

# STEAM BOILER MONITORING SOLUTIONS

DCO SYSTEMS  
3 GLOBAL BUSINESS PARK, WILKINSON ROAD,  
CIRENCESTER, GL7 1YZ. UNITED KINGDOM

+44 (0) 1285 359059  
WWW.DCOSYSTEMS.CO.UK  
INFO@DCOSYSTEMS.CO.UK

## PRODUCT SUMMARY

Our wireless boiler monitoring solutions enable remote monitoring of boiler performance with real-time notifications and alerts for performance and safety issues. Integration with our cloud-based dashboard, analysis and reporting services provides an “out of the box” solution.

## BENEFITS

Monitoring of the physical parameters of the steam generating boiler is key to understanding its performance. Our monitor provides real-time performance measurement and integration with analytics that enable you to act upon changes in performance – both on short and long timescales.

## MONITORING, ALERTING AND MAINTENANCE

Each boiler has a specified (as per-design) behaviour and a corresponding real-world performance model. Detailed monitoring permits one to be mapped onto the other, building up a picture of the real-world performance of the unit. Rapid changes in performance can be indicative of localised or remote failure, while change over time can provide indication of degradation needing to be addressed by maintenance.

Steam generating boilers are complex and safety critical pieces of equipment and a range of data points are utilised by our monitors. Temperature sensing probes permit measurement of thermal parameters at multiple locations, integration with 3rd party flow meters (water and steam) permit inputs and outputs to be monitored.

Mechanical sensing via precision vibration sensing enable monitoring of movement on fine and large scales indicating internal mechanical failures or external problems such as water hammer, blow-over and excessive thermal stress. Similarly, acoustic sensing permits identification of problems local to and adjacent to the boiler, such as high velocity steam and hammer in pipework.

The monitored performance characteristics can be extended with specialist sensors to measure gases (input and flue) and water quality (e.g. feed water, make-up water and condensate).



Individual physical parameters are combined within the monitoring system analysis process to provide calculated and computed datapoints such as heat flow and boiler efficiency level.

## PERFORMANCE OPTIMISATION

The multitude of data points available using our boiler monitoring solution enables a detailed model of performance to be provided. Detailed records of fuel and feed inputs over time enable performance optimisation and continuous improvement techniques. Alternative performance profiles can be applied, and their impact measured to determine which ones yield measurable returns. Upgrades and improvements to downstream equipment and configurations can be tested and their impact assessed before they are rolled out more fully across a plant or process.

## ROBUST AND FLEXIBLE

Our boiler monitoring solutions have evolved to meet the needs of boilers in harsh and atypical environments in the UK and internationally. They have been applied to boilers at high altitudes, in wide ranging environmental conditions and even to boilers that are manually loaded.

We can provide solutions to meet custom and unusual needs, for example, in developing markets solid (wood) fuel manually front-loaded boilers are not uncommon and specialist techniques are required to measure fuel consumption. Our monitors can integrate with load cells on weighing platforms to measure the mass of fuel and be equipped with visual and infrared systems to assess the duration and frequency of fuel loading.



## WORKFORCE OPTIMISATION

For many steam users the pool of engineers available is a significant constraint on their ability to manage and optimise their systems. Monitoring permits more effective use to be made of those engineers.

The elimination of manual measurement, often a tedious and repetitive task undertaken by qualified mechanical engineers, greatly reduces the burden on them and frees them to concentrate on analysis and improvement work more suited to their skills and experience.

The introduction of consistent, regular data points provides the foundation for ensuring that engineering staff are deployed where they are needed, when they are needed. Predictive maintenance permits much more effective use to be made of the pool of engineers by ensuring they minimise unnecessary travel and maximise the work they can undertake while at a given location or site.



## WHOLE SYSTEM PERFORMANCE

Working in concert our monitors can be used to identify the large-scale performance of the system connected to a boiler. Monitoring in one location can detect issues such as water hammer but the synchronised collection of data across multiple points permits localisation of such problems and the means to determine root causes and sources.

The introduction of whole system monitoring provides engineers with the data they require to fully understand the performance of the systems for which they are responsible. Even recently installed systems have many physical parameters that may not have been monitored because of the high cost of traditional sensors and monitoring equipment. Legacy installations may never have been instrumented to the extent desired and may at best still be reliant on paper charts and systems that have no ability to log data over time or record it in a way that is useable in other applications.

## AUDIT AND MANAGEMENT CHANGE

Auditing of change is crucial for real-world environments. Processes involving steam are often

complex and contain a wide range of equipment, often maintained and serviced by different vendors and engineering teams. The extensive data our monitors collect enables identification of changes to your system and the creation of performance audit trails prior and post any changes made to your system or installed equipment.

## TRULY WIRELESS

While boiler systems generally have local power available our monitors are available with integrated energy harvesting capabilities to remove the need for integration by electrical engineers and already support wireless transmission to give you a “true wireless” capability.

## CONFIGURABLE REPORTING

Data is collected regularly and transmitted to our cloud platform for storage, analysis and alerting purposes. Default reporting intervals are 15 minutes but can be configured up or down as required, to second-by-second reporting if required. Intelligent on-board assessment of their power budget enables our devices to automatically adjust their reporting intervals dependent upon requested bounds and the level of activity they see in the equipment that they monitor.

## EXTENDED SENSING

Our devices support additional plug-in sensing options over and those integrated into the standard device, allowing for extension of the number and type of physical parameters that can be monitored. Additional electrical measurement, environmental condition and physical sensing options are plug-and-play options for our standardised sensor bodies.

## INTEGRATION

In addition to the parameters that they measure themselves our sensor modules support integration with devices and sensors that you may already have installed. Optional plug-and-play integration modules permit integration with 0-20mA, 4-20mA, HART, RS-485, EMS, Modbus and protocols overlaid on Ethernet or TCP/IP links.