



Preventive Maintenance

Case Study
CNC Machine Diagnosis using Vibration Analysis



Installing Symroc Sensor on an Oil and Gas Facility

Preventive Maintenance

- Large industrial facilities and equipment have high maintenance and downtime cost, plus malfunctioning machines are dangerous to workers.
- Rotating machines such as mining ore grinding machines, CNC machines generate vibration signals when operating.
- Monitoring the vibration signals generated by these machines can be used to predict and diagnose mechanical failures.
- Predictive maintenance allows scheduled downtime to optimise operation efficiency, extend equipment useful life, and prevent accidents.
- Our system can accurately monitor the low frequency vibration in the machines, especially under 10 Hz.

System Feature

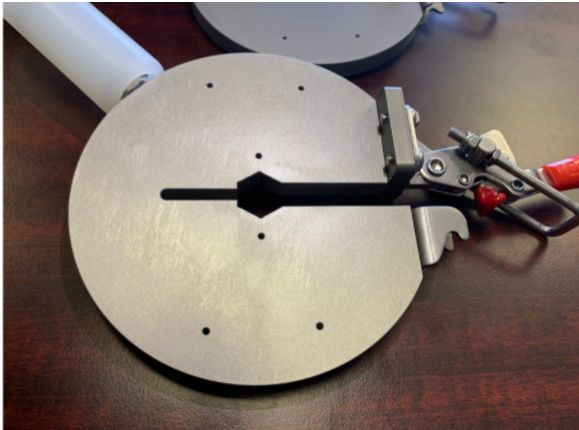
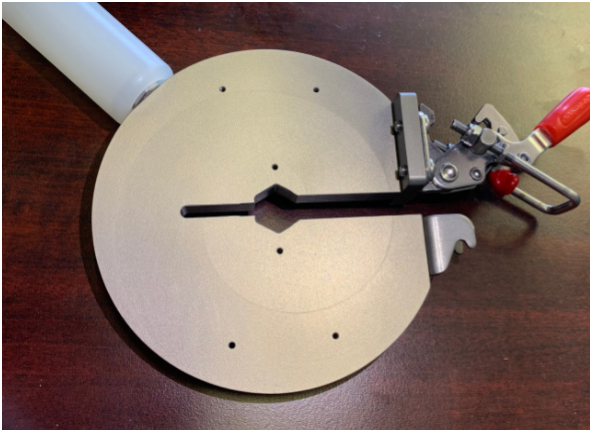
0.3 to 1600Hz	Can monitor the widest range of frequencies, from 0.3 Hz to 1600Hz. Allows detection of harmonics.
32 Bit	High accuracy data up to 32 Bit digitization.
High Resolution	Distinguish active source signals from ambient signals, less false alarms.
24/7	Data transmitted in real time via LTE network 24/7
Online Access	Access data online via our software or web-based dashboard.
<30 Minutes	Temporary installation within 30 min, easy to remove or relocate.



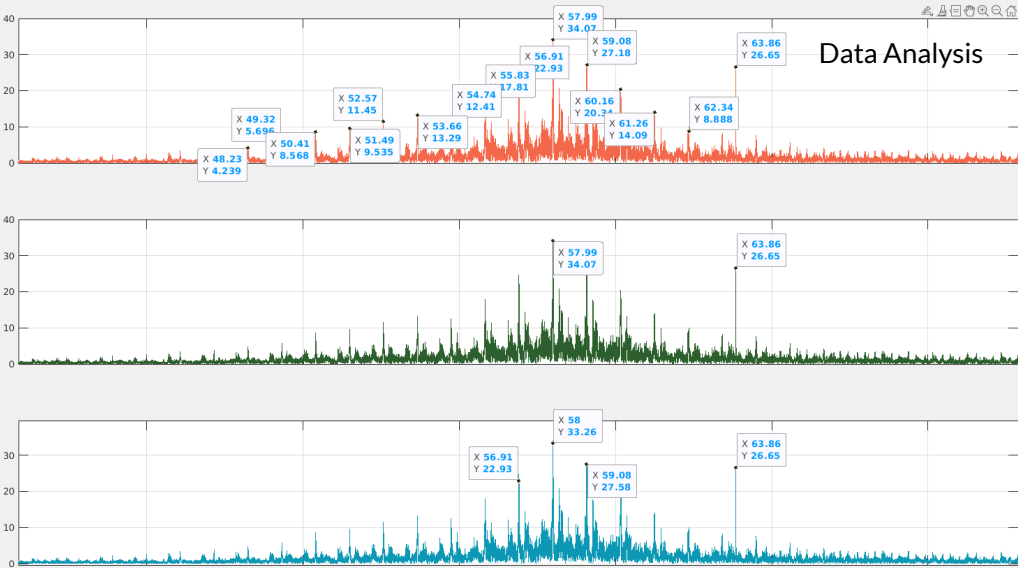
A sensor attached to facility with magnet

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Our client needed a diagnosis of the root cause of a computer numerical control (CNC) machine defects.



Qualified product (left) has a smooth surface, whereas product made with defect CNC machines has dented surface that does not meet the quality control requirements.



Analysis

- According to OEM specifications, this machine should rotate at 4000 rpm.
- We can see a peak at 63.86 Hz (3831.6 rpm) which agrees with the OEM specs.
- Multiple peaks immediately below 3831.6 rpm can be observed.
- Each peak represents a different mode of movement that is not supposed to happen which indicates the machine is close to its end of life.

Results

- Machine shop owners are taking a chance when purchasing a second hand CNC machine.
- With our device, they can observe the health of the machine by observing the patterns which will give them a better understanding of the health of the CNC machine.

