

CONDITION MONITORING

INTRODUCTION:

With increasing automation in production and packing, the number of equipment used are increasing day by day. Maintaining all these devices, on a regular basis, has become a tire-some task to perform.

To overcome the problem of tiring predictive maintenance process, we have designed an IoT based system to monitor all the motors, pumps, compressors, and related equipment by sensing their temperature as well as vibration in all 3 axis.

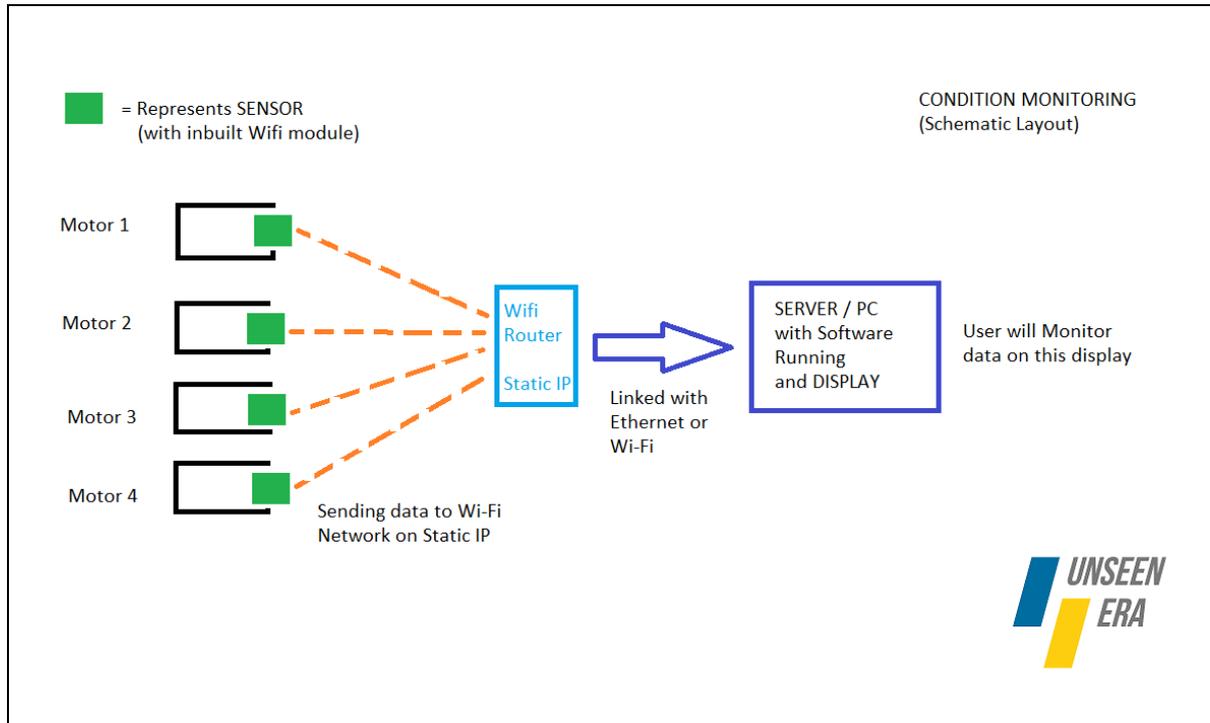
The continuous monitoring of these devices provides with many benefits for the user.

- 1) **TIME SAVING:** No more spending time in checking each and every motor during preventive maintenance schedule. Since the data of all motors is available at one place, so it will save lots of time involved in manual checking.
- 2) **LESS MANUAL WORK:** Rather than going to each and every motor, the user can simply scroll through line-wise screens in software and check condition of each and every motor fitted with sensor.
- 3) **AUTOMATED ALERTS:** In case any motor shows abnormality, it will be displayed in the software.
- 4) **MUTIPLE FAULT DETECTION:** Rise in temperature or vibration will occur in case motor needs more oiling, change of bearing, or tightening of screws for mounting. Even if there is any issue with coupling, it will lead to increase in vibrations, thereby alerting the user.

MACHINE MONITORING FUNCTIONS AND FEATURES:

- Defect detection and Alerts.
- Real Time and Long term Data Reporting with Trend monitoring.
- FFT for Spectral Analysis of Rotating equipment.
- Availability of Automatic and Manual rollback feature for firmware upgrade OTA (Over the Air) by wireless technology.
- Factory firmware option is also available.
- Geo-location.
- Polarity reversal and Overload power supply protection is also provided.
- Visual feedback through LEDs and colour codes. Easy 1-min installation.

CONDITION MONITORING



WIFI SPECIFICATIONS:

Protocol	802.11 b/g/n support
Frequency Range	2.4GHz to 2.5GHz (2412 MHz to 2484 MHz)
Transmit power	802.11 b: +19.5 dBm, 802.11 g: +16 dBm, 802.11 n: +14 dBm
Receive Sensitivity	802.11 b: -91 dbm (11 Mbps), 802.11 g: -74 dbm (54 Mbps), 802.11 n: -71 dbm (MCS7)
Antenna	Integrated in device
Security	WPA/WPA2
Encryption	WEP/TKIP/AES
Network Protocol	HTTP, MQTT, TCP/IPv4

CONDITION MONITORING

SENSING & PROCESSING:

Vibration Sensor	MEMS based Tri-axial accelerometer
Frequency range	10 Hz to 1300 Hz (X, Y and Z axis)
Default configuration	F-max: 1300 Hz and LOR: 200
Output data rate (Sampling rate)	Up to 3.3kHz
Sensitivity	0.122 mg/LSB ($\pm 4G$)
Resolution	16 bit
Derived values	<ul style="list-style-type: none"> • 3-axis acceleration RMS and velocity RMS • 3-axis acceleration and velocity FFT • 3-axis spectral features as per configuration
FFT frequency resolution (delta-f)	Configurable between 0.2033 and 6.5039 Hz
Shock Tolerance Range	10,000g for 0.2ms
Temperature sensor Range	-20 to 85°C