



# SUBSEA TRENCHING



ENGINEERING  
EXCELLENCE  
UNDERWATER

SMD is the world's leading subsea trenching equipment supplier, committed to high quality and performance, founded on thorough engineering and solid support. SMD offer the world's largest range of subsea trenching products. The trenching business stream supplies towed and self-propelled vehicles, with a comprehensive range of in-house engineered launch and recovery systems (LARS) and state-of-the-art control systems.

SMD has delivered over one hundred subsea trenching systems spanning a thirty year period, developing a unique and comprehensive, world class product range with cutting edge technology. The success of these systems is reflected in repeat business from a valued, worldwide customer base. SMD seek to continuously improve and develop new products and new technologies to satisfy the ever evolving technical challenges.

SMD's trenching product range has been created in a way which provides tailored solutions for a variety of different markets and end uses.



#### SELF PROPELLED SYSTEMS

The self propelled systems include the QTrencher (QT) and heavy tracked trencher ranges. QTrenchers are SMD's fourth generation trenching ROV. Subsea power available ranges from 400hp through to 2800hp all able to free fly with track upgrades. Heavy tracked trenchers are available in a range of chassis sizes and power ratings to suit trenching in hard ground up to 50MPa. Trenchers can be configured to carry multiple tools, simultaneously or in interchangeable cartridges, including rock and clay chains, jetters, dredges, eductors and backfill tools to suit every soil combination.

Bespoke, self propelled systems developed for customers include RT-1, the world's most powerful subsea tractor and UT-1, the world's largest trenching remotely operated vehicle (ROV). RT-1 (180Te) was designed to trench 1.5m diameter pipelines to 2m deep in 40MPa rock. UT-1 (60Te) was designed to trench 1m diameter pipelines at water depths of 1500MSW.

SELF PROPELLED	PRODUCT	POWER (HP)	OIL & GAS	POWER CABLES	TELECOMS
QTrencher	QTrencher 400	400	-	-	Yes
	QTrencher 600	600	-	-	Yes
	QTrencher 800	800	-	Yes	Yes
	QTrencher 1000	1000	Yes	Yes	Yes
	QTrencher 1400	1400	Yes	Yes	Yes
	QTrencher 2800	2800	Yes	Yes	-
CBT	CBT800	800	Yes	Yes	Yes
	CBT1100	1100	Yes	Yes	-
	CBT2100	2100	Yes	Yes	-
	CBT3200	3200	Yes	Yes	-
	LBT1100	1100	-	Yes	-



TOWED SYSTEMS

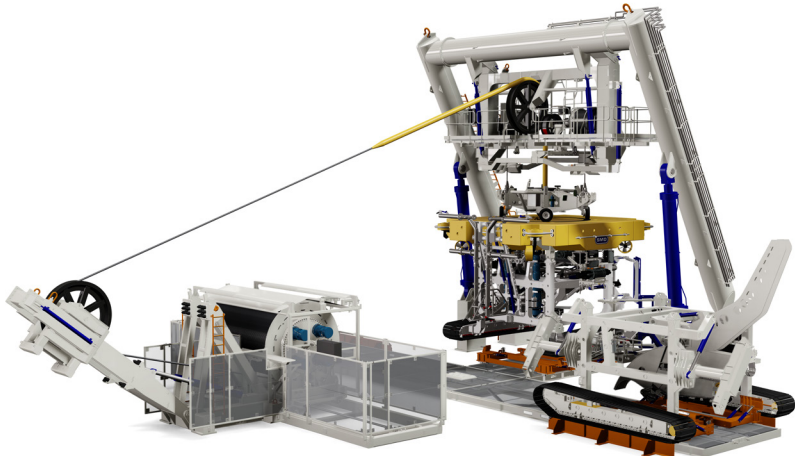
SMD's towed systems are designed to bury subsea telecommunication and power cables up to 350mm diameter and pipelines up to 1500mm diameter. Available systems include the Multi-Depth Plough (MD3) Heavy Duty Plough (HD3), Ultra Duty Plough (UD4) and Multipass Plough (MP) systems, supplied with tow load capability of 80Te, 120Te, 150Te,

250Te and 350Te. SMD Smart Ploughs (MD3, HD3 and UD4) all have powered steering and variable depth control to maximise cable protection. All Smart Ploughs have optional jetting to transform progress rates in dense sands.



TOWED	PRODUCT	SIZE (MM)	OIL & GAS	POWER CABLES	TELECOMS
Slot Plough	MD3-160	160	-	Yes	Yes
	HD3-200	200	Yes	Yes	Yes
	HD3-300	300	Yes	Yes	-
	UD4-400	400	Yes	Yes	-
'V' Plough	MP	1500	Yes	Yes	-
	BP		Yes	Yes	-

The trenching business stream is dedicated to the safe and efficient protection of submarine cables and pipes, supplying complete turnkey systems including lars.







# INSTALLATION AND MAINTENANCE ROV

The SMD 400hp trenching ROV set the new benchmark when it was first introduced in the late 90s. Using high power to provide effective cable maintenance and other specialised tasks, it is purpose designed to provide maximum jetting and thrust performance. With further development and refinement the ROV continues to boast a reputation for reliability and ease of maintenance. It has become an essential part of any suite of cable installation vehicles. SMD offer a turnkey cable maintenance solution including LARS and umbilical system.

## FEATURES

- Optional rear eductor for large product burial
- Optional track modules for hard ground trenching
- Variable high flow or high pressure jetting for optimised trenching
- Optional cable maintenance tools package incl manipulators, cable cutter and clamp



	QTRENCHER400	QTRENCHER500	QTRENCHER600	QTRENCHER800	QTRENCHER1000
<b>GENERAL</b>					
Depth rating	10-1500/ 2000/ 3000msw	10-1500/ 2000/ 3000msw	10-1500/ 2500msw	500-2000msw	500-2000msw
<b>Dimensions</b>					
Length (excl. swords)	3.8m	5.0m	5.0m	5.0m	5.0m
Width	3.2m-4.6m	4.2m-5.0m	4.2m-5.0m	4.2m-5.0m	4.2m-5.0m
Height	2.5m	3.3m	3.3m	3.3m	3.3m
Weight in air (skids)	9.5Te	14.0Te	17.0Te	19.0Te	21.0Te
Submerged Weight	Buoyant	Buoyant	Buoyant	Buoyant	Buoyant
Max tow Load	1500kg	2100kg	2100kg	2100kg	2100kg
Power (hp)	400	500	600	800	1000

	QTRENCHER400	QTRENCHER500	QTRENCHER600	QTRENCHER800	QTRENCHER1000
PERFORMANCE					
Vertical	1.5 knots	1.5 knots	1.5 knots	1.5 knots	1.5 knots
Fore / Aft	3.5 knots	4.0 knots	4.0 knots	4.0 knots	4.0 knots
Lateral	3.0 knots	2.0 knots	2.0 knots	2.0 knots	2.0 knots
ROV power	400hp (300kW) total: 1 x 400hp (300kW) 4-pole Curvetech™ HPUs	500hp (375kW), 1 x 500hp (375kW), 4-pole Curvetech HPUs	600hp (450kW) total: 1 x 600hp (225kW) 4-pole Curvetech™ HPUs	800hp (600kW) total: 2 x 400hp (300kW) 4-pole Curvetech™ HPUs	1000hp (750kW) total: 2 x 500hp (375kW) 4-pole Curvetech™ HPUs
JETTING SYSTEM					
Trench depth	up to 2.0m legs		0-2.0m standard, 0-3m with ext ended swords	0-2.0m standard, 0-3m with ext ended swords	0-2.0m standard, 0-3m with ext ended swords
Width control - leg spanning (between inside of legs) 50mm to 400 mm - remotely variable	+50/400	+50/400	+50/400	Yes +250/600	Yes +350/700
Water supply (in tracked mode)	up to 250kW		twin hydraulically driven water pumps absorbing up to 400kW	twin hydraulically driven water pumps absorbing up to 550kW	twin hydraulically driven water pumps absorbing up to 700kW
Trench depth - up to 1.0m (soil dependent)	Yes		Yes	Yes	Yes
OPTIONAL TRACK MODULES					
Speed	0 to 2km/hr		0 to 2km/hr	0 to 2km/hr	0 to 2km/hr
SUBSEA ELECTRONICS					
Depth rating	up to 3000m		up to 3000m	up to 2000m*	up to 2000m*

\* Standard arrangement - bespoke solutions available





# PIPELINE AND POWER CABLE INSTALLATION ROV

The QTrencher (QT) 1400 and 2800 remotely operated vehicles (ROVs) are based on two high strength steel chassis designs which provide high power trenching capability for the burial of cables, umbilicals and large diameter pipes up to 3m deep in various water depths. The ROVs use variable high flow or high pressure jetting to optimise the trenching to suit the anticipated conditions. The QT1400 can be fitted with tracks and/or a rear eductor to enhance burial of large diameter products, it can also be supplied with independent track bases for chain cutting trenching, core drilling or cutter dredge applications.

The QT2800 is the world's most powerful free-swimming jet trencher. With more than 2 megawatts of total power, the trencher delivers 1.5 megawatts of jetting power. SMD offer a turnkey, integrated solution including SMD designed high sea state launch and recovery systems (LARS) and umbilical systems.

## FEATURES

- Optional rear eductor for large product burial
- Optional track modules for hard ground trenching
- Variable high flow or high pressure jetting for optimised trenching

	QTRENCHER1400	QTRENCHER1600	QTRENCHER2800
<b>GENERAL</b>			
Depth rating	1000, 2000 & 3000msw options	1,000 or 2,000m	1500msw
<b>Dimensions</b>			
Length (excl. swords)	7.8m	7.8m	7.8m
Width	6.5m	6.5m	7.8m
Height	5.0m	5.0m	5.6m
Weight in air	35-42Te	40-47Te	30-40Te
Submerged Weight	Neutral	Neutral	Neutral
Max tow Load	1000kg	1000kg	5800kg
Power (hp)	400	600	600
<b>PERFORMANCE</b>			
Vertical	2.0 knots	2.0 knots	2.0 knots
Fore / Aft	3.0 knots	3.0 knots	3.0 knots
Lateral	2.0 knots	2.0 knots	2.0 knots
ROV power	1400hp (1050kW) total: 2 x 150kW, 4160V 2 x 375kW, 4160V	1600hp (1200kW), 2 x 200kW (4160V), 2 x 400kW (4160V)	2800hp (2100kW) total: 2 x 300kW, 3300V 4 x 375kW, 3300V
<b>JETTING SYSTEM</b>			
Twin legged jet tool providing constant jet angle	from 0.5m to 3.0m	from 0.5m to 3.0m	from 0.75 to 2.5m
Max trench depth	Variable 2.5-3.5m Variable 2.5-3.5m	Variable 2.5-3.5m Variable 2.5-3.5m	Variable 2.5-3.5m
Width control (remotely variable)	Leg spanning (between inside of legs) Min 150mm Max 900mm	Leg spanning (between inside of legs) Min 150mm Max 900mm	Leg spanning (between inside of legs) Min 250mm Max 1200mm
Water pumps	up to 2 x 375kW	Up to 2 x 400kW	p to 4 x 375kW
Water supply (approx.)	2400m3/hr@7bar or 1200m3/hr @ 15bar (2 pumps)	2560m3/hr@7 bar 1280m3/hr @ 15 bar (2 pumps)	3600m3/hr4bar or 2400m3/hr @ 9bar (2 pumps)
<b>EDUCTOR SYSTEM</b>			
Configuration	Twin legged eductor mounted on constant angle linkage system	Twin legged eductor mounted on constant angle linkage system	Twin legged eductor mounted on 180° pivoting system
Trench depth	Variable from 0.25m	Variable from 0.25m	Variable from 0.25m
Trench width	0.5-1.2m remotely controlled	0.5-1.2m remotely controlled	0.5-1.2m remotely controlled
<b>SUBSEA ELECTRONICS</b>			
Electronics pod	One atmosphere pressure vessel		One atmosphere pressure vessel
Depth rating	3000m	2000m	3000m
Test pressure - 1.25 x working pressure	Yes		Yes
Connection point for vacuum checking of seals	Yes		Yes

# MULTI TASK BASE MODULES

The QTrencher (QT) 1400 system utilises a core buoyancy module with integral HPUs, thruster pack, water pumps, cameras, central control pod, etc. This can be attached quickly and easily to various functional base modules which include, but are not restricted to, jet trenching module, chain trenching module, core drilling module and crane dredge cutter module. The base modules are connected to the core buoyancy module with mechanical linkage pins, wet connectors, water hosing and hydraulic piping where necessary for minimal change-over time.

SMD offer a turnkey, integrated solution including SMD designed high sea state launch and recovery systems (LARS) and umbilical systems. The LARS can be supplied with deck transfer system for module change-out in sea state 3 - 6.



## CUTTING DREDGE

- Track based free fly crane mounted cutting head or jet cutter with integral dredging for site clearance operations
- Dredge pump capable of transporting up to 200m<sup>3</sup>/hr solids
- Depth of operations to 3000m



## JETTING

- Track based jetting module for jetting in sand and clay up to 100Kpa
- Burial depth from 1m to 3m for cables and pipelines up to 800mm diameter
- Rear eductor system for trench clearing
- Depth of operations to 1500m and 3000m





#### CORE DRILLING

- Track based wire line core drilling module for soil investigations with 75mm drill rods and up to 10Te push force, together with drill casings and CPT capability
- Supplied with subsea loaded drill magazines for drilling depth beyond 90m
- Depth of operations to 500m, 1000m, 2000m and 3000m



#### CHAIN CUTTING

- Track based chain cutting module for trenching in clays up to 400KPa
- Burial depth from 1m to 2m with integral depressor and cable handling equipment
- Suitable for cables up to 200mm diameter and 3m MBR
- Depth of operations to 500m and 1000m



# SLOT PLOUGHS

The Smart Plough range including the Multi-Depth Plough (MD3), Heavy Duty Plough (HD3) and Ultra Duty Plough (UD4), is recognised globally as setting the standard in cable ploughing. It provides assured cable burial in most soils including sands, clays and soft rock. The range is designed to handle 160 to 400mm diameter cables (with repeaters and joints for telecommunication systems). The ploughs come with a further range of cable MBR capability from 1.5m to 6.0m.

Using patented technology, the ploughs are designed to minimise pull force requirements and provide effective trenching capability from 0 to 4m depth. Their performance can be enhanced with jetting and rock ripping upgrades. Coupled with tow winches, umbilical winches and wide angle A frames, SMD are able to supply a turnkey flexibles burial solution for a wide range of cable sizes and vessel tow loads together with cable handling systems such as drum cable engines (DCEs) and linear cable engines (LCEs).

## FEATURES

- Diverless subsea loading and unloading
- Emergency cable unload
- Multi depth burial capability
- Steering bridle +/- 12 degrees
- Jetting system for enhanced burial in sand
- Jetting thruster for positional accuracy when landing on seabed

# SUBSEA TRENCHING

	SD2-160	MD3 160	HD3-200	HD3-300
<b>GENERAL</b>				
Depth rating	2000m	2000msw	1500msw	1500msw
<b>Dimensions</b>				
Length (excl. swords)	8.5m	9.1m	13.5m	15.0m
Width	5.1m	5.1m	6.3m	6.5m
Height	4.4m	4.4m	6.6m	6.6m
Weight in air (std)	15Te	22Te	35Te	45Te
Submerged Weight	13Te	19Te	30Te	39Te
Max tow Load	50Te	80Te	150Te	150Te
<b>PERFORMANCE</b>				
Trench depth	Variable 0 to 2.0m	Variable 0 to 3.0m	Variable 0 to 3.0m	Variable 0 to 3.3m
Max. cable dia.	20-160mm	20mm to 160mm	30mm to 200mm	30mm to 300mm
Min. cable bend radius	1.5m	1.5-2.0m	2.0-3.5m	2.5-5.0m
Steering	+/- 15 degrees	+/- 15 deg.	+/- 12 deg.	+/- 12 deg.
Max repeater diameter	380mm	380m		
<b>MECHANICAL</b>				
Ultra high strength steel chassis	Yes	Yes	Yes	Yes
Replaceable wear-resistant steel wear parts	Yes	Yes	Yes	Yes
<b>TRENCHING SYSTEM</b>				
Configuration - passive parallel sided share	Yes	Yes	Yes	Yes
Optional jetting - 250-500kW	No	Yes	Yes	Yes
Water supply (approx) - 800m3/1600m³ @ 6bar (approx)	No	Yes	Yes	Yes
Plough share tip, knife jetting & forward jetting arm	No	Yes	Yes	Yes
<b>DIVERLESS SUBSEA UNLOADING</b>				
Crane - knuckle boom			Yes	Yes
Slewing depressor - to assist cable into share			Yes	Yes
Front bellmouth tines - load cable into front bellmouth			Yes	Yes
Jetting thruster - to assist landing over cable			Yes	Yes
Tipping trough - to assist with unloading			Yes	Yes
ROV intervention panel - emergency unload			Yes	Yes
<b>HYDRAULIC &amp; INSTRUMENTATION</b>				
Installed power		15kW	15kW	15kW
Smart heavy duty marine cylinders		36lpm@250bar	36lpm@250bar	36lpm@250bar
Stainless steel, oil compensated valve packs		Yes	Yes	Yes
Stainless steel manifolds, pipes & fittings		Yes	Yes	Yes
Forward vertical and lateral cable sensing		Yes	Yes	Yes
Rear cable sensing and load measurement		Yes	Yes	Yes





# PIPELINE V PLOUGH

The Multipass Plough (MP) builds on SMD's reputation for the continuous development of innovative products. The MP sets the standard globally for multipass pipeline ploughing offering remotely variable multipass capability. This allows the operator to remotely adjust the spoil depth during trenching. The plough system also includes SMD advancements such as Hi-Tow points and the active share track, making the MP the most advanced pipe trenching technology in the world. Towing capability ranging 250Te, 300Te and 350Te vessel pull, combined with the track drive and jetting ensures maximum burial capability with minimal power consumption. The ploughs are also available with air tank buoyancy for minimum ground pressure.

## FEATURES

- 2x25Te to 2x75Te pipe handling capacity
- Large pitch capability
- Hi-Tow points reduce tow force requirements
- Optional active share track reduces tow force requirements
- Optional jetting on share reduces tow forces in sands
- SMD powered steering

# PIPELINE V PLOUGH

SPECIFICATIONS

GENERAL

Depth rating	1000msw
Dimensions	
Length	18.5-21.4m
Width	9.8-11.75m
height	8.5-9.65m
Weight in air (std)	140-180te
Submerged weight	125-155te
Max tow load	250/300/350te

PERFORMANCE

Trench depth	1st pass - 1.5-2.0m 2nd pass – 2.0-2.5m
Max. product diameter	700-1460mm dia.
Steering	+/- 8 deg.
Soft ground capability	5kPa at full trench depth

MECHANICAL

Construction	High strength steel chassis
Wear parts	Replaceable wear-resistant steel
Other	Stainless steel fittings and housings

TRENCHING SYSTEM

Main share	Passive blades 35 deg. V trench
Fixed mouldboards	25 deg. slope spoil heaps either side of trench
Share track	Reduces tow forces up to 80te down force up to 1400m/hr track speed
Optional jetting	150kW Plough share jetting Upgrade to umbilical and Winch Upgrade to Power and control system



# PIPELINE BACKFILL PLOUGH

The Backfill Plough (BP) builds on SMD's reputation and long history of pipeline protection. The BP sets the standard globally for pipeline stabilisation and protection through backfill. The backfill plough comes with a number of features to simplify and de-risk operations such as remotely variable mouldboard depth control, trench following front skids and steering. The ploughs are also available with air tank buoyancy for minimum ground pressure. The backfill plough can share the hydraulic surveillance and electric systems, lift point and remote intervention system with the MP (Multipass Plough) to reduce cost.

## FEATURES

- Remotely driven mouldboard depth control
- Hi-tow points reduce tow force requirements
- Trench following front skids
- SMD powered steering
- Detachable (shared) lift point, hydraulics and electronics
- Optional forward and rearward launch



# PIPELINE BACKFILL PLOUGH

SPECIFICATIONS

GENERAL

Depth rating	1000msw
Dimensions	
Length	17.8 –19.7m
Width (launch)	9.4-11.3m
Height	8.0-9.3m
Weight in air (std)	100-120te
Submerged weight	90-102te
Max tow load	120/160/200te

PERFORMANCE

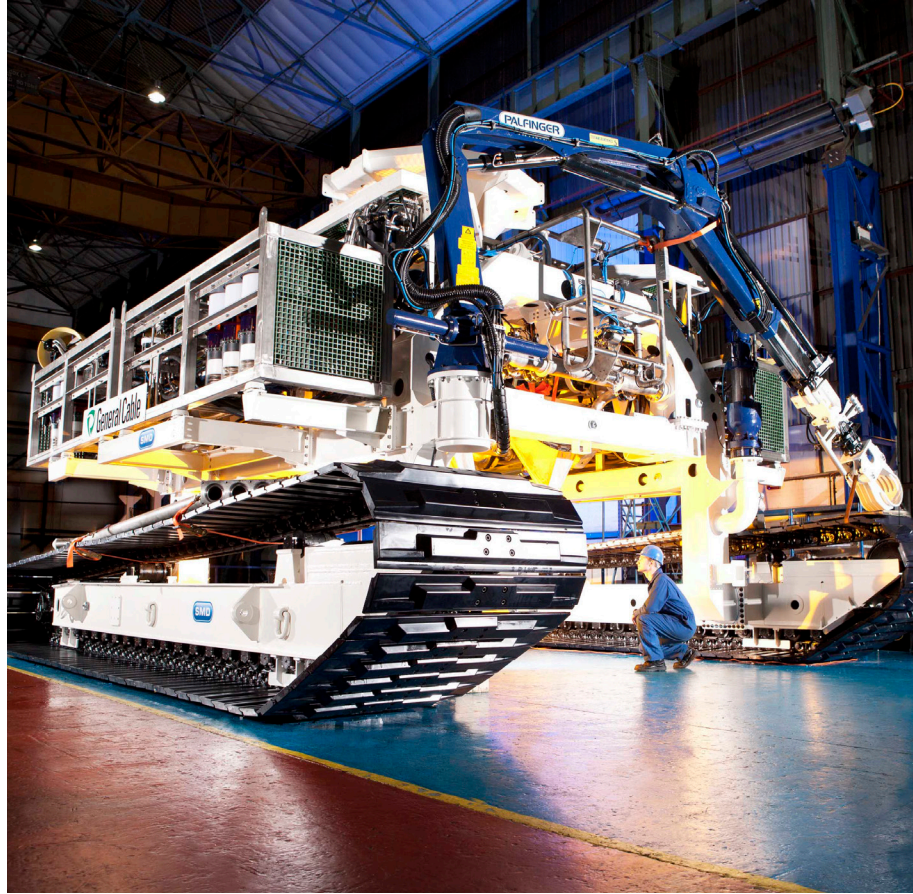
Steering	+/- 8 deg.
soft ground capability	5kPa at full trench depth

MECHANICAL

Construction	High strength steel chassis
Wear parts	Replaceable wear-resistant steel
Other	Stainless steel fittings and housings

BACKFILL SYSTEM

Mouldboards	Variable blades
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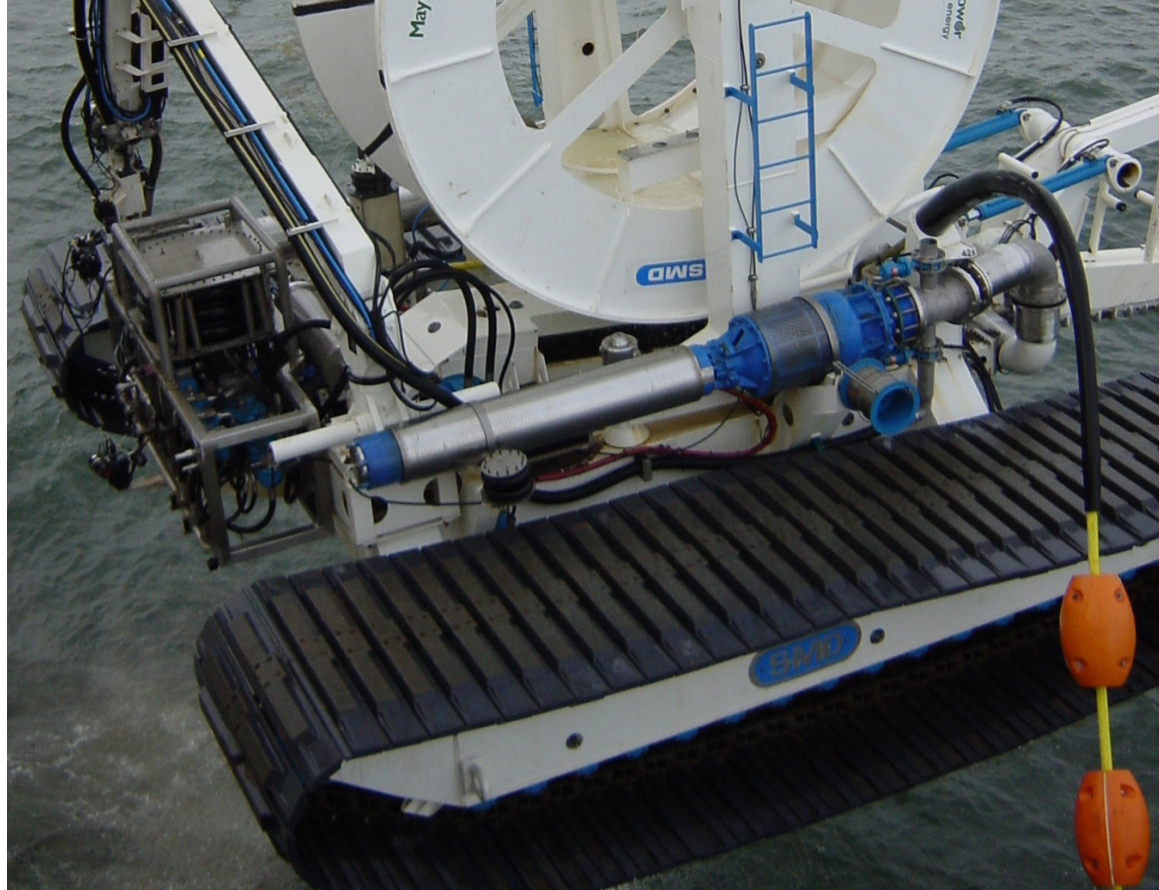
# INNOVATIVE CABLE AND PIPELINE BURIAL SOLUTION

The Cable Burial Tractor (CBT) range draws on SMD's experience of tracked vehicles, trenching and product handling subsea to provide a soft or hard ground burial solution in one neat package. The vehicle is also available as a Burial Tractor configured for pipeline burial. The CBT comes equipped with a selection of powerful chain cutter trenching tools, dredge pumps and jet legs. Well proven chain cutter deployment systems allow pre or post-lay burial of cables up to 300mm diameter and 5.0m MBR, and pipelines up to 1.5m diameter. SMD offer a turnkey, integrated solution including SMD designed high sea state launch and recovery systems (LARS) and umbilical systems.

## FEATURES

- Pre and post lay cable and pipeline burial
- 3.0m Variable jetting capability with depressor
- 2.0m to 3.0m chain cutter for hard ground up to 80MPa
- Optional fore, mid and aft dredge pumps
- 300mm max. cable/umbilical diameter with rear swords with 3.0-5.0m min. bend radius
- 1500mm max pipe diameters with pipe handling up to 75te each
- Optional 3Tem crane manipulator with tools

	BT 500	BT 800	BT 1100	BT 2100	BT 2400	BT 3200
<b>GENERAL</b>						
Depth rating	1000m	1000msw	1000msw	1000msw	1000m	1000msw
<b>Dimensions</b>						
Length (with tools)	6m	13.0m	13.5m	14.5m	17m	22.5m
Width	5.5m	6.0m	6-7.5m	7.5m	8 or 10m	13.0m
Height	12m	5.4m	5.5m	5.5m	7.5-8.5m	9.6m
Weight in air (std)	30Te	35Te	50Te	60Te	100Te or 130Te	180Te
<b>PERFORMANCE</b>						
Trench depth (jetting)	1.0-1.5m	1.0-2.0m	Variable 0 to 3.0m	1.0-3.5m	3.0-6.0m	2.5m
Max. product diameter	300mm	300mm	300mm	800mm	Up to 400mm	1500mm
Speed 0-250m/hr	Yes	Yes	Yes	Yes	Yes	Yes
Soil types						
Sand	All sands	All sands	All sands	All sands	All sands	All sands
Clays	10 to 1000kPa	10 to 1000kPa	10 to 1000kPa	10 to 1000kPa	10 to 1000kPa	10 to 1000kPa
Rock	1 to 35 MPa	1 to 40 MPa	1 to 40 MPa	1 to 80 MPa	1 to 40 MPa	1 to 80 MPa
Soft ground capability (with buoyancy)	12-20 Pa	12-20 Pa	12-20 Pa	14-25 Pa		20-40 Pa
Installed power	375Kw total, 1 x 375kW HPU	600kW total 2 x 300kW HPU	800kW total 2 x 400kW HPU	1600kW total 4 x 400kW HPU	1800kW total, 4 x 450kW HPU	2400kW total 6 x 400kW HPU
<b>MECHANICAL</b>						
High strength steel chassis	Yes	Yes	Yes	Yes	Yes	Yes
Replaceable wear-resistant steel wear parts	Yes	Yes	Yes	Yes	Yes	Yes
Stainless steel fittings and housings	Yes	Yes	Yes	Yes	Yes	Yes
<b>TRENCHING SYSTEM - MECHANICAL</b>						
Configuration –						
Wheel cutter depth	1.3m	1.5m	1.6m	2.0m & 2.2m		2.2m
Multiple 'V' chains						Yes
Separate rear jet tool		Yes	Yes	Yes		Yes
'Duplex Chain with Injector Sword					Yes	
Trench depth	1.5m	2.0m	2.0 / 3.0m	3.0m	3.5 or 6m	2 / 2.5m
Trench width	0.45m	0.5m	0.6m	0.6m	0.7m	4.0m (90 deg.)
Chain power	300kW	300Kw	400kW	800kW	1 x 800kW or 2 x 400kW	3 x 400kW
Chain width	450mm	800mm	600mm	600mm	700mm	900mm
Chain speed 0 to 4m/s	Yes	Yes	Yes	Yes	Yes	Yes
Forward dredge pump (spoil removal)	1 x 25kW 200m³/hr	1 x 50kW 400m³ /hr	1 x 75kW 600m³/hr	2 x 75kW 600m³/hr	2 x 75kW 1200m³/hr	3 x 75kW 600m³/hr
Dredge spoil backfill	Yes	Yes	Yes	Yes	Yes	Yes
Spoil fed to cover cable	Yes	Yes	Yes	Yes	Yes	Yes
<b>TRENCHING SYSTEM - JETTING</b>						
Configuration –						
Water pumps supply hyd. deployable twin-legged device either side of cable with in-built depressor.	Yes	Yes	Yes	Yes	Yes	Yes
Jetting power	2 x 150kW	2 x 200kW	2 x 300kW	2 x 300kW	2 x 400kW	2 x 400kW
Jet leg depth	2.0m	2.0m	3.0m	3.0m	: 3.0 or 6.0m	2.0m



# INNOVATIVE CABLE INSTALLATION SOLUTION

The Lay and Burial Tractor (LBT) is based on the CBT800 tractor specification and draws on SMD's experience of tracked vehicles, trenching and cable handling subsea to provide lay and burial solution in one neat package. LBT comes equipped with a powerful chain cutter, spoil dredge pump and jet legs to simultaneous lay and bury cable or post lay cable burial. LBT has a driven cable reel mounted on the vehicle itself and this means it can operate independently of the installation vessel with only the umbilical attached. This has benefits in sectors such as offshore wind farm installation, significantly reducing installation time where tidal and weather windows are often restricting. The reel can be pre-loaded and installed on the vessel, or reel-to-reel loading schemes are available.

## FEATURES

- 90V feature = 2000m x 150mm cable reel capacity
- High current stability (8 Knots)
- Simultaneous and post lay burial
- 1.0-2.0m depth jetting capability
- 2.0m chain cutter
- 250mm max. product diameter
- 1.8-2.0m min. bend radius
- Fore Dredge pump with rear trench backfill function
- 3T m crane manipulator with jet/dredge tools



	LBT 1	LBT 1100
<b>GENERAL</b>		
Depth rating	1000msw	1000msw
<b>Dimensions</b>		
Length (with tools)	13.5m	13.5m
Width	10.0m	12.0m
Height	9.0m	10.7m
Weight in air (with cable)	65Te	75-125Te
<b>CABLE REEL</b>		
Core dia.	3.0m	4-5m
Drum width	2.3m	3m
Product MBR	1.5m	2-2.5m
Cable capacity	1000m (150mm dia. max.)	2000m (150mm diameter)
Weight	4Te empty 30Te loaded	6-8Te empty (options for 40Te and 50Te)
Hyd. drive	1.5Te @ 30m/min.	
Emergency brake	Yes	Yes
Post lay burial		Yes
Dredge pump spoil removal		Yes

# SPECIAL PROJECTS

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## BESPOKE SUBSEA SOLUTIONS AND SPECIALIST HANDLING EQUIPMENT

SMD can apply expertise and experience to a wide range of problems which require a subsea remotely operated solution or specialist handling equipment. SMD has a long track record of developing innovative solutions, which mitigate risk by using, wherever possible, a standard range of components and drawing on the experience of over 350 subsea projects.

Projects undertaken include the fall pipe remotely operated vehicle (ROV) designed to control the positioning of an 800mm diameter, 2km long rock dump fall pipe with 600Kw of on board power. The system included dynamic positioning, pipe following and survey equipment.

Facilitated by over 40 years of experience in subsea engineering, SMD offer a range of specialist marine cable handling equipment, which utilises hydraulic and electric drive systems. One notable development is SMD's range of self fleeting cable drums, such as the drum cable engines (DCE's) and linear cable engines (LCE's). Both are particularly suited to handling sensitive cables.



## RESEARCH AND DEVELOPMENT PROJECTS

### MODULAR-BASED DESIGN ETHOS

SMD has employed a modular-based design ethos which enables the subsea vehicle system to be broken down into manageable key vehicle components. Each of the components is designed to be integrated with one another, allowing a larger permutation of functionalities on a singular platform while reducing customer costs.

### INTEGRATING TECHNOLOGIES

In all subsea operations, the client requires visibility, both from a data-logging perspective and a visual aspect; the latter enabling the operator/pilot to have awareness of their surrounding environment. SMD has been developing back-office systems to integrate with control systems platforms to provide data feedback and thus performing trend analyses of these systems. The condition monitoring system gives the added advantage of charting vehicle performance and improving operational stability. In terms of subsea scene analysis, SMD is currently researching capabilities with a technology provider in the aerospace industry to provide a new vision technology which penetrates obscurants and uses low processing power but produces image results in real-time and in high-resolution.

### ANALYSIS & MODELLING PACKAGES

SMD has developed an analysis and modelling package for jetting applications in various soil conditions. This model further enhances our design capabilities in terms of utilising the appropriate jet swords against parameters such as trench width, sword length, jet nozzle configuration/angle, water pressures and flows. SMD is currently developing a similar model for cutting applications.

In-line contamination  
monitor



# LARS

## FULL DECK SPREAD CAPABILITY

SMD bring years of knowledge and experience to the design and manufacture of launch and recovery systems (LARS) for some of the world's largest subsea machines to offer a range of A-frames specifically designed for handling subsea trenching equipment. All have attained Lloyds Design Approval and are tested according to Lloyds Rules.

## WIDE ANGLE A FRAME

- Large range supplied.
- Suitable for cables ploughs and trenching ROVs.
- Load ranges from 20Te sea state 6 to 75Te sea state 5.
- Can allow tow wire/lift wire to run over central sheave when A frame is in board towing.
- Can maximise outreach and vessel clearance in trenching ROV.

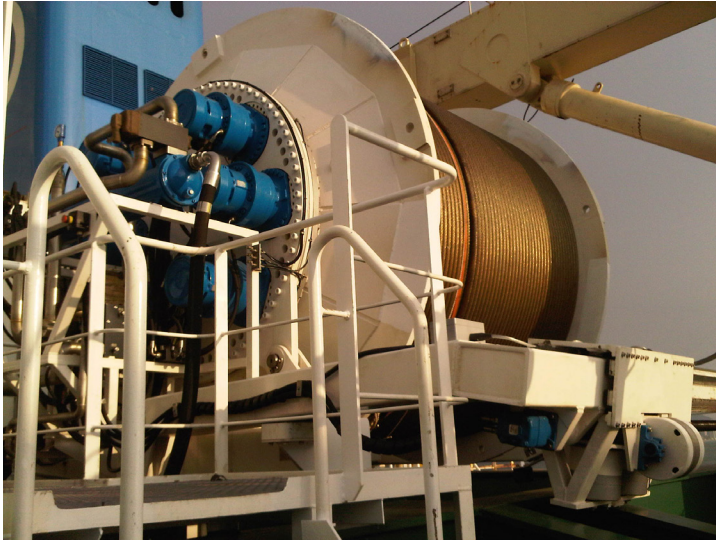


## NARROW ANGLE A FRAME

- Large range supplied.
- Suitable for trenching ROVs, tractors and pipeline plough systems.
- Load ranges from 8Te sea state 6 to 300Te sea state 5.
- Simple robust systems minimising maintenance and weight.



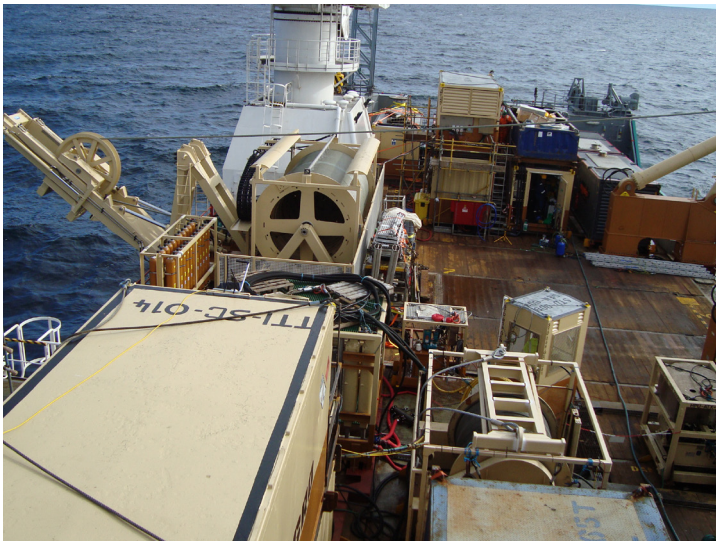




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#### TOW WINCH

- Tow capacities from 35Te to 200Te tow load.
- Incorporate fleeting systems in conjunction with render functions for various towing speeds.



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#### UMBILICAL WINCH

- Lifting umbilical winches can handle loads up to 25Te in sea state 7.
- Lifting umbilical winches are double armoured and operate from 3300 to 4500V.
- Steel wire armoured or buoyant umbilical cable handling capabilities available.
- Operating depth ranges up to 4000m.
- Non lifting umbilical winches provide power to heavy tractors, large cable ploughs and pipeline ploughs.



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#### PASSIVE HEAVE COMPENSATOR

- Supplied for lifting operations to land subsea machines from 100Te to 350Te on the sea bed in a controlled manner.
- For sea states up to and including sea state 6.
- Manual, Automatic, Slack wire and Taut wire operating modes.

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