000 kg Node Base (in air)
- 100% Titanium pressure vessels with dual O-ring seals
- Electronics qualified to IEC60068 (Part 2 Section 64, Table A.1 & A.2 Category 2)

OceanWorks International is a subsea solutions engineering company, providing almost 30 years of service to the Military, Scientific & Environmental, and Oil & Gas markets.