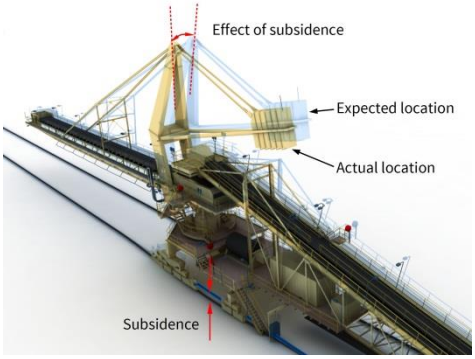
3D-SAM™

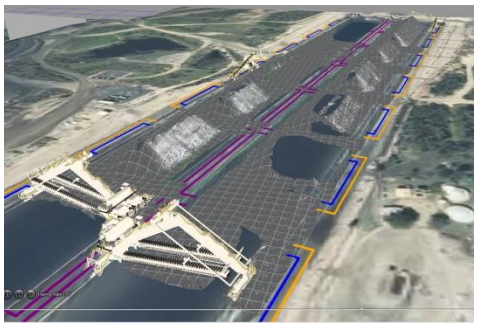
3D Spatially Aware Machines

Space age technology delivering immediate Return on Investment with no risk!

Traditional machine based position and orientation encoders used by mining bulk materials machinery have been the industry "mainstay" positioning sensors for decades. However, today they are unable to deliver the high navigation accuracies required for future machine and rail network 3D spatial control and the platform readiness for future Real Time Stockpile Mapping using advanced Radar and Laser Scan technologies.



Incremental productivity/efficiency improvement requires the latest disruptive navigation technologies reliably delivering machine 3D orientations to centimetre and milli-radian accuracies in real time. Today the 3D-SAM technology is delivering precisely this to its Australian mining customers.



Is your organisation;

- Wasting money on routine rail and stockpile surveys, supplied by survey contractors?
- Unable to access the base of your stockpiles due to traditional encoder accuracy limitations?
- Experiencing rail subsidence, impacting machine operations or safety?
- Spending significant time "reclaiming air" due to encoder inaccuracies?
- Interested in increasing existing yard capacity through enhanced dual navigation solutions?
- Interested in future machine platform readiness for Real Time Stockpile Mapping in 3D?
- Losing production time due to sensor re-calibration procedures?
- Limited by CCTV vision not covering the yard under all conditions?

3D-SAM was specifically designed and developed to address all the above topics by delivering high accuracy "3D terrestrial" navigation streaming data for machine six degrees freedom determination and beyond.

Your machines can easily be upgraded to join the modern 3D world!

3D Spatially Aware Machines

The aviation industry has long understood that deploying duplicate and dissimilar technologies is the best way to achieve maximum fault tolerance and resilience for mission-critical systems. 3D-SAM technology does exactly this, delivering a fully independent *absolute* terrestrial positioning system. When two independently derived locations and orientations, (for example, tags with encoders, and 3D-SAM) agree then PLC control can be totally satisfied that machine positions are true with very high integrity.

3D-SAM technology operational enhancements include:

NAVIGATION SENSOR DUPLICATION

Fully independent dissimilar navigation sensor duplication for the existing RF-Tags and rotation encoders.

3D BACKUP ANTI COLLISION

Backup Anti Collision functionality based on inter-machine 3D spatial separations of external surfaces, (not zones), implemented through on-machine ESTOP interlocks circuits. Totally independent and far more accurate than the primary encoder and RF-Tag SIL2 based system operated from central control room.

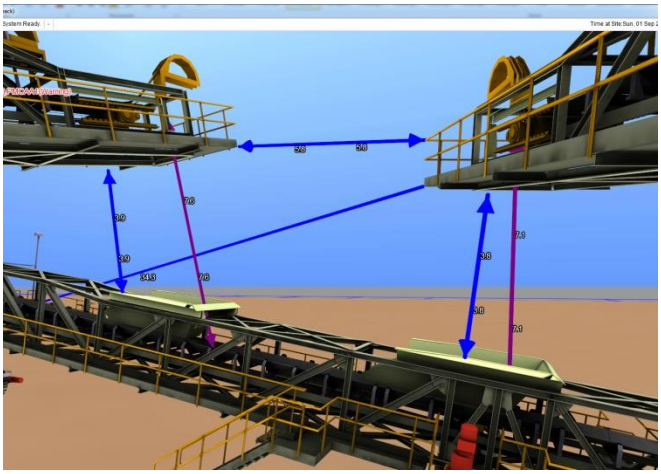
3D SPATIAL POSITIONING

Precise terrestrial 3D positional information on any location of either machine or yard (eg. boom extremities etc.), including automatically computed critical separation vectors between adjacent machines applied to unique internal 3D survey grade models.

- Rail 3D subsidence and machine lean accurately determined under full load conditions.
- Precise 3D machine dynamics for Real Time Stockpile Mapping upgrades.

REMOTE SYNTHETIC CCTV VISION

As with modern 3D gaming technology the machines and yards can be viewed with “virtual cameras”. Ability to view yard/machine 3D positions and orientations synthetically, remotely, day or night, without the need for expensive traditional CCTV camera technology substantially improving supervisor situational awareness.



CONTINUOUS INTEGRITY UPDATES

Continuous satellite integrity assessments on all measurements independently verified against aviation industry standards and further validated against known physical machine and rail mechanical constraints.

3D Spatial Processing

- High resolution 3D machine models 10K+ pts each
- Quaternion mathematical transformations
- Machine 6DoF Body + 2DoF Boom data
- Advanced internal 3D spatial environment
- Aviation grade integrity verification
- Physical machine and rail validation

Processor Platform

- Intel® Atom™ Dual Core D2550 processor, 1.86 GHz
- Intel® NM10 Express chipset
- Dual Intel® 82574L GbE LAN ports
- OS Linux – Embedded Industrial

Navigation Sensors

- 6 x external Navigation Inputs
- GNSS Channels: 120 GPS, GLONASS, BeiDou
- Accuracy: Horizontal 1cm Vertical 2cm
- Measurement Rate: 20Hz
- Power: (Supplied by PoE @ 2W)

Communications

- 2 x USB2.0
- 1 x RS-232 Console
- 1 x DVI-I & 1x HDMI display output

Power & Interfaces:

- Processor 24Vdc nominal, 9-36Vdc
- Processor Rack 15W
- Navigation Sensors 2W (via PoE)
- ESTOP 24Vdc or 110VAC Opto Isolated Relay

Environment

Temperature

- Processor Rack convective cooling -5 ~ 55C
- Navigation Sensors -40 ~ 75C

Humidity, Waterproof

- 95% Non-condensing
- Nav Sensor Cabinet IP66 Stainless Steel

Vibration, Shock, Accel

- Navigation Sensor MIL-STD-810, 5g
- Processor IEC68-2-64, 1g

Weight

- Processor Rack 4kg
- Nav Sensor Cabinet 4kg (each)

Protocols

- Wide variety, flexible. Contact us for details

EtherNet/IP Modbus

Features

- Automatic daily performance reports
- Remote software access, update and configuration

www.gpsatsys.com.au
info@gpsatsys.com.au
Tel:+61.3.9455.0041

GPSat SYSTEMS AUSTRALIA Pty Ltd