

# Driving the best results from data acquisition to data visualization and management

**December 7, 2021, Tuesday,** SGT 9.00pm – 10.00pm, GMT 1.00pm – 2.00pm



### Your Hosts

Wei Ling, Teo Marketing Manager, ACKCIO

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### **Featured Speakers**



#### **Mobashir Mohammad**

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#### **Steve Pollett**

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#### **Thorarinn Andresson**

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#### **Andres Andresson**

Director, Business Development Bentley Systems Andres.Andresson@bentley.com Iceland



# Q&A team



Radershan Suguneswaran Embedded Engineer ACKCIO



### **Gudmundur Steinsson** Senior Business

Development Manager Bentley Systems



## Housekeeping Rules





#### We are live!

Pose questions to the speakers here. We'll get to these at the end.

Recording of the webinar will be sent out immediately after the webinar.



## Agenda

The role of remote monitoring and how it can benefit your project

2

Wireless monitoring technology for mining projects

3

Overview of Ackcio Beam wireless data acquisition system



Overview of Vista Data Vision software data management platform

5 in V 6 Q&/

Setup of a project with Ackcio Beam in Vista Data Vision

Q&A session

Closing



## **Evolution of Remote Monitoring**



# AI + ML Cloud **Future** 2015



### **IIoT paving digital transformation** of many traditional industries



Construction

Infrastructure

Mining



#### Rail



# **120** tailings dam failures in the last 50 years



There are 12,000 to 30,000 tailings dams, and many are believed to be structurally insecure.

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### The Brumadinho collapse



2019

### Tailings dams

Córrego do Feijão iron ore mine Owned by Vale, Brumadinho, Brazil

Broke and released millions of cubic meters of waste. The liquid sludge plowed 8 kilometers (5 miles) downhill, over farmland and communities.

Authorities identified 259 people killed, and 11 remain missing.

Scientists have called the collapse one of Brazil's worst environmental disasters and deadliest industrial accidents.

Image by Felipe Werneck/Ibama via Wikimedia Commons (CC BY-SA 2.0).



### Global Industry Standard on Tailings Management - August 5, 2020



Conformance Protocols for the Global Industry Standard on Tailings Management

The Global Industry Standard on Tailings Management on August 5, 2020 "strives to achieve ... zero harm to people and the environment with zero tolerance for human fatality," according to its preamble.





Piezometers measuring the underground pore water pressure

2. Probes measuring water quality of the dam water

3. Wireless tiltmeters measuring the slope stability around the mine site

4. IPI's and SAAs measuring settlement/lateral displacement beside the mine slope

> 5. MPBX measuring vertical deformation at various depths

> > 6. Pressure cells measuring total earth pressure and pore water pressure within the soil/backfill

7. Environmental sensors measuring rainfall, temperature, humidity, pressure, and water evaporation



### Benefits of real-time monitoring



**Workforce Safety** - No more manual readings in dangerous and remote areas requiring minimal workforce requirement on-site.

**Risk Management** - Reactive to proactive using real-time data and analysis and move towards preventive maintenance

**Reduced Cost** - Reduced manpower dependency and expenses due to vandalism and extensive maintenance routines

**Increased Efficiency** - Frequent and real-time data collection leads to deeper insights, quick actions and allows us to capture long-term trends

**Data Integrity and Security** - High quality and secure data availability through reduced manual interventions and end-to-end data encryption



### **Traditional Monitoring Practices?**

### MANPOWER-BASED SOLUTIONS



Costly

Accuracy might suffer

Infrequent readings

### CABLE-BASED SOLUTIONS



Deployment takes time

Maintenance is costly

Prone to effects like EMI



### Industrial Grade

Why is monitoring a mine hard? Harsh and extreme deployments -Equipment can easily get damaged





– Rugged die-cast aluminum enclosure

IP67 for weather and waterproof design

Operational in extreme temperatures (-40 to 80 °C )





### Multi-hop Routing

Why is monitoring a mine hard?

Geographically spread monitoring points - Infeasible for manual or cabled solutions and hard for star topology to reliably cover





# **3** Self healing

#### Why is monitoring a mine hard?

Constantly evolving structures -Change can happen in seconds and failures come without warnings





### **G Frequency Hopping**

Why is monitoring a mine hard? ISM bands are getting increasingly

congested causing packet losses due to high ambient noise





# **5** On-demand downlink

Why is monitoring a mine hard?

Deployment of nodes in difficult to access locations make access for remote configuration challenging





# 6AES-128Encryption

Why is monitoring a mine hard? Risk-averse tech adoption and lack of trust in IoT security and secured cloud infrastructures





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# **SOLUTION**

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## ACKCIO BEAM



#### Ackcio Analogue Nodes

**BEAM-AN-S1:** Supports 1 sensor (2 analogue channels and 1 thermistor channel)

**BEAM-AN-S4:** Supports 4 sensors (8 analogue channels and 4 thermistor channels)



#### Ackcio Vibrating Wire Nodes

**BEAM-VW-S1:** Supports 1 sensor (1 vibrating wire channel, 1 pulse counter, and 1 thermistor channel)

**BEAM-VW-S8:** Supports 8 sensors (8 vibrating wire channels and 8 thermistor channels)



#### Ackcio Digital Node

**BEAM-DG:** Supports digital sensors using RS232, RS485 or SDI-12 communication protocols. Supports digital sensors like in-place inclinometers, digital tiltmeters, borehole extensometers, water level sensors, ShapeArrays etc.



# **ACKCIO BEAM**

### **Supported Digital Sensor Brands**













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## ACKCIO BEAM



#### Ackcio Tiltmeter Node

**BEAM-TM:** Wireless Tiltmeter Node. BEAM-TM uses MEMS bi-axial tilt sensor modules built, installed, and calibrated by Sisgeo Asia Pacific, thus providing highly accurate and reliable tilt readings.



#### Ackcio Repeater Node

**BEAM-RN:** Repeater Node that helps to expand the network coverage.



#### Ackcio Gateway

**BEAM-GW**: Beam Gateway with Snape, Ackcio's on-Gateway data and device management software.





### Case Study

### Kalgoorlie Gold Processing Facility – Australia

### CHALLENGES

### Remote location

• Vast land area

### SENSORS MONITORED

- Piezometers
- In-place inclinometers (installation pending)

### PRODUCTS USED

- BEAM-VW-S1
- BEAM-GW
- BEAM-DG





# Case<br/>StudyKalgoorlie Gold ProcessingFacility – Australia





By using Ackcio Beam, our client obtained regular real-time readings from a robust and reliable wireless monitoring system. This, in turn, led to their increased awareness of the dam's stability and alleviated the high labour costs of manual monitoring for a large geographical area.

The flexibility and scalability of system made it easy to expand the monitoring network by adding digital nodes for MEMS, in-place inclinometer sensor chains, seamlessly integrating into the existing Ackcio Beam system.





# ACKCIO BEAM System Benefits

Patented long-range wireless mesh system Supports many sensors Suited for underground environments **Designed for harsh environments** (-45 to +80 °C temperature)

**IP67-rated enclosures** 

FCC, CE, IC and Anatel certifications (915 | 868 MHz radio)

**Battery-powered installation** 

**Cost effective** 

Easy to set up, use, and maintain



### ACKCIO BEAM Business Benefits

Increased safety



by up to 70%



Increase productivity

4

**Implement state-of-the-art** risk management processes



Predictive maintenance

6

**Comply with regulations** that are getting stricter

### Monitoring cost reductions



**VISTA DATA VISION** 

# A single solution to rule all instrumentation Platform Overview



# **Our topics** for today

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- 2.
- 3.
- 4.

What is VDV? Different markets How does VDV work? Benefits of using VDV



**VISTA DATA VISION** 

# The industry-leading platform for instrumentation data acquisition, visualization, and management.



#### OUR MISSION AND VALUES

### A single solution to rule all instrumentation. Bring real-time insights from the field, for all types of instrumentation projects.

### Trustworthy

We believe that complete security, reliability and ability to react promptly are paramount

### Personal

We nurture personal relationships with our customers to understand their needs and inform our product development

### Flexible

We're dedicated to building the product that unifies a wide landscape of equipment and use cases







# **Specialized Industries**



#### Dams

Seismic · Reservoir Earthfill · Concrete



### Environmental

Meteorology · Hydro · Ground water · Water quality · Agriculture



**Mining** Open pit · Tailings dam



#### Tunneling

TBM · Prism · Surveying · GIS · Multiple Stakeholders



#### **Geotechnical & structural**

Seismic · Construction · Excavation · Slope stability · Pipeline · Transportation



#### **Air quality** Regulation · Industry · Cities



#### Smart city

Water · Garbage · Electricity



### **VDV** Architecture Scheme





VISTA DATA VISION

- Works with any instruments
- Custom Development
- Quick deployment
- No vendor lock-in
- Scalable



# Ackcio & VDV Integration





Q&A



Mobashir Mohammad

Co-Founder & Chief Technology Officer ACKCIO



Steve Pollett Customer Success Manager Americas ACKCIO



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#### Thorarinn Andresson

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