

# Digital solutions for surface drilling

Data-driven productivity solutions

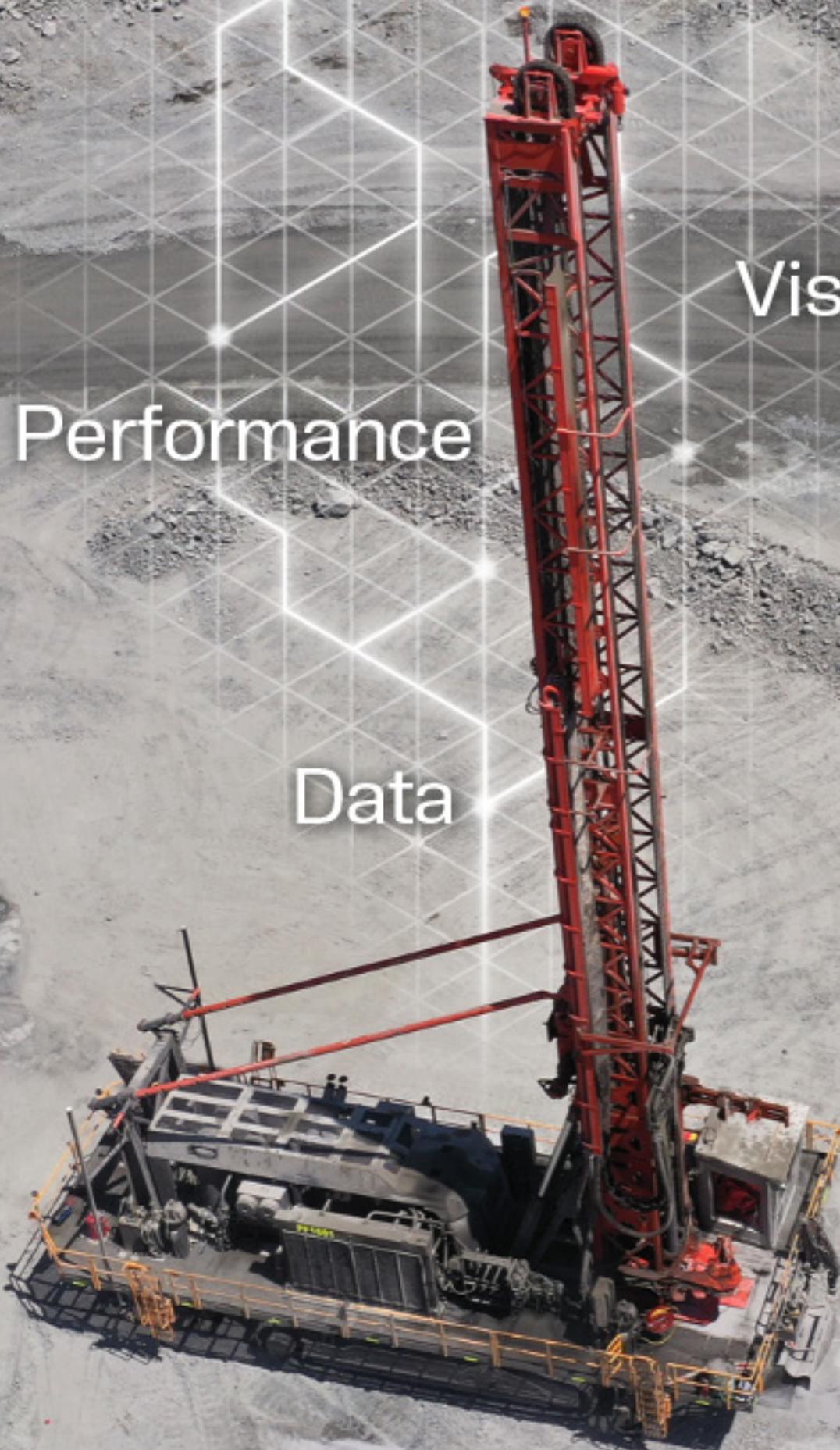




Visibility

Performance

Data





# Powering tomorrow, today.

The iSeries family of rotary blasthole drill rigs represents the next generation of surface drilling technology. Designed for what lies ahead, these automation capable drills are equipped to meet your needs today and in the future.

iSeries drill rigs simplify operations using automated functions while an intuitive user interface delivers a consistent operator experience across the iSeries range. The comprehensive Sandvik Intelligent Control System Architecture (SICA), a key component of our iSeries family, provides the operator with real-time feedback regarding the machine's performance and health, along with tools for drill planning, reporting and analysis ensuring quality and consistency hole-to-hole.



**DR410i**

152 – 251mm  
(6" – 9.875")

**DR412i**

216 – 311mm  
(8.5" – 9.875")



**DR413i**

250 – 349mm  
(9.875" – 13.75")

**DR416i**

273 – 406mm  
(10.75" – 16")



# Automation & telemetry is the key to the perfect hole

In addition to its intelligent drilling control system, Sandvik iSeries drills offer autonomous, high precision navigation, and digital transformation solutions to fit your operational needs.

Sandvik intelligent control system



iDrill scalable automation platform



MySandvik digital solutions





# Sandvik intelligent control system architecture

Sandvik Intelligent Control System Architecture (SICA) is the foundation for developing Sandvik's onboard and remote technology and automation solutions. SICA enables Sandvik's digital solutions by providing real-time sensor feedback improving drill performance and health.

The data generated from the control system can then be utilized to enable fast and efficient fault identification through industry leading onboard diagnostics; and provides the digital gateway to both, Sandvik and 3rd party, technologies.



## DRi

Sandvik advance software versioning system unifying the capabilities of all current and new iSeries rotary drilling solutions into a single software version. DRi is built on SICA.

DRi allows Sandvik to bring new features and improvements to the market faster and allows the ability to deploy, support, and train more efficiently across all rotary iSeries drilling rigs.

## Sandvik certified HW

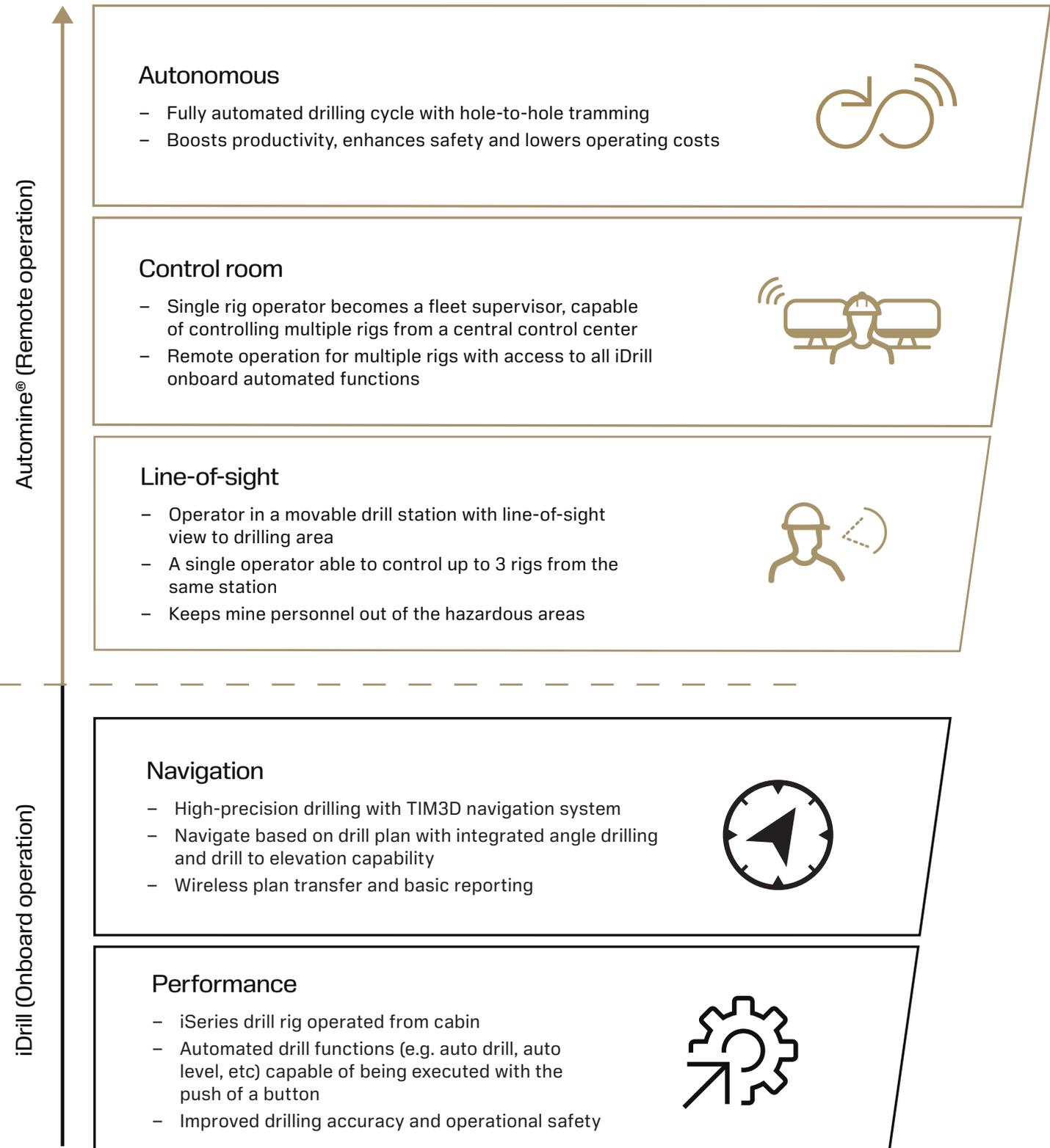
As part of Sandvik's sustainability initiative, we share as many components as possible between our iSeries family of Surface Drills and Sandvik underground and surface machinery.

Our initiative runs deep and as part of ensuring compatibility, we ensure that our control systems can maximize the capabilities of all Sandvik-certified hardware components.



# iDrill scalable automation platform

The scalable iDrill on-board automation platform provides automation options and digital services designed to speed up your production process and support your mine operations. You can use as much or as little technology as you need, knowing more is available when you need it.





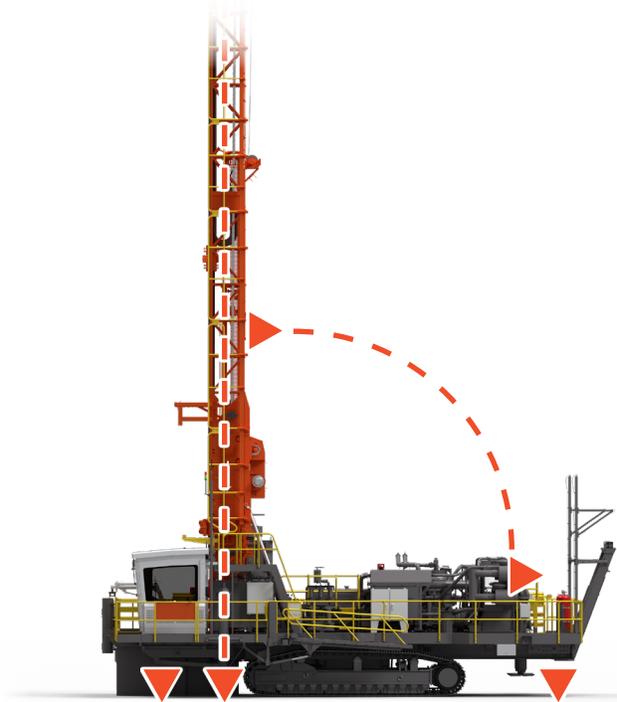
# iDrill Onboard

Onboard automation and technology makes the operator's job easier by improving efficiency and consistency with automation and providing visualization and feedback, keeping the operator focused on the task at hand...drilling meters.

## Performance

A packaged solution consisting of automation-assisted features and functions onboard the equipment. The functionality increases efficiency and accuracy by automating manual functions such as leveling and drilling using the Sandvik Intelligent Control System Architecture (SICA) platform.

Features: AutoMast, AutoLevel, Adaptive AutoDrill



## Navigation

The Onboard Navigation package (TIM3D) when equipped with iDrill Performance, further improves the efficiency and accuracy of all onboard automation-assisted capabilities by providing the ability to calculate drill depth and drill angles based on actual rig position, planned hole position, and elevation corresponding to an imported drill plan.

Features: High precision navigation, mast angle and frame tilt sensors, integrated iDrill performance visualization



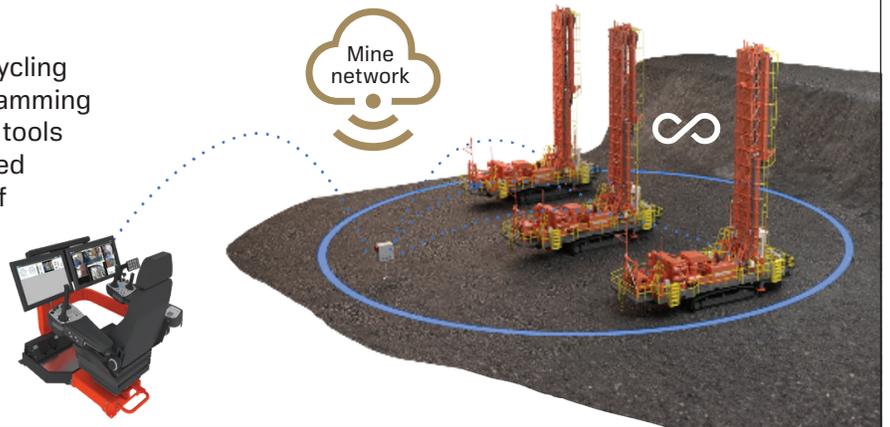
# AutoMine<sup>®</sup> surface drilling

Remote solution allowing one operator to automate multiple drills increasing utilization with the ability to operate across delays, lowering costs, and ensuring rig operation occurs within specifications while ensuring operator safety, reducing mining environment exposure.

Autonomous

Autonomous operation including auto cycling with hole-to-hole tramming improves tramming efficiency and utilization. Path planning tools optimize the drilling sequence with added features to stop tramming in the case of obstacles.

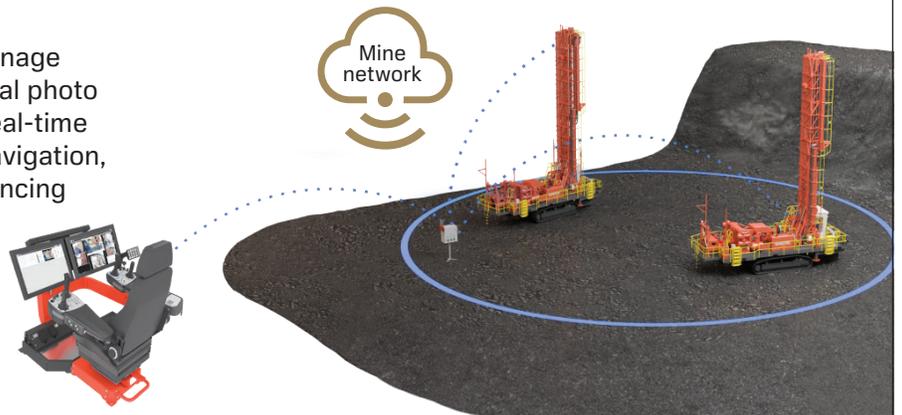
Features: AutoCycle, AutoGeofence, AutoPlanning, AutoDetect



Control Room

One operator in a control room can manage multiple drills, boosting efficiency. Aerial photo access, geofencing capabilities, and real-time obstacle detection enable precision navigation, reducing equipment damage and enhancing overall operational safety.

Features: TeleGeofence, TeleDetect, InfoGeoPhoto



Line of Sight

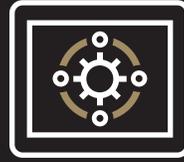
Operator in a movable drill station with line-of sight view of the drilling area enhances safety and boosts productivity through increased drilling efficiency. Automated drill operation and precise navigation further improve both the quality and efficiency of drilling.

Features: ACS Basic, TeleControl, InfoDrills, InfoView, InfoMap

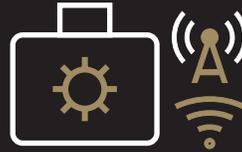




# MySandvik digital services



01 TIM3D high precision guidance



02 Knowledge box™ network client



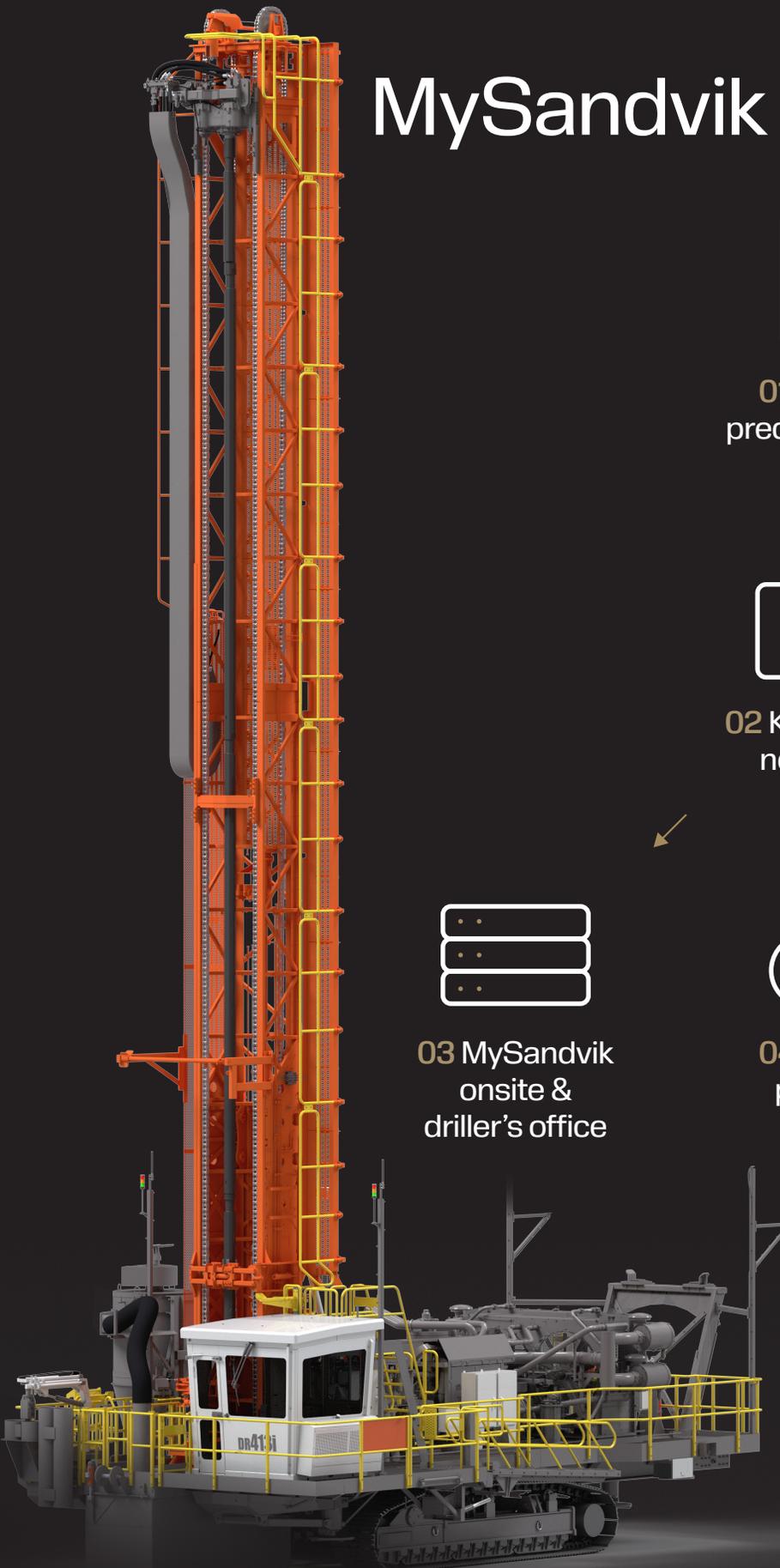
03 MySandvik onsite & driller's office



04 MySandvik productivity & RMS



05 Open drill interface





# 01 TIM3D

## Single source of truth

TIM3D onboard user interface is the digital gateway linking the iSeries family of drills to advance automation and technology offerings from Sandvik. Advance technologies typically require identification and location of planned drill holes along with the actual parameters to drill the hole. TIM3D provides positional functionality through its 3D Navigation.

### High precision navigation

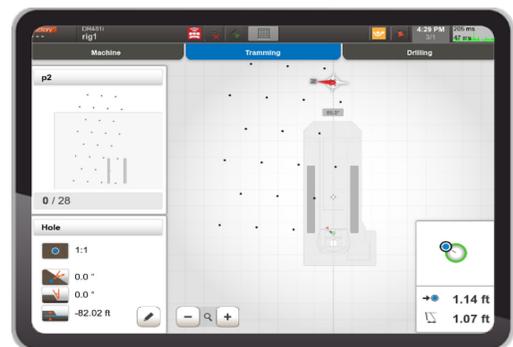
Guides operators to pinpoint collar angle and bit position, and elevation within 10cm of hole design. Drill plans can be imported or created onboard improving operator accuracy and efficiency.

### Driller's notes & measure while drilling (MWD)

Provides the operator a means for collecting and storing drilling information about the hole during drilling. The solution collects drilling parameters automatically and provides the operator with the ability to add comments.

### Operator efficiency tracking

Provides mining operations the ability to track operational states/reasons throughout a shift. This information is then utilized to provide operations with a quick update of the status of equipment, calculate operation and maintenance KPIs, and identify coaching or scheduling opportunities.



# 02 Knowledge box™

## Wireless & LTE network client

Included as a standard option for iSeries drills, the Sandvik KnowledgeBox is an 802.11 capable network client able to transmit drill health and productivity data from Sandvik's onboard technologies through the mine local network to Sandvik's digital local and cloud solutions.





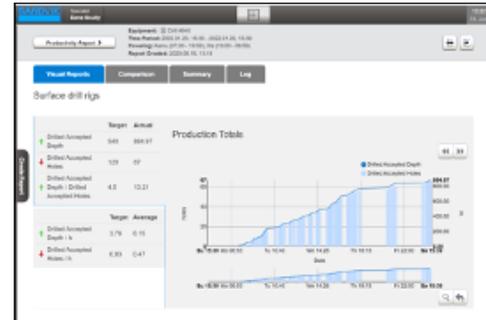
# 03 MySandvik onsite

## On-premises drill fleet management solution

### Production management

Stay on the pulse and boost productivity by:

- Addressing concerns when they happen with real-time feedback.
- Analyzing performance, identifying improvement opportunities.
- Reducing effort through wireless pattern and as-drilled data transfer.



### Operational efficiency

Improve process and production efficiency by:

- Analyzing operating vs idle time.
- Highlighting improvement opportunities by analyzing time usage (ready, delay, down, etc.) and time spent drilling, tramming, etc.
- Comparing equipment and shift efficiency to identify top performers.



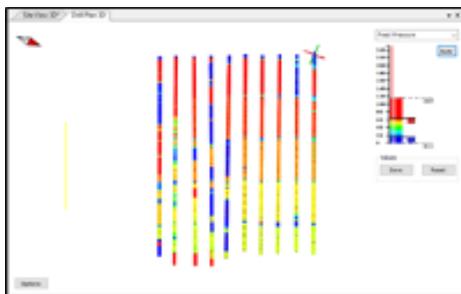
### Maintenance & availability

Maximize rig availability and uptime by:

- Increasing drill health awareness through alert visualizations.
- Improving preventive maintenance via alert details before the rig arrives at the shop.
- Reducing troubleshooting with the ability to analyze sensors.

# Driller's office

## Pattern Visualization Tool



Driller's Office is a surface drilling planning and as-drilled visualization tool. Through Driller's Office, operations can design/convert drill plans, manage as-drilled hole information, and report MWD data.

Driller's Office follows the logic of the job site and features simple visualizations of the drilling pattern and measurement while drilling data in 3D, helping the planning process. The solution is compatible with drill rigs equipped with Sandvik's TIM3D navigation solution.

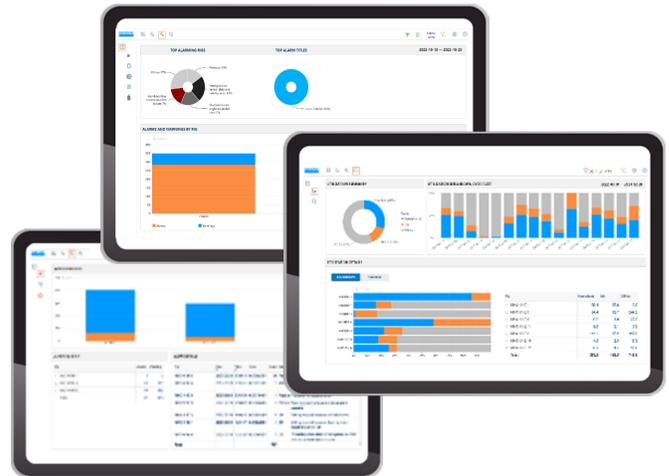


# 04 MySandvik productivity

## Cloud reporting solution

MySandvik Productivity cloud reporting solution brings fleet reporting and drill health data to mining professionals without the need of network infrastructure or servers. The solution summarizes fleet performance and efficiency without the need to dig into the details.

- Maximize your fleet with dashboards built to provide operations with productivity, maintenance, and environmental metrics.
- Better understand maintenance needs with detailed alarm reporting and component signal management.
- Understand your operation with efficiency tracking and operational vs idle reporting.



# RMS

## Remote monitoring service

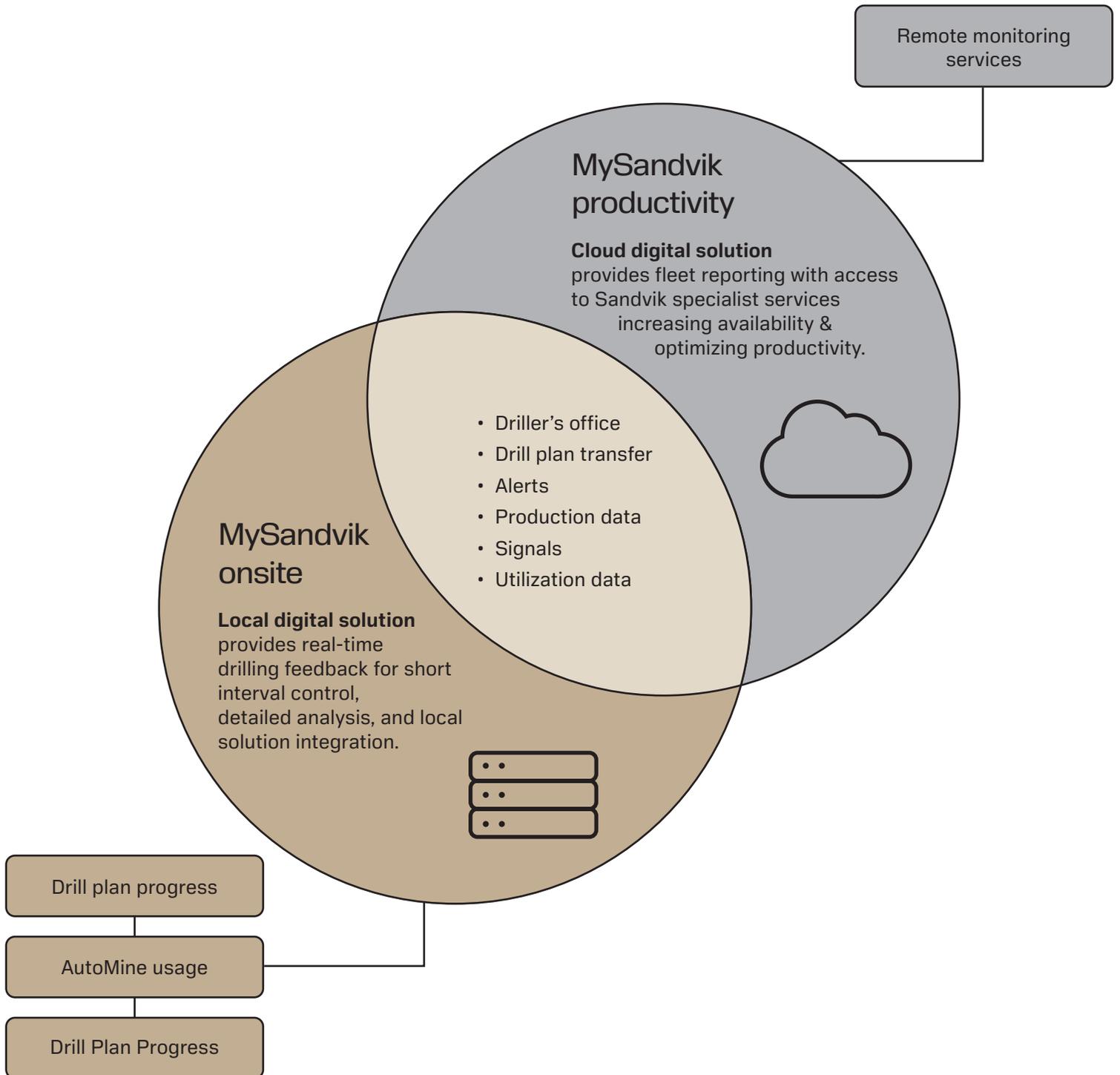


The Remote Monitoring Service (“RMS”) enables Sandvik to read and analyze machine health status and recommend actions to the customer before problems arise. RMS enables customers to improve their efficiency and competitiveness by providing in-depth OEM expertise over the lifecycle of their Sandvik fleet. The continuous improvement process of RMS allows customers to become a Sandvik performance partner.

Once the equipment is connected and the (raw) data has been transmitted to the cloud, the Sandvik big data engine processes and converts raw data to predictive data. Sandvik global and local monitoring centers analyze the data with OEM knowledge, turning predictive data into prescriptive recommendations.



# MySandvik digital solutions





# 05 iLink data interface

## Interoperability solutions

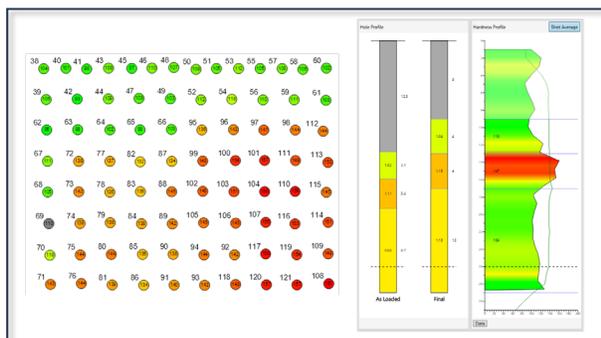
iLink is Sandvik's solution for connecting Sandvik's iSeries family of drills to 3rd party technologies existing at the mine. Whether on the rig or in the office, iLink provides other technologies the data necessary to improve efficiency and promote productivity.

The iLink data interface solution enables seamless communication between Sandvik's iSeries family of drilling solutions' control system on the drill rig and an external third-party device. This connection can be either physical or wireless and can be established onboard the drill rig itself or remotely with network access to the drill rig.

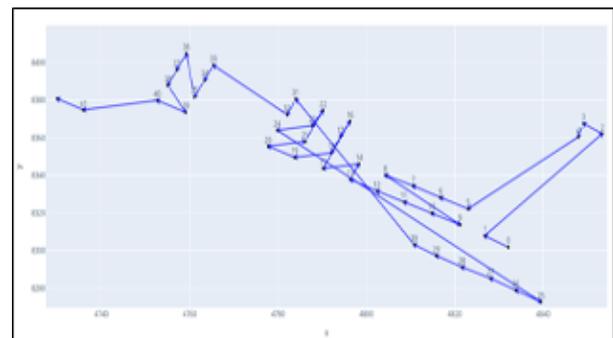
Typically utilized to connect onboard fleet management and guidance solutions to provide the 3rd party systems with operating parameters, health, and measurement-while-drilling data such as depth, RPM, pull-down pressures, air pressures, etc.

The data is utilized by the fleet management system to analyze the drill hole, record productivity, and measure operator/driller performance. The interface helps avoid the need for 3rd party systems to install their own technology and sensors to measure the information that we provide. Thus, making the solution easier for the customer to maintain.

In addition to interfacing with 3rd party fleet management solutions, the iLink data interface is capable of interfacing with 3rd party planning and blasting tools as well to provide simple transfers of drill patterns, MWD, and raw production information maximizing planning, production, and blasting efficiency.



Blasting solution integration – Dyno nobel



Operating efficiency integration

