Terabot®-S Manipulator

Oceaneering’s Terabot® family of manipulators consists of a range of multi-degree-of-freedom (DOF) all-electric manipulators capable of a wide variety of tasks. The Terabot®-S is the latest in the series and features an optional Spatially Correspondent (SC) master user interface for highly intuitive control, allowing the operator to focus on the task, not the robot. The manipulator joints have integrated clutches for constant protection against overloads and are fully sealed, making them water and dust tight. The manipulator uses a quick-release manual tool interface and a variety of options, including a 2 jaw gripper. A variety of custom tooling can be supplied, or the user can choose to integrate their own tooling on a quick-release interface plate.

Features

- 5-DOF + gripper, articulated robotic arm, & high efficiency digital controller
- Integrated joint overload clutches
- Absolute joint encoding, clutch independent
- Mobility platform independent
- High payload-to-weight ratio
- Manual quick-release tool changeout
- Open serial interface protocol
- Compact, low profile stowage
- Joint space control
- Optional SC master controller
- Optional 2 jaw gripper with replaceable / customizable fingers
- Optional scalable link sizes for custom configurations

Benefits

- Flexible system performs complex tasks
- Intuitive control greatly minimizes training; makes the robot work for the operator, instead of the operator working for the robot
- Quick-release interface allows easy installation of user tools / sensors
- Joint clutches provide constant protection against overloads
- Operation in harsh environmental conditions (IP65)
- System may be washed / decontaminated
- User I/O pass thru minimizes external cables
- Lightweight system can be used on virtually any vehicle as OEM or retrofit
- Open command/data interface allows connection to any user system
- Low power consumption extends vehicle battery life

Applications

- Military Operations / EOD
- First Responders / Tactical Law Enforcement
- Biotech / Biochem Response & Cleanup
- Mining
- Education / Research
Terabot®-S Manipulator Specifications

**Base System**

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<tr>
<th><strong>Manipulator</strong></th>
<th><strong>Current Accessories</strong></th>
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<tr>
<td>Configuration</td>
<td><strong>SC Master Controller</strong></td>
</tr>
<tr>
<td>5 DOF + Gripper</td>
<td>Configuration: 5 DOF + Gripper Control</td>
</tr>
<tr>
<td>Housing Material</td>
<td>Length: ~12 in, Fully Extended</td>
</tr>
<tr>
<td>Aluminum</td>
<td>Power Source: 9-18 VDC, 0.5A max</td>
</tr>
<tr>
<td>Environmental Protection</td>
<td>Data Interface: RS232, 19.2k Baud</td>
</tr>
<tr>
<td>Static &amp; Dynamic Seals</td>
<td>User Interface: 4x40 LCD, Switches</td>
</tr>
<tr>
<td>Joint Encoding</td>
<td><strong>Gripper (with replaceable fingers)</strong></td>
</tr>
<tr>
<td>Absolute</td>
<td>Housing: Aluminum, Sealed</td>
</tr>
<tr>
<td>Joint Backlash</td>
<td>Grip Force: 20 lb at Center of Grip</td>
</tr>
<tr>
<td>&lt; ±.05°</td>
<td>Opening: 4 in, Bypass Fingers</td>
</tr>
<tr>
<td>Tool Interface</td>
<td>Interface: Quick Release</td>
</tr>
<tr>
<td>Quick Release, Manual</td>
<td><strong>Lift Cylinder Kit (Increases Lift Capacity)</strong></td>
</tr>
<tr>
<td><strong>User I/O</strong></td>
<td>Quick Release Interface (for User Supplied Tools)</td>
</tr>
<tr>
<td>Internal Pass Thru</td>
<td><strong>Gripper Plier/Cutter Adapters (for COTS Pliers)</strong></td>
</tr>
<tr>
<td><strong>Camera</strong></td>
<td></td>
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<td>Color, Bullet Style</td>
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**Manipulator System Controller**

| Housing              | Aluminum, Sealed                                               |
| Power Source         | 24-30VDC, 10A max                                              |
| Data Interface       | RS232, 19.2k Baud                                              |
| Command / Query      | Joint Space, Status                                            |

**Terabot®-S Options**

- Custom powered or unpowered tools (sensors, grippers, cutter, digging, probing, scraping implements, etc.)
- Custom quick release interface adapters
- Quick release manipulator mount
- Alternate camera, additional lighting
- Longer segment lengths (reach) for custom applications
- Alternate communications using RS 422/485 or Ethernet
- Manipulator may be sealed to IP67

**Dimensions:**

- **Base System:**
  - 8.33” (212)
  - 9.02” (229)
  - 16.50” (419)
  - 14.35” (364)
  - 10.38” (267)
  - 3.48” (88)
  - ±170°<sup>°</sup>*

- **Current Accessories:**
  - 9.02” (229)
  - 16.50” (419)
  - 14.35” (364)
  - 10.38” (267)
  - 3.48” (88)
  - ±170°<sup>°</sup>*

**Payload (Full extension / 12 in reach):** 20 / 50 lb with Lift Kit (10 / 25 lb nom.)

**Reach:** 40 in

**Weight:** 22 lb

**Tooling / Gripper:** Manual Quick Release

**Power (Standby / Max):** < 5W / 280W

**Joint Resolution:** ~0.1°

**Joint Rate (Max):** 35°/s

**Joint Type:** Low Backlash, Clutch Protected