



FULLY ELECTRIC, SILENT,
MODULAR, ZERO WIRE BREAK,
ZERO MAINTENANCE, ZERO PULL OFF



FULLY ELECTRIC. SILENT. ZERO MAINTENANCE.



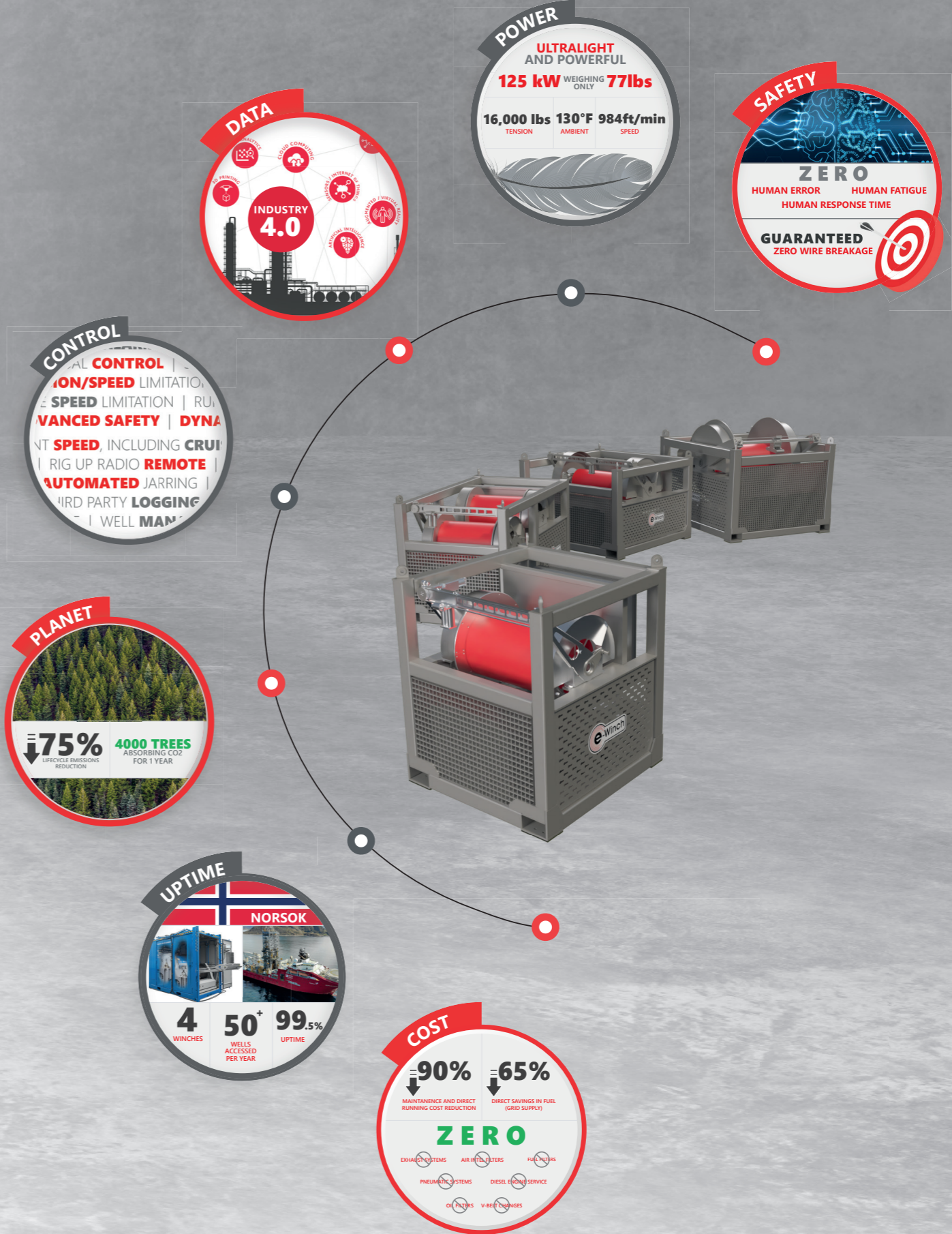
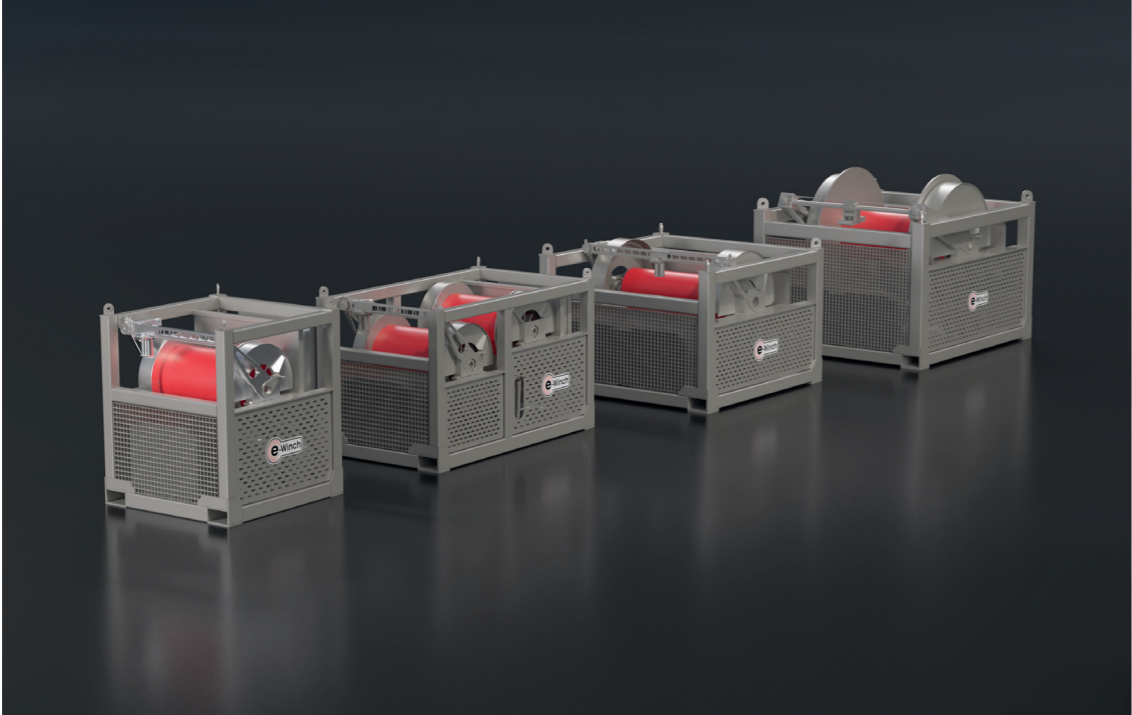
DOING MORE WITH LESS!

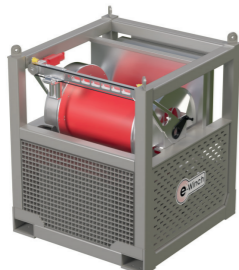
Paradigm's all electric e-Winch® technology is built upon the extensive smart conveyance product range and delivers the much-needed breakthrough in operational safety, performance and reduced environmental impact demanded in accordance with today's low-carbon operations.

The precise and smooth control of the high torque electric motors provide rapid response for fast stopping capability, instant torque delivery enabling fast acceleration and jarring as well as ultra-slow stable logging speeds.

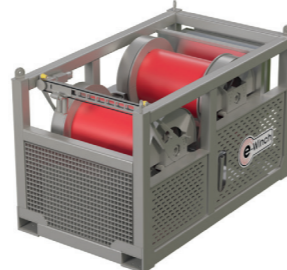
The e-Winch® system uses the latest design in compact high-power inverters and permanent magnet motors. The direct electric drive system combined with sophisticated control software, delivers the best winch control and automation available in the market today.

The software affords a high degree of safety functionality by combining automated control with operationally defined parameters, preventing overpulls, unintentional pull-offs at surface, or other unsafe situations.





e-Winch® E10 PD02



e-Winch® E20 PD02



e-Winch® E30 PD15



e-Winch® E40 PD10

SLICKLINE / FISHING / CASED HOLE					
Electrical Characteristics					
75 kW			75 kW		
380-480 V, 50-60 Hz, 125 A, 3 phases			380-480 V, 50-60 Hz, 125 A, 3 phases		
Mechanical Characteristics					
Metric	Imperial	Metric	Imperial	Metric	Imperial
< 75 dB(A) @ 1 m	< 75 dB(A) @ 3 ft	< 75 dB(A) @ 1 m	< 75 dB(A) @ 3 ft	< 75 dB(A) @ 1 m	< 75 dB(A) @ 3 ft
Hempel paint system, ISO 12944 C5-M		Hempel paint system, ISO 12944 C5-M			
Gray RAL 7030		Gray RAL 7030			
Dimensions & Weights					
1,290 x 1,325 x 1,580 mm	4.2 x 4.3 x 5.2 ft	1,290 x 2,250 x 1,388 mm		4.2 x 7.4 x 4.6 ft	
194 x 102 mm	7.6 x 4.0 in	194 x 102 mm		7.6 x 4.0 in	
1,600 kg	3,500 lbs	2,500 kg		5,500 lbs	
Environmental Limitations					
-20 to +50° C	-4 to +122° F	-20 to +50° C		-4 to +122° F	
-40 to +40° C	-40 to +104° F	-40 to +40° C		-40 to +104° F	
100%@+50°C	100%@+122°F	100%@+50°C		100%@+122°F	
Winch Performance					
Metric	Imperial	Metric	Imperial	Metric	Imperial
1:6		1:6		1:8	
PD02		PD02		PD05	
700 mm	27.56 in	700 mm	27.56 in	700 mm	27.56 in
504 mm	19.84 in	504 mm	19.84 in	260 mm	10.24 in
690 mm	27.17 in	690 mm	27.17 in	700 mm	27.56 in
513 m/min	1,683 ft/min	513 m/min	1,683 ft/min	385 m/min	1,263 ft/min
369 m/min	1,212 ft/min	369 m/min	1,212 ft/min	143 m/min	469 ft/min
1,468 kg (2,543 kg)*	3,238 lbs (5,608 lbs)*	1,468 kg (2,543 kg)*	3,238 lbs (5,608 lbs)*	1,985 kg (2,543 kg)*	4,317 lbs (5,608 lbs)*
2,040 kg (3,532 kg)*	4,497 lbs (7,788 lbs)*	2,040 kg (3,532 kg)*	4,497 lbs (7,788 lbs)*	5,271 kg (6,847 kg)*	11,623 lbs (15,097 lbs)*
0.011 m/min	0.035 ft/min	0.011 m/min	0.035 ft/min	0.008m/min	0.026 ft/min
8,600 m	28,215 ft	8,600 m	28,215 ft	n/a	n/a
10,500 m	34,450 ft	10,500 m	34,450 ft	n/a	n/a
n/a	n/a	7,620 m	25,000 ft	7,620 m	25,000 ft
n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a

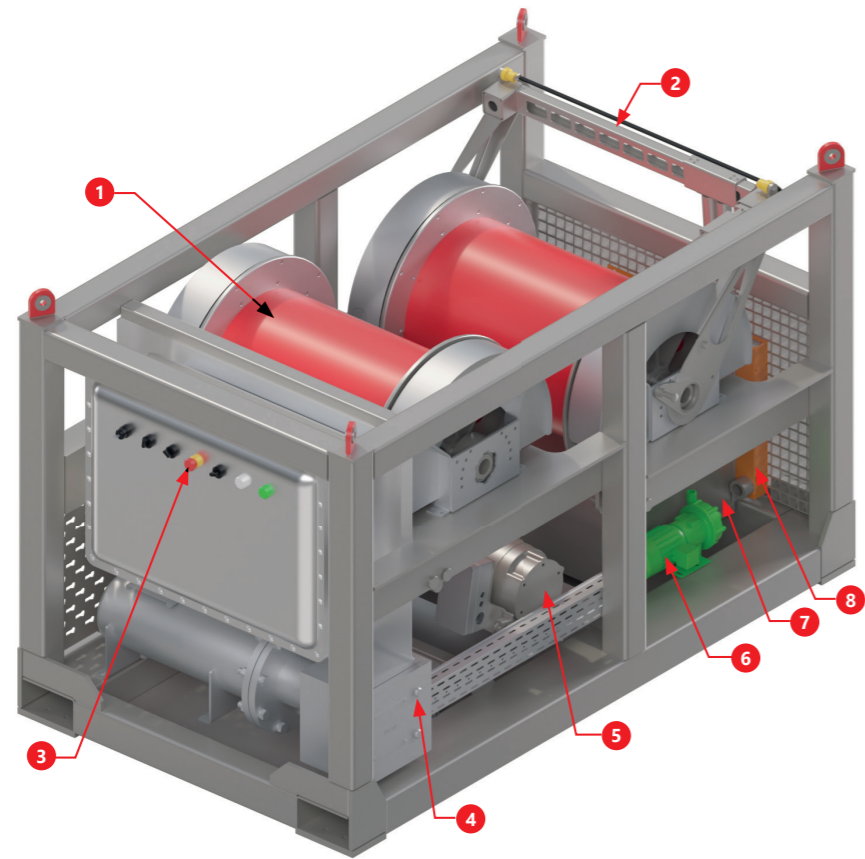
CASED HOLE		OPEN HOLE		Nominal Specification	
Electrical Characteristics					
75 kW		125 kW		Rated Power	
380-480 V, 50-60 Hz, 125 A, 3 phases		380-480 V, 50-60 Hz, 180 A, 3 phases		Electrical Connection	
Mechanical Characteristics					
Metric	Imperial	Metric	Imperial	System of Measurement	
< 75 dB(A) @ 1 m	< 75 dB(A) @ 3 ft	< 75 dB(A) @ 1 m	< 75 dB(A) @ 3 ft	Noise Level	
Hempel paint system, ISO 12944 C5-M		Hempel paint system, ISO 12944 C5-M		Corrosion Protection	
Gray RAL 7030		Gray RAL 7030		Topcoat Colour	
Dimensions & Weights					
1,990 x 2,000 x 1,580 mm	6.5 x 6.6 x 5.2 ft	1,990 x 2,400 x 1,580 mm	6.5 x 7.9 x 5.2 ft	Dimensions (W x L X H)	
194 x 102 mm	7.6 x 4.0 in	194 x 102 mm	7.6 x 4.0 in	Forklift Pocket Size	
2,700 kg	6,000 lbs	3,400 kg	7,500 lbs	Weight (With Empty Drums)	
Environmental Limitations					
-20 to +50° C	-4 to +122° F	-20 to +50° C	-4 to +122° F	Operating Temp. Range Standard	
-40 to +40° C	-40 to +104° F	-40 to +40° C	-40 to +104° F	Operating Temp. Range Arctic	
100%@+50°C	100%@+122°F	100%@+50°C	100%@+122°F	Humidity	
Winch Performance					
Metric	Imperial	Metric	Imperial	Drum and Gearbox Options	
1:22.62		1:22.62		Planetary gearbox ratio	
PD15		PD10		Drum Type	
1016 mm	40.00 in	1,400 mm	55.12 in	Drum outer diameter	
400 mm	15.75 in	550 mm	21.65 in	Drum core diameter	
1054 mm	41.50 in	1,054 mm	41.50 in	Drum width	
261 m/min	855 ft/min	259 m/min	851 ft/min	Maximum line speed at OD	
103 m/min	336 ft/min	102 m/min	334 ft/min	Maximum line speed at core	
2,803 kg (5,005 kg)*	6,181 lbs (11,037 lbs)*	2,817 kg (5,030 kg)*	6,210 lbs (11,090 lbs)*	Maximum line tension at OD	
7,120 kg (12,713 kg)*	15,699 lbs (28,033 lbs)*	7,169 kg (12,802 kg)*	15,808 lbs (28,229 lbs)*	Maximum line tension at core	
0.005 m/min	0.018 ft/min	0.005 m/min	0.018 ft/min	Minimum stable speed at OD	
n/a	n/a	n/a	n/a	Wire capacity 0.160 Slick-E-Line®	
n/a	n/a	n/a	n/a	Wire capacity 0.125" Slickline	
n/a	n/a	n/a	n/a	Wire capacity 7/32" Wireline	
11,500 m	37,730 ft	n/a	n/a	Wire capacity 5/16" Wireline	
n/a	n/a	11,700 m	38,400 ft	Wire capacity 7/16" Wireline	
n/a	n/a	10,400 m	34,100 ft	Wire capacity 15/32" Wireline	

All products, product specifications and data are subject to change without notice, to improve design, reliability, functionality or otherwise.

* Maximum line tension performance in optional boost mode (drive system limits).

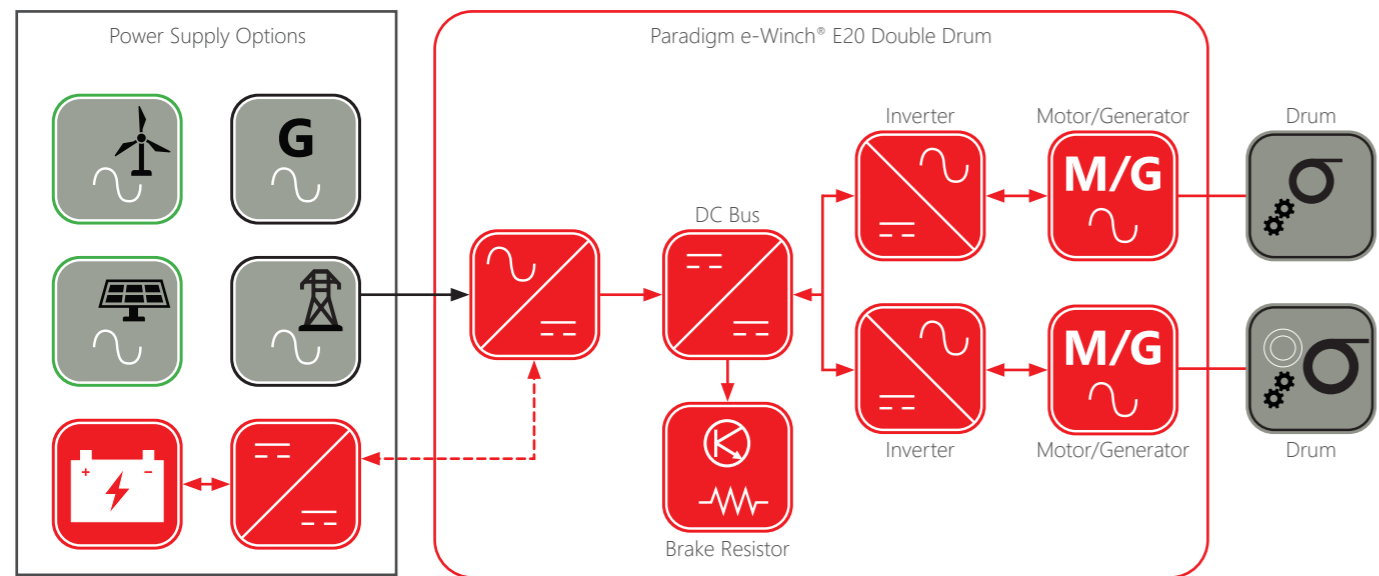


PARADIGM



e-Winch®			
1	Exchangeable Drum	5	Electric motor/gearbox and chain tensioning system
2	Level wind	6	Cooling pump
3	Ex drive and local control	7	Hydraulic brake release system
4	Brake resistor	8	Cooling system

e-Winch® Direct Electric Drive System Layout



PARADIGM SHIFT. SHIFT TO PARADIGM.

FULLY ELECTRIC. SILENT. ZERO MAINTENANCE. e-WINCH®



e-Winch® Control Options	
1	Zone 1 Control Panel
2	Suitcase Panel
3	HandHeld Remote
4	Zone 2 Panel
5	Control Chair

Power Supply

The e-Winch system's power source is adaptable, with the option to connect it either to the electrical grid, a battery pack or a generator set.

Irrespective of the available source, a power supply module and inverter perform the vital function of transforming incoming supply to a controlled voltage and current, which in turn controls the speed and torque of the motor driving the drum.

Electrical power is also generated by the winch, as the motor acts as a braking mechanism during running in

hole, decelerating or when coming to a complete stop. This power is efficiently channeled into a designated power pack from where it is either recovered to supply the drive system with recuperated energy or destroyed in the brake resistor.

Future iterations of the direct electric winch drive system are expected to offer enhanced energy recovery systems, further emphasizing the system's commitment to optimizing energy efficiency.

PARADIGM TECHNOLOGY SERVICES



PARAWINCH™

ParaWinch™ is the software package that runs the e-Winch® unit through layers of control and functionality. Due to our differentiating software capabilities we offer numerous functionalities, which are essential in realizing the operational safety and performance benefits of an electric wireline unit.

DATA RECORDING

e-Winch® data recording of all machine parameters, utilized for job analysis and optimizing of future operations.

PREDICTIVE MAINTENANCE

This enables the maintenance engineer to see equipment run hours and implement a maintenance schedule in accordance with actual usage.

OPERATIONAL DATA VISUALIZATION

Visualizes depth, speed, tension, differential depth and differential tension.

BRAKE TEST

A mandatory safety step required after each power cycle or drum change out to ensure the brake system is working correctly.

BOOST POWER

This enables the option to apply up to 80% extra torque, for a limited period.

CONSTANT TENSION

For maintaining constant cable tension for pump down or logging while drilling operations. This is independent of the position of the cable on the drum.

CONSTANT SPEED & CRUISE CONTROL

Providing constant speed functionality over the length of a well or logging pass. Delivers more accurate logging operations, also in combination with very low speeds. It includes the functionality to perform repeated automated logging passes.

DATA FORWARDING (EXTERNAL)

Forwarding of depth, tension, and speed by ethernet to company or third-party logging system.

CABLE MANAGEMENT

This feature provides the possibility to track cable usage. This gives insight on which cable sections are being used more heavily than others. Cumulative Feet-Over-Wheel (FOW) is also tracked.

MANUAL CONTROL

The e-Winch® is manually controlled via a joystick.

DOWNHOLE/SLICK-E-LINE® DATA VISUALIZATION

Visualization of parameters, well pressure, well temperature, CCL tool position and downhole tension.

ADVANCED SAFETY

This gives the option to input the results from pre-job-simulation software, ParaRun™. The e-Winch® will then automatically reduce its speed, taking account of wellbore in the well. Warning messages are presented to the operator should there be notable anomalies between the actual and theoretical tension profile while running in hole. Action can then be taken to avoid issues later in the operation.

REMOTE CONTROL ETHERNET

Enabling a logging engineer to remotely change setpoints like 'depth to go' or 'speed to run at'. Safety measures are always maintained within the winch control system. The logging engineer can be in the logging cabin but can also be remote.

HANDHELD RIG-UP REMOTE CONTROL

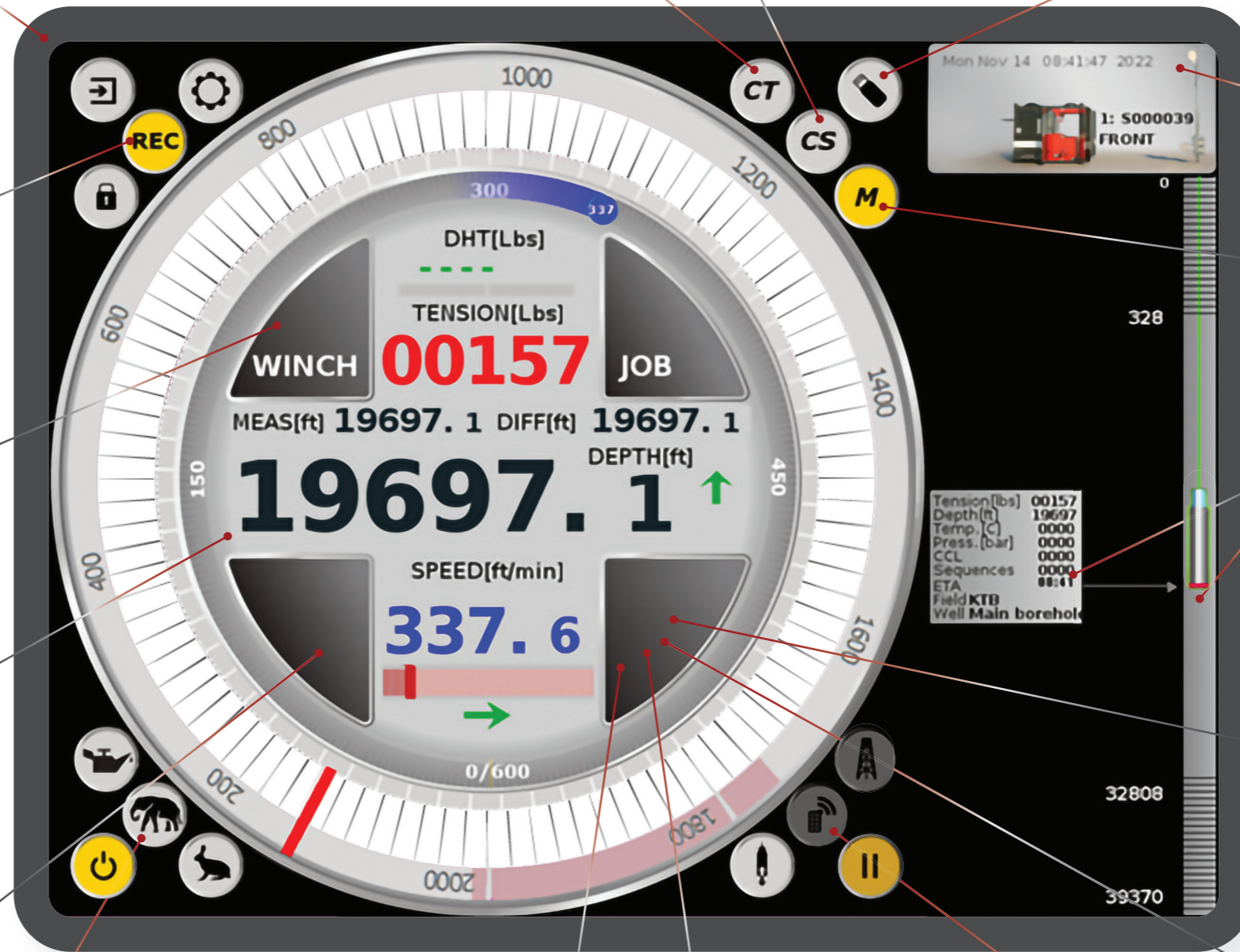
Enabling control of the winch during job preparation and rig-up/rig-down via a handheld device

OPERATIONAL SAFETY

The system is checking its fundamental inputs, such as depth, speed and tension, drum rotation, temperature and incoming power. In case of issues, the system will take action and warn the operator.

ALARM & SAFETY SHUTDOWN

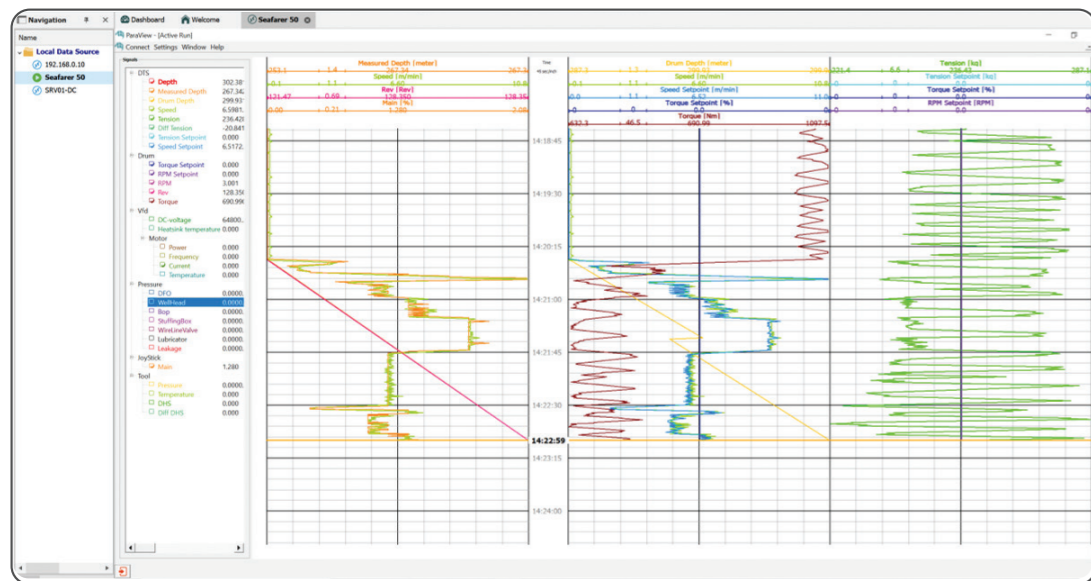
The company-specific policy for running speed, max. cable tensions and other operational limits can be entered into the system databases. During operations, the operator is not able to exceed those limits. Speed can be limited, both RIH and POOH, in surface area, well area and the total depth areas.



Live Data Forwarding

All live operational winch data can be forwarded by ethernet to a dedicated software package called ParaView™. This desktop application runs on any standard Windows PC and displays data plots in time- or depth-based views.

The plot can be paused, interrogated and exported, and it can be used locally in the cabin or remotely via an internet connection. Ideal for remote support or observation.

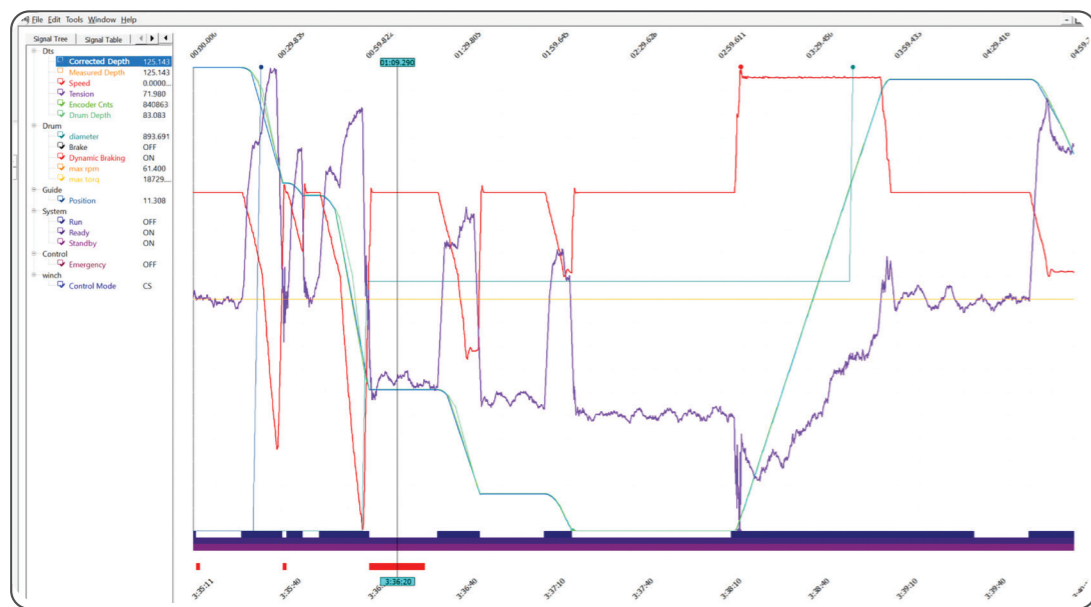


ParaView™ Desktop Application - Screen Shot

Post-Job Data Analysis

For post-job data analysis full data sets can be imported in to a separate Windows desktop app ParaChart™. In addition to operational data, ParaChart™ also plots

technical winch data for detailed job analysis and training purposes. The plots can be paused, inspected, exported and can be accessed locally or remotely.



ParaChart™ Desktop Application - Screen Shot

i-Winch® Technology

The i-Winch® 75 system uses the latest design in compact high-power inverters and permanent magnet motors. Sophisticated drive control software allows for precise and smooth control of the liquid cooled high torque electric motors.

instant torque delivery enabling fast acceleration and jarring as well as ultra-slow stable logging speeds.

The software affords a high degree of safety functionality by operator defined parameters, to prevent overpulls, unintentional pull-offs at surface or other unsafe situations. The i-Winch® 75 system hardware is fully compatible and pre-prepared for Paradigm's real-time Slick-E-Line® conveyance system.

The direct electric drive system delivers the best winch control and automation available in the market today, providing rapid responses for fast stopping capability,

SlimLine™ Drive System Technology Comparison

	SlimLine™ Diesel	i-Winch® Electric
Performance		
Installed Power	54 kW	75 kW
Machine Efficiency	65 %	85 %
Power at the Drum	35 kW	64 kW
Energy Supply Efficiency	30 % (diesel engine)	60 % (grid supply)
Acceleration	1 m/s ²	3 m/s ²
Speed Control	+/- 1 m/min	+/- 0.1 m/min
Noise (at the operator position)	<82 dB (A)	<75 dB (A)
Automatic Jarring and Logging	✗	✓
Constant Speed with Cruise Control	✗	✓
Indoor Unventilated Operation (shop spooling)	✗	✓
Advanced Tamperproof Safety & Data Recording	✗	✓
Energy Recovery System (RIH & Deceleration)	✗	✓
Energy Consumption On-Demand	✗	✓
Full Remote Control	✗	✓
Reduced CO2 emissions	✗	✓
Reduced Daily Running Costs	✗	✓
Reduced Yearly Maintenance Costs	✗	✓
Guaranteed Zero Line Breakage	✗	✓
Increased Power at Drum	✗	✓
Improved Overall Efficiency	✗	✓
Low Noise Pollution	✗	✓
Environmental Emissions & Impact*		
Direct machine exhaust CO2 emissions (nominal)	20 kg/hr	0 kg/hr
Direct machine exhaust CO2 emissions (per 8 year/5000 hour asset operating life)	100000 kg	0 kg

*Exhaust gas emissions



ADDITIONAL PARADIGM PRODUCTS THAT POWER THE FUTURE...



PARACOMM

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Please note that e-Winch® technology and components are covered by worldwide patents.

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