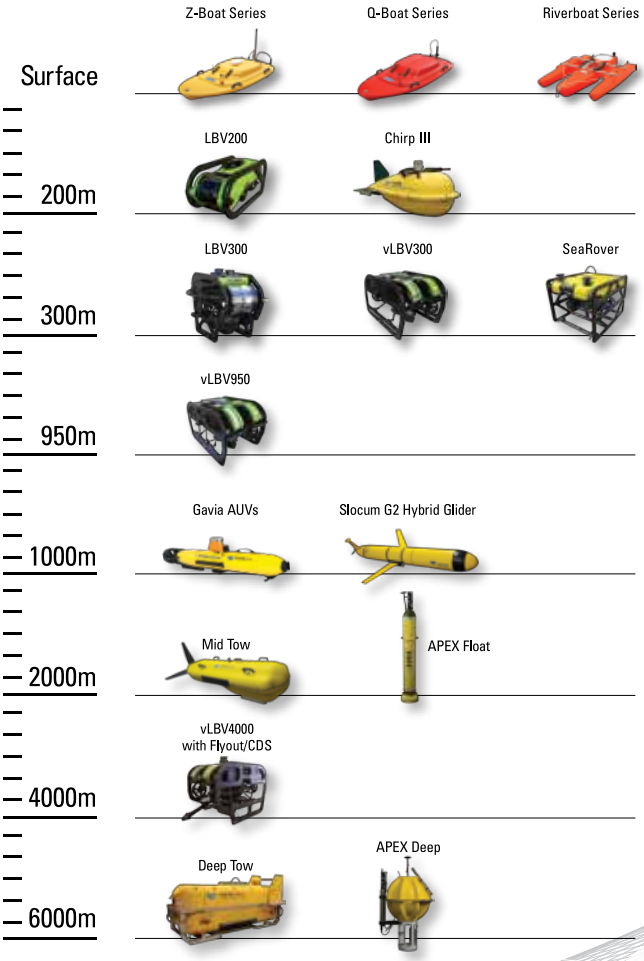
Teledyne Marine Vehicles

Surface to Seafloor...One Supplier



TELEDYNE MARINE
Everywhereyoulook™

Teledyne Marine manufactures a wide selection of unmanned underwater vehicles operating throughout the water column from the surface to the seafloor. The Teledyne Marine Vehicles group is comprised of Benthos, Gavia, Oceanscience, SeaBotix, and Webb Research, all of whom are industry and technology leaders.The Teledyne Webb Research Slocum glider has earned its reputation at sea and continues to be the most reliable and versatile underwater glider with over 600 units delivered since 2002. The Gavia Offshore Surveyor AUV has become the low logistics vehicle of choice for the offshore survey market. Gavia's modular design and small footprint make it easily deployable from a vessel of opportunity and quickly reconfigurable to meet changing mission requirements. The Oceanscience Remotely Operated Surface Vehicles are the industry's most popular vehicle for safe remote survey and ADCP deployment on rivers and other inland waterways. Teledyne SeaBotix ROVs are well known for their reliable operation and small footprint. SeaBotix ROVs are widely used by the EOD for a number of tasks that help keep military personnel out of harm's way. These and other Teledyne brands continue to develop and manufacture highly engineered, proven solutions for harsh environments across a broad range of markets and applications.

Autonomous

Teledyne Marine manufactures a wide range of autonomous vehicles for the research, defense, and oil and gas markets. Teledyne Marine autonomous vehicles are all proven, reliable platforms with years of operational history. Each vehicle is designed to carry a wide range of sensors in the most cost effective manner possible. Whether you're starting a new program or expanding an existing fleet, Teledyne Marine autonomous vehicles are the vehicles of choice..

Autonomous Underwater Vehicles

Teledyne Gavia's AUVs are self-contained, low logistics, modular survey platforms capable of delivering high quality data while operating from vessels of opportunity or from the shore. The Gavia AUVs can be a productive asset to any commercial, defense, or scientific operation and have been proven in real world environments, providing cost effective data when compared to traditional means using surface vessels and ROVs.

As standard, the Gavia is equipped with obstacle avoidance sonar, GPS, Iridium Satellite communication, and a wireless LAN connection for data transfer. Gavia vehicles have the option of using an acoustic modem for communication which provides status updates while the vehicle is submerged. An array of additional sensors and options are available including side scan sonar, sub-bottom profiler, camera, swath bathymetry, ADCP / DVL, high-grade inertial navigation, and obstacle avoidance. Optional environmental sensors such as oil-in-water detection, CTD, sound velocity, O2, and optical backscatter sensors can also be added to the Gavia.

Autonomous Underwater Gliders

Slocum G2 gliders, from Teledyne Webb Research, offer flexibility, efficiency and the ability to succeed in a harsh ocean environment. Buoyancy driven, the long range and duration of Slocum gliders makes them ideally suited for persistent remote water column observation in the research, defense, and oil and gas markets.

No matter the sea state, gliders are capable of continuous sampling without risking personnel or costly assets. Over 40 sensors and other options are available for a wide variety of ocean conditions and sampling requirements. Slocum gliders can run pre-programmed routes, surfacing to transmit real time data to shore while downloading new instructions at regular intervals at a substantial cost savings compared to traditional surface ships. Additionally, fleets of gliders can be operated with minimal personnel and infrastructure. The robust Slocum glider provides the data you need, at an affordable cost, with the flexibility required for changing mission requirements.

Autonomous Profiling Floats

APEX Autonomous Profiling Floats, designed and manufactured by Teledyne Webb Research, are the most trusted name in profiling floats and have a history of performance and reliability. Their long life, reliable performance, and data quality have earned them the premier spot in the Argo program and many other persistent monitoring programs and they remain the most cost effective profiling drifters available. Our standard range of APEX floats are available with a variety of sensors and operate at depths up to 2000m. The APEX Deep utilizes a patented design that allows it to profile to 6000m. Take your research to the next level with one of our available configurations or let us help you design a customized system that will satisfy your specific requirements.

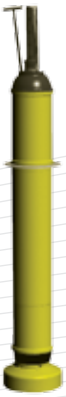
Autonomous

Underwater Vehicles (AUVs & Gliders)

AUV Specifications	Offshore Surveyor	Defense
HULL		
Length	2.7m (typical, depends on configuration)	From 1.8m for base vehicle (Typical MCM 2.6m)
Weight in Air	70 - 80kg (typical, depends on configuration)	From 49kg for base vehicle (Typical MCM 62kg)
Diameter	200mm	200mm
Depth Rating	500m or 1000m	500m or 1000m
Battery Module	1.2kWh lithium ion rechargeable cells per module	1.2kWh lithium ion rechargeable cells per module
Max Speed	> 5.5 knots	> 5.5 knots
Endurance	Dependent on speed and exact configuration. Typically 4-7 hours per rechargeable battery module. Vehicle can be operated with two batteries for increased endurance (roughly doubled) or batteries can be field swapped for continuous operations.	Dependent on speed and exact configuration. Typically 4-7 hours per rechargeable battery module. Vehicle can be operated with two batteries for increased endurance (roughly doubled) or batteries can be field swapped for continuous operations.
COMMUNICATION		
Wireless LAN	IEEE 802.11g compliant	IEEE 802.11g compliant
Satellite Communications	Full global coverage via Iridium link	Full global coverage via Iridium link
Acoustic Modem	For tracking and status updates	For tracking and status updates
NAVIGATION		
	High accuracy DGPS ready receiver	As standard GPS and Fluxgate Compass
	Optional DVL aided Inertial Navigation System (INS) - Non ITAR options available Optional DVL aided Long Baseline (LBL) Optional Ultra Short Baseline (USBL)	Optional DVL aided Inertial Navigation System (INS) - Non ITAR options available Optional DVL aided Long Baseline (LBL) Optional Ultra Short Baseline (USBL)
TYPICAL SENSOR OPTIONS		
	Swath bathymetry module	Swath bathymetry module
	Teledyne Blueview Microbathymetry and Gapfill	Teledyne Blueview Microbathymetry and Gapfill
	Side scan sonar	Side scan sonar
	Camera	Camera
	Sub-bottom profiler	Sub-bottom profiler
	Various environmental sensors including CTD, SV, Eco Pucks, and oil in water	Various environmental sensors including CTD, SV, Eco Pucks, and oil in water

Scientific	Glider Specifications	Slocum G2 Glider
	GENERAL	
From 1.8m for base vehicle	**Deployment**	Versatile, deployment with 1-2 people. LARS options available.
From 49kg for base vehicle	**Power**	Alkaline (A) or Lithium (L) batteries
200mm	**Range**	600 - 1500 km (A) / 4000 - 8000 km (L)
500m or 1000m	**Deployment Length**	15-50 days (A) / 4 - 12 months (L)
1.2 kW lithium ion rechargeable cells per module	**Depth Options**	(4 to 200m) or (40 to 1000m) operating depth range*
> 5.5 knots	**Navigation**	GPS, Pressure Sensor, Altimeter, Dead Reckoning
Dependent on speed and exact configuration. Typically 4-7 hours per rechargeable battery module. Vehicle can be operated with two batteries for increased endurance (roughly doubled) or batteries can be field swapped for continuous operations.	**Communication**	RF Modem, Iridium (RUDICS), ARGOS, Acoustic Modem
	Speed	.35 m/s (0.68 knot) Average Horizontal (buoyancy engine), up to 1m/s (2 knots) with thruster
IEEE 802.11g compliant	**Mass**	54 kgs (dependent upon configuration)
Full global coverage via Iridium link	**Dimensions**	Vehicle Length: 1.5 meters; Hull Diameter 22 cm
For tracking and status updates	* Modular buoyancy engine dependent **Note**: Endurance and range dependent on sensors and sampling frequency, energy source and communications.	
As standard GPS and Fluxgate Compass	**TYPICAL SENSOR OPTIONS**	**TYPICAL SENSOR OPTIONS**
Optional DVL aided Inertial Navigation System (INS) - Non ITAR options available Optional DVL aided Long Baseline (LBL) Optional Ultra Short Baseline (USBL)	Acoustic Doppler Current Profiler (ADCP)	Optical Backscatter Options
	Acoustic Modem	Optical Attenuation Options
Swath bathymetry module	Acoustic Mammal Detection	Optical Fluorometry Options
Teledyne Blueview Microbathymetry and Gapfill	Beam Attenuation Meter	Oxygen Options
Side scan sonar	CTD Pumped	PAR
Camera	Echosounder	Radiometer
Sub-bottom profiler	Fish Tag Detection	Turbulence
Various environmental sensors including CTD, SV, Eco Pucks, and oil in water	Hydrophones	Nitrate
	Custom Solutions Available	Spectrophotometer for Harmful Algal Blooms (e.g., Red Tide)

Autonomous
Profiling Floats



The Argo standard profiling float. 50% of all Argo floats are APEX. Choose Argos or Iridium with GPS.

Core Argo, WBC

Our most frequently requested sensor configuration in one package.

Bio-Argo, Polar, WBC

Specifications	Argo	BioGeochem (BGC)
HULL		
Aluminum (maximum depth: 2000m)	Standard	Standard
Carbon Fiber (maximum depth: 2000m)	Optional	Optional
Glass Sphere (maximum depth: 6000m)	N/A	N/A
COMMUNICATIONS/TELEMETRY		
Argos	Standard	N/A
Iridium Circuit Switch/RUDICS	Optional	Standard
Iridium Short Burst Data (SBD)	Recommended Option	Optional
ENERGY		
Alkaline Batteries	Standard	N/A
Lithium Primary (Non-Rechargeable)	Optional	Standard
FEATURES (CONFIGURATION DEPENDENT)		
Air Deployable	Optional	Optional
Volunteer Observing Ship (VOS) Package	Optional	Optional
Ice Avoidance	Optional	Optional
Surface Temperature	N/A	Optional
Compensator - Recommended Near Equator	Optional	Optional
External Ballast	Optional	Optional
Handles	Optional	Optional
Wood Shipping Crates (International)	Standard	Optional
Molded Shipping Crates	Optional	Optional
SENSORS		
Conductivity - Temperature - Depth (CTD)	Sea-Bird SBE-41, RBR argo	Sea-Bird SBE-41CP
Temperature - Depth (TD)	N/A	N/A
Dissolved Oxygen	N/A	Aanderaa 4330
Fluorometers	N/A	WET Labs FLbb
Radiometers	N/A	N/A
Transmissometer	N/A	N/A
pH	N/A	N/A
Carbon Dioxide	N/A	N/A
Nutrients	N/A	N/A
Acoustics	N/A	N/A
Custom sensor integration	N/A	N/A

For researchers who want more. APEX AMS offers unique integration rings top/bottom for maximum flexibility.

Bio-Argo, Coastal, Polar, WBC

Advanced Multi-Sensor

The APEX Electro-Magnetic (EM) helps researchers gather greater details on motion within the water column.

Coastal, Polar, WBC

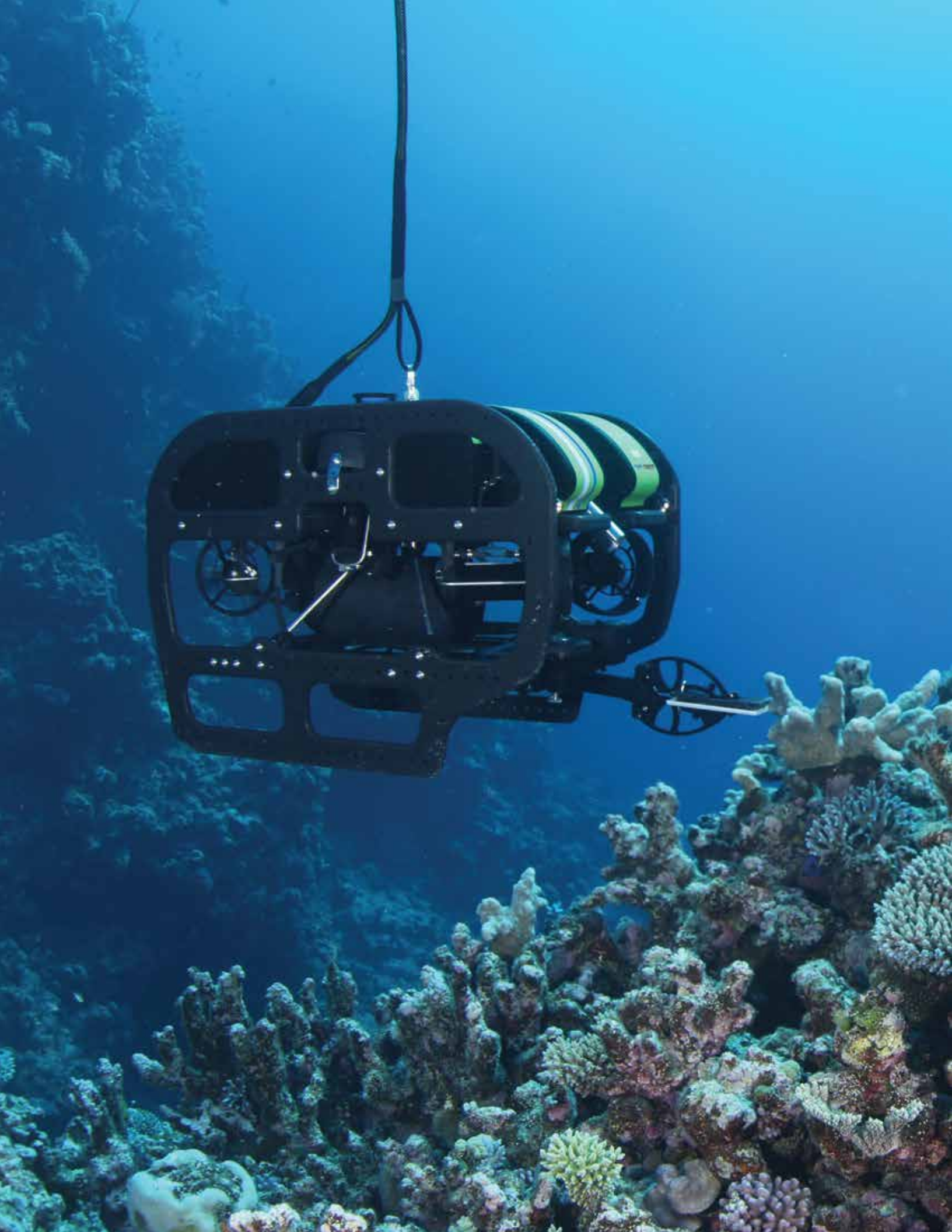
Current Profiling

Take ocean measurements to new depths. Rated to 6,000 meters, APEX Deep is your cost effective deep ocean profiler.

Deep Argo

Deep

Advanced Multi-Sensor	Current Profiling	Deep
N/A	N/A	N/A
Standard	Standard	N/A
N/A	N/A	Standard
N/A	N/A	N/A
Standard	Standard	Standard
Optional	Optional	Optional
N/A	N/A	N/A
Standard	Standard	Standard
Optional	Optional	N/A
Optional	Optional	N/A
Optional	Optional	Optional
Optional	Optional	N/A
Optional	N/A	N/A
Optional	Optional	N/A
Optional	Optional	Standard
Optional	Optional	Standard
Optional	Optional	Optional
Sea-Bird SBE-41CP, RBR argo	Sea-Bird SBE-41CP	Sea-Bird SBE-61
RBR, SeaScan	N/A	N/A
Aanderaa 4330, Sea-Bird SBE-43	Aanderaa 4330	Aanderaa 9831
WET Labs FLbb (CD)	WET Labs FLbb (CD)	Wet Labs ECO
Satlantic 504, PAR	N/A	Future Capability
WET Labs C-Rover	N/A	N/A
When Available	N/A	When Available
When Available	N/A	When Available
Satlantic SUNA	N/A	N/A
RAFOS	N/A	N/A
Optional	Optional	Optional



Remotely Operated

Teledyne Marine's remotely operated vehicles have an operational range from the water's surface to 4000m. Remotely operated surface vehicles from Teledyne Oceanscience are the industry leading survey and instrument boats for inland water and coastal areas. The remotely operated underwater vehicles from Teledyne SeaBotix and Teledyne Benthos represent flexible inspection platforms that are lightweight, powerful, and readily portable. Find out how the Teledyne Marine family of Remote Operated Vehicles can fulfill your next inspection or monitoring task.

Surface Vehicles

Z-BOATS: REMOTELY OPERATED SURVEY BOATS

The Teledyne Oceanscience Z-Boats are designed with the surveyor in mind. The hull shape, propulsion system, radio communication, and sonar instrumentation combine to offer an easy to use and powerful option for the hydrographic surveyor. The new Z-Boat 1800-RP adds an IP67-rated ruggedized design with interchangeable sensor wells, making the latest Z-boat a reliable and flexible option for coastal mapping.
The Z-Boats offer unmatched convenience for jobs where access to the survey area is poor, or conditions are unsafe.

Q-BOATS: REMOTELY CONTROLLED INSTRUMENT PLATFORMS

The remotely controlled Q-Boats from Teledyne Oceanscience offer the ultimate in survey flexibility and personnel safety for ADCP deployment during river velocity profiling and discharge monitoring. Oceanscience is the leading manufacturer of remotely controlled instrumentation boats. For the past decade, Oceanscience remote boats have deployed a wide variety of acoustic Doppler current profilers (ADCPs), water quality monitoring instruments, and echo sounders in lakes, rivers, and coastal environments. GPS and radio modems for data transmission are available to provide a turnkey remote environmental monitoring system. Configurations for multiple ADCP types are available, and all boats are easily customized for special projects.

Underwater Vehicles

Teledyne Benthos and Teledyne SeaBotix manufacture a range of Remotely Operated Vehicles (ROVs) that are powerful, compact, open-frame observation and inspection class vehicles with extensive built-in flexibility.

Benthos and SeaBotix ROVs share the common advantage of being small and lightweight, yet powerful enough to navigate strong currents, carrying a multitude of sensors and payloads. This makes them ideally suited for tasks such as ship hull inspection, dam and tunnel inspection, and search and recovery operations, to name a few.

Modularity is another key design feature of the Teledyne Marine ROVs. Each of the major components (i.e. thrusters, cameras, lights, electronics bottle, and flotation) is designed for easy installation or removal. This design concept allows for efficient upgrades, updates and maintenance, while minimizing down time, and allowing the systems to be reconfigured and "grow" as needed.

Remotely Operated
Surface Vehicles

Specifications	Z-Boat 1800-RP	Z-Boat 1800
PHYSICAL		
Hull Length and Width	180 x 100cm (5.9 x 3.3ft)	180 x 90cm (5.9 x 2.95ft)
Draft	0.28m	0.25m
Weight of Base Boat/Payload	38kg/30kg (66lbs)	30kg (66 lbs.) / 30 kg (66 lbs.)
Hull Material	UV-Resistant ABS	UV-Resistant ABS
Motor	Dual Brushless 24V DC Outdrives	Single-Brushed DC Outdrive (1800)
		Dual Brushless 24V DC Outdrives (1800 HS)
REMOTE		
Navigation Remote	Hitec with Vessel Telemetry	Hitec with Vessel Telemetry
Navigation Remote Frequency	2.4GHz FHSS	2.4GHz FHSS
Navigation Remote Range	1200m	1200m
Data Telemetry Range	Up to 2km (5GHz MIMO)	600m (Bluetooth)
	Worldwide (4GLTE)	>2000m (900 MHz Hydrolink)
	Up to 1500m (5 GHz SISO)	
PERFORMANCE		
Typical Survey Speed	3-3.5 kts (1.5-1.8m/s)	3-4 kts (1.5-2.0m/s)
Top Speed	8 kts (1800 RP)	4 kts (2m/s) (1800)
		10 kts (5m/s) (1800 HS)
Battery Endurance	Up to 4.5 hours	Up to 2.5 hours (150 minutes) (1800)
		Up to 4 hours (1800 HS)
Battery Pack	4x24v 30Ah	1 x 12V 10Ah m (1800)
		3 x 24V 30Ah (1800 HS)
AVAILABLE INSTRUMENTATION		
All Z-Boat Survey Vehicles are available with optional HD video cameras and can accommodate most industry standard ADCPs All Z-Boats and Q-Boats are compatible with other sensors on the market and custom sensor integration is available on most models.	Teledyne Odom MB1, MB2 Multibeam Echosounder, and Teledyne Odom CV100/CV100 DF	Teledyne Odom CV100/CV100 DF
	R2 Sonic 2020 MBES	Airmar "Smart" Transducer SS510
	Tritech Side Scan Sonars	Tritech StarFish Side Scan Sonars
	Biosonics MX Echosounder	R2Sonic 2020 MBES
	POS MV WaveMaster	Biosonics MX Echosounder
	SBG Ekinox	YSI and Hanna Sondes
	TSS DMS525	SBG Ekinox
	Teledyne RD Instruments ADCPs	Teledyne RD Instruments ADCPs

Z-Boat 1800-MX	Z-Boat 1800-SS	Q-Boat 1800
180 x 90cm (5.9 x 2.95ft)	180 x 90cm (5.9 x 2.95ft)	180 x 90cm (5.9 x 2.95ft)
0.25m	0.25m	0.25m
30kg (66 lbs.) / 30 kg (66 lbs.)	30kg (66 lbs.) / 30 kg (66 lbs.)	30kg (66 lbs.) / 30 kg (66 lbs.)
UV-Resistant ABS	UV-Resistant ABS	UV-Resistant ABS
Single-Brushed DC Outdrive (1800)	Single-Brushed DC Outdrive (1800)	Single-Brushed DC Outdrive (1800)
Dual Brushless 24V DC Outdrives (1800 HS)	Dual Brushless 24V DC Outdrives (1800 HS)	Dual Brushless 24V DC Outdrives (1800 HS)
Hitec with Vessel Telemetry	Hitec with Vessel Telemetry	Hitec with Vessel Telemetry
2.4GHz FHSS	2.4GHz FHSS	2.4GHz FHSS
1200m	1200m	1200m
Up to 1500m (5 GHz Ethernet)	Up to 1500m (5 GHz Ethernet)	600m (Bluetooth)
		>2000m (900 MHz Hydrolink)
3-4 kts (1.5-2.0m/s)	3-4 kts (1.5-2.0m/s)	3-4 kts (1.5-2.0m/s)
4 kts (2m/s)	4 kts (2m/s) (1800)	4 kts (2m/s) (1800)
	10 kts (5m/s) (1800 HS)	10 kts (5m/s) (1800 HS)
Up to 2.5 hours (150 minutes)	Up to 2.5 hours (150 minutes) (1800)	Up to 2.5 hours (150 minutes) (1800D)
	Up to 4 hours (1800 HS)	Up to 4 hours (1800P)
1 x 12V 10Ah m	1 x 12V 10Ah m (1800)	1 x 12V 10Ah m (1800D)
	3 x 24V 30Ah (1800 HS)	3 x 24V 30Ah (1800 HS)
Biosonics MX Echosounder	Tritech StarFish Side Scan Sonars	Teledyne RD Instruments RiverPro
		Teledyne RD Instruments RiverRay
		Teledyne RD Instruments Rio Grande
		Teledyne RD Instruments StreamPro
		Teledyne RD Instruments Monitor
		Sontek RiverSurveyor M9/SS
		Linkquest Flowquest

Remotely Operated

Underwater Vehicles

SPECIFICATIONS	LBV150-4	LBV200-4	LBV300-5
GENERAL			
Depth Rating	150 m (500 ft)	200 m (660 ft)	300 m (1,000 ft)
Length	530 mm (21 in)	530 mm (21 in)	520 mm (20.5 in)
Width	245 mm (9.65 in)	245 mm (9.65 in)	445 mm (17.5 in)
Height	254 mm (10 in)	254 mm (10 in)	260 mm (10.2 in)
Weight in Air	11 kg (24.3 lbs)	11 kg (24.3 lbs)	13 kg (28.7 lbs)
Camera	Hi-res color with 180° tilt	Hi-res color with 180° tilt	Hi-res color with 180° tilt
Lighting	Ultra bright LED (tracking camera)	Ultra bright LED (tracking camera)	Ultra bright LED (tracking camera)
THRUSTERS			
Configuration	2 forward, 1 vertical, 1 lateral	2 forward, 1 vertical, 1 lateral	2 forward, 1 vertical, 1 lateral
Motor Type	Brushless DC direct drive	Brushless DC direct drive	Brushless DC direct drive
Bollard Thrust-Fwd	7 kgf (15.4 lbf)	7 kgf (15.4 lbf)	7 kgf (15.4 lbf)
Bollard Thrust-Lat	3 kgf (6.6 lbf)	3 kgf (6.6 lbf)	3 kgf (6.6 lbf)
Bollard Thrust-Vert	3 kgf (6.6 lbf)	3 kgf (6.6 lbf)	7.5 kgf (16.5 lbf)
Speed at Surface	3 knots (1.54 m/sec)	3 knots (1.44 m/sec)	2.8 knots (1.44 m/sec)
CONTROL/POWER SYSTEM			
Configuration	Single rugged case, w/monitor, OCU & power supply	Single rugged case, w/monitor, OCU & power supply	Single rugged case, w/monitor, OCU & power supply
Power Requirement	1,200 W, 100-130/200-260 VAC	1,200 W, 100-130/200-260 VAC	1,200 W, 100-130/200-260 VAC
Auto Functions	Depth, heading, trim	Depth, heading, trim	Depth, heading, trim
TETHER			
Tether Diameter	8.9 mm (0.35 in) nominal	8.9 mm (0.35 in) nominal	8.9 mm (0.35 in) nominal
Max. Tether	250 m (820 ft)	350 m (1148 ft)	350 m (1148 ft)
Working Load	100 kgf (220 lbf)	100 kgf (220 lbf)	100 kgf (220 lbf)
Breaking Strength	700 kgf (1543 lbf)	700 kgf (1543 lbf)	700 kgf (1543 lbf)
CRAWLER SKID ATTACHMENT			• **LBC**
Patented Vortex Suction			Yes
Drive Mechanism			Wheeled

vLBV300	vLBV950	SeaLift vLBV-10	SeaRover
300 m (1,000 ft)	950 m (3,100 ft)	300 m (1,000 ft)	150 m (500 ft)
625 mm (24.6 in)	625 mm (24.6 in)	625 mm (24.6 in)	550 mm (21.6 in) grabber retracted
390 mm (15.4 in)	390 mm (15.4 in)	638 mm (25.1 in)	250 mm (9.8 in)
390 mm (15.4 in)	390 mm (15.4 in)	455 mm (17.9 in)	368 mm (14.5 in)
18 kg (39.9 lbs)	18 kg (39.9 lbs)	30 kg (66 lbs)	17 kg (38.4 lbs)
Hi-res color with 180° tilt	Hi-res color with 180° tilt	Hi-res color with 180° tilt	Hi-res color with 180° tilt
Ultra bright LED (tracking camera)	Ultra bright LED (tracking camera)	Ultra bright LED (tracking camera)	Ultra bright LED (tracking camera)
4 vectored, 2 vertical	4 vectored, 2 vertical	4 vectored, 6 vertical	2 forward, 1 vertical, 1 lateral
Brushless DC direct drive	Brushless DC direct drive	Brushless DC direct drive	Brushless DC direct drive
18.1-22.5 kgf (40-50 lbf) variable	18.1-22.5 kgf (40-50 lbf) variable	18.1-22.5 kgf (40-50 lbf) variable	8.5 kgf (18.7 lbf) each fwd
7.3-15.2 kgf (16.2-33.5 lbf) variable	7.3-15.2 kgf (16.2-33.5 lbf) variable	7.3-15.2 kgf (16.2-33.5 lbf) variable	3 kgf (6.6 lbf)
9 kgf (19.8 lbf)	9 kgf (19.8 lbf)	15-20 kgf (33-44 lbf)	3 kgf (6.6 lbf)
3 knots (1.54 m/sec)	3 knots (1.54 m/sec)	Varies with payload	3 knots (1.54 m/sec) fully equipped
Dual rugged cases, w/monitor, OCU & power supply	Dual rugged cases, w/monitor, OCU & power supply	Dual rugged cases, w/monitor, OCU & power supply	Single rugged case, w/monitor, OCU & power supply
3,300 W, 85-265 VAC	4,500 W, 85-265 VAC	3,000 W, 85-265 VAC	1,200 W, 100-130/200-260 VAC
Depth, heading, trim	Depth, heading, trim	Depth, heading, trim	Depth, heading, trim
8.9 mm (0.35 in) nominal	8.9 mm (0.35 in) nominal	8-11.2 mm (0.3-0.44 in) nominal	8.9 mm (0.35 in) nominal
2,250 m (7,381 ft)	2,250 m (7,381 ft)	350 m (1,148 ft)	350 m (1,148 ft)
100 kgf (220 lbf)	100 kgf (220 lbf)	100 kgf (220 lbf)	100 kgf (220 lbf)
700 kgf (1543 lbf)	700 kgf (1543 lbf)	700 kgf (1543 lbf)	700 kgf (1543 lbf)
• **vLBC**			
Yes			
Tracked			

Tethered

Teledyne Marine's range of Riverboat tethered boats from Oceanscience represents the leading deployment option for ADCPs. All Riverboats are designed to be nearly indestructible and ready for the challenges of environmental monitoring.

Tough Trimaran Boats for ADCP Measurements

Oceanscience tethered boats for the deployment of acoustic Doppler current profilers (ADCPs) from cableways, bridges, manned boats, or fixed structures are used by hydrographers and hydrologists across the world. The Riverboat is the undisputed platform of choice for ADCPs used in hydrologic monitoring, offering unmatched data quality and instrument stability. Oceanscience Riverboats can be customized to deploy depth sounders and can be equipped with a range of radio communications and GPS positioning instruments.

Unrivaled Boat Design Expertise and Experience

ADCPs offer detailed velocity and discharge data, however without a stable deployment platform, the data quality is compromised. Trimaran Riverboats for the Teledyne RDI Rio Grande, RiverRay, RiverPro, and StreamPro, SonTek RiverCat and RiverSurveyor S5 and M9 profilers are standard, with custom boats for other profilers also available. The new High-Speed Riverboat can be used with multiple profilers, and its innovative hull design further expands the applicability of ADCPs to hydrology in challenging flow conditions.

In order to improve ADCP discharge data in slow to moderate water velocities, Oceanscience has developed the Cable Chimp II cableway ROV. This remote controlled cable crawler will steadily pull your Riverboat across a river transect for great data with maximum convenience.

Tethered

Survey Boats (Surface)

Specifications	Riverboat	Riverboat ST
PHYSICAL		
Center Hull Length	121cm (48in)	121cm (48in)
Overall Width	81cm (32in)	81cm (32in)
Weight	7kg (15 lbs)	7kg (15 lbs)
Hull Material	Molded Unbreakable Polyethylene	Molded Unbreakable Polyethylene
Crossbar Material	Anodized Aluminum	Anodized Aluminum
Safety Lines	Stainless Steel	Stainless Steel
Fasteners/Hardware	Stainless Steel	Stainless Steel
Fin Configuration	Kick-up Fins	Large Kick-up Fins
Mounting Plate/Clamp	Cross Bar Mount	Clamping Collar
PERFORMANCE		
Typical Measurement Water Velocity	0.6-3m/s (2-10 fps)	0.6-3m/s (2-10 fps)
Maximum Water Velocity	4.6m/s (15 fps)	3.6m/s (12 fps)
INSTRUMENTATION		
Acoustic Doppler Current Profilers	Teledyne RD Instruments Rio Grande	Sontek RiverSurveyor M9/S5
	Teledyne RD Instruments Sentinel	
	Teledyne RD Instruments Monitor	
	Linkquest Flowquest	
	Rowe RiverPROFILER	
Depth Sounder	Airmar Smart Sensors	Airmar Smart Sensors
GPS	Most Industry Standard GPS	Most Industry Standard GPS

Specifications	Cable Chimp II	Specifications
Typical Measurement Water Velocity	2-10 fps or .6-3 m/s	**Line Size**
Length	9.5in or 24 cm	**Line Type**
Width	14in or 35.5 cm	**Transect Speeds**
Depth	4.5in or 11.5 cm	**Maximum Climbing Angle**
Construction Material	Lightweight Powder Coated Aluminum	**Dry Line Pulling Force**
Hardware Material	Stainless Steel	**Wet Line Pulling Force**
Weight with Battery	4.8 lbs or 2.18 kg	**Battery**
Shipping Weight with Case	22 lbs or 10 kg	**Wall Charger**
Transmitter	Hitec Single Stick 72MHz	**Battery Endurance**
Transmitter Running Time	2-3 Hours Continuously	**Transmitter Range**

Riverboat SP	High Speed Riverboat
121cm (48in)	152.5cm (60in)
81cm (32in)	122cm (48in)
7kg (15 lbs)	13.6kg (30 lbs)
Molded Unbreakable Polyethylene	High Impact, UV Resistant ABS
Anodized Aluminum	Anodized Aluminum with Quick Release Clamp
Stainless Steel	Stainless Steel
Stainless Steel	Stainless Steel
Large Kick-up Fins	Large, Foldable Kick-up Fins
Clamping Collar	Quick Release Mounting Plate
0.6-3m/s (2-10 fps)	3-5m/s (10-16 fps)
3.6m/s (12 fps)	6.09m/s (20 fps)
Teledyne RD Instruments StreamPro	Teledyne RD Instruments RiverRay, RiverPro
	Teledyne RD Instruments RioGrande, SteamPro
	Sontek RiverSurveyor
	Teledyne RD Instruments Monitor
Airmar Smart Sensors	Airmar Smart Sensors
Most Industry Standard GPS	Most Industry Standard GPS

Cable Chimp II
1/4" (6mm) High-grip Line
Continuous filament low stretch three-strand polyester or Kevlar line
0.1 to 0.7 ft/s
8 Degrees
6.5 lbs (29N)
4.5 lbs (20N)
Rechargeable NiMH
110V AC
2-3 Hours
100 ft or 30m

Cable Chimp II

Towed

The Teledyne Marine Towed Systems product line provides solutions for conducting a wide range of shallow and deep water applications. Building on Teledyne Benthos' and Teledyne Odom Hydrographics' experience in solving complex undersea problems, our towed systems serve as a base platform to be configured to meet an operator's specific needs.

Chirp III

Portable and affordable, the Chirp III (TTV-170 series) from Teledyne Odom Hydrographic is a low cost system ideally suited for many applications. Its versatile system configuration provides the user with various styles of tow vehicles and hull mounted arrays.

Mid-Tow

The Mid-Tow (TTV-290 series) system is an affordable, proven choice for conducting data collection, survey, and other geophysical exploration to depths of 2000m. The strong mid plate and hydrodynamic body form a robust, dependable base for a combination of side scan sonars, multi beam sonars, and sub bottom profilers or any other customer specified sensor. The transducer bays offer 20, 30 and 40 degrees downward looking positions for optimum performance in various applications. The high visibility yellow polyethylene covers are designed for years of use and are impact resistant and easy to modify or replace.

Deep-Tow

The Deep Tow (TTV-190 series) 6000m assembly system consists of the deep tow body, 50m tether and termination, and a depressor weight.
The tow body accommodates different sensors and optional equipment. It is positively buoyant with an emergency acoustic release capability for recovery if an unexpected event occurs.
The 50m tether is provided and electrically and mechanically connects to a tow cable through the termination. The 900kg depressor rides below the tow fish as a safety.

Teledyne Marine Towed Vehicles are an exceptional system for data collection, inspection, and survey in the most challenging marine environments.

Courtesy Odyssey Marine

Towed

Survey Vehicles (Underwater)

SPECIFICATIONS	Chirp III
Side Scan Sonar	
Sub Bottom Profiler	●
Bathymetry	
Model	TTV-170 (Series)
Maximum Operating Depth	200m
Length	61 cm (24 in)
Front Cross Section	45.7 cm (18 in) O.D.
Weight (in air)	44.5 kg (98 lbs)
Weight (in water)	36.3 kg (80 lbs)
Applications	Offshore hazard surveys Pipeline and small object surveys Mining and dredging Wind farm site survey

Mid-Tow	Deep-Tow
●	●
●	●
●	●
TTV-290 (Series)	TTV-190 (Series)
Sensor Dependent	6000 m
208.7 cm (82 in)	274.3 cm (108 in)
38.4 cm x 53.3 (15.1 in x 21 in)	121.9 cm x 137.2 cm (48 in x 54 in)
147 kg (325 lbs)	900 kg (2,000 lbs)
74.8 kg (165 lbs)	-90 kg (-200 lbs positively buoyant)
Sub-bottom geographical studies	Deep water survey applications
Hydrographic charting	Deep sea floor habitat mapping
Engineering and scientific studies	Oil and gas route survey
Habitat mapping	Pipeline hazard inspection
Cable and pipeline route surveys	Search and locate

Teledyne Marine

Vehicles

Surface to Seafloor...One Supplier

Customized Solutions

All of the Teledyne Marine vehicles are designed to accommodate both standard and customized sensor and accessory options. Teledyne manufactures a broad range of sensors, cameras, lights, and other accessories that are designed for integration onto our many vehicle platforms. In addition, most third party sensors that meet the form factor and power requirements of the vehicle can be integrated to meet your specific job tasks and objectives. Many other modifications can be made to accommodate specific and often unique applications. Contact any of our sales specialists to find out how a Teledyne Marine Vehicle can be outfitted to meet your specific requirement.

The Teledyne Marine Advantage

Teledyne Marine brings the combined strength of its industry leading technologies together with three unique resources to offer customers a superior level of design, collaboration, expertise, and problem solving for their toughest challenges and most demanding projects. At **Teledyne Scientific** we are developing a materials database by qualifying materials performance under actual adverse operating conditions of temperature, pressure, time and mechanical stress in deep ocean conditions. This data base is used by the New Product Development teams at the **Teledyne Oil & Gas Technology Development Center** and applied to achieve new levels of performance to meet over the horizon challenges for deep ocean technology. At **Teledyne Brown Engineering**, we combine new product development, complex systems engineering, and integration to manage large projects and programs and provide full life-cycle hardware and systems for high reliability, critical performance.

Our Commitment to You

- Best-in-class products, engineered solutions, and services
- One stop shopping options for innovative technology solutions
- One-on-one relationships built on trust and integrity
- Service and support when and where you need us
- Reliable, consistent, and demonstrative performance

TELEDYNE
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