Robit Plc – Growth Company

Sense Systems
Digitalizing Your drill string
Sense Systems – Blasthole deviation measurement
Hole deviation can cause overall inefficiencies and added costs when boulder size is too large and requires secondary breaking and blasting.

Safety hazards are a significant risk when hole deviation causes over-charging of certain blast segments. Explosives consumption rises and overall efficiency drops.
Robit® Sense Systems – What for?

- **Hole deviation is a serious safety concern**
  - Even in the highly regulated Nordic industry safety breaches occur:
    - In 2012 blasting at a jobsite in Espoo, Finland, resulted in 7 injuries as rocks flew more than 250 m, breaking car and apartment windows
    - Reason: front row holes too close to rock face + over-charging

- **Quantification of drill hole deviation**
  - Overall, 67 drill holes were investigated in the case study.
  - The results show that 76 per cent of the drill holes had deviation.
    - Century Mine Case Study [EXPLO 2011]
  - **Why?**
    - “Poor hole alignment, a lack of guide tubes, too high feed force, poor collaring, badly selected drill steel, and various rock types with faults that can steer the drill bit in the wrong direction.”
    - Fredrik Gransell: Decision analysis: determining the most appropriate drilling method for production drilling in underground mining
Robit® Sense Systems - Benefits

1. Efficiency
   • Increase overall efficiency of drilling-crushing-transportation process by controlled drilling and blasting

2. Cost saving
   • Cutting costs in
     ➢ Fuel
     ➢ Explosives
     ➢ Transportation
   • Reducing downtime

3. Safety
   • Ensure safe blasting without the risk of flying rocks
Robit® S Sense – Concept

1. Extract accurate and easy-to-use measurement data right after each hole is drilled. Adjust drilling parameters for safe and efficient charging and blasting.

2. Upload drilling information to the Cloud Service to be used by multiple users anywhere.

3. Manage your entire fleet and all sites. Keep track of their positions and job status. Build on accurate data to analyze, plan and develop your overall processes.

Sense Systems added feature: The system allows for integration of jobsite laser scanner data.
1. Identify and work with multiple loggers – Recording measurements is easy and takes only a fraction of the total drilling process.

2. Measurements are immediately ready as the hardware is retracted from the hole – The operator can adjust drilling parameters to ensure optimal drilling results for blasting.

3. Jobsite drilling pattern design and progress can be tracked in 2D and 3D environments ready for blast planning.
Sense Cloud online environment (1/3)

Manage sites, individual drilling plans and drill hole data in the online environment.

Data exports into your next process steps (e.g. blast planning software) are done through the Cloud Service.

System integration into your existing process is always designed and done with the Sense Team!
When the tablet is connected to the Internet, deviation data is automatically uploaded into the Cloud.

Plans, individual hole data and driller notes are available anywhere in the world.

When Internet is not available, data is stored on the tablet and uploaded into the Cloud next time connection is gained.
Change easily between 2D and 3D views on the Cloud and choose individual holes and related data for closer inspection.
Deviation measurement – One piece of the puzzle

System / process description map

Import

- Multiple solutions
- Drill planning (Method / software)
- Current data format (e.g., csv, json, txt, int)
  - Example file available: yes, no

Sense Cloud

Export

- Current data format (e.g., csv, json, txt, int)
  - Example file available: yes, no

- Blast planning (Method / software)

Multiple solutions

- Orica
- Geokonzept
- iBlast
- O-Pitblast
- ...

Other systems (e.g., hole location)

- Laser scanning
- Photogrammetry
- GPS positioning
- Machine control
Robit is dedicated to the drill string. Full focus on consumables and a global reach ensure we help you drill right – every time, everywhere.

Sense Systems takes a step deeper. The world’s first drill string mounted deviation measurement system is proof we can quantify your drilling process like no-one else.

The tools and the data guarantee we are the right partner when it comes to getting drilling truly right.

Welcome to intelligent drilling – welcome to Robit Sense Systems!
Robit®

Committed to serving you

Bit Better