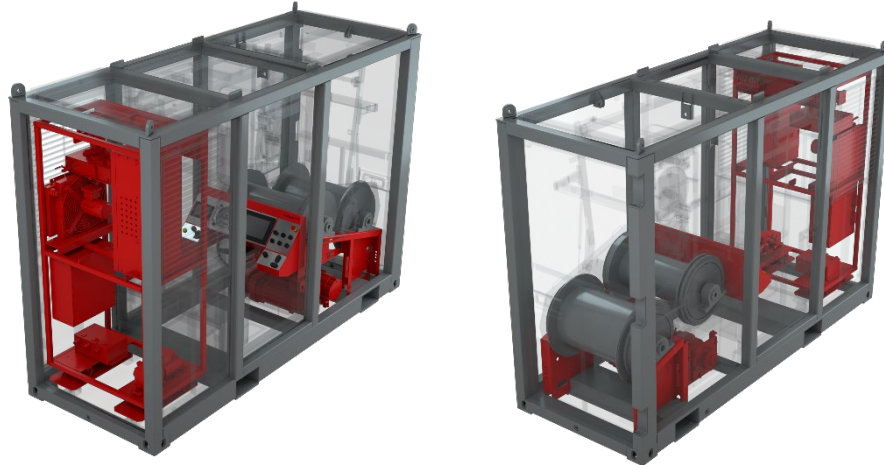


The i-Winch[®] 75 SlimLine[™] Plug-In gives next generation electric drive technology directly into an existing ASEP SlimLine[™] winch.

Upgrading with the i-Winch[®] 75 maintains the same ease-of-use inherent to the original SlimLine[™] unit, whilst converting it to a simple electrical Plug-In system that delivers guaranteed performance with zero wire breakage, zero pull-off, zero maintenance, zero operational carbon footprint.

Paradigm's all electric i-Winch[®] technology is built upon the extensive intelligent conveyance product range and delivers the much-needed breakthrough in operational safety, winch performance and environmental impact reduction demanded in today's low-carbon operations.



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. The direct electric drive system delivers the best winch control and automation available in the market today, providing rapid responses for fast stopping capability, instant torque delivery for fast acceleration and jarring, and ultra-slow stable logging speeds. The software affords a high degree of safety functionality by operator defined parameters, to prevent overpulls, 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.

Applications

- Slickline mechanical services
- Efficient wireline operations
- Digital Slickline operations
- Heavy duty fishing operations
- Cased hole logging services

Benefits

- Minimize crew requirements
- Ultra-slow logging speeds
- Unmatched jarring performance
- Energy efficient, no hydraulic system losses
- No operational emissions
- Reduced environmental risks
- Low cost of ownership
- Maintenance free with high uptime
- Low noise

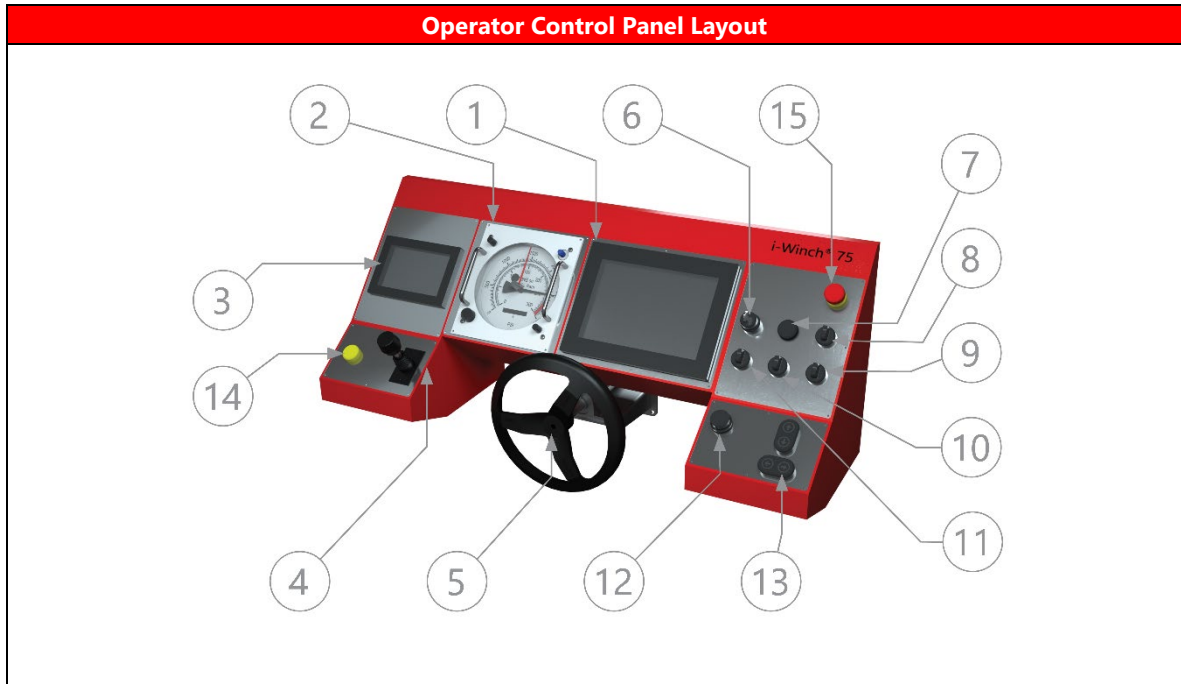
Features

- Standard joystick control
- Electronic depth, tension and speed visualization
- ATEX/IECEx Zone 2 certified drive system
- Advanced safety functionality
- Remote monitoring and operation
- Real time remote support
- Continuous operation
- Automatic brake function test
- Slick-E-Line[®] compatible

Directives & Certifications

- Machinery directive 2006/42/EC
- ATEX directive 2014/34/EU
- Low voltage directive 2006/95/EC
- Electromagnetic compatibility 2004/108/EC

Scope of Supply	
Plug-In Powerpack Module	
1	AC power supply and control enclosure
2	Dual inverter and DC supply enclosure
3	Cooling system
4	Brake resistor enclosure
5	Winch brake control system
6	Shock mounted plug-in frame
Winch Drive	
7	Modified drum mount
8	Dual electric motor/gearbox mounting system
9	Rear drum planetary gearbox, ratio 1:6
10	Front drum planetary gearbox, ratio 1: 8
11	Electric permanent magnet motors
12	Control panel

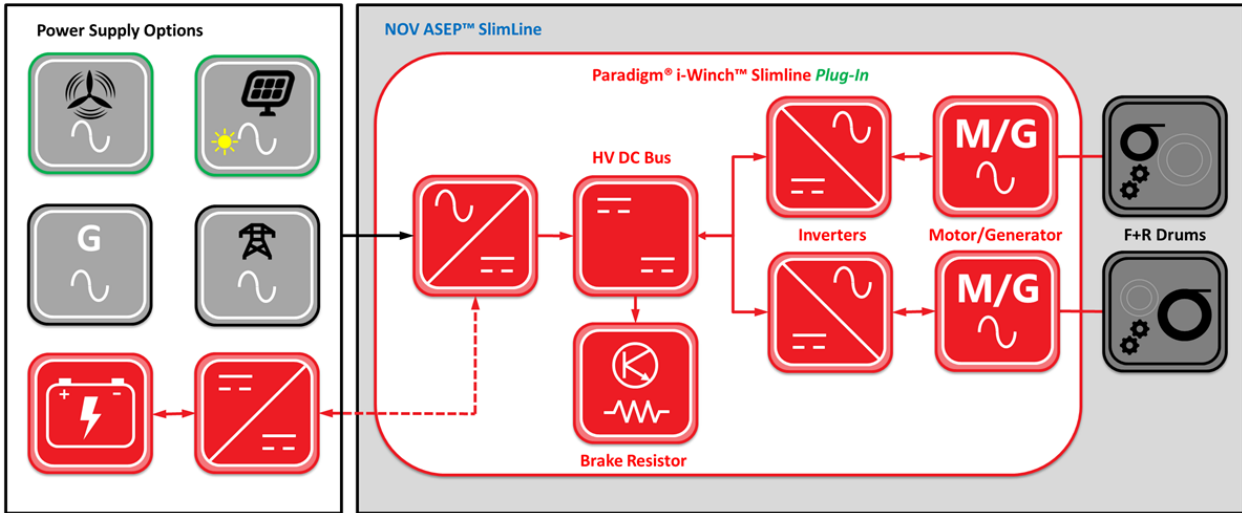


Control Panel

1	12" Paracomm™ Data processing panel (optional, part of Slick-E-Line® system)
2	CombiGauge™ (original part of SlimLine)
3	7" electric drive system display
4	Joystick for winch speed and direction control
5	Steering wheel level wind control (original part of SlimLine)
6	Winch on / off
7	Winch stop
8	Winch speed mode settings (slow/normal/jarring/boost)
9	Winch control mode settings manual/automatic/rig-up remote (optional)
10	Winch rear/front drum selection
11	Brake on / off
12	Line tension control/Torque control
13	Automatic level wind control override (optional)
14	Electric horn
15	Emergency stop



i-Winch® Electric Drive System Layout for a Dual Drum SlimLine™ Winch.



The i-Winch® system power supply can be connected to either the grid or a generator set. The power supply converts the AC supply to a DC voltage on a common DC-bus. The motor inverters connected to the common DC-bus convert the DC voltage to a controlled AC voltage and current to control the speed and torque of the motor driving the drum.

When the winch is running in hole the load on the cable/winch is driving the motor, and the motor acts as a generator feeding the power generated back to the DC-bus, and if needed into the brake resistor. Energy recovery systems will also be available on future versions of Paradigm’s electric winch drive systems, maximizing the energy efficiency of well intervention winch systems.

Nominal Specifications* – i-Winch® 75		
	Metric	Imperial
Drive performance		
Rated Power	75 kW	
Electrical characteristics		
Input voltage	360 – 480 V	
Input frequency	48 – 63 Hz	
Input current at 400 V	125 A (32A)**	
Electrical connection	3 phases, 4 wires	
Mechanical characteristics		
Noise level	< 75 dB(A) @ 1 m	< 75 dB(A) @ 3 ft
Temperature limitations		
Operating temperature range Standard	-20 to +40° C	-4 to +104° F
Operating temperature range Arctic	-40 to +40° C	-40 to +104° F
Operating temperature range Desert	0 to +50° C	+32 to +122° F
* Paradigm equipment, software and specifications are nominal and subject to change without notice to improve design, reliability, function or otherwise.		
**Workshop connection can be limited to 32A for system testing, wire (re)spooling, training and software upgrades.		

i-Winch® 75		
	Metric	Imperial
Winch performance		
Rear drum position		
Planetary gearbox ratio	1:6	
Drum type	SC06, NOV Elmar	
Drum outer diameter	600 mm	23.62 inch
Drum core diameter	350 mm	13.78 inch
Drum width	700 mm	27.56 inch
Maximum line speed at OD	466 m/min	1,463 ft/min
Maximum line speed at core	260 m/min	853 ft/min
Maximum line tension at OD	1,572 kg (2,495 kg)***	3,466 lbs (5,502 lbs)***
Maximum line tension at core	2,695 kg (4,277 kg)***	5,942 lbs (9,432 lbs)***
Wire capacity 0.125" Slickline	10,500 m	34,450 ft
Front drum position		
Planetary gearbox ratio	1:8	
Drum type	BC06, NOV Elmar	
Drum outer diameter	700 mm	27.56 inch
Drum core diameter	260 mm	10.24 inch
Drum width	700 mm	27.56 inch
Maximum line speed at OD	390 m/min	1,280 ft/min
Maximum line speed at core	145 m/min	476 ft/min
Maximum line tension at OD	1,796 kg (2,852 kg)***	3,961 lbs (6,288 lbs)***
Maximum line tension at core	4,837 kg (7,677 kg)***	10,665 lbs (16,929 lbs)***
Wire capacity 7/32" Wireline	7,620 m	25,000 ft
Drum type	PD02, Paradigm	
Drum outer diameter	700 mm	27.56 inch
Drum core diameter	504 mm	19.84 inch
Drum width	690 mm	27.17 inch
Maximum line speed at OD	390 m/min	1,280 ft/min
Maximum line speed at core	145 m/min	476 ft/min
Maximum line tension at OD	1,796 kg (2,852 kg)***	3,961 lbs (6,288 lbs)***
Maximum line tension at core	2,495 kg (3,961 kg)***	5,502 lbs (8,733 lbs)***
Wire capacity 7/32" Wireline	8,600 m	28,215 ft
*** Maximum line tension performance in optional boost mode (drive system limits).		

Optional Hardware

- Zone rig-up remote radio winch control
- Alternative planetary gear ratio
- Slick-E-Line® integration and hardware
- Slick-O-Line® integration and hardware
- Automatic level wind control
- 12" depth, tension and speed display
- 12" data processing/logging panel
- ATEX/IECEx Zone 1 certified drive system
- Alternative supply voltages
- Well control functions
- Well control pressure sensors
- Ambient temperature options, desert, arctic

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 CO ₂ emissions	✘	✓
Reduced Daily Running Costs	✘	✓
Reduced Yearly Maintenance Costs	✘	✓
Guaranteed Zero Line Breakage	✘	✓
Increased Power at Drum	✘	✓
Improved Overall Efficiency	✘	✓
Low Noise Pollution	✘	✓
Cost of Ownership (Maintenance)		
Fluid level checks	Daily	Daily
Exhaust gas cooler cleaning	Every 300 hours	Never
Exhaust flame arrester cleaning	Every 300 hours	Never
Exhaust spark arrester cleaning	Every 300 hours	Never
Air, fuel, oil filters change	Every 300 hours	Never
V-belt change	Yearly	Never
Air inlet safety valve service and calibration	Yearly	Never
Pneumatic air system service	Every 600 hours	Never
Diesel engine service (valves, fuel pump)	Every 600 hours	Never
System sensor calibration	Yearly	Yearly
Coolant pump service	Yearly	Yearly
Electrical System Check (CompEx or equivalent)	Yearly	Yearly
Yearly maintenance cost (for Diesel engine, Zone 2 exhaust kit, hydraulic system)	\$ 15.000,00	\$ 0,00
Environmental Emissions & Impact[#]		
Direct machine exhaust CO ₂ emissions (nominal)	20 kg/hr	0 kg/hr
Direct machine exhaust CO ₂ emissions (per 8 year/5000 hour asset operating life)	100000 kg	0 kg
[#] Exhaust gas emissions		

Paradigm i-Winch[™] software is part of Paradigm's well intervention software suite for intelligent conveyance, ParaWinch[™]. The basic i-Winch[™] software functionality can be extended with optional features and functions. These extra features and functions can be enabled with specific software licences and additional software products.

Basic control, visualization, safety and data recording functions

- Manual winch control
- Depth, tension and speed visualisation
- Job/Run data recording
- i-Winch[™] system data recording
- Configurable system alarms
- Brake test
- Level wind control
- Sound alarm
- Shutdown alarm

Optional safety functions

- Tension and speed limits
- Differential tension safety
- Well section speed limits (limitations of line speed at certain well sections)
- Dynamic braking (feature to have extra safety in place to avoid line breakages in case of a complete black out of the GPS systems on a vessel)

Optional control functions

- Constant speed and cruise control (providing constant speed functionality over the length or section of a well, including the ability to perform repeated automated logging passes)
- Constant tension (maintaining a constant tension on the line)
- Automated Jarring (accurate and repeatable jarring movements with simple control and full safety online)
- Boost Power (enables an option to apply extra torque, approximately +100%, for a short time period)
- Rig-up remote control (device to control the winch from the well head)
- Remote control (ethernet) (enabling a logging engineer to remotely change setpoints in logging mode whilst safety measures are always maintained at local level)

Optional data recording, visualization, connection and integration functions

- Third party logging system (facility to send and receive run data to and from a non-Paradigm logging system)
- Fieldbus connectivity (customer system)
- ParaView[™] live data trending (facility for remote support and live job presentation in any location in the world)
- Slick-E-Line[®] integration (facility to integrate Paradigm's Slick-E-Line[®] technology into the i-Winch[™])

Optional software products

- ParaLife[™] Line management (feature to track line usage, recording data such as: lengths, tension patterns, jarring, bends, wire cut back, hot spots, running hours of lines, measuring head, drums, i-Winch systems)
- ParaRun[™] Run predictor Interface with advanced safety (automated torque adjustment relative to existing conditions, option to have the data available live at the winch panel)