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**TRUSUB™**

Drilling Optimization and Monitoring System

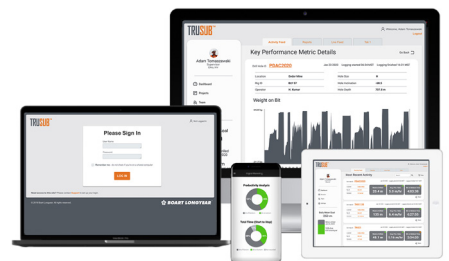
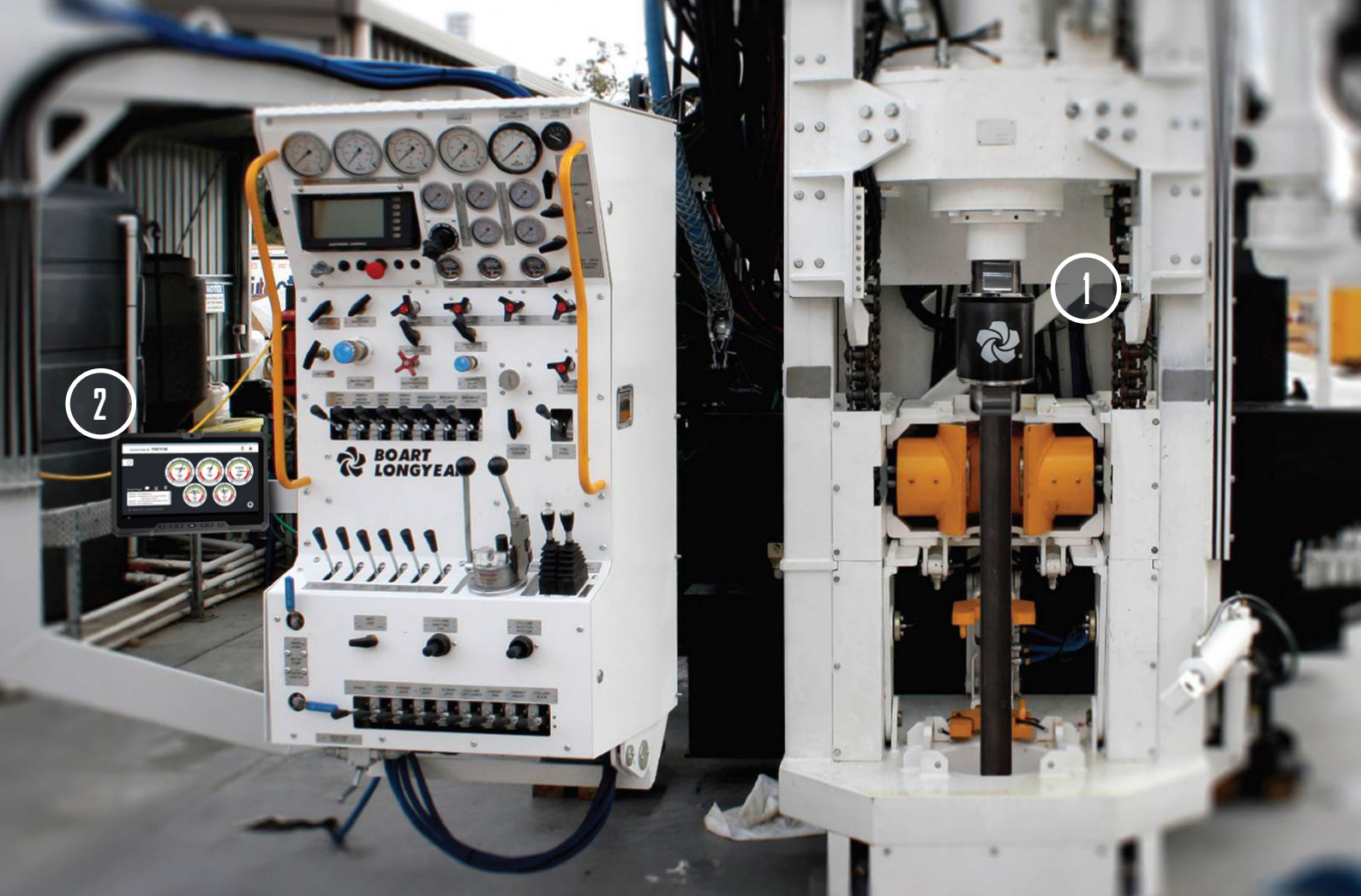
 **BOART LONGYEAR™**

## **TRUSUB™ OPTIMIZATION AND MONITORING**

The TruSub Drilling System is designed to increase the efficiency and productivity of drilling programs through a real-time drill parameter display and automated reporting of key performance metrics.

The system hardware is available as an in-field installation option for most top drive diamond coring rigs. Productivity reporting metrics and live rig parameter monitoring can be available in real-time from anywhere with an internet connection.





## 1. WIRELESS SUB

The high strength steel construction integrates and protects the precision sensors measuring the drilling parameters used to generate valuable productivity insights.

## 2. OPERATOR INTERFACE PANEL

The operator interface combines rich text and dynamic visualizations with live drilling parameters streaming wirelessly from the top of the drill string.

All parameters are viewable live at the rig controls by the operator and retained for further processing.

## 3. REMOTE VIEWING WITH DRILLING INSIGHTS

The remote viewing functionality allows both the operator and geologist real-time access to drilling parameters and productivity metrics.

Operator inputs and wireless sub outputs combine to provide a comprehensive depth based log of each hole. Powerful filtering functionality makes finding the useful information easy.

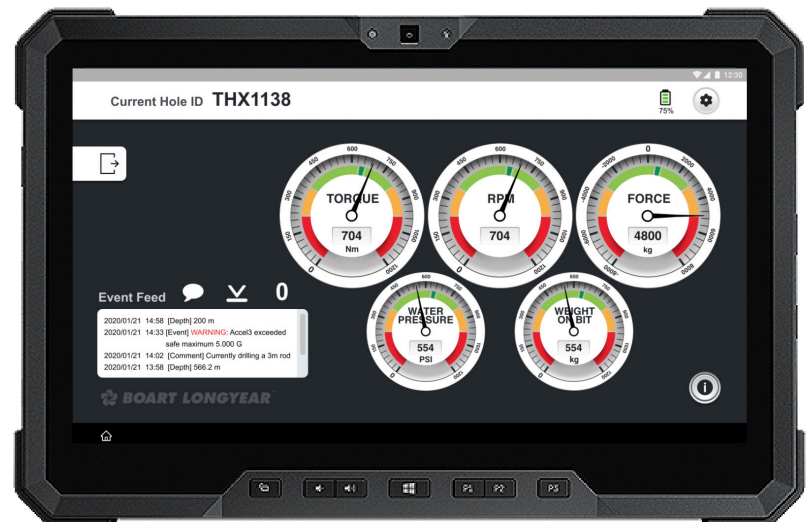
# OPTIMIZE DRILLING AT THE RIG AND SEE THE RESULTS

## UNDERSTAND THE DATA

Operators see real-time drilling parameters directly from the rod string, providing a firm baseline to improve on personal performance.

## SET TARGETS

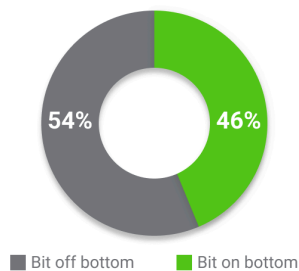
Lock in parameters that work or fine-tune adjustments on the fly. Setting parameter thresholds enables at-a-glance visual feedback to alert operators when corrective actions on the rig are needed to maintain optimal drilling.



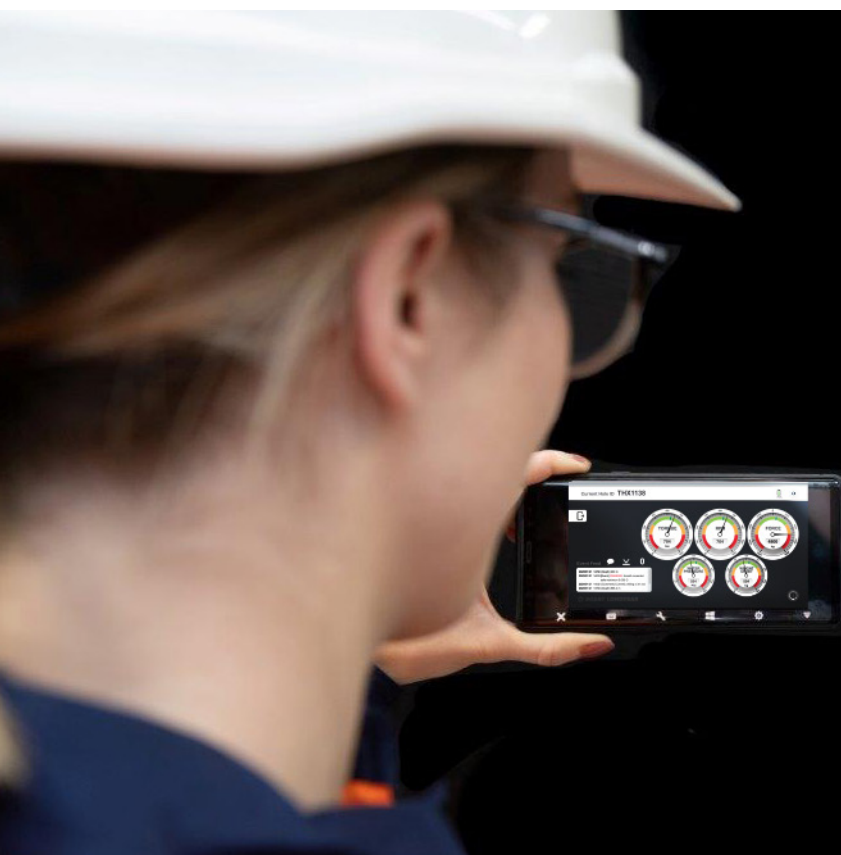
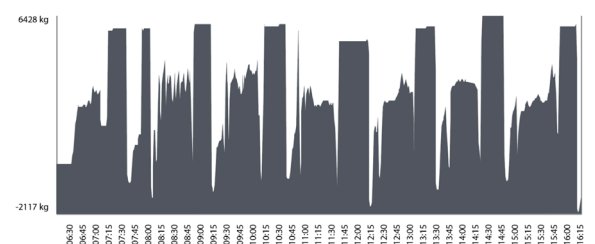
## MEASURE THE IMPROVEMENTS

Powerful visualizations driven by the TruSub sensor data enable key measurements of field operation parameters needed for continuous improvements.

### Productivity Analysis



### Weight on Bit



## COMPARE SHIFTS AND RIGS

Better understand the drilling techniques and equipment that work and the ones that don't. Share winning strategies and techniques across shifts and crews to maximize performance.

## SECURE IN THE CLOUD

All data is hosted in a highly available, secured environment using access permissions and encryption at rest.

# TECHNICAL INFORMATION

Drilling Applications	
Project Types	Greenfield Exploration, Brownfield Drilling and Surface Coal
Rig Types	Top drive diamond coring only

Operator Interlace	
Live Drill Parameter Display	<ul style="list-style-type: none"> <li>• Weight-on-Bit (WOB) (kilogram/metric tonne/pound-force)</li> <li>• Torque-on-Bit (TOB) (newton-metre/lb-ft)</li> <li>• Liquid (Mud) Pressure (Pa/kPa/PSI/Bar)</li> <li>• Rotation Speed (RPM)</li> <li>• *Penetration Rate (mm/min)</li> <li>• *Fluid Flow Rate (L/min)</li> </ul>
Misc. Event Logging	Stamp data with user entered comments flagged by depth/time
'At a Glance' Parameter Alarms	Set parameter thresholds to trigger prompt for rig adjustment
Operator Interface Hardware	MS Windows PC Based Wireless Sub Console Program
Communication Distance to Sub	Up to 5m

*\*Only available with optional ancillary sensor package*

Data and Reporting Capability	
Header Info	Hole name, operator name date and time, sensor type, serial no, rig name and location
Sensor Parameters	<ul style="list-style-type: none"> <li>• Force measurement (kN)</li> <li>• Weight on bit measurement (Kg)</li> <li>• Rotation speed measurement (RPM)</li> <li>• Torque measurement (Nm)</li> <li>• Mud Pressure measurement (Pa)</li> <li>• *Penetration Rate (mm/min):</li> <li>• *Fluid Flow Rate (L/min):</li> </ul>
Operator Entered Parameters	Depth, Drilling Status, Misc. Event Log (open field entry)
Automated Reporting Metrics	<ul style="list-style-type: none"> <li>• Average Torque (Nm)</li> <li>• Average Water Pressure (PSI)</li> <li>• Average Rotation Speed (RPM)</li> <li>• Average Weight on Bit (kg)</li> <li>• *Average Penetration Rate (mm/min)</li> <li>• *Average Fluid Flow Rate (L/min)</li> </ul>

*\*Only available with optional ancillary sensor package*

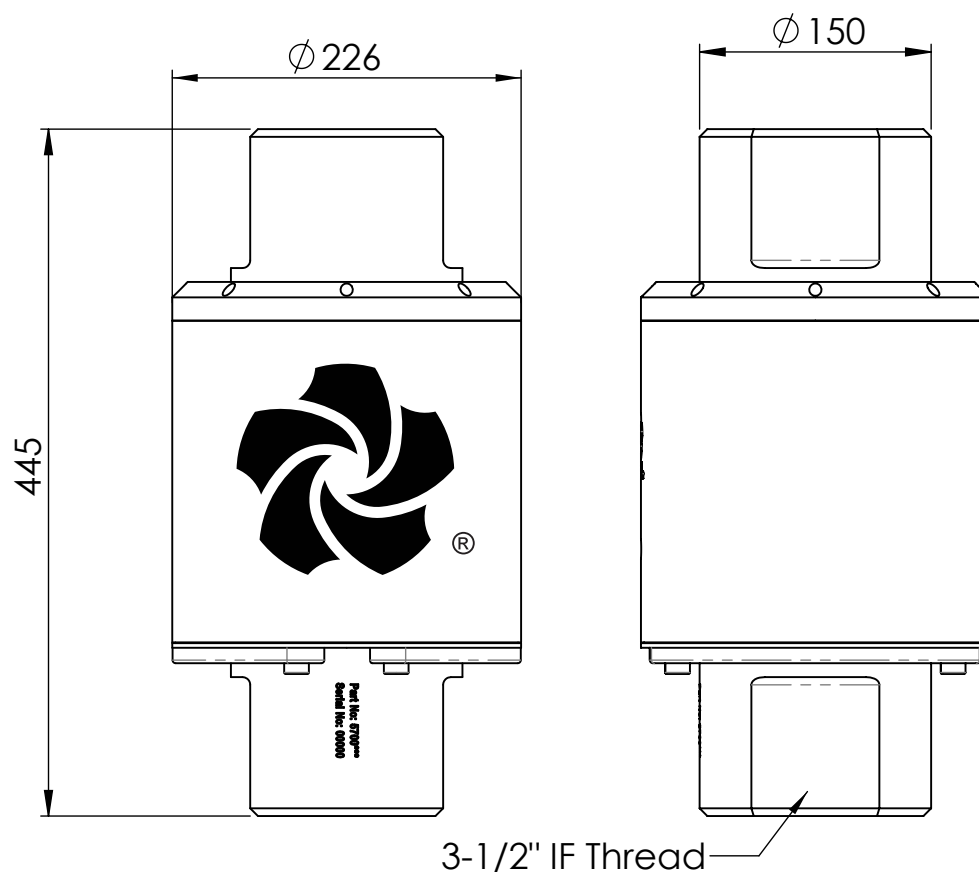
TruSub Battery Information	
Type	Panasonic Rechargeable Pack LI-ION 3.6V, 26Ah
Capacity per pack	94 Wh
Battery Caution Warning	Temperature NOT TO EXCEED 45°C while charging
Life	2 Batteries included. Estimated 2 weeks per charge

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# TECHNICAL INFORMATION

## Physical Dimensions

TruSub Only\*



Weight	49.5kg (Sub Body including Battery Pack)
Sub Body Material	High-Strength Steel
Operating Temperature Rating	-20°C to 60°C
Pressure Rating Dia (Mud)	3000psi
Enclosure Rating	IP67

## Rig Compatibility (Top Drive Diamond Coring Only)




Rated Rigs	UDR1200, LX16 and KWL™1600
Thread Connections	3-1/2 in IF API
Total Installed Length	Variable. Adapter sub lengths dependent on rig





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