

ARTEMIS CABLE & PIPE TRACKER



ENGINEERING
EXCELLENCE
UNDERWATER

GAME-CHANGING SURVEY & TRACKING TECHNOLOGY

Artemis is the cable and pipeline tracking solution that everyone has been crying out for. Representing a huge leap forward in cable detection technology, like its namesake, the Artemis is an unrivalled hunter, significantly outperforming the next best solution in terms of depth, orientation and accuracy.

- Detects cables and pipelines deeper than any existing technology
- Accurately locates and orientates unpowered, powered and faulted cables
- Surveys cables twice as fast, in real time
- Simultaneous cable tracking and burial depth assurance
- Plug and play for any asset

Soil Machine Dynamics Limited, world leader in subsea vehicle manufacturing & seabed intervention specialists, has joined forces with Optimal Ranging Inc to bring to market this unique range of cable and pipeline tracking and survey technologies.

Artemis Trenching and Artemis Survey systems have been specifically developed to address the detection and tracking issues of multi-pass trenching and surveying of cables and pipelines during installation, during repair and when the power is off with out the need for a tone.

Relaunching Optimal Ranging's Orion as Artemis Live and Artemis Toned, we have improved the operability and set up of the existing technology for live cables and where it is convenient to set up a tone on the cable for detection and survey. By upgrading the software and adding an Antenna, the same hardware can be upgraded to Artemis Trenching and Artemis Survey.

Trenching companies can now have the ultimate confidence that they will be able to perform single or multi-pass jetting operations without an issue.

Surveyance and cable repair companies are now more able to find deeply buried, broken and abandoned cables without the need for power/tone generation.

CURVETECH® CABLE TRACKER ARTEMIS

TABLE TITLE	LIVE POWER CABLE	POWER OFF WITH TONE	DAMAGED CABLE NO POWER	CABLE DURING	PIPE INSTALLATION
Artemis	Up to 10m	Up to 10m	Up to 4–5m	Up to 4–5m	Up to 5m
Orion	Up to 10m	Up to 10m	No	No	No
Innovatum	Only when magnetised	Up to 5m magnetised	Only when magnetised		
Teledyne 440	No	1.7m	1.7m	1.7m	1.7m
Teledyne 350	No	Up to 5m	No	No	No

Standard cable burial depth in European offshore wind farms
Inter array - 1.54–2.5m / Export 4– 3-5m

ARTEMIS RANGE AVAILABLE TO LEASE

FIND IT

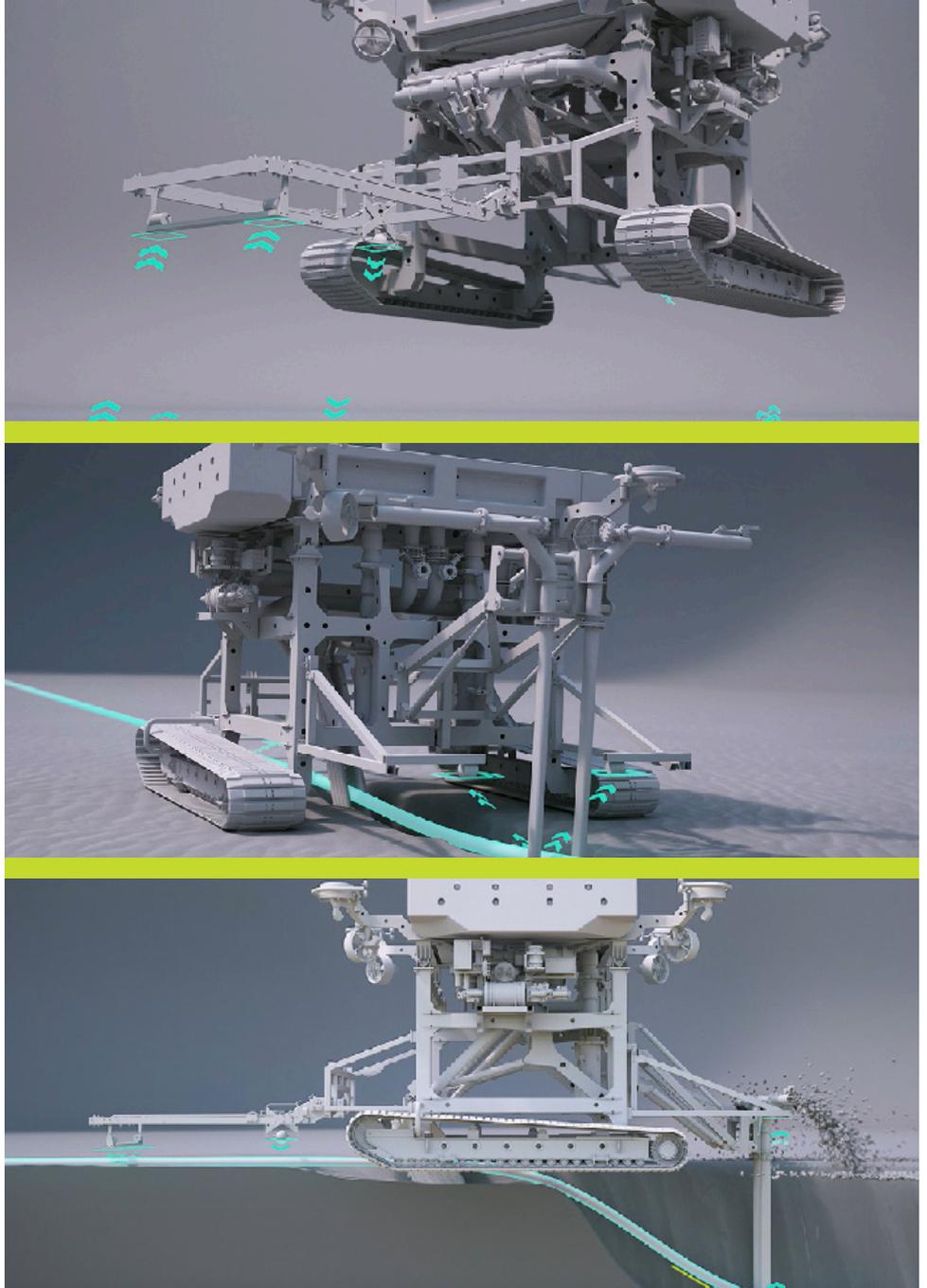
Artemis enables power cables to be quickly and accurately located from a distance of 5m without the need for cables to be live, toned or magnetised. The unrivalled, versatile system can track broken cables, cables during installation, trenching, deburial and damaged cables. Applies to all copper and aluminium power cables.

TRACK IT

Unlike other cable/pipeline tracking systems, Artemis can ignore interference from sources other than the cable, removing any margin for error while reducing time taken to locate and track the asset. An inductive coil is used to induce a continuous 2800-3200hz AC tone, using low power, into the cable or pipeline. The tone produces a magnetic field around the asset which is then used to accurately track the cable or pipeline.

PROVE IT

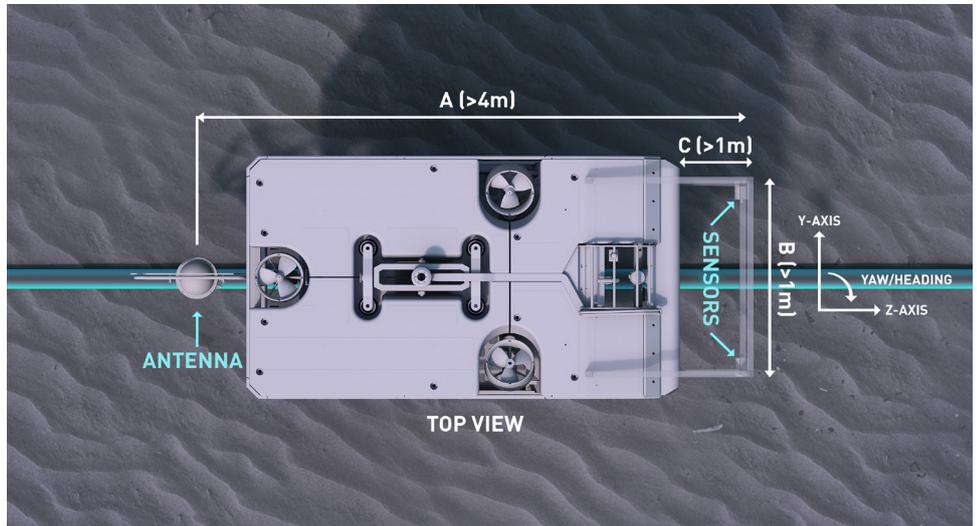
Artemis is the only solution which can simultaneously provide exact location and orientation data at the front and rear of a vehicle for ultimate assurance of cable burial by tracking the depth, offset, yaw and angle of cable burial at the rear of the trencher while directing the vehicle at the front. When combined with SMD's trenching technology, this capability allows cables and pipelines to be accurately tracked and buried to the desired depth.



- A - Antenna separation:
Minimum 4m - No maximum
- B - Sensor separation:
Artemis Live with toned = 1.5m minimum up to 5m
Artemis Trencher or Survey = 1m minimum up to 5m
- C - Sensors must be at least 1m from metallic structures

FITTING

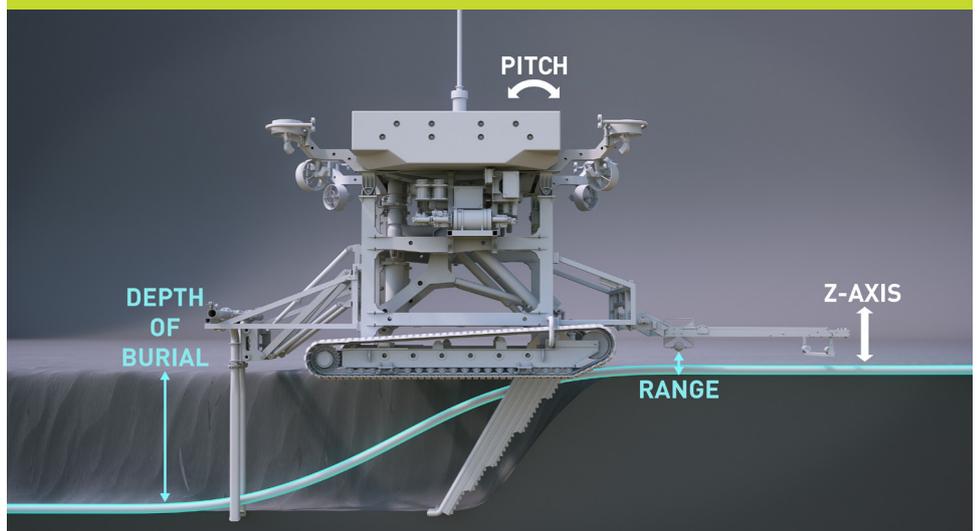
Artemis cable tracking technology is available in four different options, each tailored to a different end use.



The antenna should be spaced away from large metallic structures. There is no defined minimum distance, but it is recommended to be 1m from any large metallic mass.

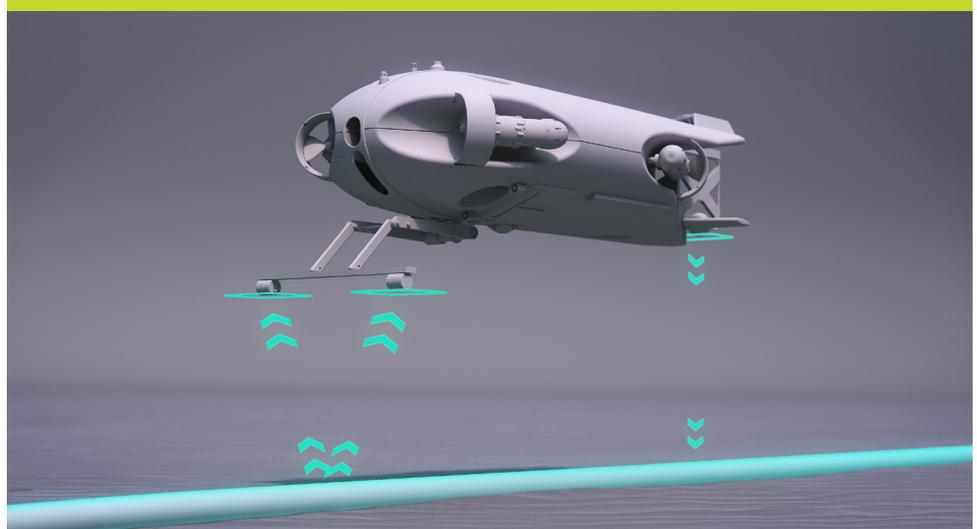
Range is defined as the distance from the antenna and sensor centre line to the centre of the target (product).

Depth of Burial (DOB), for Artemis, is defined as the distance between the altitude of the vehicle and the centre of the cable located by Artemis, for true survey purposes, this should be adjusted by decreasing the DOB by the radius of the cable. This entered and calculated in future versions of Artemis.



UNRIVALLED SURVEY AND TRACKING TECHNOLOGY

The tables below compare Artemis with other established products in the marketplace for common key applications. It is clear from the data that the performance of the Artemis makes it no contest. Our system measures the AC magnetic field on a utility if it exists on the cable; if not, it can induce it on the utility. The TSS Dualtrack 440/350 can measure an existing AC field or use a metal detector mode when there is no existing AC magnetic field. Likewise, when there is no AC magnetic field, Innovatum relies on measuring the local change in the Earth's DC magnetic field caused by the presence of metal, such as in pipelines, magnetized cables, or flow of DC current.



POWER CABLES

Power Cables based on 150mm armoured cables typical for wind farm inter-array and export cables, and inter-country connect cables. For survey, it is assumed that the ROV is flying 1m over the seabed. For trenching this figure assumes that the sensors are 0.5m above the seabed. 'Live' is when the cable has power running through it. 'Not live' means no power in a cable. Data = Range & (depth of burial)

POWER CABLE TYPE	SURVEY (LIVE)	SURVEY (TONED)	SURVEY (NOT LIVE)	TRENCHING (NOT LIVE)
Artemis	10m (9m)	10m (9m)	4-5m (3m+)	4-5m (3m+)
TSS Dualtrack 440/350	1.8m (1.3m)	10m (9m)	1.8m (0.8m)	1.8m (1.3m)
Innovatum	Magnetized only	5m (4m)	Magnetized only	Magnetized only

PIPE LINES

Artemis can be used with all pipelines that are constructed from metal or have a pathway for an electric current. Its performance is not linked to the amount of metal in the pipeline, and will perform well in all applications and sizes.

PIPE SIZE	<4"	10-20"	48"+
Artemis	4-5m (3m+)	4-5m (3m+)	4-5m (3m+)
TSS Dualtrack 440/350	2.2m (1.2m)	3m (2m)	4m (3m)
Innovatum	Not feasible	2m (1m)	3m (2m)

SMALLER CABLES/UMBILICALS (NOT LIVE)

Artemis works in the same way regardless of the size of the product. As long as there is an electrical earth path along the cable or its armour, it will perform equally well in all applications including telecoms cables.

CABLE SIZE	10MM	25MM	100MM
Artemis	4-5m (3m+)	4-5m (3m+)	4-5m (3m+)
TSS Dualtrack 440/350	Not feasible	Not feasible	Not feasible
Innovatum	Not feasible	Not feasible	Not feasible

WEIGHTS & DIMENSIONS

E-POD	4 kg each (1 required)
Antenna	10 kg each (1 required)
Sensor	3.6 kg each (2-6 required)

CONNECTIVITY REQUIREMENTS

Data Port	RS-232 or RS-485
Voltage	24-30VDC
Current	5A Max
Connector	Subconn



SIMULATED ENVIRONMENT

Following considerable lab testing, we proved how the Artemis works and how its performance can exceed the current state-of-the-art technology using a 33kV offshore power cable buried to 3 different depths in a controlled seawater dock environment.

VEHICLE INTEGRATION

Artemis was tested with various offshore vehicle types and sizes to ensure the two systems do not affect each other and that the Artemis can truly be fully adaptable.

OFFSHORE TESTING 'TRACKING'

Artemis was tested offshore in the North Sea alongside a competitor product to prove its worth in a live export cable multi-pass burial project. The Artemis was proven to be the superior tracking system.

OFFSHORE TESTING 'SURVEY'

The interaction of Artemis with the seabed, sea, and air interfaces behaved differently than our assumptions in the lab. After four offshore tests, we updated the software, and now the calibration of the system has been built into the latest software release (June 2020). SMD is now back out in the offshore environment performing surveys with Artemis, so please contact us to discuss your needs.



TRACK RECORD

Artemis sensors have been used for survey, known as Orion, prior to the development of Artemis, with a good track record in survey of live cables and cables with a tone applied. Example projects are:

Nornde (ARTEMIS LIVE)
SK\$ (TONED)
Next 3 all LIVE
Tennet (both LIVE)
Energinet (LIVE)

Enerco Wind Belgium
ARTEMIS TRENCHER
Seamade (Mermaid) – 18.5km
Export Cable – multi-pass jet
trenching

Seamade (Seastar) – 6.5km
Export Cable – multi-pass jet
trenching

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CONTACT US
SMD
INFO@SMD.CO.UK
+44 (0) 191 234 2222
SMD.CO.UK



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