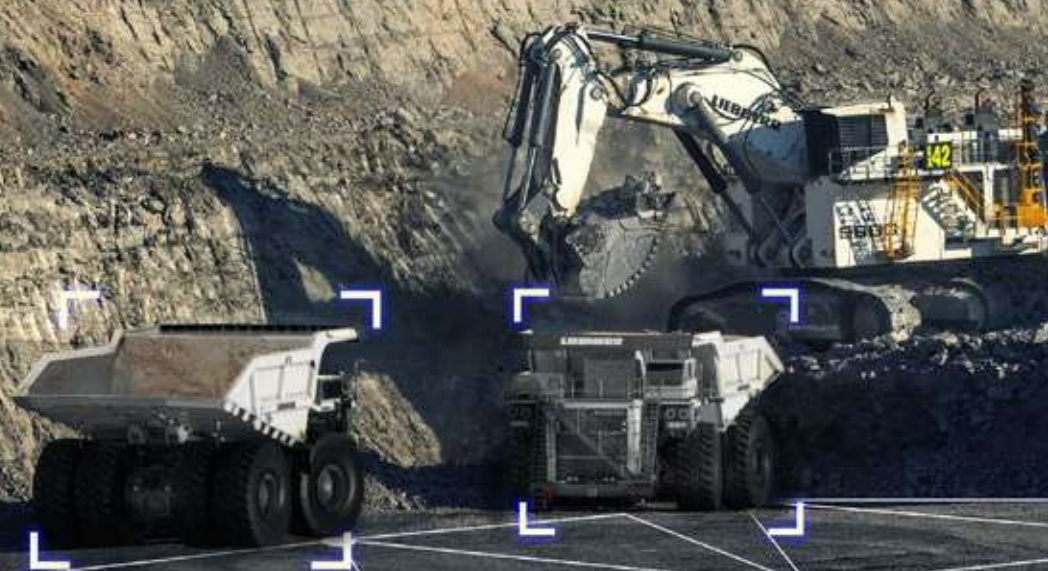

Assistance Systems

Get the best out of your
Liebherr mining excavator

LIEBHERR

Mining equipment



Discover the
Assistance Systems
online
www.liebherr.com

The best performance. Easy.



Measure and analyse every bucket payload for optimal truck loading



Data visualised within different views & advanced filtering



Display targeted productivity and actual payload with 99% accuracy



Provide transparency of performance, operating time and fuel efficiency



Identify operational conformance and improve operator effectiveness



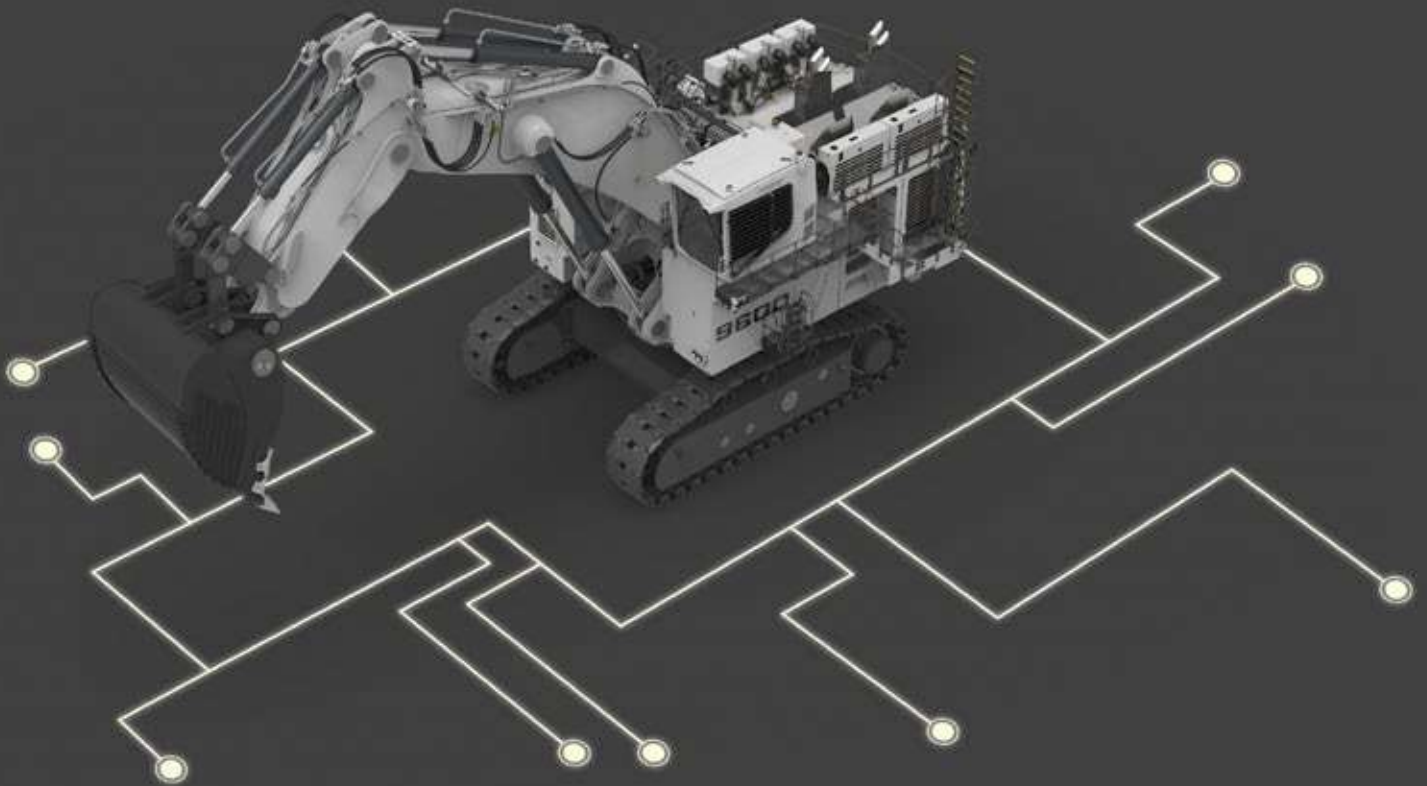
State-of-the-art onboard touchscreen displays



Make informed decisions



Increase productivity



The Liebherr Assistance Systems are advanced onboard products and applications designed to support operators to become more efficient through analytics. The products and applications will further assist maintainers and site management to realise improvements in safety, maintenance and overall equipment effectiveness.

An integrated Liebherr solution

By combining hardware and software, as only an OEM can do through the in-depth knowledge of the machine, Liebherr increases the performance of mining excavators.

With vertical integration of Liebherr components in its mining equipment, Liebherr has the advantage of being able to deliver the highest value to the customer in terms of component reliability and efficiency.



Want to live the real experience?

Scan this QR-Code and live our Assistance Systems as if you were in the cab of a Liebherr mining excavator.

System availability

Operational Excellence & Operational Analytics Suite

| | R 9150 | R 9200 | R 9350 | R 9400 | R 996B | R 9600 | R 9800 |
|-------------|--------|--------|--------|--------|--------|--------|--------|
| New machine | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ |
| Retrofit | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ |

Operational Excellence Suite



Truck Loading Assistant



The Truck Loading Assistant notifies the operator of the pass loading strategy, the loading tendency and indicates the actual payload per pass before it is loaded into the truck. Assists the operator to obtain target truck payloads consistently with confidence by:

- Measuring the bucket payload instantaneously
- Providing real-time information to the operator
- Strategizing the number of passes required
- Visualizing the loading tendency alignment with load strategy

Customer advantages:

- Increase truck loading accuracy
- Increase operational efficiency
- Reduce under and overloading of truck
- 99% measurement accuracy

99% accuracy



Loading tendency

Remaining tonnes to load

Bucket teeth depth

Last bucket advisor

Instantaneous bucket payload

Truck selection



Number of passes

Material selector
(waste or ore)

Current truck payload

Operational Analytics Suite

The Analytics Suite are onboard products that monitor and display specified KPIs in real-time supporting the understanding of operational performance, machine operation and site application.

Performance Monitoring Assistant



Measures and analyses overall productivity and performance.

Provides detailed analysis and statistics of operator and machine performance collected during work periods. This assistant offers operators a method to visualise and improve on their performance by allowing analysis and comparison of their previous work patterns.

Liebherr has also developed an application to display these reports on mobile devices when in range of the machine as an overview for supervisors. The data will be stored in the cloud via Liebherr digital services to enable remote monitoring and analysis of operator and machine productivity and performance.

Customer advantages:

- Understand operational performance
- Make operational decisions based on KPIs

The performance summary page will allow the comparison of multiple performance indicators over selectable time periods:

- Production KPIs
- Loading indicators
- Time distribution
- Energy efficiency



Loading indicators



Time distribution



Energy efficiency

LIEBHERR

12:55

Operator

100% 70°C

Performance - Production Overview

This session

All trucks

88/88/8888 00:88 88888888

70 min ago
Truck A 91t
88.8 t
4
97%

36 min ago
Truck B 110t
111.2 t
5
101%

49 min ago
Truck A 91t
84.7 t
4
93%

7h 10 ago
Truck A 91t
105.6 t
5
116%

1h 25 min ago
Truck B 110t
108.8 t
5
98%

2h 15 min ago
Truck A 91t
88.8 t

9 250 t
Tons moved

723 t/h
Tons moved / Hours

18.8 t
Mean bucket load

570 L/h
Fuel rate

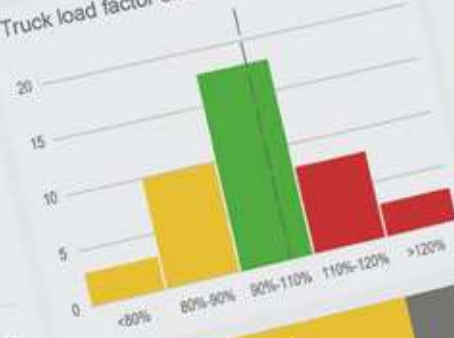
95
Truck loaded

8
Truck loaded / Productive hours

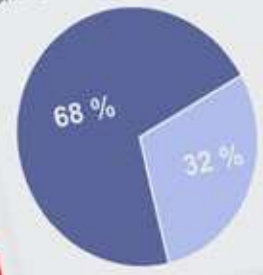
108°
Mean swing angle

2.8 %
Travel ratio

Truck load factor distribution
Mean = 102 %



Working hours distribution



F1 F2 F3

- + Power

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Application Severity



Quantifies application, reports severity indicators and provides an overall application severity score.

Designed to enable detailed evaluation of the site application, quantifies and reports severity indicators by the machine sensing the operating environment and calculates an overall severity score for the selected period. The algorithm provides actionable insights regarding the impact and evolution on operating costs, productivity, reliability throughout the machine's life cycle.

The assistant also gives information about underfoot conditions, temperature profile, engine load factor, suspended load and more, a major benefit providing input for the drill and blast optimisation.

- Provides an evaluation of machine environment and state
- Computes characteristic Application Severity Indicators to notify operator and supervisors
- Automatically quantifies, monitors and assesses indicators

Customer advantages:

- Make informed decisions
- Understand your application
- User-friendly interface



Operational Conformance Assistant



Monitors and detects non-conforming operational events to improve operator effectiveness.

Engineered to detect when the machine is utilised outside the scope of the machine design. A report can be generated to show the occurrences and duration of each activity over a selected period of time. It provides results on how the machine was operated to enable prediction of potential maintenance costs or to identify training needs.

- Automatically detects machine operational conformance events
- Algorithms monitor the machine continuously



Customer advantages:

- Increase machine operational safety, machine lifetime & availability
- Helps understanding reasons for downtimes or delays



The four pillars of the Liebherr Mining Division

With more than 50 years of experience in the mining industry, Liebherr has identified four key factors of customer satisfaction: Performance, Safety, Service, and Sustainability. These pillars provide structure and focus for all our activities, and embody Liebherr's customer commitments.





Performance

Productive, efficient and reliable



Safety

Protecting your most important assets



Service

Where you need it,
when you need it



Sustainability

Committed to our future





Mining excavator



Mining truck



Mining dozer



Mining dragline



Service tools



Customer service

Quality commitment

- Liebherr-Mining Equipment Colmar, France, ISO 9001 certified
- Compliance of materials tested in laboratory
- Quality control during all stages of production

Subject to technical modifications. All comparisons and claims of performance are made with respect to the prior Liebherr model unless specifically stated.
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