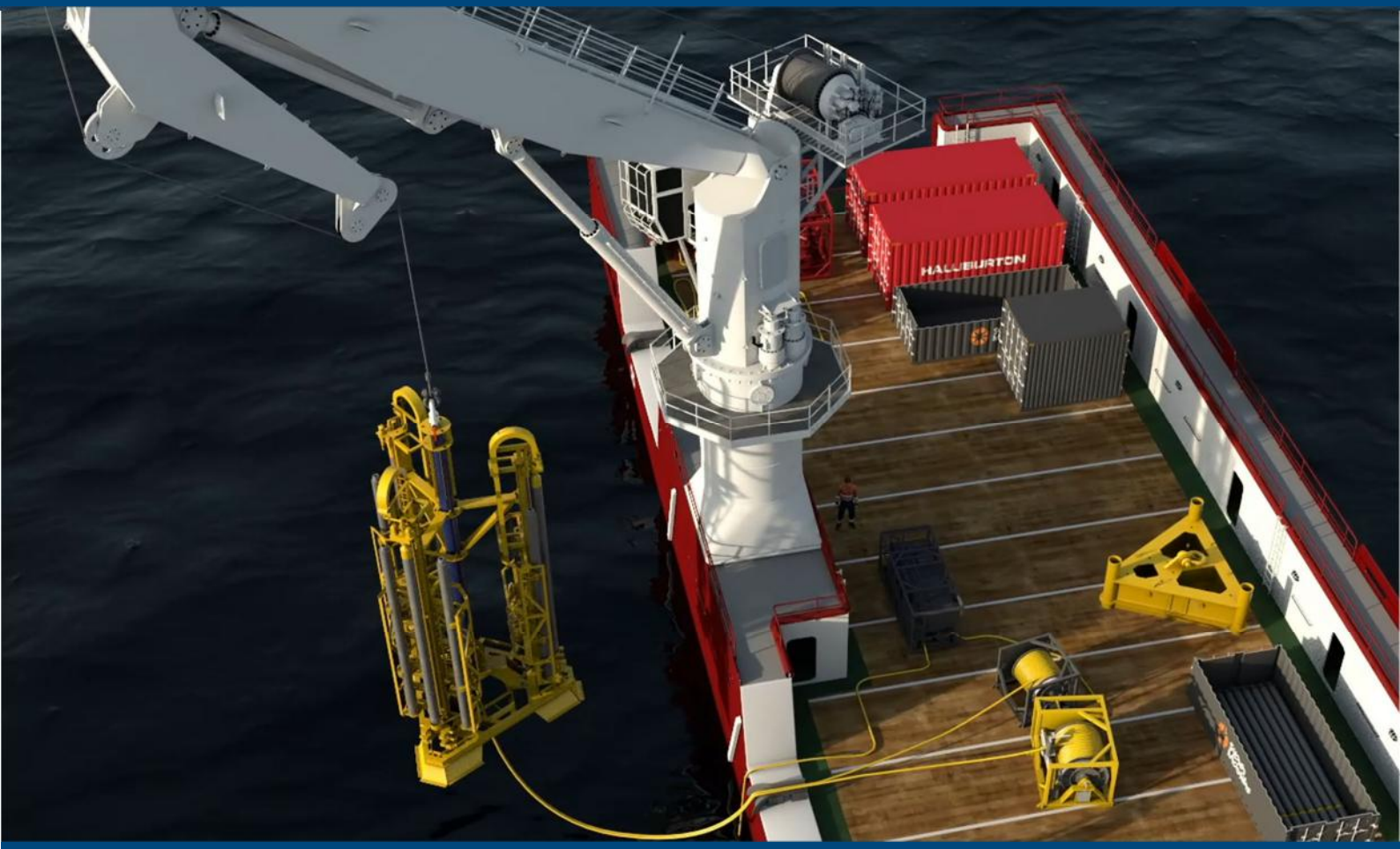
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CASE STUDY

Subsea Micropiling Drill Rig



MJR has a long standing relationship with Subsea Micropiles, who are leading the way as a pioneer of advanced foundation technologies designed to lower the impact and cost of secure anchoring in complex seabed conditions, essential for offshore structures. Working closely with Subsea Micropiles MJR has developed and successfully delivered a high performance surface and subsea power and control system platform with sophisticated telemetry, instrumentation and control software.

This collaboration underscores MJR Power & Automation's commitment to delivering bespoke electrical power conversion and automation solutions tailored to the unique challenges of subsea environments. By partnering with Subsea Micropiles MJR joins its engineering consultancy, turnkey design, procurement, construction, and installation expertise with the Customers pioneering technology in an important strategic partnership to advance the efficiency and safety of subsea operations.

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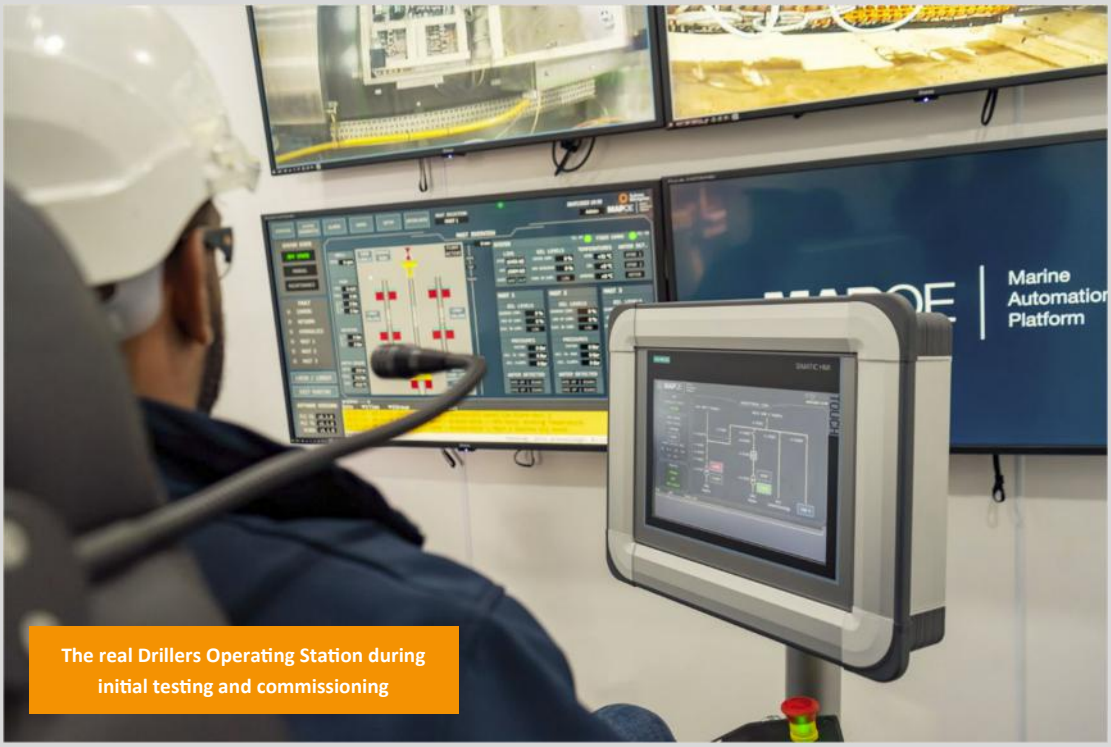
Concept Model of Drillers Operating Station

MJR's scope of work was to provide a turnkey design, build, supply, installation and commissioning package covering all aspects of the electrical power, control, software, telemetry and monitoring of the subsea drilling rig. Including all of the topsides and subsea equipment. The scope of supply included the following:

- **DNV 2.7-1 Approved ISO 20' Control & Power Van with MV PDU for Subsea HPU**
- **Redundant Drilling, Subsea Control System & Data Logging Package**
- **Comprehensive Subsea Sensor & CCTV Package**
- **Subsea Pods & Pressure Compensated Oil Filled I/O Stations**
- **All Subsea Harnesses**
- **Electrically Driven Umbilical Winch**
- **Installation & Commissioning**
- **Remote Access to the entire Control System via 5G Industrial Router with encryption. Also via Vessel VSAT during Offshore Operations**

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The real Drillers Operating Station during initial testing and commissioning



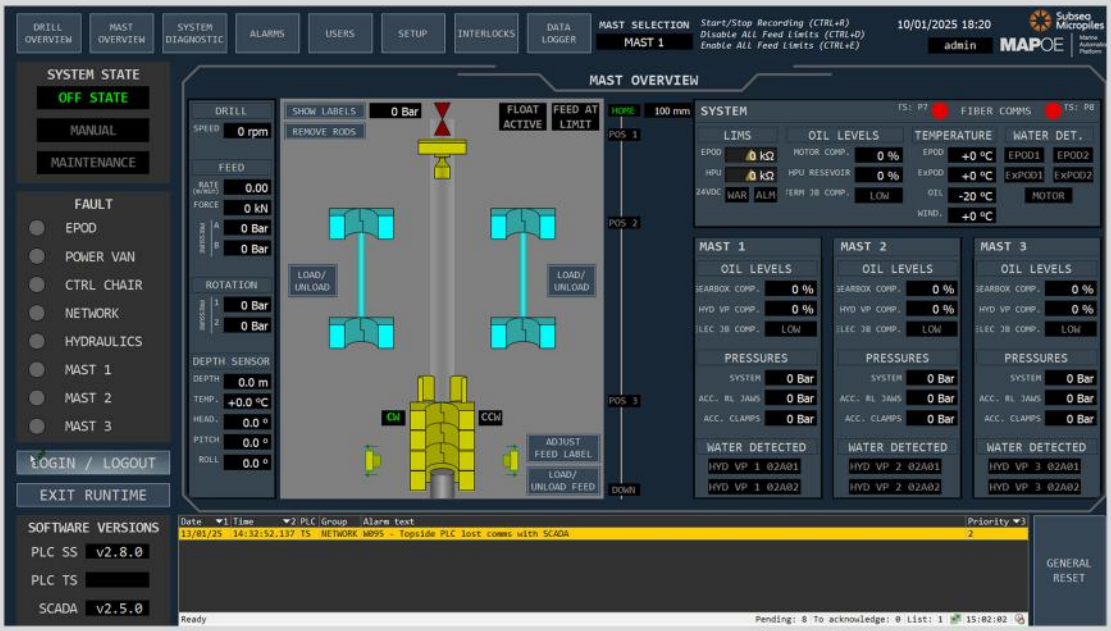
Drilling Overview Screen

At the heart of the system is MJR's bespoke Drilling software platform, developed in close collaboration with Subsea Micropiles and with features more normally associated with much larger drilling systems found on deepwater mobile drilling units and drillships. Real time animation provides the Driller with visual status of the drilling operation and pile position, and live visual data streams provide feedback on performance. All data is logged and both the data and the operation can be accessed and monitored onshore.

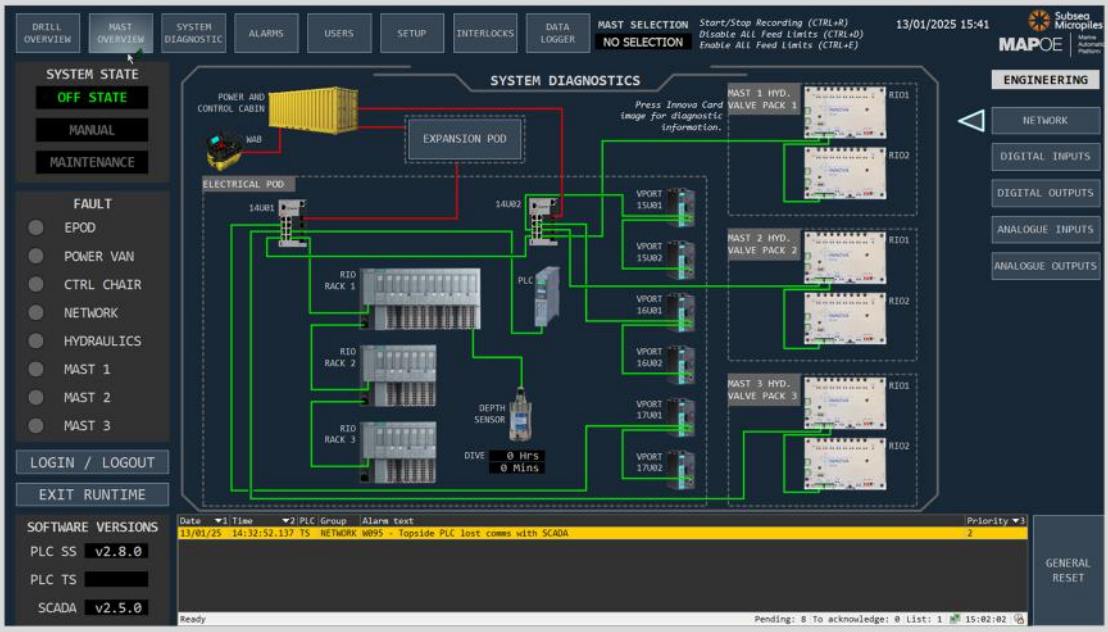
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'Mast Overview' presents a full overview of the subsea system. A dynamic visual representation of the selected mast and drilling position is shown on the Drill View, together with real time process values.



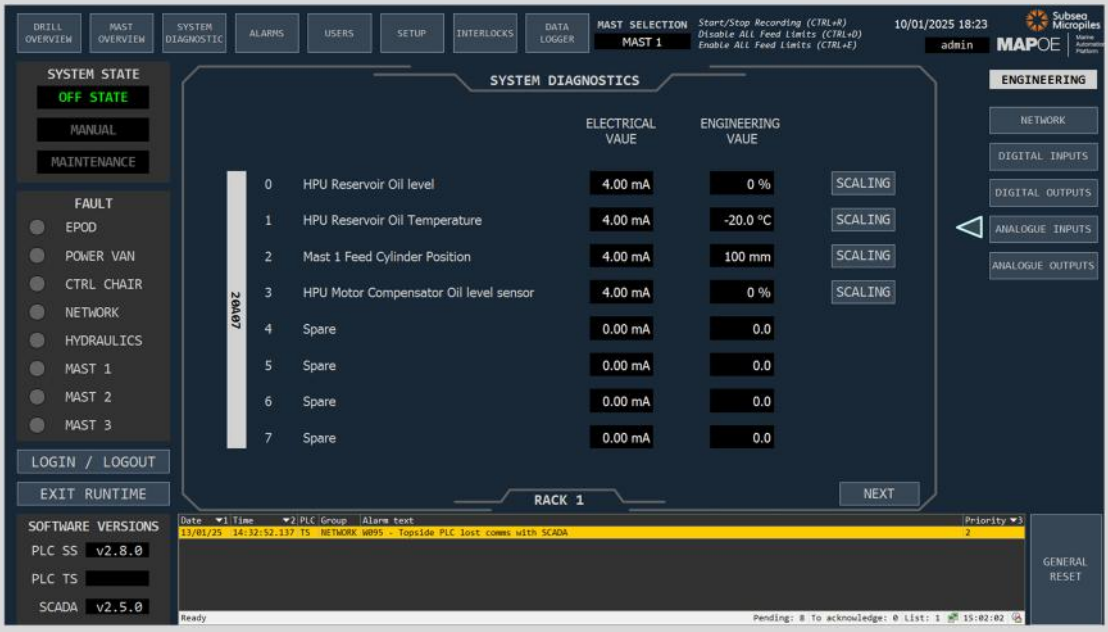
Extensive real time network diagnostics are provided that detect any anomalies on the network and indicate these graphically on the network overview page to lead the Technicians intuitively to the source of any problem.

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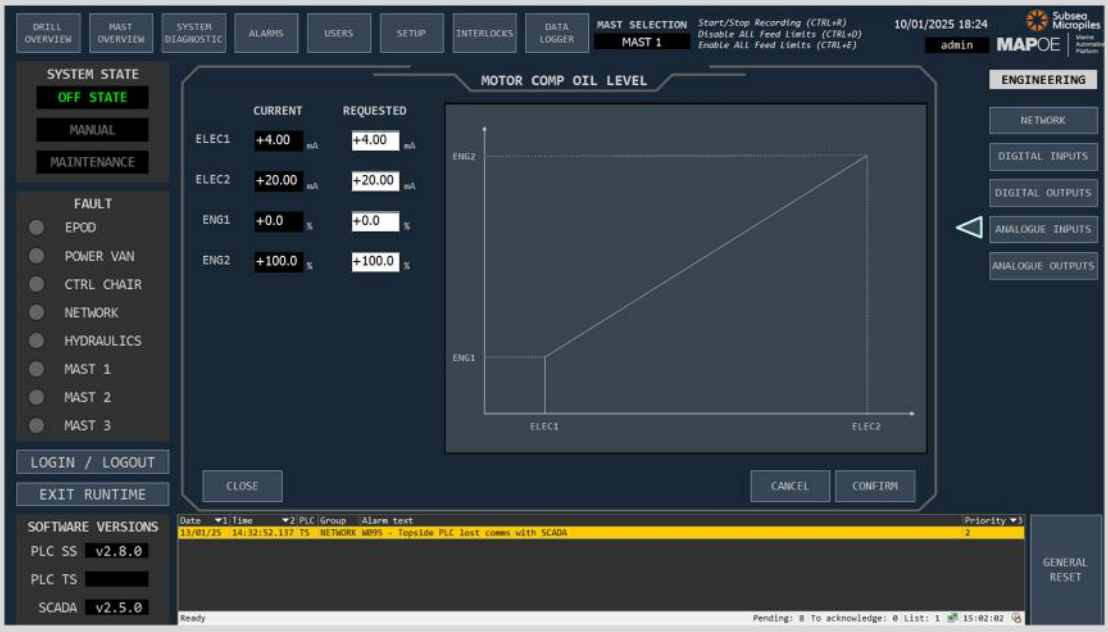


Digital Input (above) & Analog Input (below) status.

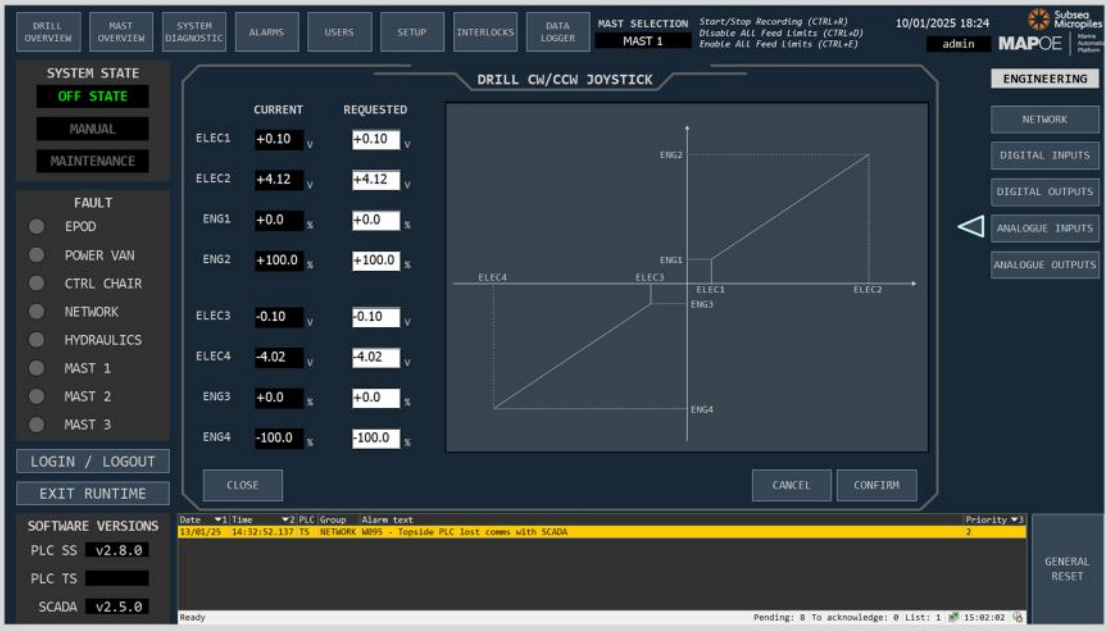


Real-time status of all Digital and Analogue Inputs are shown to help Technician diagnostics, allowing for testing of sensors during maintenance periods and to facilitate rapid fault-finding during operations.

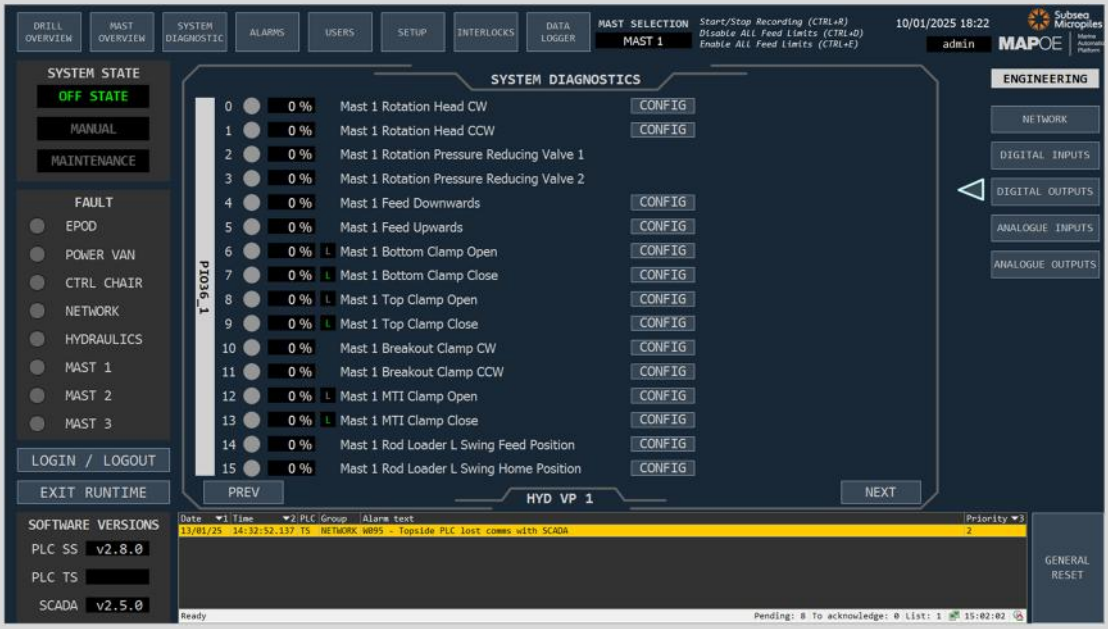
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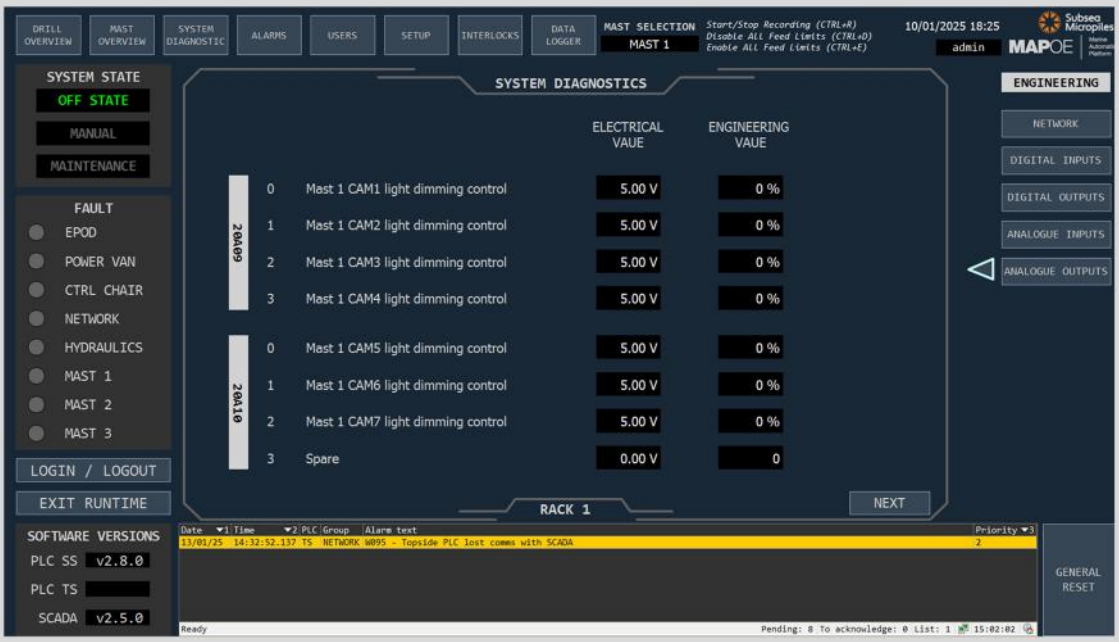
Analogue Input scaling & calibration.



Joystick Input Scaling. Control Chair Joystick Input scaling is provided allowing Technicians to configure the sensitivity of the joystick and dead bands in the central position.



Digital Output (above) & Analog Output (below) real time values.

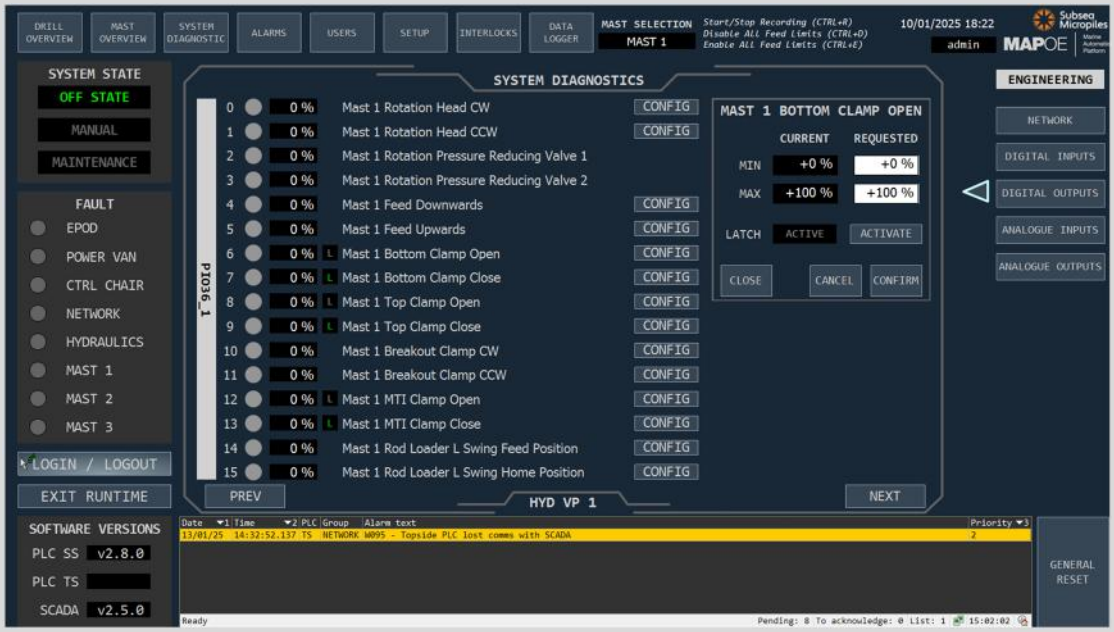


Real-time status of all Digital and Analogue Outputs are shown to assist with Technician diagnostics allowing for testing of sensors during maintenance periods and to facilitate rapid fault-finding during operations.

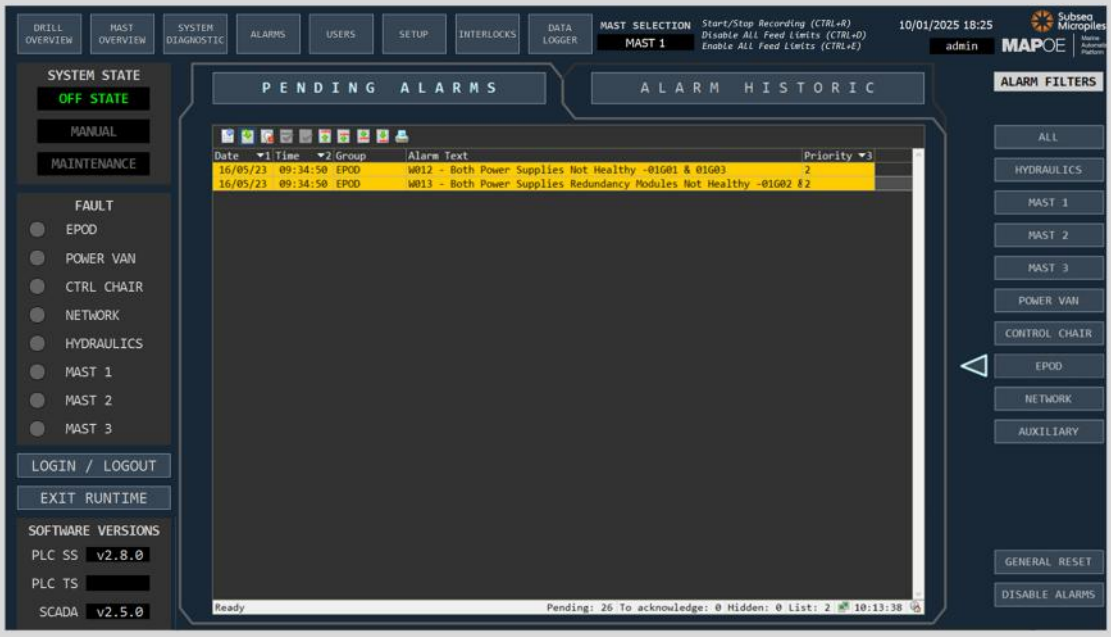
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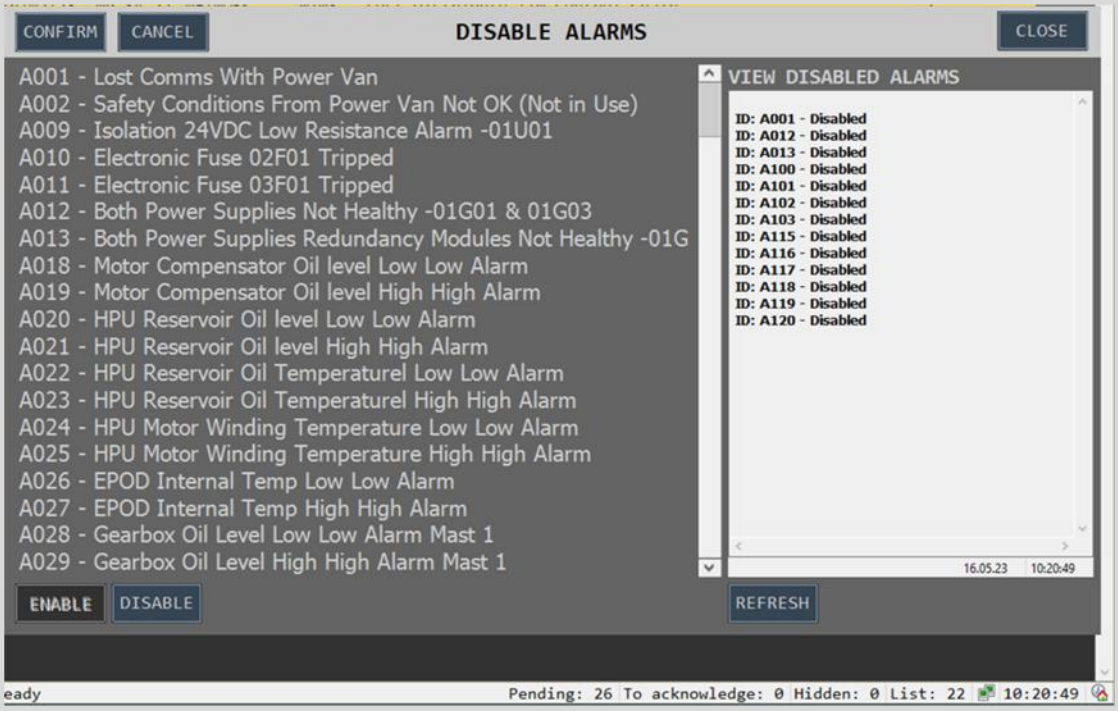
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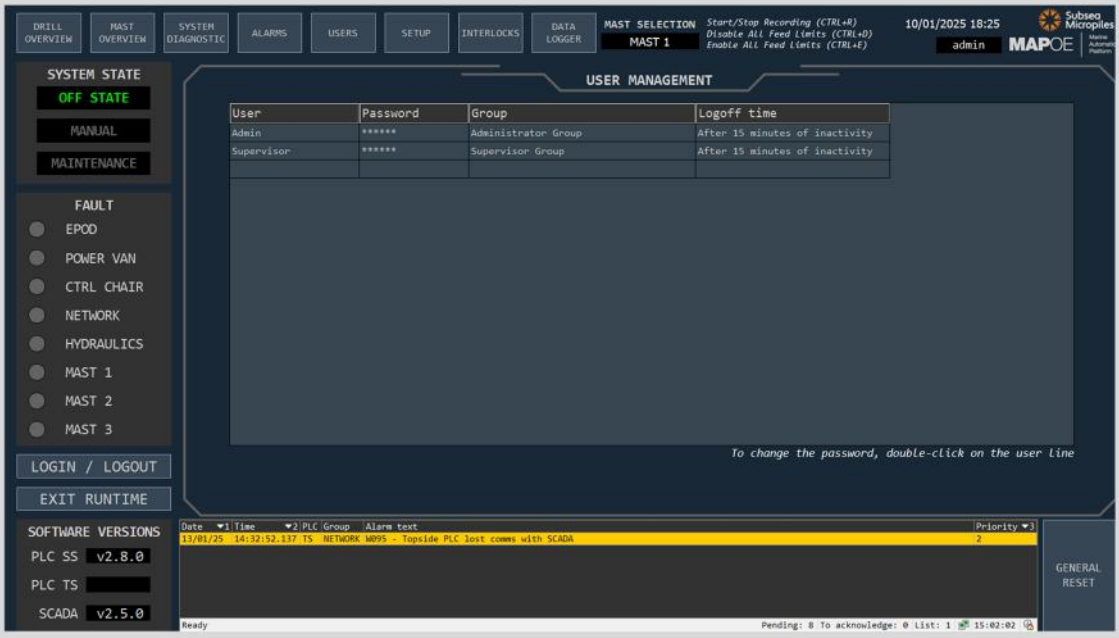
PWM Output configuration is provided. Technicians can configure a Minimum and Maximum PWM signal directly correlating to the OFF and ON states of the output.



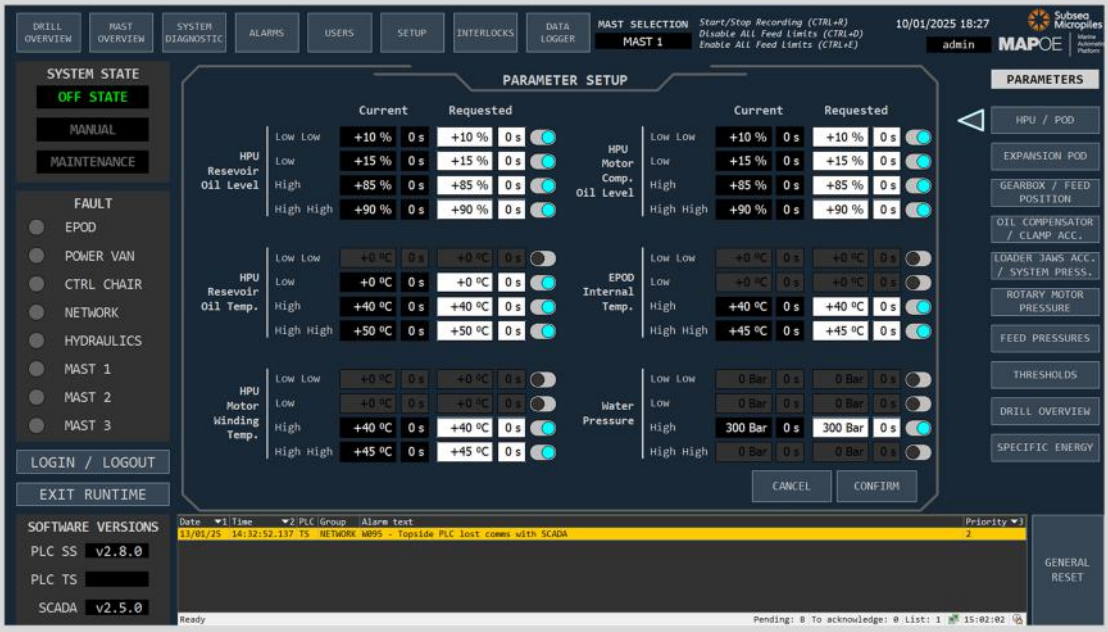
Display of all pending alarms with pre-defined buttons configured to filter the alarm view with respect to specific system functions.



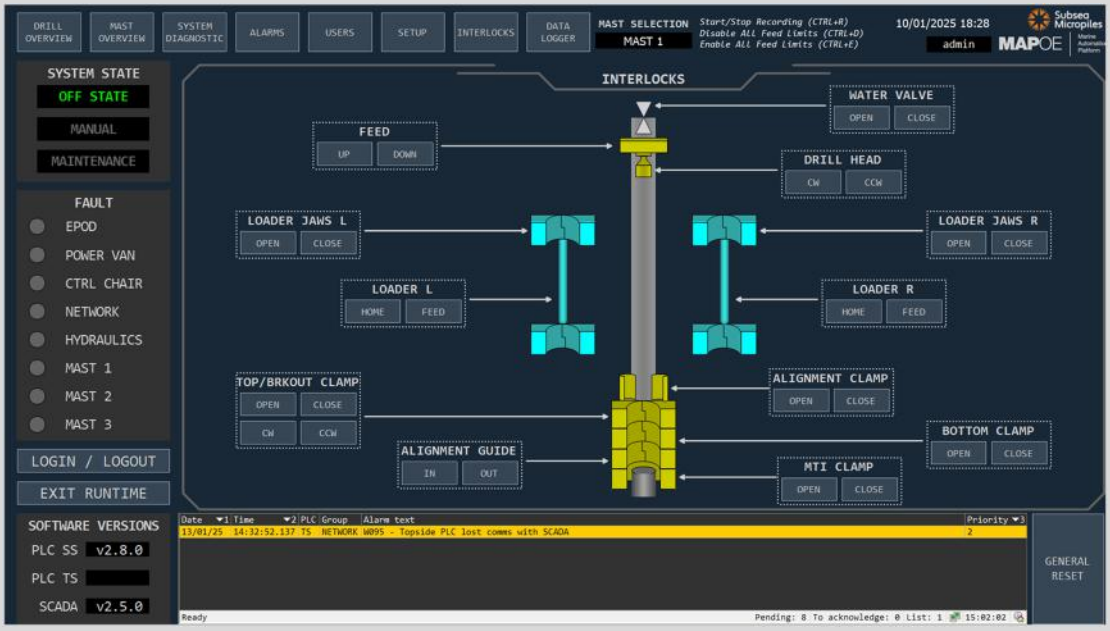
Technicians can enable or disable alarms in the system. If a disabled alarm is active, it will present in the alarm view as a warning and will not inhibit operation.



Pressing the ‘Users’ button displays all configured Users, and User Groups configured in the system . Technicians have the ability to create new users, change passwords, and configure the logoff time via this screen.



Technicians can configure ‘high’ and ‘low’ warning and alarm thresholds for all analogue transducers wired to the system. They can also configure alarm delays to prevent false alarms from the sensors. ‘High’ and ‘Low’ alarms can be deactivated if not required.



Pressing the ‘Interlocks’ button provides a graphical representation of a single mast highlighting all functions which can be configured with interlocks.

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A parameters screen is available allowing the Technician to configure the conditions to inhibit the corresponding function.



A sophisticated data recording, historian and analysis package is provided that logs all system parameters and user interaction and allows in depth system analysis.

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CASE STUDY



DNV 2.7-1 Approved ISO 20' Control & Power Van complete with segregated MV Power Distribution Compartment

Powering the system is an MJR Power Van, with separate control room and power distribution unit (PDU). Power distribution to the subsea vehicle is medium voltage and is therefore segregated from the control room and utlises *'Castell'* type safety key interlocks and hard wired secondary interlocks to ensure that personnel cannot come into contact with dangerous voltages.

MJR has a long track record and reference list in the design and manufacture of power and control vans for subsea equipment, systems and vehicles including:

- ROVs
- Power & Telecom Cable Ploughs
- High Powered Tracked Trenchers (up to 2500kW)
- Jetting Tools
- Mattress Installation Systems
- Rock Dumping Systems

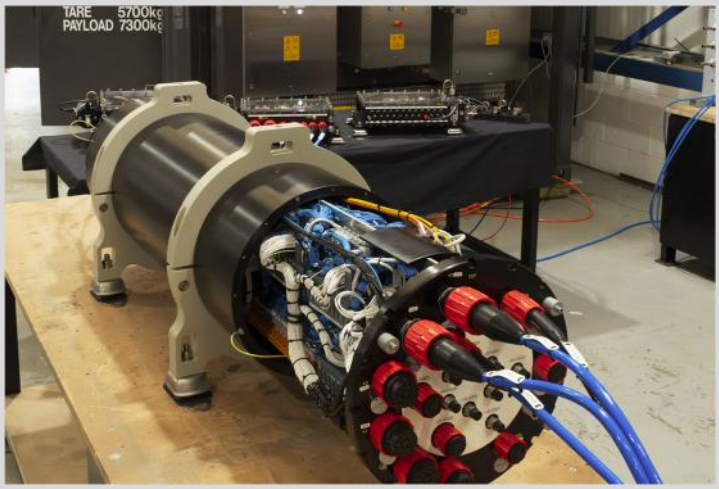
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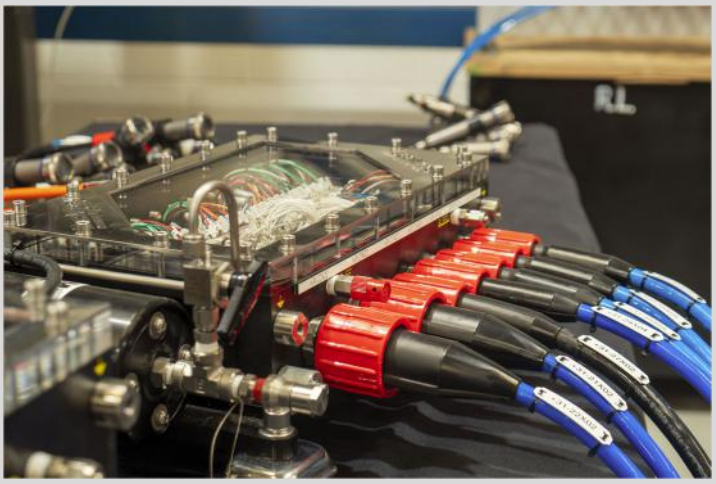
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ELSYS MARINE AUTOMATION

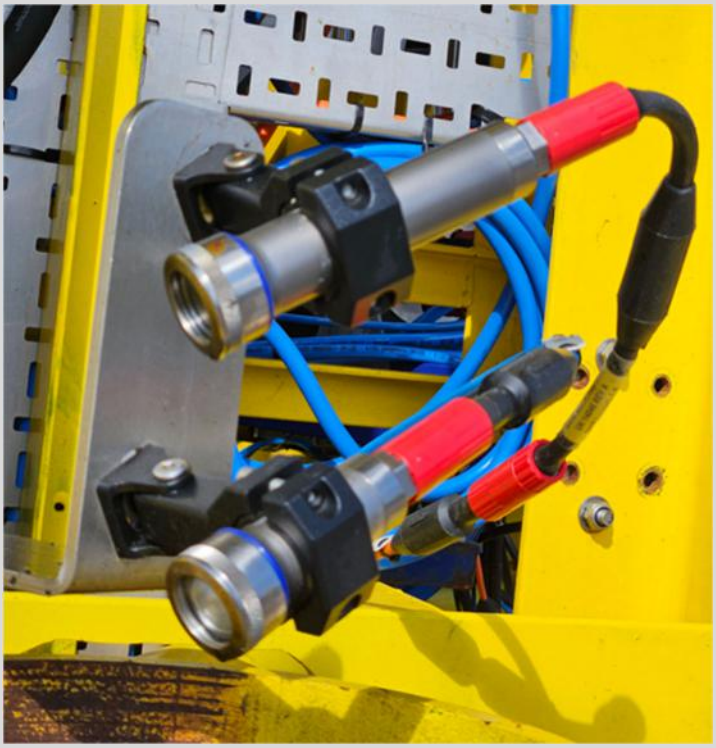
CASE STUDY



Subsea Control Pod



Pressure Compensated Oil Filled I/O Stations



Subsea Cameras



Umbilical Winch

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Subsea Machine Solutions

J0122-12297 SUBSEA MICROPILES SEMPRE CONTROL SYSTEM

J0422-12349 SUBSEA MICROPILES POWER & CONTROL CABIN

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