Terabot® Manipulators

The Oceaneering Terabot® manipulator catalog consists of a range of multi degree-of-freedom (DOF), all-electric manipulators capable of completing a wide variety of tasks with various payload capabilities. The Terabot®-S is the latest in the manipulator series and features an optional spatially correspondent (SC) master user interface for highly intuitive control.

The Terabot®-S joints have integrated load-limiting clutches that protect the manipulator and its surroundings from damage and enable the arm to be operated safely around humans. The joints are fully sealed, making them water and dust tight. The quick-release manual-tool interface accommodates end effectors to suit project needs. The user can also integrate their own tooling on a quick-release interface plate that provides power and data connections. Cartesian control options are available to provide true end-point control and automated routines for repetitive tasks.
**Applications**
- Military operations / Explosive Ordnance Disposal (EOD)
- First responders and tactical law enforcement
- Biotech / Biochem response and cleanup
- Mining
- Education and Research

**Benefits**
- Flexible system performs complex tasks
- Intuitive control greatly minimizes time dedicated to training
- Quick-release interface allows easy installation of user’s tools and sensors
- Joint clutches provide constant protection against overloads
- Suitable for operation in harsh environmental conditions
- System may be washed / decontaminated
- User I/O pass thru minimizes external cables
- Lightweight system can be fitted to many vehicles as OEM or retrofit
- Open command/data interface allows connection to any user system
- Low power consumption extends vehicle battery life
- High payload-to-weight ratio
- Integrated joint overload clutches and absolute joint encoding
- High-efficiency digital controller

**Manipulator**

**Configuration**
- 5 DOF with gripper

**Housing material**
- Aluminum

**Environmental protection**
- Static and dynamic seals

**Joint encoding**
- Absolute

**Tool interface**
- Quick-release or manual

**User I/O**
- Internal pass thru

**Camera**
- Color with auto IR lighting

**Manipulator System Controller**

**Housing**
- Aluminum, sealed

**Power source**
- 28 VDC Nominal, 24-30 VDC operating range, 15A max

**Data interface**
- RS-232, 19.2 kbaud

**Command / query**
- Joint space, status

**Gripper**

**Housing**
- Aluminum, sealed

**Grip force**
- 15 lb / 7 kg at center of grip (with 3 sec closing rate)

**Fingers**
- Replaceable

**Opening**
- 100 mm (maximum)

**Interface**
- Quick-release

**Spatially Correspondent (SC) Master Controller**

**Configuration**
- 5 DOF and gripper control

**Length**
- ~11.8 in / ~300 mm, fully extended

**Power source**
- 9-18 VDC, 0.5A max

**Data interface**
- RS-232, 19.2 kbaud

**User interface**
- 4 x 60 LCD screens, switches

**Payload (full extension)**
- TERABOT®-S: 9.9 lb, 19.8 lb option**
- TERABOT*: 22.3 lb / 11 kg
- TERABOT® XL: 11 lb / 5 kg

**Reach**
- TERABOT®-S: 41.3 in / 105 cm
- TERABOT*: 42.1 in / 107 cm
- TERABOT® XL: 72 in / 183 cm

**Weight**
- TERABOT®-S: 22 lb / 10 kg
- TERABOT*: 41.9 lb / 19 kg
- TERABOT® XL: 110 lb / 50 kg

**Tooling / Gripper**
- Manual quick release
- 2 finger
- Auto tool changer

**Power (standby / maximum)**
- <5w / 280w
- <6w / 225w
- <6w / 800w

**Joint resolution**
- ~0.1°
- ~0.05°
- ~0.01°

**Joint rate (maximum)**
- 35°/sec
- 40°/sec

**Joint type**
- Low backlash, clutch protected
- Zero backlash, clutch protected

**with lift assist cylinder**

**Tool interface plane**
- 14.35°
- 170°
- 163°
- 14.3°
- 170°
- 10.3°
- 8.32°
- 9.02°

**Fingers**
- Replaceable

**Opening**
- 100 mm (maximum)

**User interface**
- 4 x 60 LCD screens, switches

**Power (standby / maximum)**
- <5w / 280w
- <6w / 225w
- <6w / 800w

**Joint resolution**
- ~0.1°
- ~0.05°
- ~0.01°

**Joint rate (maximum)**
- 35°/sec
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**Spatially Correspondent (SC) Master Controller**

**Configuration**
- 5 DOF and gripper control

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- ~11.8 in / ~300 mm, fully extended

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- 9-18 VDC, 0.5A max

**Data interface**
- RS-232, 19.2 kbaud

**User interface**
- 4 x 60 LCD screens, switches

*** Stop position adjustable**
Additional Options

» 2-jaw gripper with interchangeable fingers
» Cartesian space control with onboard kinematics
» Alternate link lengths for custom configurations
» Custom tooling including grippers, cutters, digging implements, and sensors
» Quick release interface adapters to attach user-supplied tooling and sensors
» Automated tool changeout and quick-release manipulator mount

» Color zoom camera with remote zoom, focus, and iris
» Lift assist cylinder kit: increases payload to 19.8 lb / 9 kg
» Graphical user interface software for control from a notebook PC with scripting, Cartesian control and display, and integrated video
» Alternate communications using RS 422/485 or Ethernet, WiFi

For more information visit oceaneering.com/space-systems