

HYSON™

ToolMIND

Sensor Technology Development

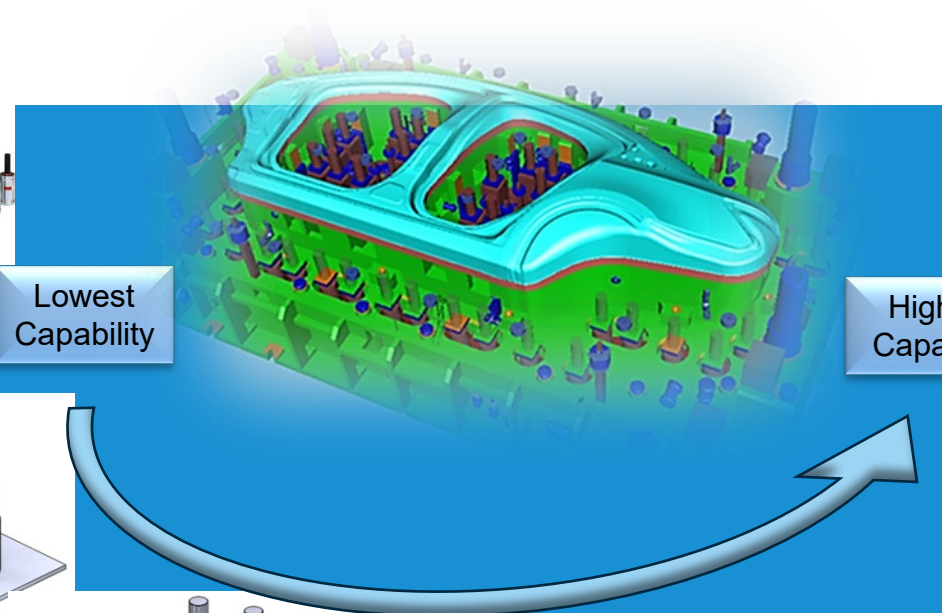


Stamping Solutions

Self Contained
Gas Springs



Lowest
Capability



Highest
Capability



Di-Dro Delay
System



Manifold
System

Baseplate
Systems



Hosed



Hose-Less



Hose-Less with
Volume Tanks

Fully Connected Ecosystem

Internal Identification:

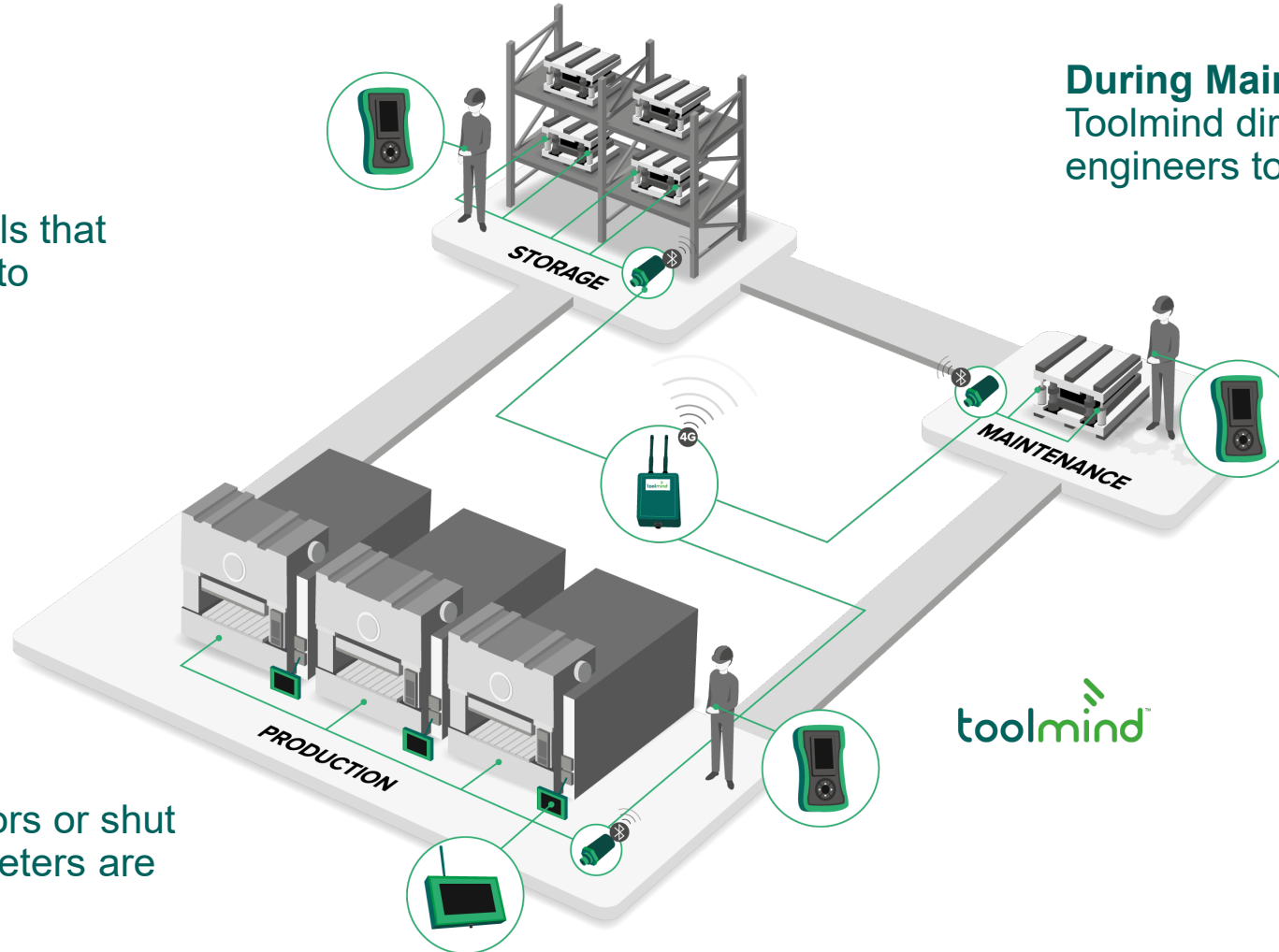
Toolmind helps identify tools that require maintenance prior to production.

During Production:

Toolmind can warn operators or shut down a press when parameters are outside set limits.

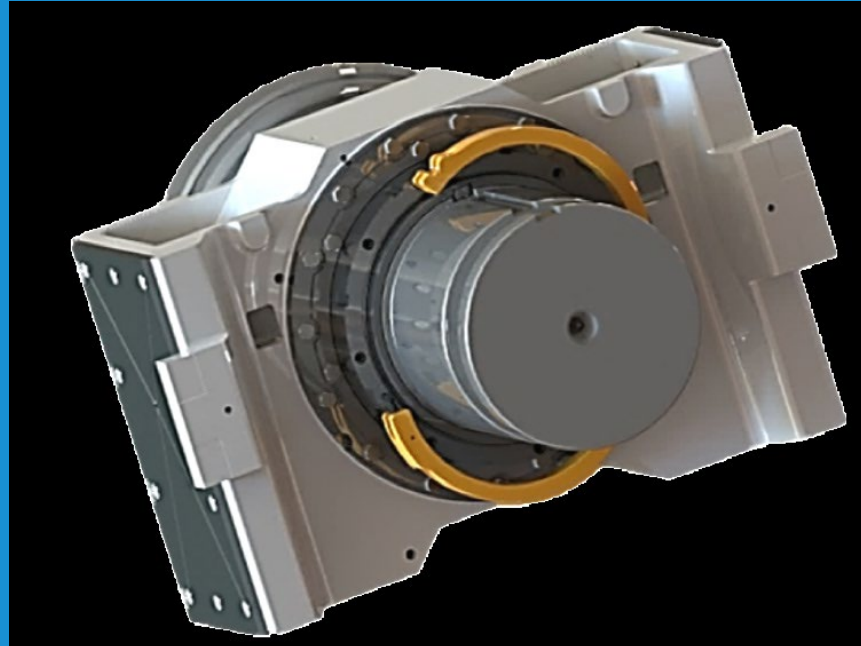
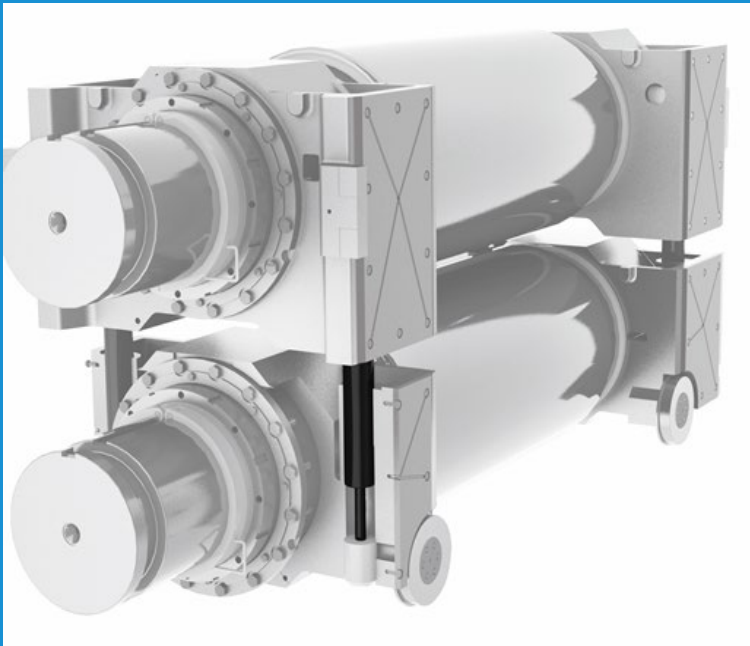
During Maintenance:

Toolmind directs maintenance engineers to the source of the issue.

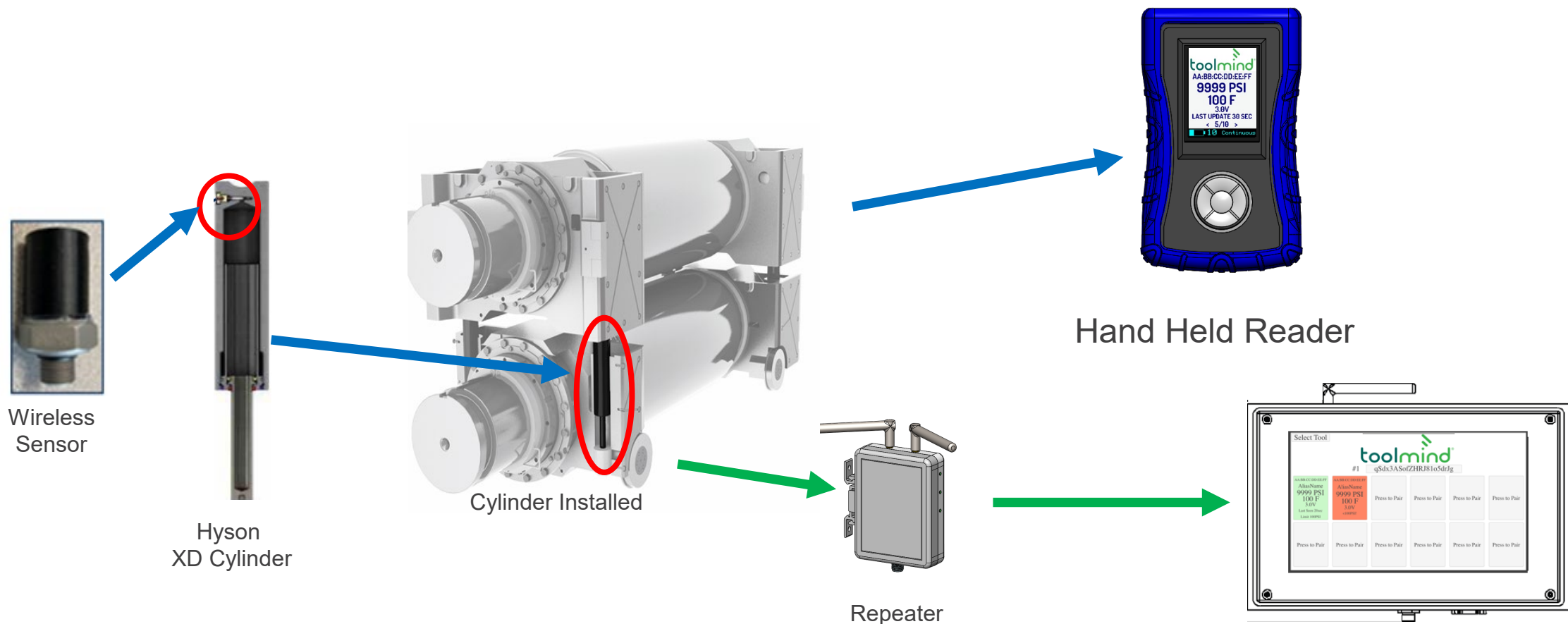




Mill Solutions

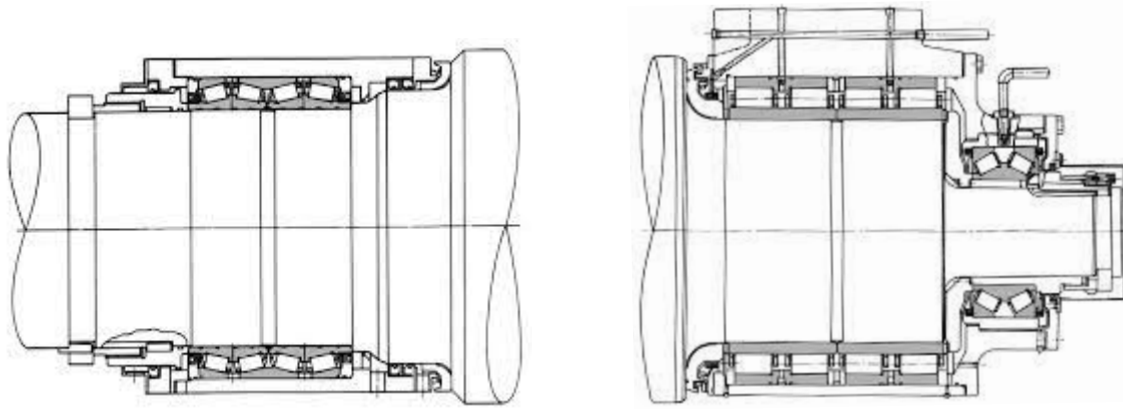


Mill - Use Overview



Bearing Temperatures... Why?

- Sensor is intended to record and output the temperature inside the chock-bearing housing
There are a few different types of bearing assemblies typically used in chocks.



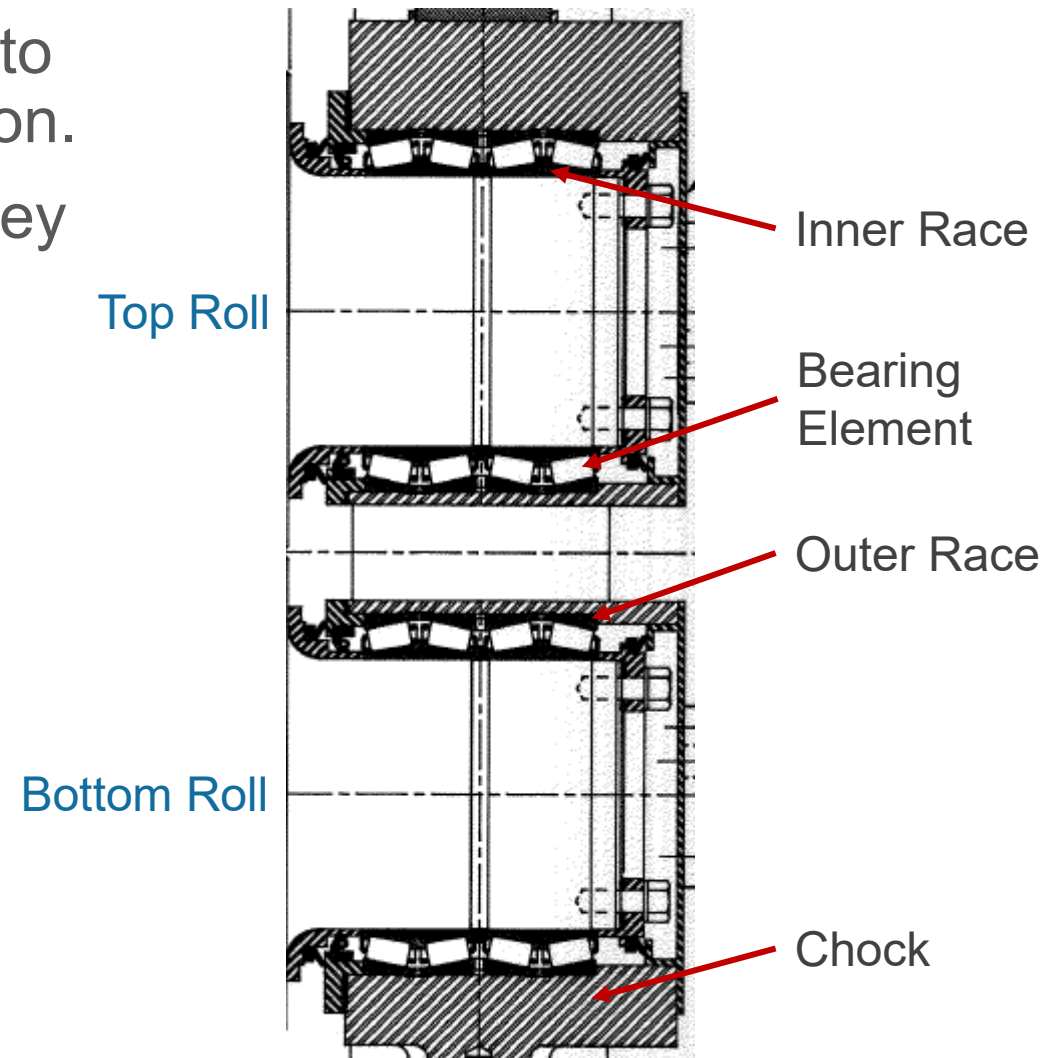
Most bearing assemblies use roller bearings in either a tapered or straight orientation and typically are packed, injected or sprayed with grease.



Anatomy of Chock

The component callouts pictured right are to be used in the remainder of the presentation.

Bearing components have a few names they are referred as, so this is intended to add clarity.



Why develop this?

- Bearing failures are a major contributor to downtime in mills, when a bearing fails it can cause the rolls to no longer rotate freely and without friction.
- Resulting failures include:
 - Additional heat and frequency development
 - Damaging of the bearing assembly
 - Damaging of the roll
 - Dangerous Events (Cobbling)
- Downtime due to a bearing failure can affect the entire line and is time consuming to replace or repair.



What causes the failure?

- Inadequate or improper lubrication
 - Without proper lubrication bearings may seize or become burnt and overheated. Lubrication without proper maintenance can cause contamination.
- Contamination
 - Contamination in the bearing housing be caused by ingress of water or solid particulates through lubrication holes mixing with lubricants and damaging bearing elements as well as raceways.
- Improper handling or installation
 - Drives misalignment and uneven wear on bearing elements and damage to the races.
- Overloading
 - Causes excessive wear on bearing elements and damages the races.

Method of Measuring

- Bearing Monitoring to determine time till failure can be done in two ways
 - Vibrations
 - Temperature
- During operation, the rate of change in temperature will increase as wear begins to negatively effect life expectancy.

Probe to Outer Race

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- Probe would utilize attachment to place the probe to the outer race and measure temperature
 - Measures temperature directly from the bearing with relatively quick temperature transfer

PROBE PROTOTYPE SPECS

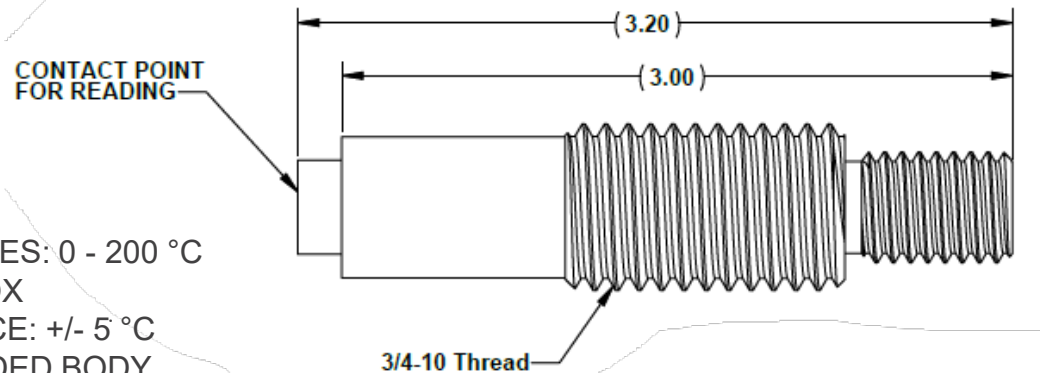
- OPERATING TEMPERATURES: 0 - 200 °C
- DIRECT WIRED TO COMBOX
- TEMPERATURE TOLERANCE: +/- 5 °C
- MOUNTING: 3/4-10 THREADED BODY
- VIBRATION RESISTANT

COMBOX PROTOTYPE SPECS

- IP67 WATER AND DUST PROTECTION
- COMMUNICATION PROTOCOL: BLUETOOTH

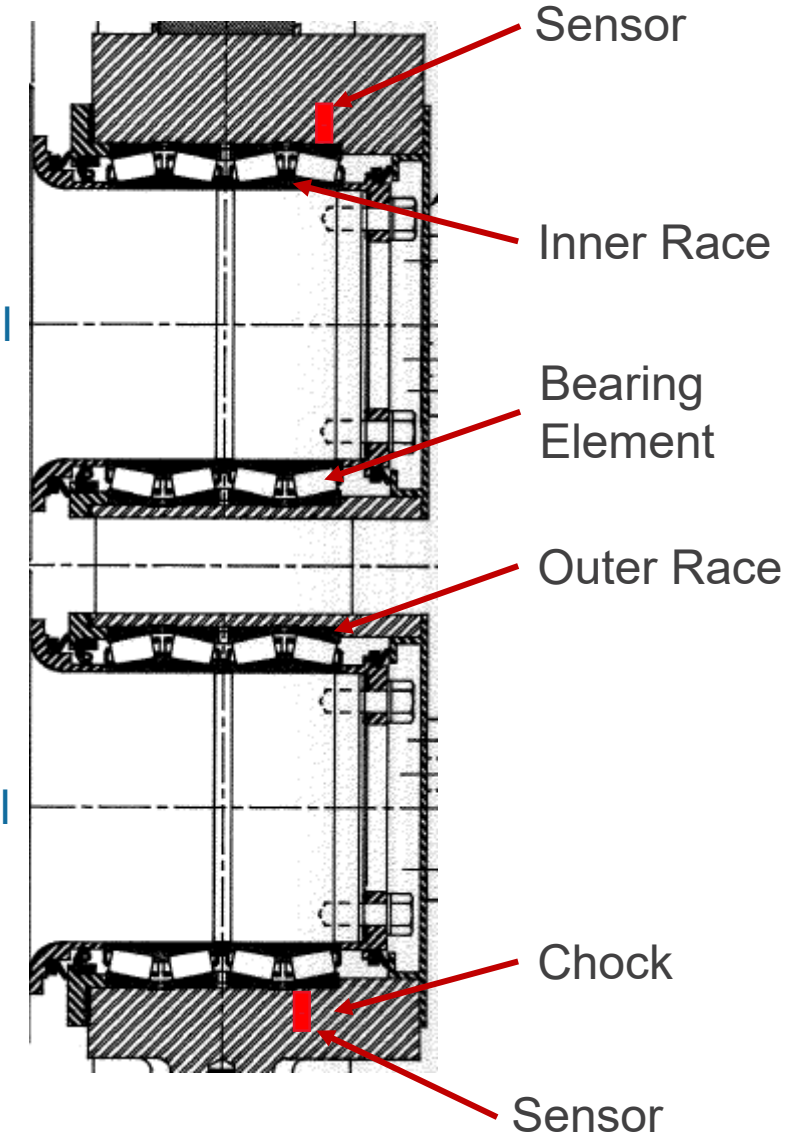
BASESTATION CAPABILITIES

- SET TEMPERATURE ALARMS
- VIEW MULTIPLE SENSORS



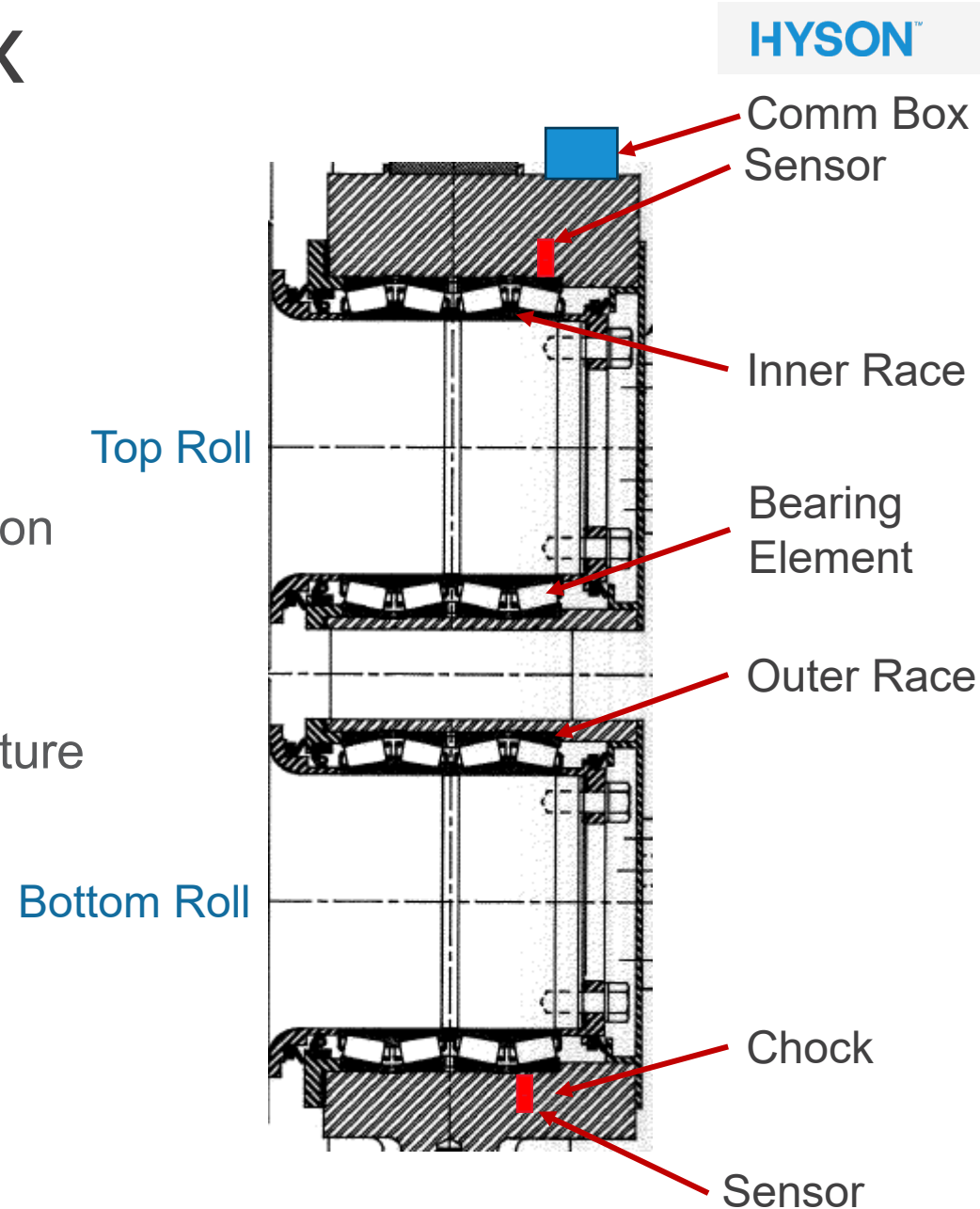
Top Roll

Bottom Roll

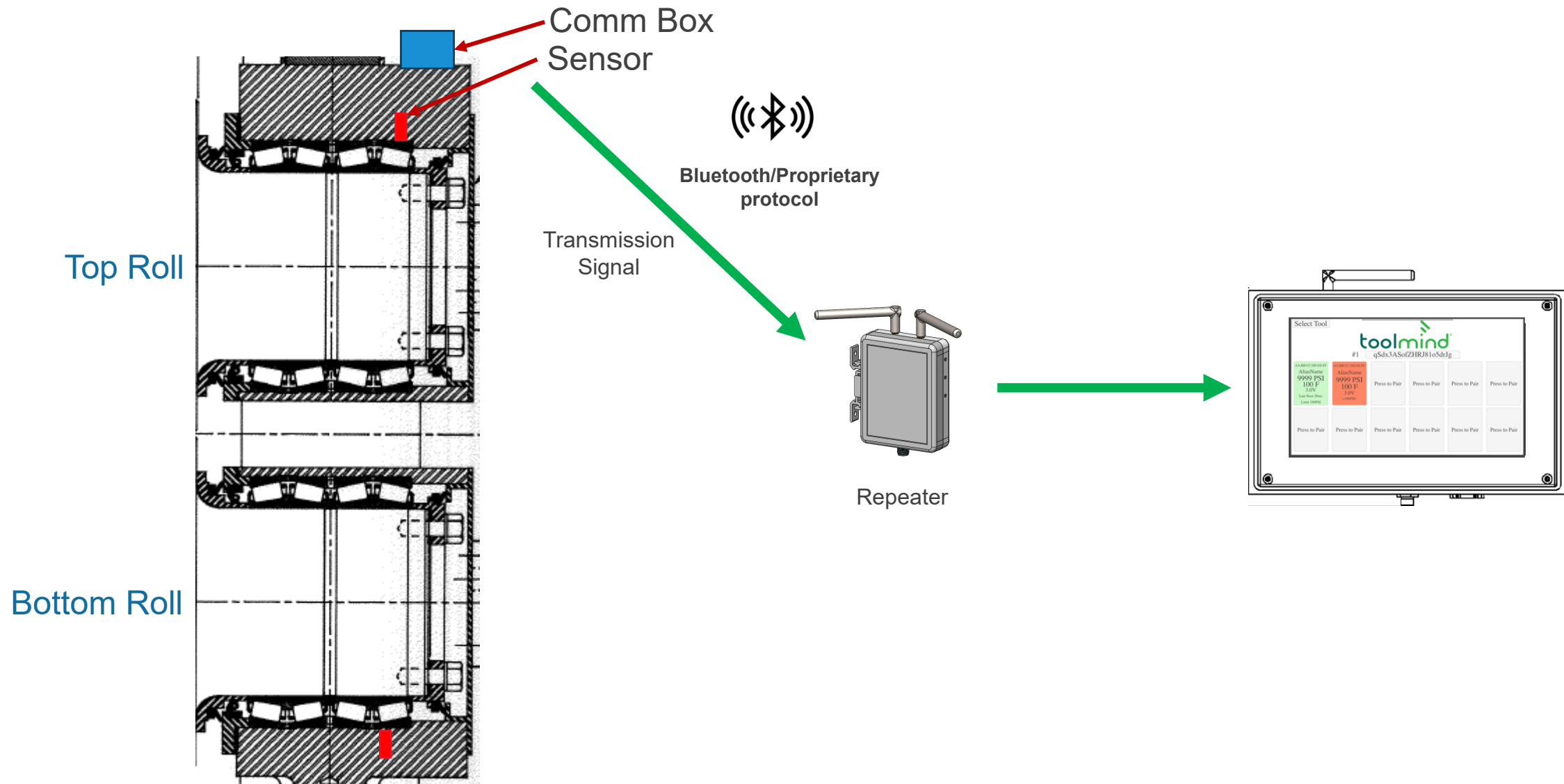


Sensor to Communication Box

- Communication box mounted to either chock connecting both sensors on the operating end
 - Direct wired connection to the comm distribution box
 - Distribution box communicates wirelessly with signal repeater
 - Signal repeater communicates wirelessly to base station
- Base Station
 - Reads all sensor data and provides real-time temperature feedback to pulpit PLC
 - PLC can use that data to determine if bearing temperatures are within operating parameters



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Questions?

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Toolmind IRD Presentation Question Forum



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