



Online automated  
analysis of the blasted  
rock mass particle  
size distribution°

# GRANCONTROL

## KEY VALUE FACTORS°

### COST REDUCTION

#### Blasting

Proper fragmentation  
measurement can identify and  
prevent excessive grinding

#### Additional loading / unloading operations

Built-in fragmentation control reduces  
boulders handling (crusher clogging)

### PERFORMANCE

#### Crusher production rate

Increase productivity by  
ensuring optimal piece size  
for crushing equipment

#### Automatic sampling

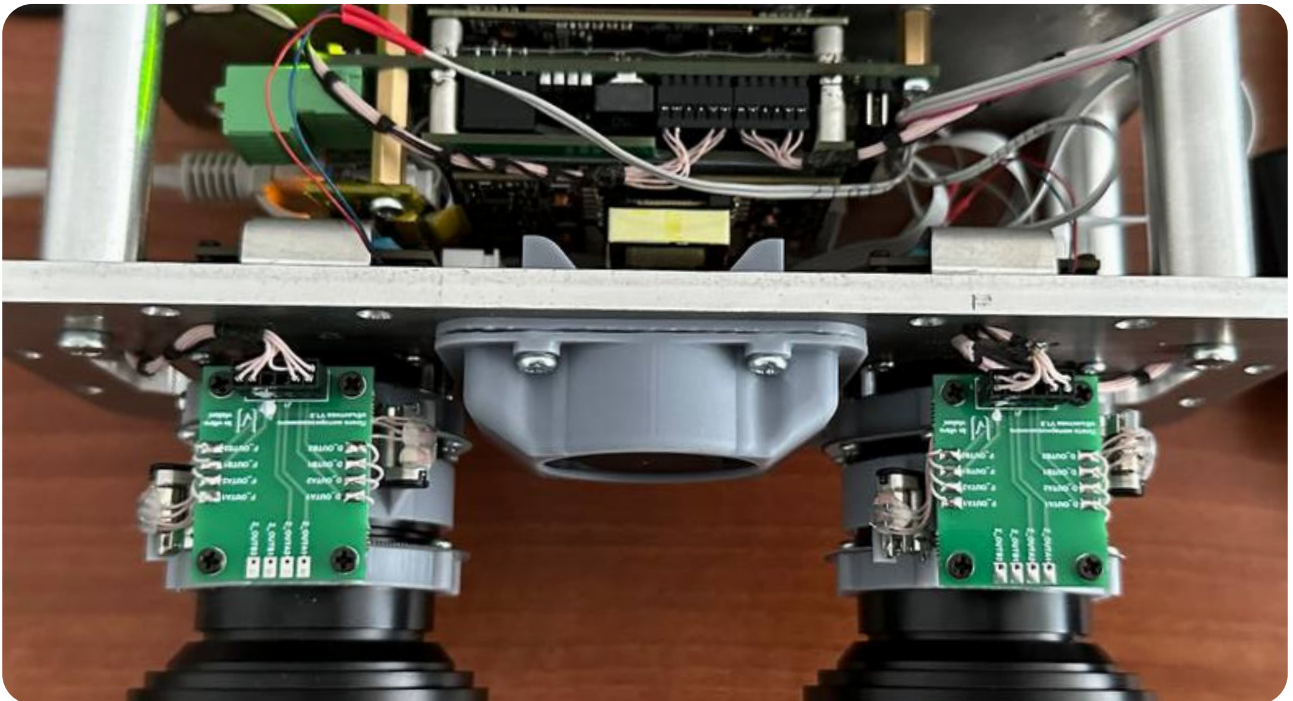
Built-in fragmentation control reduces  
boulders handling (crusher clogging)

# COMPONENTS OVERVIEW°

**A** The heavy-duty dual-lens camera is mounted on a shovel or conveyor belt and autonomously creates a continuous stream of high-quality stereoscopic images°

**B** Images captured by the camera are transmitted as data to the processor using a shielded Ethernet cable°

**C** The processed data from the processor is transmitted wirelessly (via 3G cellular or 2.4 GHz Wi-Fi) from a 5-in-1 antenna and uploaded to the GranControl secure cloud storage platform°



**1**

THE PROCESSOR USES INNOVATIVE HYBRID 2D AND 3D TECHNOLOGIES TO PERFORM FAST PARTICLE SIZE ANALYSIS OF IMAGE SAMPLES°

**2**

THE DATA PROCESSING UNIT ON THE JETSON ORIN NX PLATFORM IS LOCATED INSIDE THE CAMERA°

## STEREO CAMERA



**Communication  
and positioning  
module GNSS**



**Angular orientation  
subsystem**

MU Sensor



**Processing  
module**

NVIDIA Jetson Orin NX



**Mechatronics  
control module**

diaphragm, sharpness



**Sensor A**

4096 × 3072 px



**Sensor B**

4096 × 3072 px

3

THE PROCESSOR IS  
POWERED BY A 24 V DC  
OR POE INPUT SOURCE°

4

THE CAMERA IS  
EQUIPPED WITH  
MECHATRONICS UNITS°

# SPECIFICATION<sup>o</sup>



## Camera sensor

Sensor type	CMOS
Resolution	4096×3072 px
Sensor size	14.0 x 10.5 mm
Shutter type	Global Shutter
Frame rate	30
Chromaticity	RGB
Color depth	10/12 bits, HDR



## Processor module

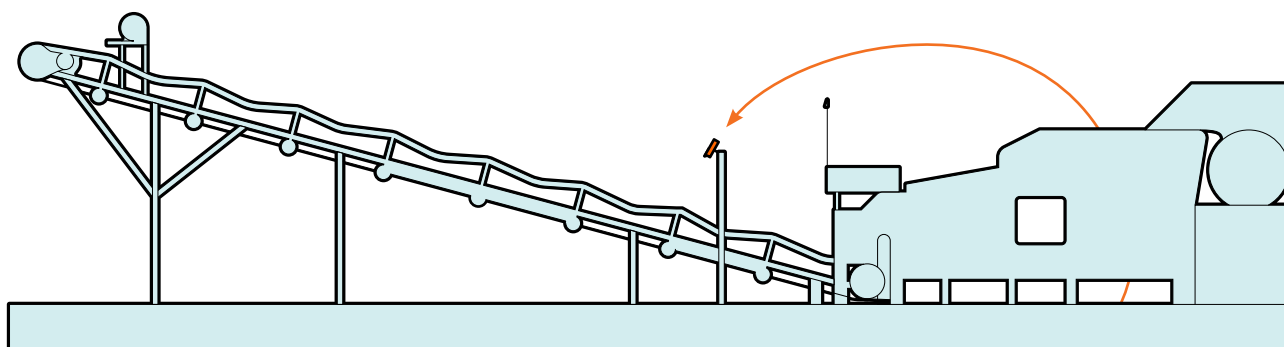
Processor	NVIDIA Jetson Orin NX (6- or 8-core ARM Cortex-A78AE)
Graphics	NVIDIA Ampere GPU with 1024 CUDA cores
Memory	8/16 GB LPDDR5
Storage	256 GB
Operating system	Linux (JetPack SDK)



# INSTALLATION

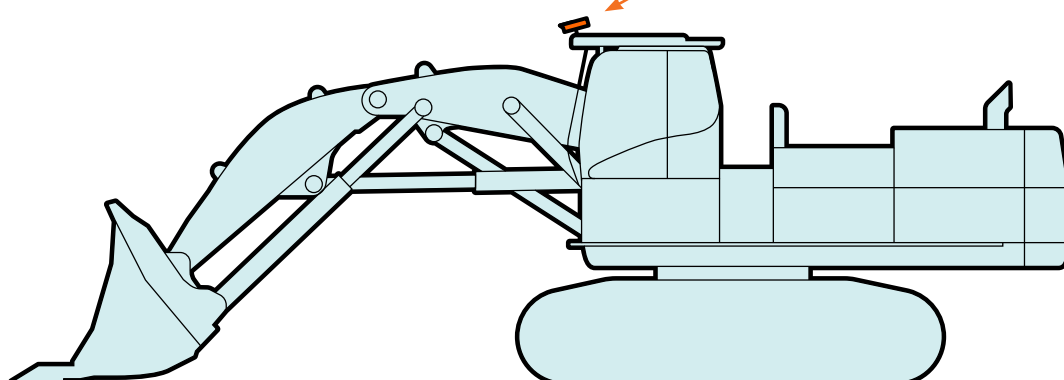
## ON A CONVEYOR°

The camera can be installed on a conveyor to get a granular composition of rock mass on the conveyor belt. The camera is usually mounted using a 90° mounting plate that is bolted to an existing special steel frame°



## ON A SHOVEL°

The camera can be mounted on the shovel to capture face images of the excavated blasted rocks. The camera is usually mounted using a camera mount and a special base plate that can be bolted or welded to the front edge of the upper deck or cabin roof to provide an optimal angle of the face image°



## ON A SHOVEL°

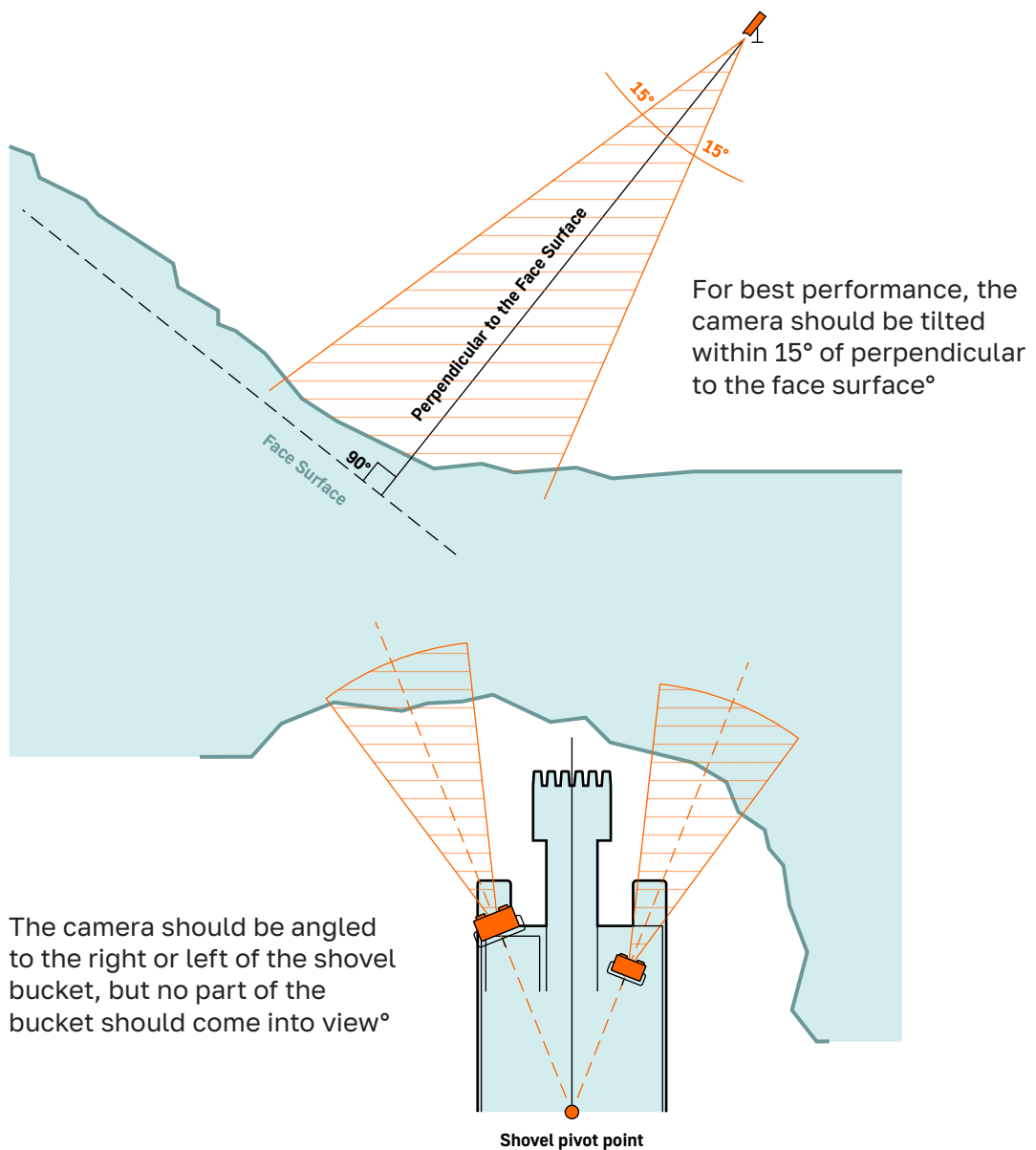
On the front edge of the cab roof or upper platform.

In a location that provides safe access for regular maintenance.\*

Using the included camera mount and base plate.

Position and orient the camera as shown on this slide.

\*The installation place should be equipped with a safety railing and is accessible by a fixed ladder.



# KEY BENEFITS°

**RELIABILITY OF DATA COLLECTION, AS THE SYSTEM CONTINUES TO OPERATE WITHOUT A NETWORK CONNECTION°**

**EXTENDED DATA INTEGRITY LOCAL STORAGE°**

**WEB INTERFACE FOR ACCESSING AND VISUALIZING FRAGMENTATION DATA°**

**OFFLINE AND REPRESENTATIVE DATA COLLECTION 100-500 PHOTOS PER DAY°**

**HIGH ACCURACY RESULTS COMPARABLE TO CONVENTIONAL SCREENING ANALYSES METHODS°**