



BULK ORE SORTING SYSTEMS

Combining IPSC and ore sorting solutions to separate ore from waste in the mine



Key Benefits

Up to 20% ore grade uplift

Up to 10% less energy usage

Up to 10% less water consumption

Lower cost per tonne

www.mmdsizers.com

THE EFFICIENT WAY TO UPGRADE ORE QUALITY

As lower ore grades become more prevalent, efficient processing and transportation of ore plays an ever increasing role in a mine's economic and environmental goals.

Bulk Ore Sorting is the process of separating valuable ore from waste. Ore sensor technology is already widely used in fixed plants and conveyor systems, however, MMD's mineral processing equipment has revolutionised the process by enabling the deployment of sensor-based ore sorting close to the mine face.

The ability to assay and sort material prior to processing and treatment will transform the way you operate: by removing unwanted waste quickly, you will haul only required material grades from pit to plant. Uplifting cut-off grades and increasing the production rate of existing fixed processing plants, or when launching an entirely new operation, significantly reducing the scale and cost of downstream processing equipment.

With several installations currently in operation, MMD's IPSC (In-Pit Sizing & Conveying) and ore diverting technologies are making material analysis at the mine face a reality.

In-pit bulk ore sorting is ideal for raw material extraction, such as:

- **Nickel Ore**
- **Platinum Ore**
- **Copper Ore**
- **Iron Ore**
- **Coal**





Up to 20%
Ore Grade Uplift

Ore grade uplifts of up to 20% are possible, resulting in potential for lower grade cut-offs and increased ore recovery



Up to 10%
Less Energy use

Only processing valuable ore, not waste, delivers reduced haulage and downstream processing energy requirements



Up to 10%
Less Water use

With less waste material processed downstream, water requirements are also reduced



Lower
Operating Costs

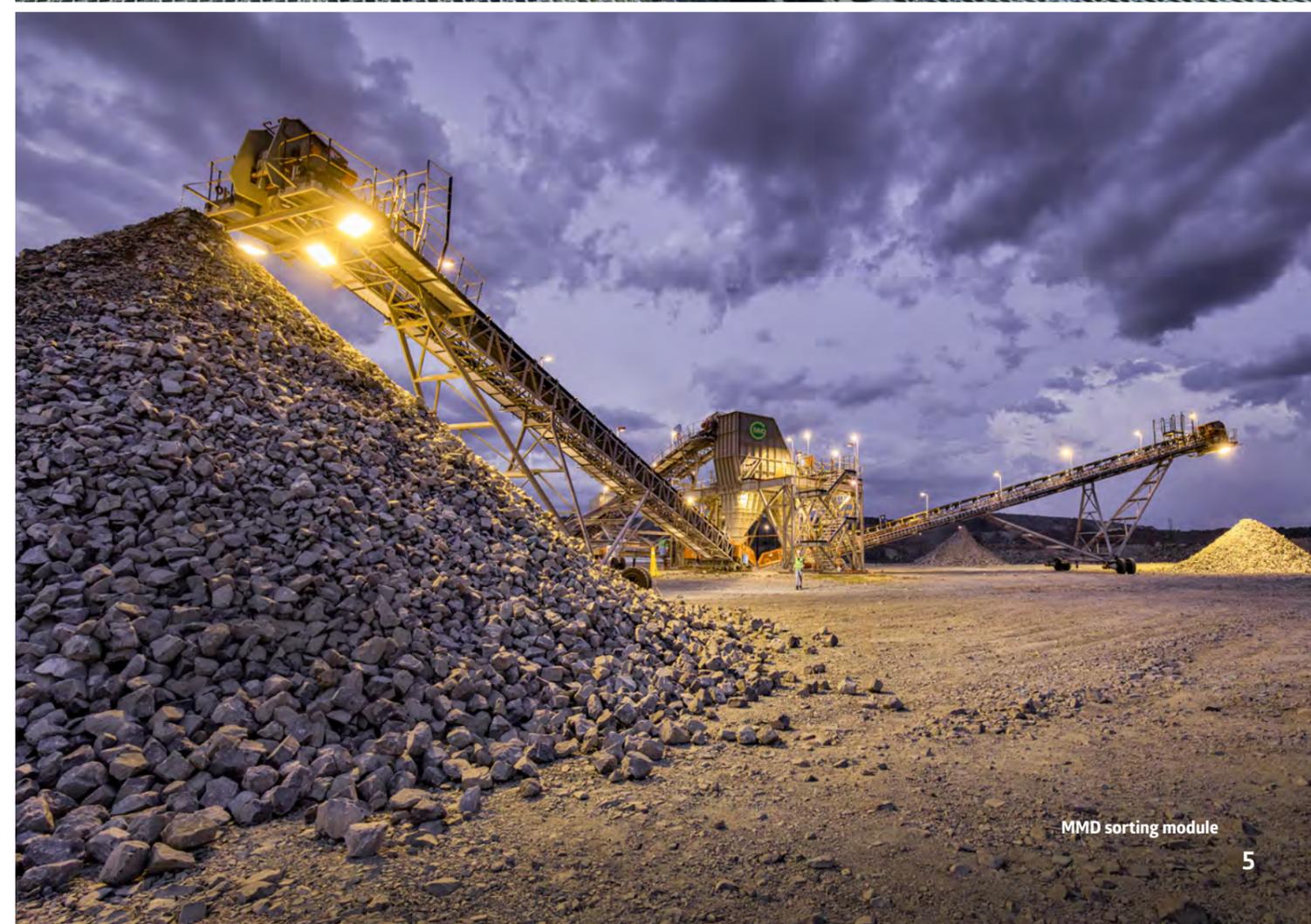
Less wear on haulage equipment and increased SAG mill efficiency are just some of the additional cost savings

Further operational benefits:

- Downstream cost savings
- Improved ore management and mine planning
- Ability to operate at lower cut-off grades
- Reduced requirement for tailings dams
- More sustainable mining method
- Revisit waste stockpiles for ore recovery
- Improve mine safety
- Reduced emissions, noise and dust



MMD In-Pit Sizing (IPS) module



MMD sorting module

TYPICAL IN-PIT BULK SORTING SYSTEM

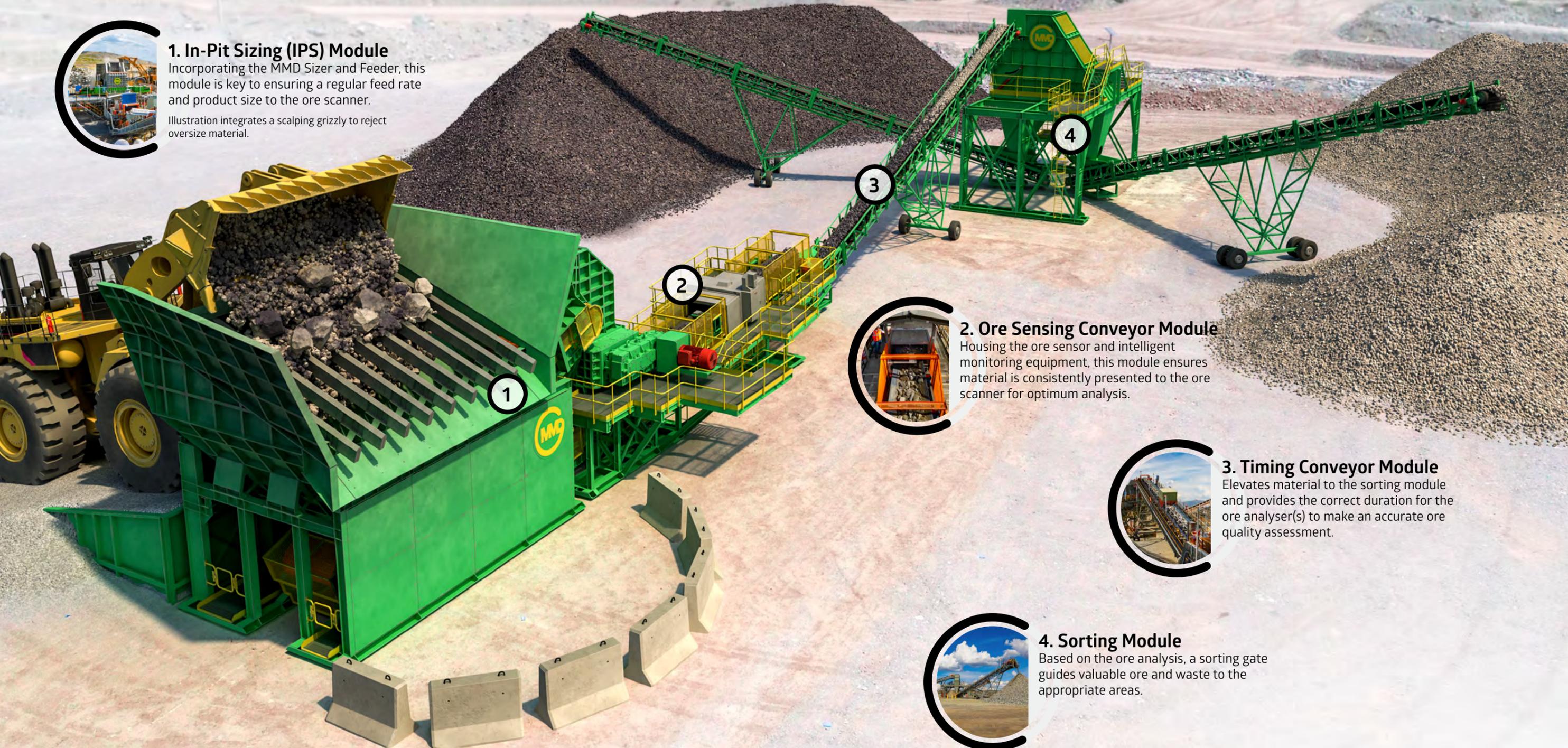
To ensure your system operates efficiently, all MMD IPSC and ore diverting equipment are scalable and tailored to match the throughput, material, sensors, grades and relocation method required.



1. In-Pit Sizing (IPS) Module

Incorporating the MMD Sizer and Feeder, this module is key to ensuring a regular feed rate and product size to the ore scanner.

Illustration integrates a scalping grizzly to reject oversize material.



2. Ore Sensing Conveyor Module

Housing the ore sensor and intelligent monitoring equipment, this module ensures material is consistently presented to the ore scanner for optimum analysis.



3. Timing Conveyor Module

Elevates material to the sorting module and provides the correct duration for the ore analyser(s) to make an accurate ore quality assessment.



4. Sorting Module

Based on the ore analysis, a sorting gate guides valuable ore and waste to the appropriate areas.



6,000 TPH semi-mobile Sizer station fed by dump truck

IN-PIT SIZING SOLUTIONS

MMD have built an extensive range of tailored in-pit semi-mobile and fully mobile Sizer stations with throughput capacities ranging from 250 TPH to over 10,000 TPH.

Sizer stations typically incorporate MMD's core equipment: the robust MMD Heavy Duty Apron Plate Feeder and unique MMD Mineral Sizer™. Together these components deliver a controlled throughput and regular product size – ideal material supply for ore analysing equipment.

Our comprehensive service extends through consultation and initial concept to commissioning and ongoing maintenance. With more than 40 years' experience in the mining machinery sector, we can tailor your Sizer station to your exact requirement – whatever the size and nature of your mine.

Semi-Mobile Stations

These stations, powered by diesel or electricity, are a common solution for many bulk sorting operations located in the pit, and are fed by a fleet of trucks or front-end loaders transporting material short distances from the mine face. The flexibility to relocate the Sizer plant closer to the working bench allows optimisation of truck and conveyor haulage distance ratios.

Depending on the application and transport method, semi-mobile stations are constructed as a single module or multiple smaller modules on skid frames, designed for relocation by bulldozer or MMD transporter. Typically, relocation will take place every few months or years.

Fully Mobile Stations

Fully mobile Sizer stations are self-propelled and mounted on tracks or powered wheels. Typically, these stations are fed by excavators, shovels or front-end loaders, allowing a very high level of flexibility. Over the years, we have tailored many such units for diverse mines around the world, creating equipment that is designed to be moved frequently.



1,000 TPH semi-mobile Sizer station fed by FEL



The MMD transporter easily relocates semi-mobile systems



Fully mobile Sizer stations with capacities in excess of 10,000 TPH are available

WHY IS AN MMD SIZER SUITABLE FOR ORE SORTING?

Since patenting Sizer technology over 40 years ago, MMD have designed and installed over 2,500 Sizers in many different industries worldwide. When it comes to in-pit ore sorting, our Sizers deliver clear advantages.

Processes Most Materials

The MMD Sizer can process any combination of wet, dry, sticky or hard material through the same machine – ideal for heterogeneous material typically found in ore sorting applications.

Controlled Cubicle Product

The MMD Sizer controls the product size in all three dimensions. A regular-sized product drastically improves the reliability and accuracy of ore analysing equipment.

Minimum Dust & Fines Production

The unique breaking action of the MMD Sizer minimises fines generation and dust, thereby optimising the accuracy of ore analysing equipment.

Flexibility

The compact and lightweight nature of the MMD Sizer requires very little supporting structure, providing high installation flexibility and manoeuvrability.



Sizers can process any combination of wet, dry, sticky or hard material



A controlled product size is important for accurate ore analysis in-pit. Image shows a fully mobile Sizer station producing in excess of 10,000 TPH

SENSING & SORTING TECHNOLOGY

After the material is sized to regular dimensions, sensors analyse its characteristics; based on this analysis and customisable grade cut-offs, the sorter redirects the material to the correct location.

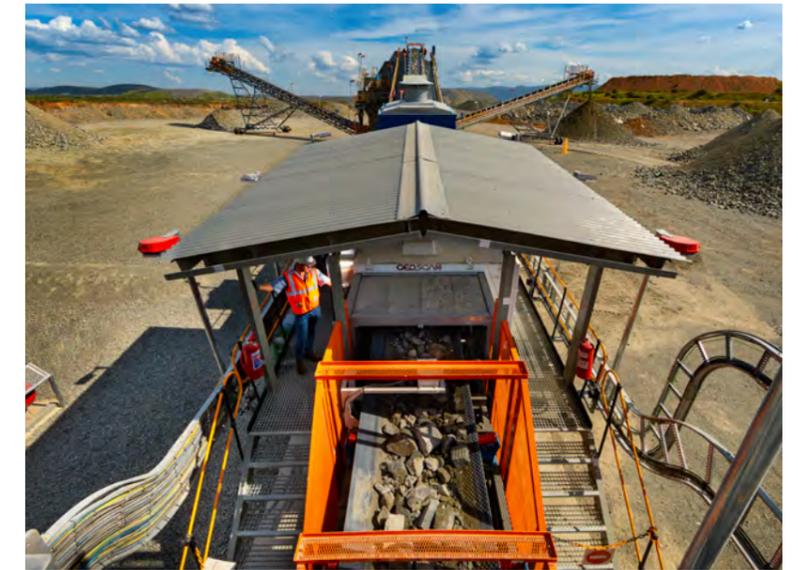


Ore Sensing Technology

A variety of ore sensors are available to measure material properties. Common examples are:

- XRF (X-Ray Fluorescence)
- PGNAA (Prompt Gamma Neutron Activation Analysis)
- PFTNAA (Pulsed Fast Thermal Neutron Activation)
- MR (Magnetic Resonance)

Our tailored approach means we can design IPSC and conveyor equipment to accommodate most analysers. Multiple types of sensor are normally used to analyse the sized material, achieving the highest levels of accuracy and separation.



Sorting and Grading

With sufficient analysis and acquisition time, an accurate assessment of the material can be undertaken, and the material sorted accordingly. This not only enables valuable and uneconomical ore to be separated, but also allows separation into different ore grades for more accurate blending or the application of different processing techniques for different grades.

MMD have developed numerous scalable sorting solutions to separate and grade materials, and we have the R&D capacity to develop customised solutions for your specific mines and needs.



Extensive material grading can be achieved in the pit



WWW.MMDSIZERS.COM

MMD is a leading designer and manufacturer of mineral processing equipment and services for the mining, metallurgical, industrial minerals and alumina industries, among many others.

We have fully equipped centres around the world to deliver a proactive service to your operation. When you buy from us, you can expect comprehensive training from experts, enabling you to get the most from your Bulk Ore Sorting System.

