



WAM•))
WEAR ASSET MONITORING

ASI
WAM V3

Smartifying bulk material handling wear plates



WHAT IS WAM?

Wear Asset Monitoring (WAM) is an industrial wireless condition monitoring system for wear liners on mining applications.

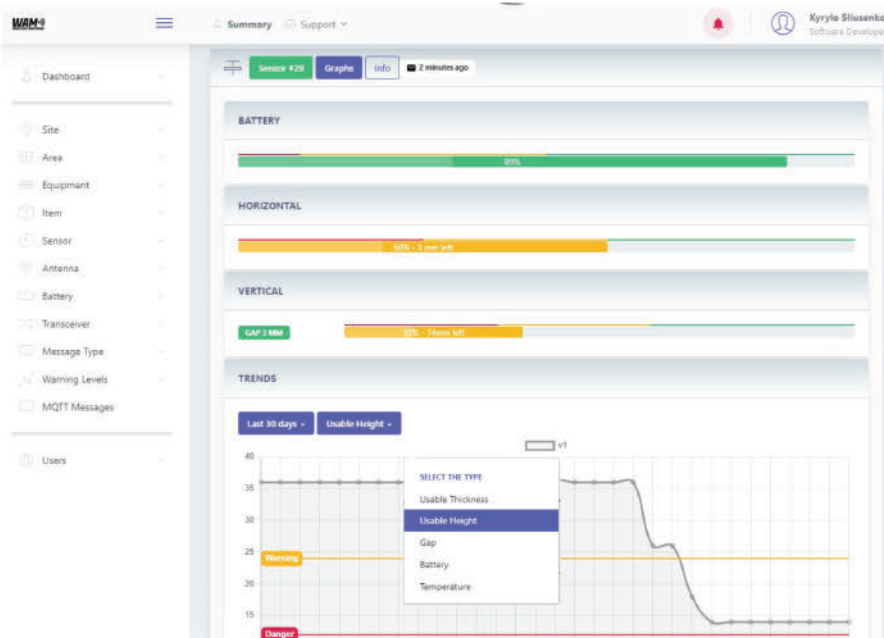
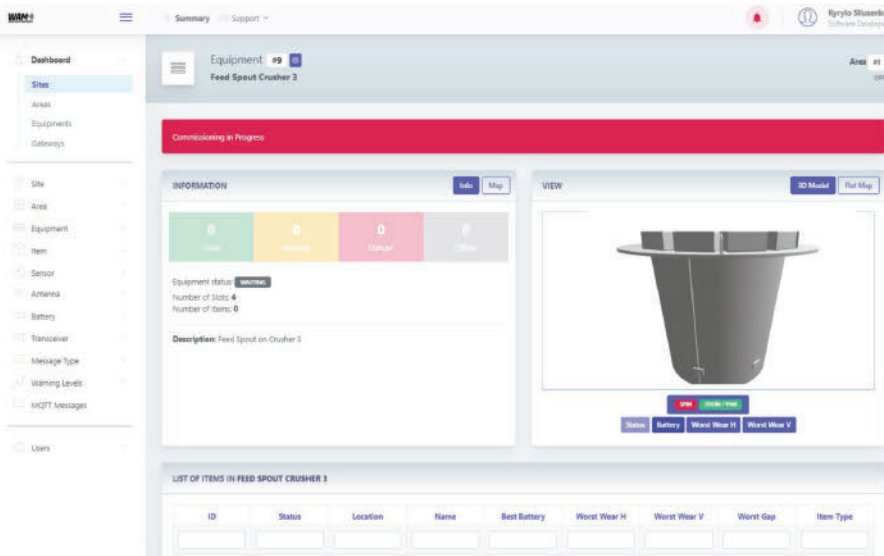
COMPONENTS OF THE SYSTEM:

- Powered for life wireless sensing units
- A line-powered long-range radio gateway
- Cross platform software for visualisation, trending and interpretation of acquired data

The sensing unit comprises of a measuring probe and long-range radio node combined into one compact battery-operated device. It measures and processes wear and temperature of the liner it is embedded.

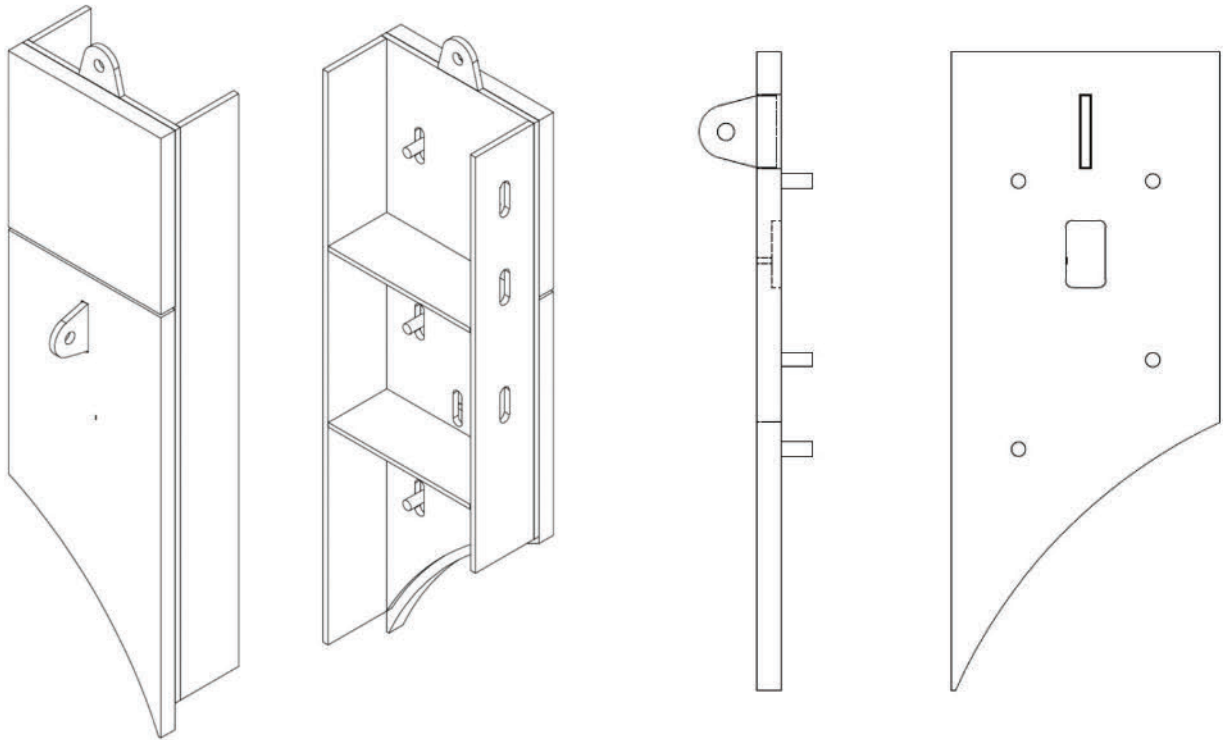
The sensing unit communicates its information over a long-range low energy wireless network, which allows pass the data across busy metal structures, typical for mining industry, back to a host gateway. The gateway transfers its geolocation along with the data received from sensing units to WAM software via mobile 3G/4G or a plant (WiFi, Ethernet cable) network. All communication channels are encrypted.

The system enables automated collection of machine health data and helps to turn it into required maintenance activities without a need for stops for inspections and before any catastrophic failure occurs.



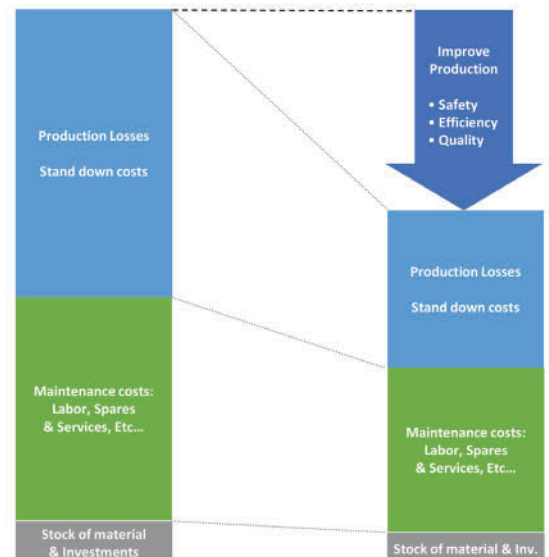
FEATURES

- Usable thickness measurement of a wear liner
- Internal temperature measurement
- Configurable data acquisition periods
- Encrypted long-range low energy network communication
- Compact low-profile formfactor of sensing unit is minimally invasive to wear liners –no liner profile increase needed
- Sensing unit electronics and probe channel are fully encapsulated – designed to comply IP68
- Battery powered for life (up to 5 years of battery life depending on configuration)
- Rugged industrial design of the gateway – IP67
- Gateway is powered by powerline or PoE



BENEFITS

- Makes wear assets condition assessment consistent, easy and reasonably affordable
- Replaces costly manual inspections and related planned downtime
- Improves onsite personnel safety
- Easy to deploy - no wiring required
- Scalability – one gateway can cover up to 100m+ radius area
- Reduces catastrophic failures related unplanned downtime by regular automated wear measurements, alarms, notifications and reports
- Allows overall asset availability improvement



HOW IT WORKS:

Compact, wireless, hermetically sealed and powered for life sensing units are normally embedded into wear liners. Rugged low-profile design of the sensing units allows to embed them into a liner without compromising its hard face thickness, overall liner profile does not increase.*

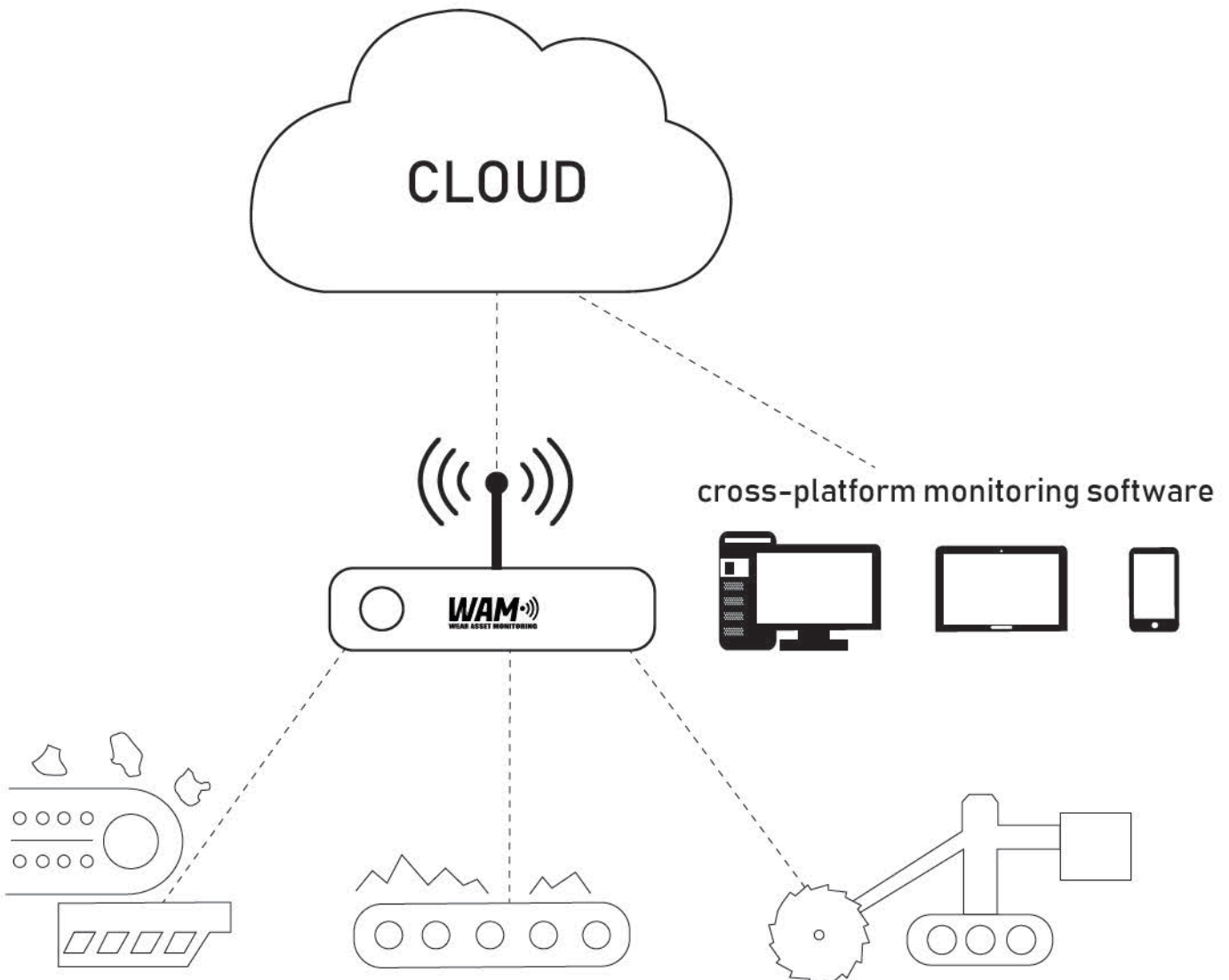
Sensing unit spends most of its time asleep and wakes up only few times a day (configurable) to check itself, measure wear and temperature and send the data to gateway.

Gateway installed in close proximity (100 m+) to equipment where smart liners will be installed. The gateway manages the low power network, pushes settings to sensing units and communicates collected data back to cloud server via mobile 3G/4G network, WiFi or wired Ethernet interface.

Web based software application manages all the sensing units' settings, stores and visualises all collected data in order to facilitate decisions for condition-based maintenance actions.

The same web based software is used for smart liners onsite installation and commissioning.

**sensing unit fits in back plate of Arcoplate or Arcotuff.*



SPECIFICATIONS

MEASUREMENTS

Wear Temperature	up to 48 mm (resolution 1 mm) from -20 to 60 degrees Celsius (resolution 1°C)
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WIRELESS COMMUNICATION

Sensing units to gateway range	up to 100 m+ line of sight
Sensing units to gateway communication frequencies	US915 AU915
Gateway to cloud communication	WiFi: 2.4GHz Cellular: With EG95: LTE CAT 4 Cellular Variant for Europe LTE FDD: B1/B3/B7/B8/B20/B28A WCDMA: B1/B8 GSM: 900/1800MHz Cellular Variant for North America LTE FDD: B2/B4/B5/B12/B13 WCDMA: B2/B4/B5

POWER

Sensing unit	Non-replaceable lithium battery Typical lifetime 5 years (depends on configuration). Excessive data acquisition rate and extreme temperatures exposure may affect battery life.
Gateway	12VDC or PoE(IEEE 802.3af/at-Compliant), 42~57VDC 12W typical power consumption

INSTALLATION

Sensing unit	Factory-embedded to wear liner. May require antenna hole in equipment's frame Operating temperature: -20°C to +60°C
Gateway	Pole or Wall mounting Weight: 3.15kg Enclosure material: aluminium Dimensions: 220mm x 220mm x 104mm Operating temperature: -30°C to +65°C IP67



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93 Mulgul Rd. Malaga WA 6090
P: 08 9248 3188 | E: info@alloysteel.net
www.alloysteel.net