



**SMART CONDITION
MONITORING FOR PUMPS**

[TRILLIUMFLOW.COM](https://trilliumflow.com)

CYCLOPS² SMART CONDITION MONITORING SYSTEM

WE MAKE YOUR PLANT MAINTENANCE EASIER

Experience the plant maintenance and productivity revolution with Trillium Flow Technologies' advanced digital transformation technology, expertly crafted for the modern industrial world.

CYCLOPS² - TOTAL CARE THROUGH CONTINUOUS REAL-TIME MONITORING AND ENHANCED ANALYTICS

At Trillium, we pride ourselves on our capability to provide innovative pump service solutions tailored to our customer's needs. This includes Cyclops², our smart condition monitoring system. With Cyclops², our customers can keep a close eye on their pumping systems at all times and take action to prevent downtime and avoid any potential disruptions.

We designed Cyclops² using the latest IIoT standards, integrating wireless sensors installed on the pumps to be monitored with gateways that collect the performance data measured and transmit it via a secure connection to a dedicated cloud service that can easily be accessed.

Our Cyclops² solutions can be installed on pumps from Trillium and other OEM brands operating across a wide array of markets including Oil & Gas, Petrochemical, Mining, Power Generation, Water, and General Industry.

AN INTEGRATED SYSTEM FOR PLANT OPERATORS

Cyclops² is easy to install, activate, and use, providing:

- Accurate continuous pump performance data in real-time vs. periodic less precise manual measurements
- Enhanced statistical analysis, facilitating troubleshooting by identifying critical issues allowing for planning corrective actions before failure.

Cyclops² contributes to a pumping system's:

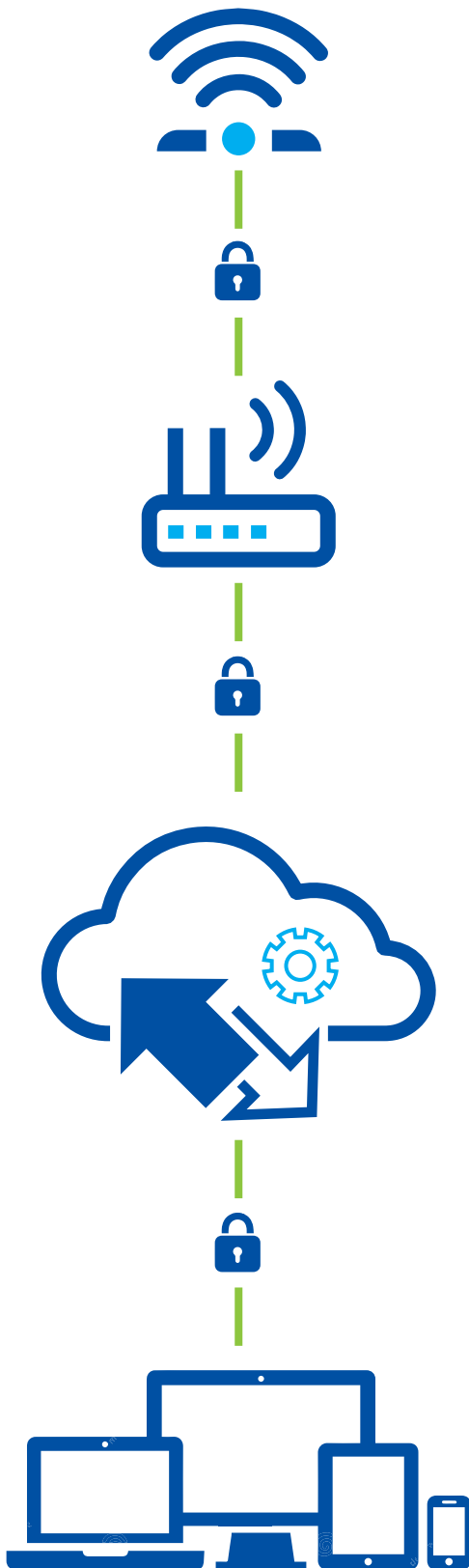
- Repair cost reduction
- MTBF (mean time between failure) increase
- Unscheduled downtime and outage reduction
- Reliability and efficiency increase
- Preventive maintenance automation and optimization
- Predictive maintenance implementation

Cyclops² is a cloud-based solution with easy and secure access to data and relative analysis via app or browser.

Overall, Cyclops² answers plant operators' need for smart solutions for machines and systems that enhance overall plant efficiency and reliability, while also reducing operational costs and minimizing risks.

CYCLOPS² SMART CONDITION MONITORING SYSTEM

WORKING PRINCIPLE



Smart Wireless Sensors

measuring pump performance parameters such as temperature & vibrations

Data Transmission System

data collection from sensors and safe transmission to a cloud system via an encrypted network (4G/5G, Wi-Fi, Ethernet).

On-Line Cloud Storage & Analytics Software

Analysis of the data transferred to the cloud system through software allowing to identify & predict pump criticalities.

Reporting & Alerts

Access to data analysis anytime anywhere through the Cloud via App or Browser.
Possibility to also receive alerts when parameters deviate from a chosen threshold limit.

CYCLOPS² SMART CONDITION MONITORING SYSTEM

WORKING PRINCIPLE

DATA COLLECTION

Cyclops² smart wireless sensors are easy to install and use, making continuous real-time pump performance data collection efficient and reliable.

Our smart wireless sensors family:

- Temperature sensors
- 3-axial vibration sensors
- Amperage sensors
- Rotation speed (RPM) sensors
- General purpose sensors (pressures, etc.)

Our smart wireless sensors family:

- Long-life battery
- Design in compliance with ATEX Class 2
- Secure & long-distance transmission capacity
- Customization of measurement intervals & alert values

ENHANCED ANALYTICS SOFTWARE

Trillium uses a software with enhanced analytics that enables our customers to improve the operation and maintenance of their pumping systems by leveraging real-time condition monitoring.

By analyzing and post-processing data on the pump parameters being monitored - like temperature, vibration, amperage, speed, and pressure - the software can not only identify potential issues but also predict them. This allows for proactive planning and corrective action to be taken before any disruption or downtime occurs.

For added peace of mind, Cyclops² offers a smart alert option, which automatically sends notifications whenever a pump performance parameter deviates from a standard threshold limit.

SAFE DATA TRANSMISSION & ONLINE STORAGE

Cyclops² wireless sensors are connected to our online cloud service through a safe and encrypted data transmission system using 4G/5G, Wi-Fi, or Ethernet connectivity.

CYCLOPS² SMART CONDITION MONITORING SYSTEM

OUR WIRELESS AND WIRED SOLUTIONS

WIRELESS-CYCLOPS² - FLEXIBLE SERVICE MODULES

The Cyclops² system is flexible and modular. Data collection can start with a standard module providing basic temperature and vibration measurements, while advanced configurations can be tailored to answer our customers' specific requirements.

CYCLOPS ² SERVICE MODULE TYPE	TEMP.	VIBRATIONS	AMPERAGE	SPEED	PRESSURE	OTHER PUMP PARAMETERS
STANDARD	•	•	—	—	—	—
INTERMEDIATE	•	•	•	•	—	—
ADVANCED	•	•	•	•	•	•

WIRED-CYCLOPS² OPTION

For pumps performing critical services, like water injection pumps performing oil extraction service, we also offer a wired version of Cyclops² for continuous real-time monitoring of all functional pump parameters through signal capture from the junction box or directly from the DCS. This option is for customers looking for ultimate reliability and efficiency.

Our Service Team of expert engineers and technicians are at your disposal to assist you throughout all the stages of the process - from defining the best module for your condition monitoring needs to installing, activating, and supporting subsequent maintenance actions.



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