



*Stéphane Canadas, Sales & Marketing Manager*

## **A note from our Editor!**

Welcome to our first ever issue of the Signal Group Newsletter, we hope you enjoy reading it and find it informative and useful!

There have been many exciting changes and developments at Signal Group this year and we look forward to sharing them all with you in this newsletter and future publications.

## **Brand new Signal Group website, designed specifically for you!**

Our brand new website has our customers at the forefront, with an extensive resource section you have all our product specification at hand.

We have included product datasheets, brochures, technical specifications, guides and much more, all for free!

We will be regularly adding new and useful information, so keep an eye out! If you don't want to miss out, sign up to our newsletter on our website.

If you have any suggestions on what you would like to see, feel free to get in touch on [sales@signal-group.com](mailto:sales@signal-group.com).



## **INSIDE JULY'S ISSUE:**

---

**A note from our Editor & the Brand New Signal Group website!**  
*Front Page*

**New demands for enhanced Greenhouse Gas monitoring**  
*Page 1*

**Video of the month & our latest product datasheets**  
*Page 3*

**Signal Group innovation disrupts gas monitoring market**  
*Page 4*

**The latest Product Updates: Giving you the tools to validate your gas analysis**  
*Page 5*

---

**Raising gas analysis to new levels**

[www.signal-group.com](http://www.signal-group.com)  
[sales@signal-group.com](mailto:sales@signal-group.com)  
+44 (0)1276 682 841

# New demands for enhanced Greenhouse Gas monitoring

Increasing political action on Climate Change is prompting a new requirement for process operators to improve the accuracy and reliability of greenhouse gas (GHG) emissions monitoring. To meet this requirement, Stephane Canadas from UK gas analyser manufacturer Signal Group is urging the operators of combustion equipment, such as boilers and incinerators, to employ reference method analysers in either the measurement of GHGs or for the calibration of installed continuous emissions monitoring systems (CEMS) for carbon dioxide (CO<sub>2</sub>) and nitrous oxide (N<sub>2</sub>O).



## Background

GHGs absorb and emit some of the energy radiated from Earth's surface. This absorption of energy results in global warming; so, increases in the concentration of GHGs in the atmosphere enhance this process. CO<sub>2</sub> is the best known GHG but others include methane (CH<sub>4</sub>), nitrous oxide and fluorinated gases such as CFCs. GHGs differ in both their ability to absorb energy and how long they stay in the atmosphere. As a consequence, methane has a Global Warming Potential (GWP) of 28–36 times larger than CO<sub>2</sub>, N<sub>2</sub>O has a GWP 265–298 times that of CO<sub>2</sub>, and many fluorinated compounds have GWPs that can be in the thousands or tens of thousands.

The term 'carbon emissions', is generally employed as a term that covers all GHG emissions. This is because different gases have different Global Warming Potential (GWP), which is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of CO<sub>2</sub>.

Building on the Kyoto protocol of 1997, the Paris Agreement in 2015 was the first legally binding global climate change commitment. It aimed to limit global warming increases to well below 2 degrees, and included a requirement to submit GHG reduction plans every five years.

Amid increasing concern about the effects of Climate Change, governments around the world have been implementing further commitments to reduce GHG emissions. In the UK for example, the government announced a plan to cut carbon emissions by 78% by 2035 (against 1990 levels), and President Biden has pledged to cut carbon emissions by 50-52% below 2005 levels by the year 2030. These pledges come in advance of the UN Climate Change Conference (COP 26) which is scheduled to take place in Glasgow in November 2021.

In the EU, Directive 2003/87/EC establishes a scheme for GHG emission allowance trading within the Community. Under this scheme operators will be required to

monitor CO<sub>2</sub> emissions from all types of combustion processes, including: boilers, burners, turbines, heaters, furnaces, incinerators, calciners, kilns, ovens, dryers, engines, fuel cells, chemical looping combustion units, flares, thermal or catalytic post-combustion units, and scrubbers (process emissions) and any other equipment or machinery that uses fuel, except that which is used for transportation purposes.

## Monitoring requirements

Monitoring is of course an essential component of GHG emission allowance trading schemes. From a pollution control perspective, in the past, it has not been necessary for the operators of most regulated industrial processes to monitor GHG emissions. However, if governments are to be able to measure and improve GHG emissions, it is clear that monitoring will be necessary. Evidence of moves in this direction is provided by communications from the Environment Agency in England urging the operators of Energy from Waste (EfW) plants to calibrate their CEMS for flow rate, CO<sub>2</sub> and N<sub>2</sub>O. This will involve meeting the requirements of EN 14181, which includes carrying out a QAL 2 exercise, implementing QAL 3 measures and carrying out Annual Surveillance Tests (ASTs) thereafter. Calibration of the CEMS will require the monitoring contractor to assume a virtual Emission Limit Value (ELV) for each pollutant. For CO<sub>2</sub> a virtual ELV of 10% will be suitable with a 95% confidence interval of 10%. For N<sub>2</sub>O this will be a virtual ELV of 20 mg/m<sup>3</sup> and a 95% confidence interval of 20%.

For some operators, their installed CEMS will already have GHG monitoring capability – analysers employing FTIR, for example, are able to monitor CH<sub>4</sub>, CO<sub>2</sub> and N<sub>2</sub>O. FTIR is stated to be the second preference according to EN TS 17405 for CO<sub>2</sub> and EN ISO 21258 for N<sub>2</sub>O. For the measurement of CO<sub>2</sub> and N<sub>2</sub>O, Non Dispersive Infra-Red (NDIR) is the standard reference method (SRM).

## Calibration

CEMS can be calibrated with standard gases, but the best way to reduce uncertainty in GHG measurements is to run an NDIR analyser in the measurement of the actual sample gas. Alternatively, an NDIR analyser could be installed to provide continuous GHG measurements; thereby employing the SRM.

NDIR analysers utilise a spectrophotometer with specificity for individual gases. Signal Group for example, manufactures NDIR analysers with a dual parameter

capability for CO<sub>2</sub> and N<sub>2</sub>O in one enclosure. This analyser has individual gas sample cells that have a measuring range (cell length) designed specifically for the measured gas and range. NDIR analysers with Gas Filter Correlation, such as the Signal 'Pulsar' range, provide extremely high levels of specificity to the gas being measured, because they use the target gas as an optical filter. Consequently, all of the wavelength in the IR spectrum that this gas absorbs will be removed from the spectrum, leaving a perfect reference with which to compare the sample absorption. As a result, there can be no cross-interference from other gases in the sample – such as H<sub>2</sub>O for example.

Obviously condensation inside any analyser is to be avoided, but freedom from H<sub>2</sub>O interference in the measurement method, is of particular importance, and means that the Signal Pulsar can operate with any non-condensing sample.

Conveniently, the latest development in the Pulsar analyser range is a built-in IP address, which means that users can connect with their analysers at any time from anywhere. Alternatively, if the data needs to be available to on-site personnel, the Signal analysers now have a detachable tablet which can connect with the analyser using its built-in WiFi. This means that whilst the analyser may be located in an inconvenient location, the user can connect with it from the comfort and safety of somewhere nearby.



**In summary, as the world increasingly seeks to implement measures to fight climate change, the requirement for accurate GHG emissions monitoring will increase as organisations seek to lower their carbon footprint and comply with the inevitable regulatory requirements.**

## Video of the month!

Every month we bring you the latest video from Signal Group, this month it's our Company Profile.

Click the image below to watch and don't forget to subscribe to our YouTube Channel so you don't miss out on our latest videos.



## Signal Group innovation disrupts gas monitoring market

Thinking out of the box' is usually a phrase that R&D engineers use as a metaphor for looking at a challenge from a different perspective, but at Signal Group (UK), the technology development team have taken the phrase to a new level. Following an intensive development program, the company has announced that all of their main line S4 gas analysers are now available with a detachable Tablet instead of the traditional built-in screen.



"We are not aware of any off-the-shelf gas analysers with this capability anywhere else in the world, so this will dramatically disrupt the gas analyser market," comments Signal Group's Stephane Canadas. "No longer will customers have to manage their analysers, while standing, sitting or squeezing into inconvenient or even hazardous locations; now they will be able to operate their equipment wirelessly from a convenient location nearby, using the instrument's built-in Wi-Fi.

"The even better news for our international customers, is that we can now confirm that the Tablet is available with user-selectable multiple languages."

The new Tablets are rugged with an IP65 rating, which means that they can even be used outdoors. However, the applications where the detachable Tablet will be of greatest value include: analysers in an ATEX enclosure; vehicle exhaust gas test cells; on a raised stack gantry; in a combustion test rig, or on any site where the location of analysis is not an ideal or safe working space.

The new S4 Tablet connects wirelessly to the analyser via an inbuilt 802.11 Wi-Fi which can connect up to 50 metres away, and the tablet's enhanced Graphical User Interface (GUI) uses intuitive graphical icons for all the main functions. This provides users with the ability to view live data remotely, and even manage data logging, alarms and calibration.

In addition to wireless connectivity between the analyser and the Tablet, all Series 4 instruments are supplied with software which provides users with simple and secure access via RS232 or Ethernet at any time, from anywhere.

**From April 2021, the new S4 Wireless Tablet will be supplied as standard on all new orders for the Series 4 gas analysers, which includes the SOLAR, QUASAR, PULSAR and AURORA models.**



## Latest Product Datasheets

We are continuously updating our resource section with the latest Product Datasheets and brochures, the latest update is the addition of our S4 Wireless Tablet Datasheet.

The Datasheet gives you all the specifications and a quick walkthrough on how it works, you can also read the article on the next page for a bit more information.



**You can download all our available resources for free on our website.**

**Simply follow this link.**