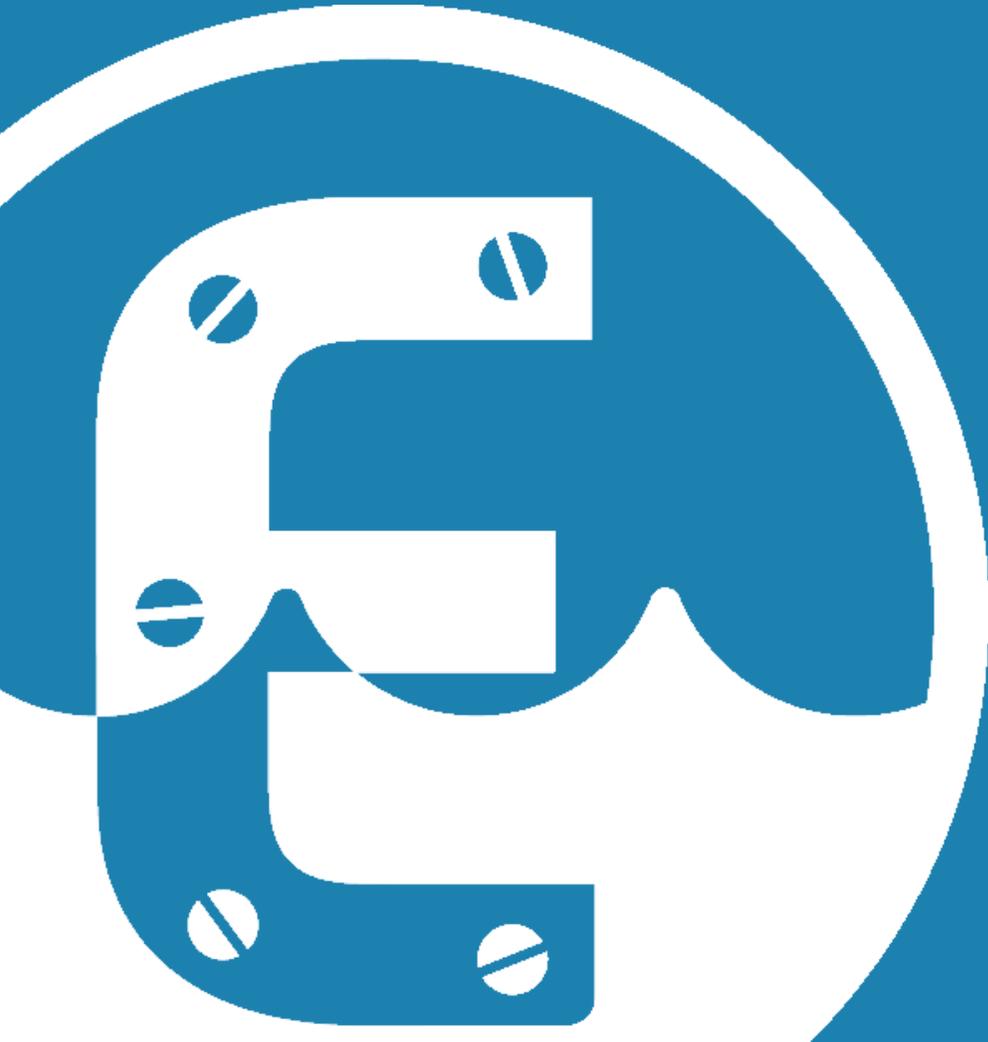




offshore
MARINE EQUIPMENT



Introducing

iRAKE SUBSEA

I RAKE SYSTEM

The i Rake is an innovative cable route clearance system which offers significant advantages over other systems available on the market without sacrificing any performance. The system increases both efficiency and speed while reducing cost and limitations of use giving it the edge over its competitors.



Utilising the i Grab control platform allows for both systems to be used together on projects meaning that any and all subsea targets can be easily cleared.



About
i Rake



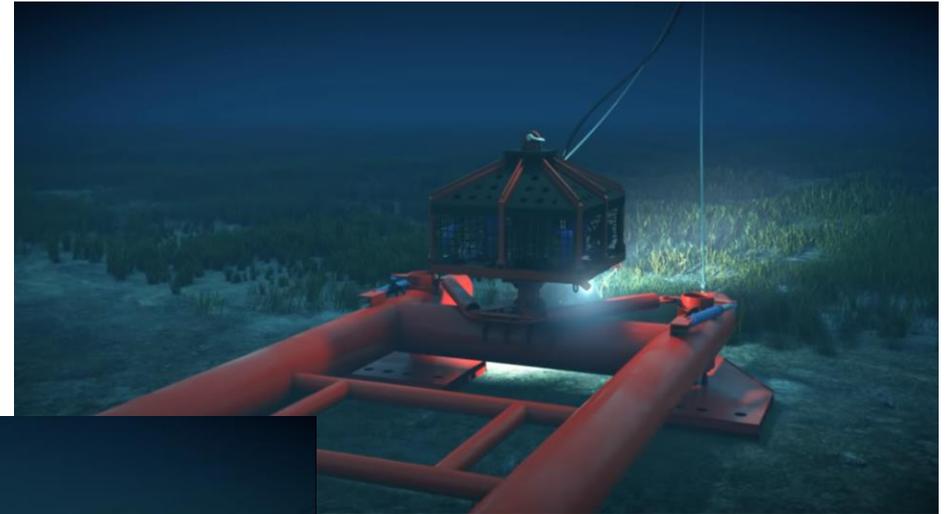
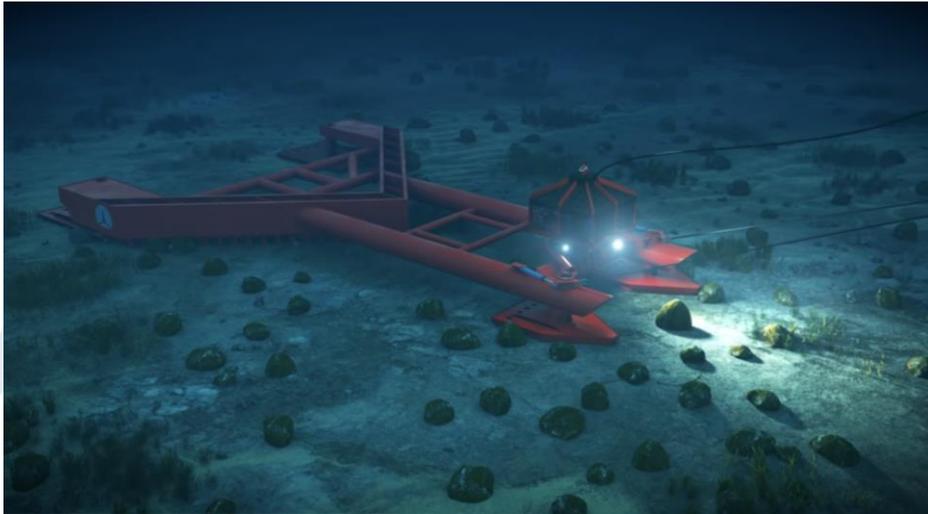
System
Advantages



Technical
Specs

I RAKE SYSTEM

A short video introduction to the system can be found [here](#).



About
i Rake



System
Advantages



Technical
Specs

IMPROVED CONTROL



About
i Rake

Steering Control

The rake can be steered in order to maintain a heading even in difficult cross current conditions and to provide a more controlled path result when compared to an un-commanded plough.



System
Advantages

Depth Control

Hydraulic elevators permits the elevation of the Rake and therefore depth the teeth operate to be set by the pilot. This also permits the amount of tow resistance to be changed according to the depth of the teeth.

The teeth can also be lifted clear of the seabed for environmentally sensitive areas.



Technical
Specs

i Grab Integration

The i Grab unit is an integral part of the i Rake.

This i Grab head unit provides telemetry, survey, live monitoring and hydraulic power control for the system.

REDUCED IMPACT



About
i Rake



System
Advantages



Technical
Specs

Reduced Environmental Seabed Damage

The majority of the seabed and seabed creatures such as crustaceans and their environments can easily pass through the teeth and under the blades meaning reduced disruption compared to a conventional plough system.

Reduced Weight

The rake will weight in approximately 50 tons. Considerably lighter to launch, recover and tow than any comparable size boulder plough. Saving on both the size of vessel required to operate the system and the size of the winch required to launch and recover.

Reduced Fuel Consumptions

The teeth of the Rake are easier to pull through the seabed when compared to a conventional plough system. Reduced towing resistance means considerably reduced fuel costs. We estimate savings of over 50% on fossil fuel burn while towing.



About
i Rake



System
Advantages



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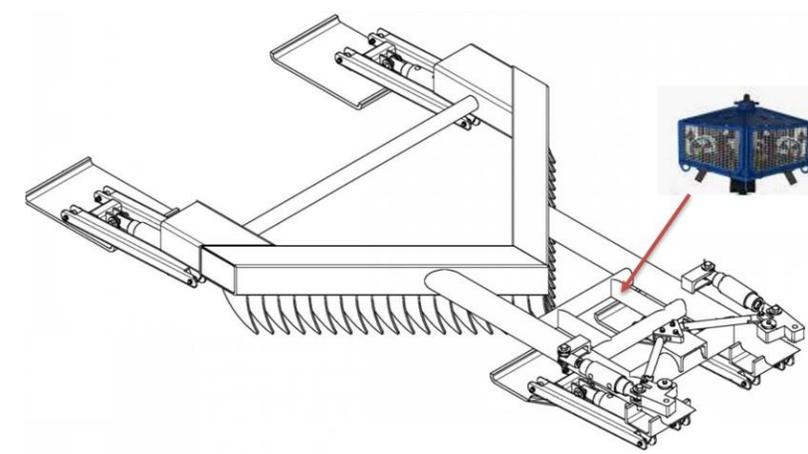
I GRAB INTEGRATION

The hydraulic grab can be easily removed leaving the top half of the i Grab. This control unit is then bolted on the front section of the i Rake to the mounting plate providing hydraulic power and full telemetry for:

- ▶ Heading
- ▶ Pitch and roll
- ▶ Angle of attack
- ▶ Hydraulic Steering
- ▶ Hydraulic depth elevation (teeth depth control)

The i Grab control unit also provides the following benefits to the i Rake for surface control:

- ▶ Subsea forward looking sonar (surface pilots can control direction)
- ▶ CCTV cameras toward seabed and onto the blades
- ▶ Subsea lighting



iRAKE

TEETH



About
i Rake



System
Advantages



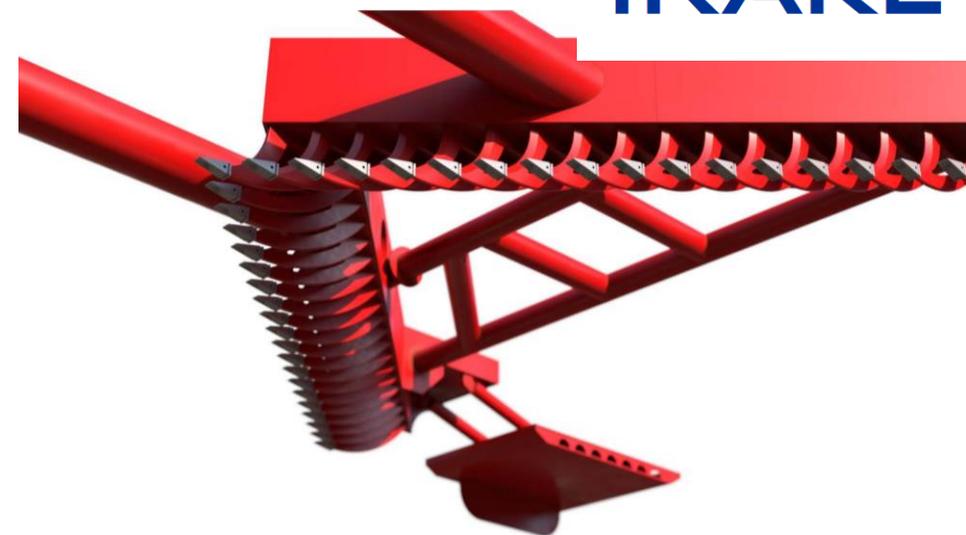
Technical
Specs

Unlike current designs of plough, the i Rake design picks out the boulders and debris, leaving the seabed environment behind.

Angled teeth penetrate the seabed instead of the whole plough which reduces tow resistance and permits the majority of the seabed to pass virtually untouched between the teeth.

The teeth are of hardened steel, similar to land excavator bucket teeth. Extremely strong and capable of deep seabed boulder extraction without damage. However, in case of unforeseen damage to teeth, they are bolted in place so can easily be replaced whilst at sea.

The teeth can be set at different gap positions so it is possible to set the size of debris or boulders which are cleared while all other smaller items will pass through the rake to be left behind.



SKIDS



About
i Rake



System
Advantages

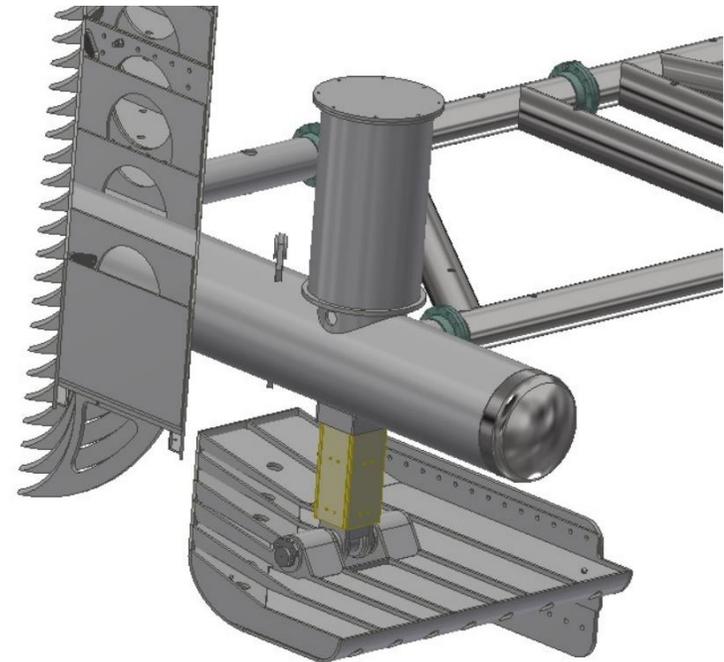
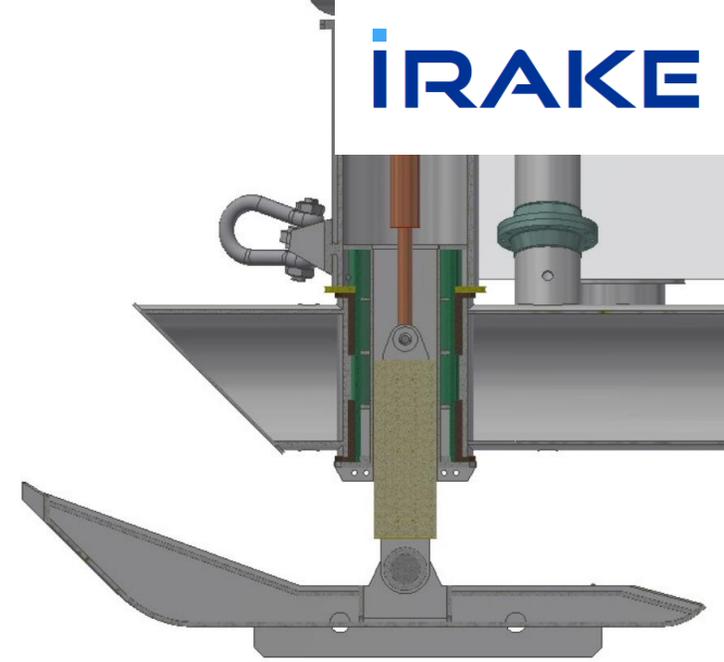


Technical
Specs

The i Rake moves along the seabed on skids which can be raised and lowered by hydraulic arms over a 300mm range.

This allows the angle of attach of the teeth to be changed to alter teeth burial and the clearance depth according to the seabed conditions and client requirements.

The front skids can be turned to steer the system using cylinders connected to a pivoting frame similar to current pipeline plough designs.





About
i Rake



System
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DECK EQUIPMENT

Umbilical Winch

The umbilical winch provides the conduit for electrical power and communications between the i Rake vehicle and control cabin. Umbilical winch provides controlled spooling in both manual and automatic (constant tension) modes. Winch hydraulic and electrical power transmitted from the control cabin power pack and switchboard via umbilical slip-rings.



Control Cabin

The Control Cabin is the main control hub for the full system and provides the following functions:

- ▶ Control of i Rake unit - Joystick, keyboard and mouse
- ▶ Monitoring of i Rake - Alarms and diagnostics
- ▶ Monitoring of sensor information – Sonars, cameras, depth & heading
- ▶ Display camera and sonar images via monitors
- ▶ Communications to crane/vessel via radio



SENSORS

The i Grab platform provides space for installation of several different types of sensor, the standard options are:

- ▶ Sonar x 2 (Teledyne Blueview P900 / GEMINI)
- ▶ Cameras x 3 (camera arrangements configurable)
 - ▶ E.g. 1 x Tritech Typhoon colour / 2 x Tornado lowlight
- ▶ USBL transponders
- ▶ Lights x 4 (Rovtech Seabeam)

These sensors can be easily monitored from the i Grab control cabin displays shown on the right.



About
i Rake



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Advantages



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REQUIREMENTS & LIMITS



About
i Rake

Electrical Power Requirements:

Component	Power Supply
i Rake Frame	440V or 2000V (Supplied by Umbilical)

Personnel Requirements:

Number	Team
1	Offshore Manager
6	i Rake Team (2x Supervisors, 4x Pilots/Technicians)
2	Survey Team (if not provided with vessel)

Other Requirements:

Item	Requirement
Crane	60 tonnes

Weather Limits:

Parameter	Condition
Sea State	4-5
Significant Wave Height	2.5 metres
Wind	30 knots
Current	3 knots max

Depth Limits:

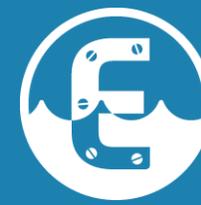
Parameter	Condition
Max Depth (determined by umbilical length)	4000m
Umbilical lengths	250m, 2000m



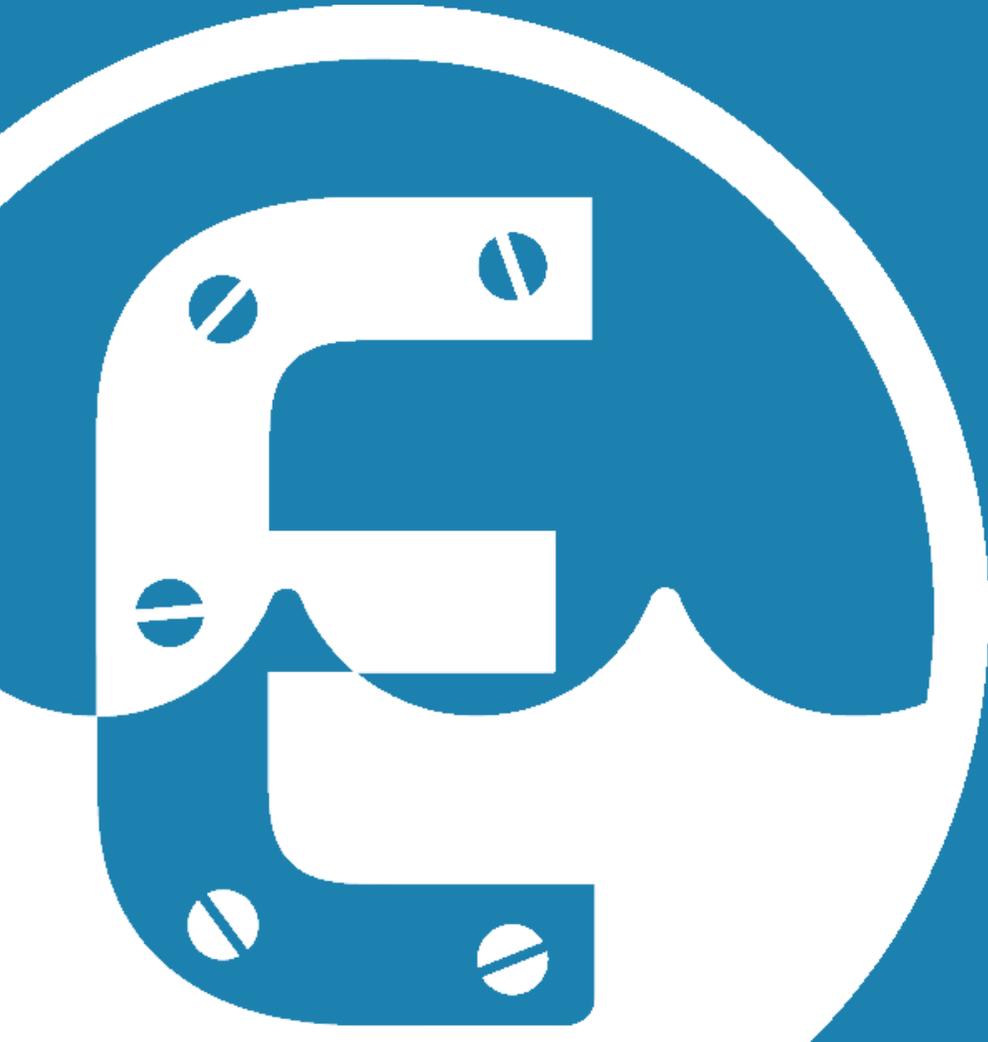
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Thank You For Your Time

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