Optimise mine performance with accurate payload information

Lower cost-per-tonne of material hauled, optimised truck loading, improved productivity and increased profits.

Loadscan's Advanced Mining Solutions are satisfying growing global demand for reliable and accurate load measurement across a range of increasingly challenging underground and surface mining operations.

Mine Payload Technologies®

powered by LOADSCAN®

Tackling some of the biggest headaches in mining today!

UNDER LOADING

Underloading your trucks could be costing you a fortune in lost production

CARRYBACK

Carryback can have a major impact on your mine throughput

OFF-CENTRE LOADING

The hidden costs of off-centre loading add to running expenses

INACCURATE PAYLOAD WEIGHT

Measuring by weight alone is inaccurate and unreliable

VOLUME

+/-1%
accuracy

scan images

RFID
tracking

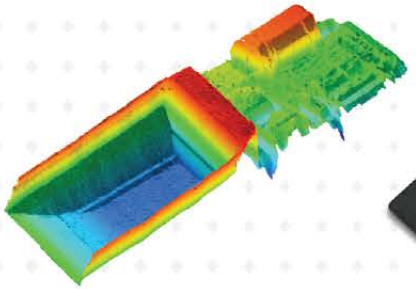
What is load volume scanning?

The Loadscan Mine Payload Scanner (MPS) system utilises eye-safe laser scanning technology combined with proprietary Loadscan software to measure the exact volume of material loaded into a truck bin. With the MPS system you'll measure actual volume, not a converted weight estimate.

By accurately calculating net volumes delivered for processing you can eliminate arguments over tonnes delivered by the haulage contractor or haulage department to the mill. It also enables you to optimise loading for maximum asset utilisation.

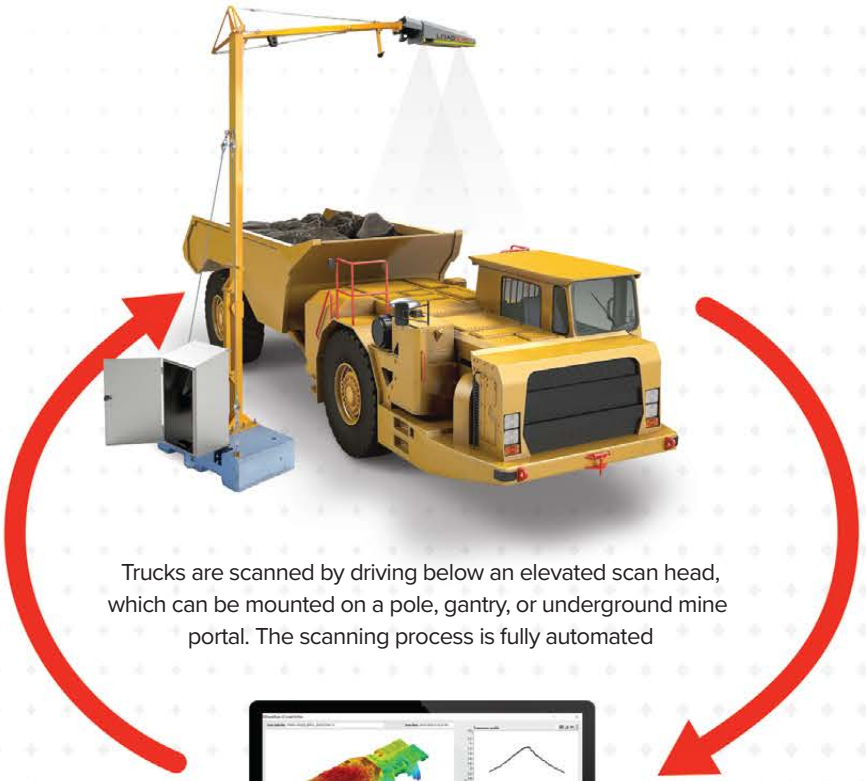
A 3D scan image of every load is generated, providing an audit trail and visual record of loading. Customers have found this extremely helpful when training and coaching their operators.

How the MPS system works

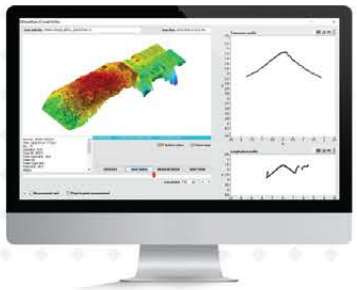


Empty truck is scanned to create reference scan in the database

Trucks can be tracked manually or fitted with RFID tags for automatic identification



Trucks are scanned by driving below an elevated scan head, which can be mounted on a pole, gantry, or underground mine portal. The scanning process is fully automated



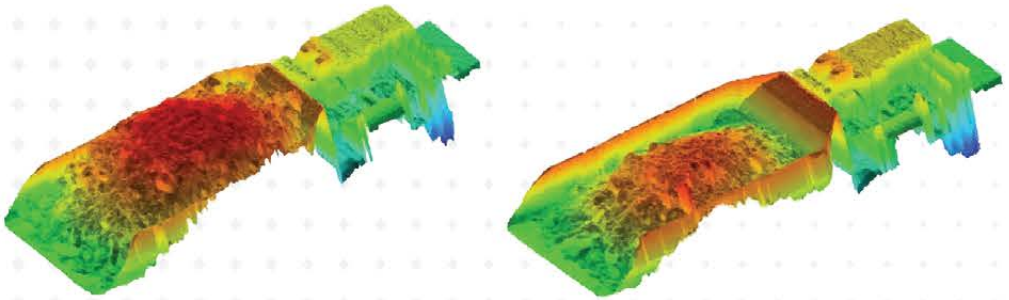
Proprietary Loadscan mining software reports volumetric measurement, including 3D load profiles of every load

Green, together

The Loadscan MPS is an environmentally-responsible technology. It consumes no fossil fuels, and outputs no harmful chemicals. The MPS optimises truck loading. Optimally loaded trucks are a more efficient use of assets, requiring less trips to shift the same amount of material. As a result, less fuel is consumed with less exhaust emissions. Loadscan technology is helping our customers to reduce their carbon footprint and lessen the impact on the environment.

Underloading could be costing you a fortune!

Underloading requires additional truck movements to shift the same amount of material, reducing profitability. We help mines to optimise loading by maximising every load, thereby increasing trucking factors and improving profits. Our load scanner accurately measures all loads and automatically generates 3D scan images that clearly indicate underloading, enabling corrective action (including operator training and coaching) to be taken.



Loaded to capacity
40 tonne payload = 22.2m^3
= 10,000 truck loads

Slightly underloaded
34.5 tonne payload = 19.2m^3
= 11,594 truck loads

Underloading requires 1,594 additional truck loads

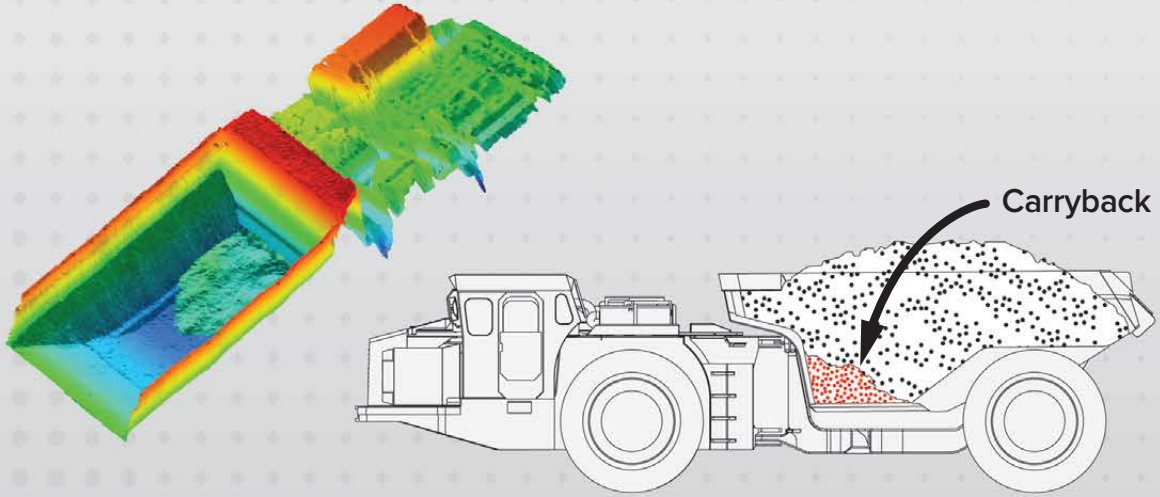
An example of Sandvik TH540 to shift 400,000 tonne material
(Based on density factor of 1.8)

> *"We don't know how we did without the Loadscan system in the thirteen years prior. We simply could not run the mine site without it now."*
>
> **ODOD Gold, Mongolia**

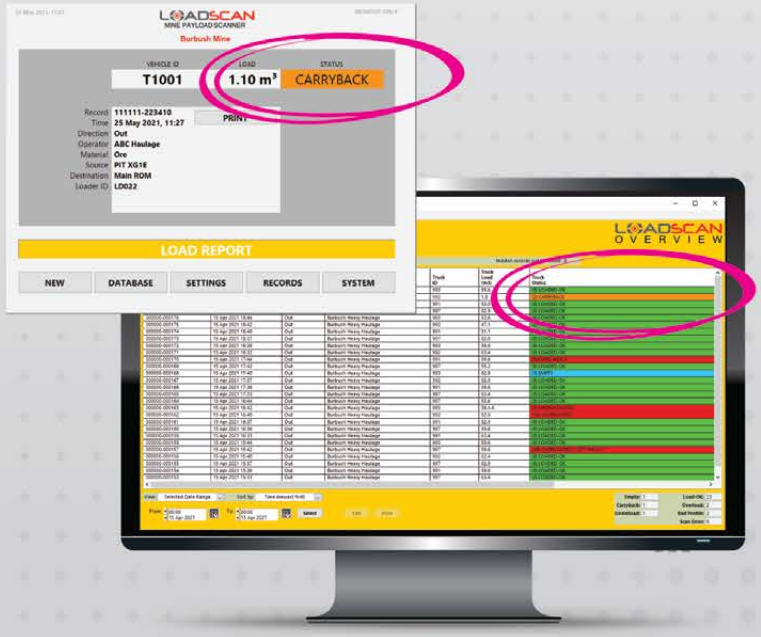
Operator console and message board indicate underloading with bold visual warning indicators.

Managing carryback to improve operations

Carryback is a common problem wherever material is being shifted and can seriously impact productivity. By scanning all loads with the Loadscan MPS, carryback out of the mine is accounted for and can be deducted from shift tallies, improving accuracy of actual loads shifted. In addition, carryback can immediately be identified through data and alerts on the message board, enabling removal from the bin.



LED message boards indicate amount of material left in the bin. Once the set threshold is exceeded, the driver is alerted with a warning indicator and can have the bin scraped out to remove carryback.



Visual warning indicators are displayed in real-time on the operator console and Overview screen.

"Loadscan has been helpful to improve operational performance by managing carryback to reveal our true shift tally. We can now accurately calculate net volumes delivered for processing. Time is also saved by minimising paperwork, there's no manual data entry, driver records or after-shift record sorting."

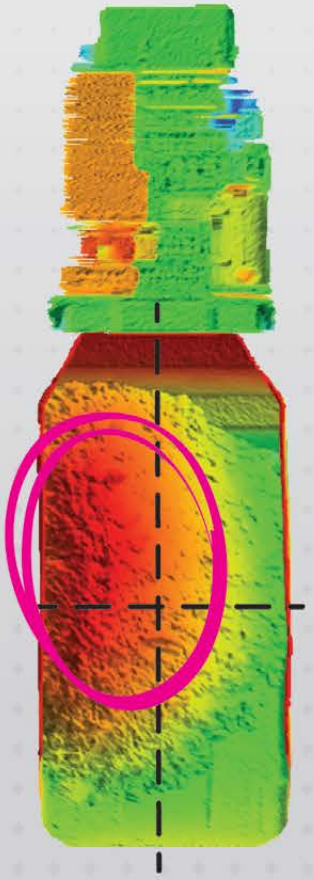
Pavan Kaushik — Vice President, Hindustan Zinc

The hidden costs of off-centre loading

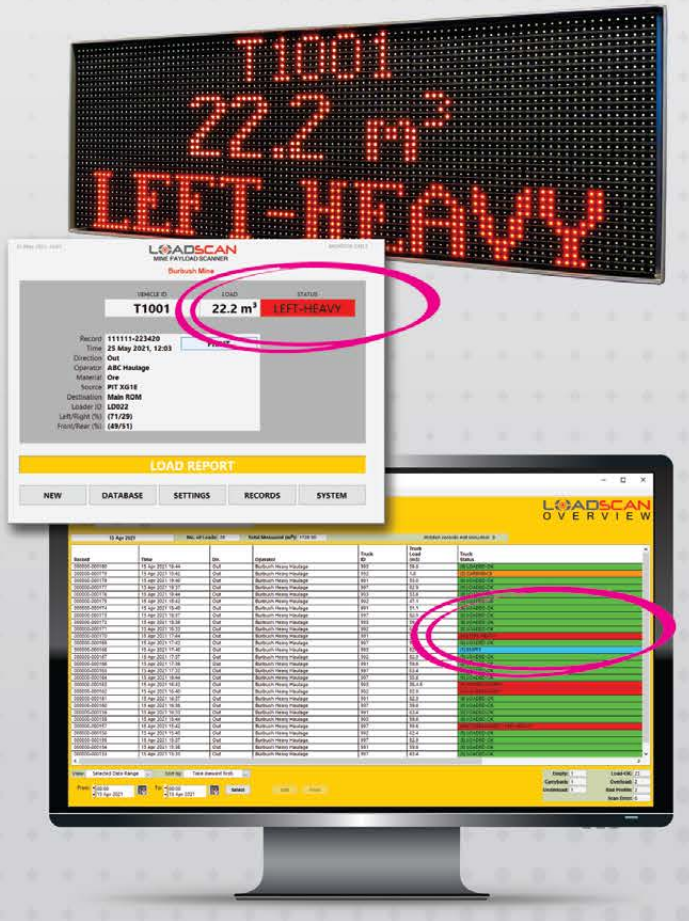
Off-centre loading can substantially increase operating costs. Uneven load distribution adds stress to truck components, reducing their working life and adding substantial costs to your operation. In addition, this can create excessive tyre wear, voiding warranties and requiring premature replacement.

The 3D scans generated by the system provide a valuable visual reference that can be used for training and coaching loader operators.

Off-centre loading adds significant wear and tear and stress to truck components



Off-centre loading is calculated and reported within the four quadrants of the truck bin



Visual warning indicators are displayed in real-time on the operator console, Overview screen and message board

Measuring truck payloads by weight or volume

Does it really matter which method you use? We think it does.

Common weighing systems are not the complete measurement solution

- Doesn't account for bulk density changes, nor enables density changes to be accurately tracked.
- Usually require frequent (and costly) maintenance and calibration.
- Large trucks must stop and settle on static weighbridges to register accurate weight. As a result, 1 to 2 loads per shift per truck could be lost = higher cost per tonne hauled.
- Dynamic weighing systems are susceptible to heavy trucks moving the scale's foundations, causing inaccurate measurements (scale motion can reduce accuracy by 3-5% or worse).
- Onboard weighing systems (which are very sensitive to calibration issues) require a system on every truck, dramatically increasing costs.

Limitations and shortcomings of weight measurement

- Density of material can vary depending on which part of the rockface the ore is extracted from, and how the bucket is loaded.
- Conversion factors typically computed under carefully controlled conditions — don't necessarily reflect accurate actual weight-to-volume ratios of materials.
- Moisture can influence the composition of load materials, and consequently its weight.

Volume scanning substantially enhances the accuracy of payload measurement...

- Volume scanning is complementary to measuring weight with scales. By combining weight AND volume, measuring material bulk densities and payloads is more accurate.
- Converting from volume back to weight using bulk density factors has proven more accurate than using onboard or dynamic weighing systems.
- Measure ACTUAL load volumes in a truck or trailer bin, eliminating guesswork.

A typical load volume scanning system

System visual is indicative only and not to scale. Final system specification may vary.

Convenient scanner system options

Loadscan offers a range of scanner options to suit your mine requirements.

Block Mounted Portable MPS-3BMP (Outrigger)

- Ideal for long-term or permanent placement
- Built-in kiosk included
- Extended or standard outrigger to accommodate large dump trucks
- Portable — fork-slots and lifting points provided

Custom Mounted MPS-3CMX

- Universal mounting
- For underground mine portals/tunnels
- Can easily be adapted to fit to custom gantry or structure

All systems include RFID tag reader, MPS measurement software and Overview reporting software

Real-time material flow measurement

The mine-specific Conveyor Volume Scanner (CVS) uses eye-safe LiDAR lasers combined with our proprietary algorithms to provide material flow measurement in real-time. With a measurement accuracy better than 98.5% you can be confident you have complete control of your material flow.

Includes onboard Modbus TCP Server with full configuration interface, RESTful API option to communicate with external control systems and optional addon I/O allowing external analogue (4-20mA) and digital Input and Output to the CVS system or external PLC's. Built-in WiFi 2.4 or 5 GHz allows password secured remote access via tablet, smartphone, laptop or company network.

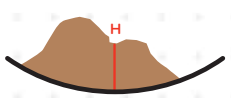
The CVS can be adjusted to mount easily on a variety of belt sizes, providing maximum flexibility to suit your conveyor system. A proximity sensor ensures a non-contact reliable speed measurement. The user-friendly operator interface makes for simple implementation.

The CVS measures and reports:

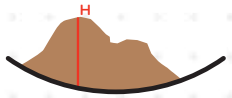
- Current material flow rate on the belt
- Cumulative running total volume
- Height and position of material on the belt
- Belt running speed
- Cumulative material weight

Load height measurement output

Monitor load height on the belt.
Load height is a measure of the height/depth of the load material above the belt. Two measurement methods are supported:



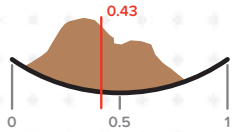
Centre Height



Maximum Height

Load position measurement output

Monitor how centred the load is on the belt. Load position is a measure of the distribution of the load material across the belt and reports the position of the centre-of-mass of the load material.



CVS-1S
Standard model

3 frame sizes

CVS-1SS: Small, 495-1320mm

CVS-1SM: Medium, 790-1770mm

CVS-1SL: Large, 1090-2210mm

Custom mount

Fits large belts up to 3000mm wide

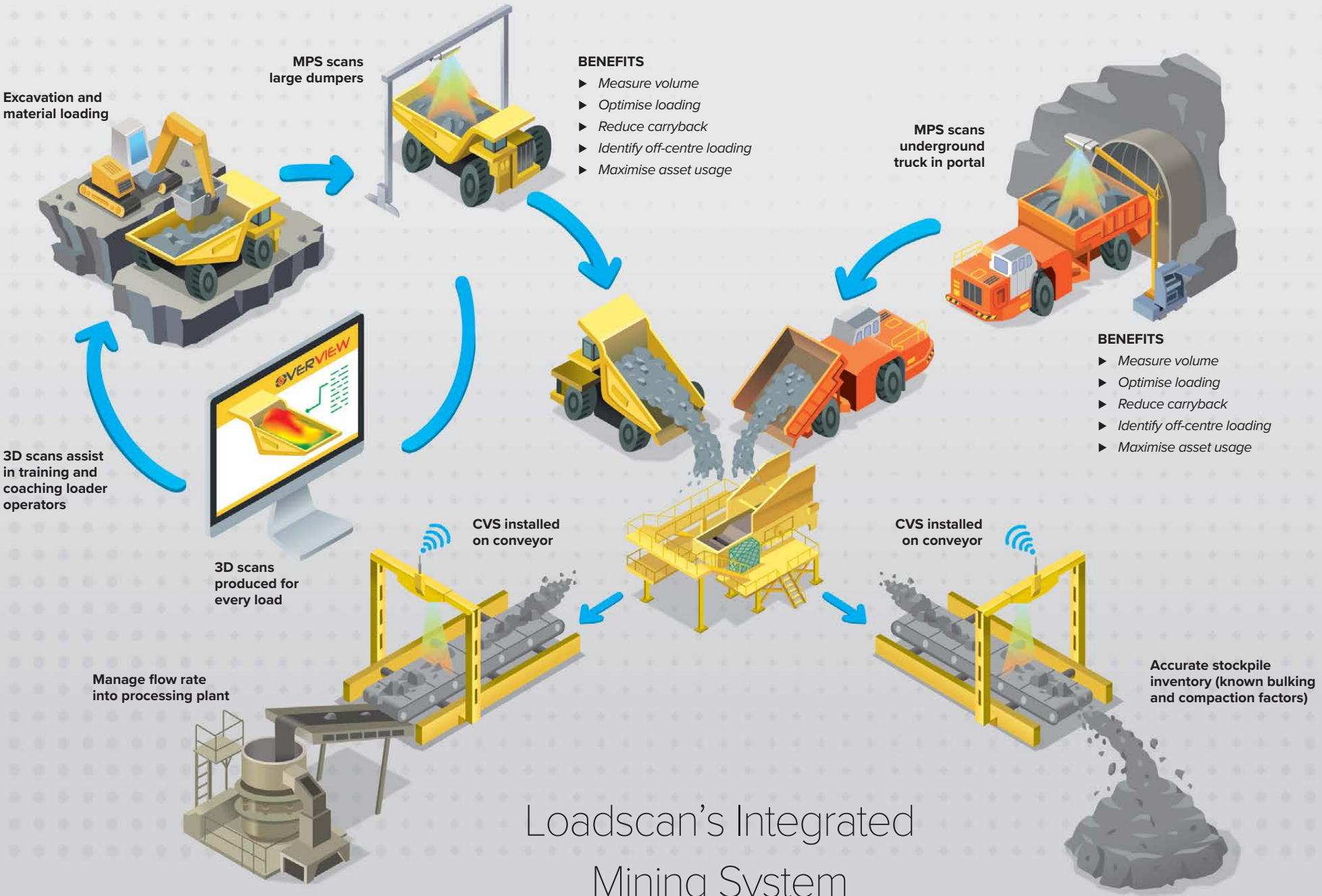
CVS-1W
Wide temperature range

Extremely robust version to withstand -40°C to 60°C

CVS-1SS: Small 495-1320mm

CVS-1SM: Medium 790-1770mm

CVS-1SL: Large 1090-2210mm



Loadscan's Integrated Mining System

SQL/API
data sync

GLOBAL
support via
phone or email

REMOTE
online access to
scanner & load data

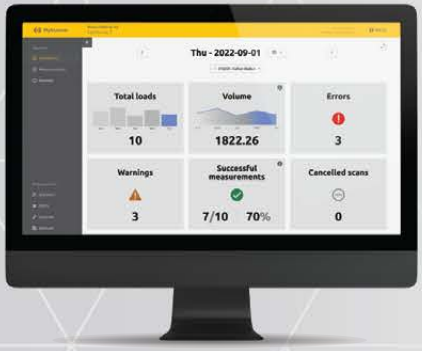
Seamless data integration with your systems

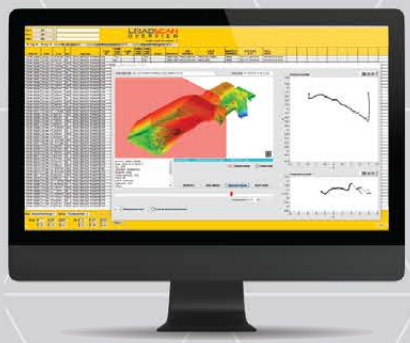
Loadscan's Advanced Mining System provides a seamless data interface with most mine management systems through standard SQL and API interfaces, providing you with the flexibility of importing all load volume measurements into your own system for analysis, action, and reporting.

Powerful 3D visualisation

Every load record is stored in the system, which is connected by LAN, WiFi or Cellular network to our proprietary *Overview* software running on your desktop.

Overview enables the automatically generated 3D scan images of all loads to be reviewed in real-time. The scan images provide a powerful insight into loading practice and can be used to educate loader operators to consistently load trucks to capacity.

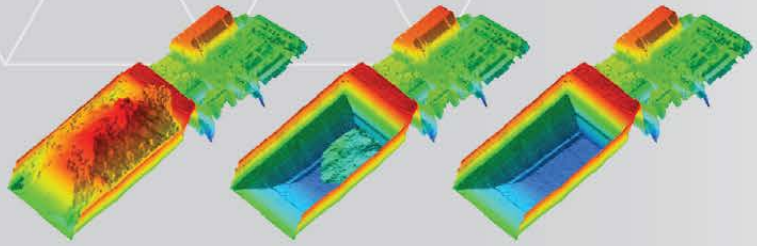




Real-time dashboard

MyScanner™ is a secure web portal allowing remote access to your scanner, real-time presentation of scan data and access to support from anywhere in the world.

The centralised dashboard of *MyScanner*™ provides a summary view of each scanner's activity and identifies errors and warnings. Empower the daily operation team with data insights in real time.



Fully loaded **Carryback** **Empty scan**

Volume scanning delivers extensive benefits for mines

- Easily identify and correct underloading to increase profitability
- Improve loader operator performance and optimise trucking factors
- Measure actual volume, not a converted weight estimate
- Measure and account for carryback
- Remove discrepancies between quantities hauled and mill processing data
- Account for every load delivered or removed from site
- Gain a better understanding of bulking and compaction factors
- Improve ore body knowledge with volumetric as well as mass data
- Automatically track truck arrival and departure times
- Eliminate hand-written load dockets and manual docket processing
- Seamless data interface with most mine management systems
- MPS measures to an accuracy of +/-1%
- No significant maintenance costs or recalibration required

Accuracy starts at the laser scan head

The scan engine is the heart of our volume scanning systems. Using eye-safe Lidar technology, the range finder lasers in our MPS systems are the highest specification available.

Accurate scanning alone doesn't guarantee accurate data!

Only when you combine it with our proprietary algorithms do you get reliably accurate measurement data that enables you to make confident business decisions.

LOADTRAK™

- In-cab touch screen console allows driver to enter load details such as:
  - *load source*
  - *material type*
  - *delivery destination*
- Automatically uploads to MPS during scanning via WiFi
- All load data is instantly available for analysis and reporting using *Overview* reporting software
- Up to six customisable fields for load reporting

We're obsessed with accuracy!

Mine Payload Technologies is the specialist mining division of Loadscan Ltd. Our business is about improving the profitability of our global customers across the mining sector.

Over 20 years ago we invented and patented the original load volume scanner. Since then, we've been the market leader in providing accurate and reliable load information across the world, with our load volume scanners measuring to an accuracy of +/-1%.

Our advanced volume scanning and measurement systems provide the detailed insights necessary for you to optimise your production loading and throughput. Loadscan technology is enabling substantially improved operational and financial performance for forward-thinking companies across the world. **We've sold our systems globally into over 35 countries, and that's growing fast!**

If you have loads to be measured, no matter where you are, you can rely on Loadscan. **Because no-one does it more accurately than us.**

Contact us today to find out how we can transform your operational performance.

Loadscan is a truly international brand, with an installed customer base stretching across every major continent.

In 2020 Loadscan invested in a new purpose-built head office and assembly facility in Hamilton, New Zealand.

Mine Payload Technologies®

New Zealand 27 Earthmover Crescent, Burbush, Hamilton 3288 New Zealand
Australia Unit 4/22 Portside Crescent, Maryville, NSW 2293 Australia
USA 27604 Commerce Oaks Drive, Conroe TX, 77385 USA
NZ 0800 825 592 | **AUS** 1 800 335 305 | **USA & INT** +1 800 747 2973
Email sales@loadscan.com

ECAAS ISO 9001 CERTIFIED QUALITY MANAGEMENT

Loadscan is the only load volume scanning company worldwide to have achieved trade certification approval for truck volume measurement. Our LVS-3 system is certified for trade in New Zealand under Trade Approval Certificate 1556 (MAPPS NZ) and in Australia under pattern approval Certificate 13/1/15 (NMI AUS). The MPS shares a common scan engine and measurement algorithms with the LVS and delivers the same level of accuracy. The MPS is sold as 'Monitor Only' and 'Not Legal for Trade Use', however it will still perform to the same high level of accuracy as required by the Trade certificates in New Zealand and Australia.

Partner:

AMA LASER

AMA Laser AB
Address Fräsarvägen 7 SE-142 50 Skogås, Sweden
Contact Andy Griffiths and Janez Urbas
Phone Janez Urbas +46 721 683431 | Andy Griffiths +46 708 631545
Email andy@amalaser.com | janez@amalaser.com

MinePayloadTechnologies.com

Mine Payload Technologies is the specialist mining division of Loadscan Ltd