

JUNCTION BOX - Mark3

Scientific & Environmental

The OceanWorks Junction Box Mark3 provides a software configurable power and communications interface between a wide range of instruments and a subsea node or shore station. The Junction Box Mark3 is the latest iteration of a proven design, successfully deployed and operational for more than a decade on several cabled observatories around the world. In this latest version, a key development is the ability to reconfigure both the voltage and communication interface of each instrument port in software without having to open the pressure vessel. Software configuration of instrument ports enables a single design to be used across an observatory providing easy sparring and on deck reconfiguration for new instruments.

Applications

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



Features

The standard Junction Box Mark3 provides a total of 10 instrument interface ports, with an option to increase to 16 ports. The standard version of the Junction Box Mark3 comes with two different types of ports: variable voltage and power (12 to 48VDC, at 5A) and high power ports (375VDC at 1875W). The ten ports can be configured to any customer defined number of each of these standard ports. Each of those ports are powered from an isolated DCDC converter with a linear regulated output. This provides an efficient, variable supply with a very low noise output ensuring optimal performance of sensitive instruments. Additional noise reducing circuitry can be provided for ultra sensitive instrumentation, such as seismometers. When a port is off, all of the power and communications signals are galvanically isolated from the connected instrument. This feature protects the Junction Box from a short to seawater in case of a failure in the instrument or the interconnecting cable between the instrument and the Junction Box.

Each variable voltage port also supports either 100BaseT Ethernet, or EIA232, 485 and 422 serial communications protocols. OceanWorks intuitive control software allows the user to simply change the protocol when connecting an instrument that requires a different protocol or power input.

Line Insulation Monitors (LIM) are included on each variable voltage port. The LIM will detect if a fault to seawater occurs on connected cables or instruments. If required, the LIM can be taken out of circuit via a software command.

The standard Junction Box Mark3 houses its electronics inside a titanium pressure housing. Titanium has proven to be the most effective way to achieve long term deployment requirements with the lowest total cost of ownership. For short term deployment or shallower deployment depth alternative pressure vessel materials can be provided. The Junction Box Mark3 is equipped with titanium Seacon mini-con dry-mate connectors for the instrument interface. These connectors have a 10+ year proven track record on OceanWorks Junction Boxes. These connectors do not have delamination issues like rubber molded connectors do. The connection to the subsea node is a Teledyne ODI wet mateable connector, this interface can be provided in a copper or hybrid configuration depending on the bandwidth requirements.

The Junction Box Mark 3 can be connected to another Junction Box via the fixed voltage and power port to increase the number of instrument ports.

Specifications

JUNCTION BOX Mark3

Input (from Observatory Node to Junction Box)

- Input range 300VDC to 400VDC, nominal 375VDC
- Over voltage transient protected
- Communications options
 - 1000BaseLX SM fiber optic Gigabit Ethernet
 - 100BaseT Copper Ethernet
- Wet-mate connector standard or Dry-mate connector systems available

Communications & Telemetry

- Telnet command interface
- UDP broadcast at rates up to 10Hz with SNTP timestamp
- Per port, voltage, current and LIM telemetry (no LIM on high power ports)

Mechanical - Standard ten port Junction Box

- Junction Box length (without connectors): 50 Inch (1270mm)
- Junction Box Outer Diameter: 14 Inch (356mm)
- 100% titanium pressure vessel with dual o-ring seals
- Vibration designed to IEC60068 (Part 2, Section 64, Table A.1 & A.2 Category 2)

Environment

- 3000msw operating depth
- -20°C to +50°C Transport
- -2°C to +30°C Operational

Standard Testing

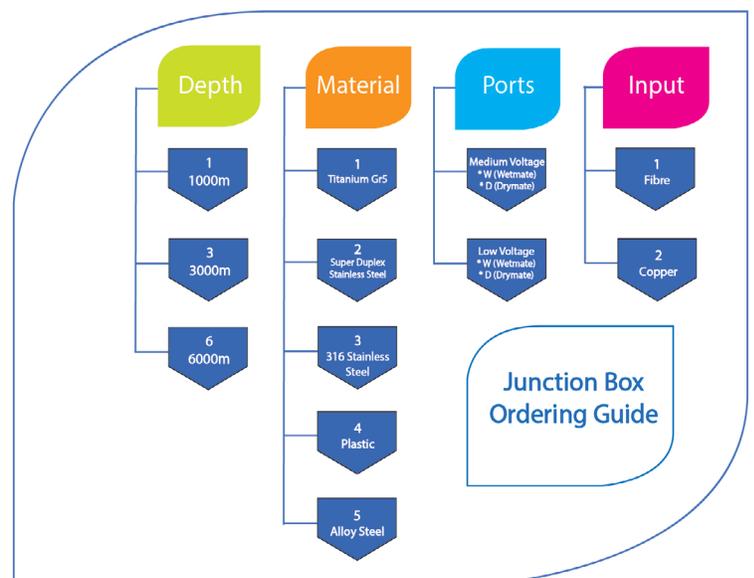
- Pressure boundary hydrostatic test
- 96 hr function test in seawater simulation tank

Options

- Custom interfaces, port voltages, communications protocol, cables and connectors can be all be incorporated into a Junction Box design
- Wet mate instrument ports can be fitted allowing a new instrument to be added to a junction box without the need to recover the Junction Box platform. Software controls provide the flexibility to change the power supply voltage and communications protocols from Ethernet to Serial
- Gigabit 1000BaseLX fiber optics communications can be provided as a dedicated option to specific ports
- Extended burn-in testing
- Design to customer specific standards such as ISO 13628-6 or API 17F standards
- Additional noise filters for variable voltage ports for ultra sensitive instruments such as seismometers
- Increased number of ports from ten (10) to 16
- Design to 4000msw depth
- Deployment and sensor mounting structure

Output (to instruments) - standard ten (10) in customer define mix. Optional up to 16 ports

- High power ports with the following features;
 - Dry-mate connectors standard (hybrid and wet-mate connectors optional)
 - 375VDC at 5A maximum current
 - Soft start
 - Software selectable current and voltage trips
 - Short circuit tolerant
 - Under voltage and over voltage protection (isolated)
- Variable voltage ports with the following features;
 - Dry-mate connectors standard (wet-mate connectors optional)
 - Each port features software configured 12 to 48VDC at 5A maximum current
 - Line Insulation Monitoring (LIM)
 - Isolated DCDC converter per port
 - Linear regulated, very low noise output
 - Software selectable current, voltage and LIM trips
 - Output short circuit tolerant
 - Communications options (software selectable):
 - 100BaseT Copper Ethernet, or Isolated serial (EIA232, 422 or 485)
 - Low Noise
- Supports TTL PPS and NEMA 0183 time code



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