



## Continuous Emission Monitoring

GCEM4100 Extractive Gas Analyser

CO, CO<sub>2</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, HCL, CH<sub>4</sub> & H<sub>2</sub>O

**Hot extractive multi-channel gas analyser for continuous process and emissions monitoring.**

- Multi-species infrared absorption analyser
- Accurate, reliable and low maintenance technology
- Extractive system with full zero & span verification using certified gas
- Gas temperature and pressure sensors  
On board normalisation to standard reference conditions
- Automatic calibration and verification
- Analogue and digital outputs - Export of data to SCADA, DCS and historian systems



## GCEM4100 Extractive Gas Analyser

The GCEM4100 hot extractive multi-channel gas analyser is CODEL's industry-proven continuous emissions monitor for difficult applications. Designed exclusively for use on gas turbines or applications where the flue gas concentration is very low and the temperature is abnormally high.

Three decades of development, knowledge and practical experience have been utilised to produce this advanced technology gas analyser which gives complete flexibility of use on process or emissions applications whilst delivering superb accuracy and repeatability at a competitive price.

Many conventional extractive systems require the sampled gas to be cleaned and dried to a very high standard prior to analysis, invariably resulting in a high maintenance demand. Such elaborate pre-conditioning is not required; the GCEM4100 creates 'perfect' duct conditions in a temperature controlled chamber within a separate free-standing, air-conditioned cabinet. Process conditions are extracted using a heated probe system which has an option of compressed air blow-back for excessively dusty applications. Once the sample has been drawn it is simply cooled (or heated) then transferred along a heated sample line, without further conditioning, to be measured using a CODEL multi-channel analyser housed in the cabinet.

Environmental agencies demand that continuous emission analysers have the facility to prove their performance using known concentration audit gasses. The GCEM4100 provides the facility to automatically check and control zero calibration point using clean, dry compressed air or nitrogen. Where independent span checks are required, bottled gases of known concentration can be injected directly into the measurement chamber.

The GCEM4100 analyser is capable of measuring CO, NO, NO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub>, CH<sub>4</sub>, HCl, N<sub>2</sub>O, CO<sub>2</sub> and H<sub>2</sub>O simultaneously and with integral temperature and pressure sensors can compute fully normalised data directly in mg/Nm<sup>3</sup>.

The analyser can be easily incorporated into the CODEL SmartCEM system along with dust, flow and oxygen signals to deliver a complete emission monitoring solution capable of meeting today's tough legislative demands.



Heated Probe

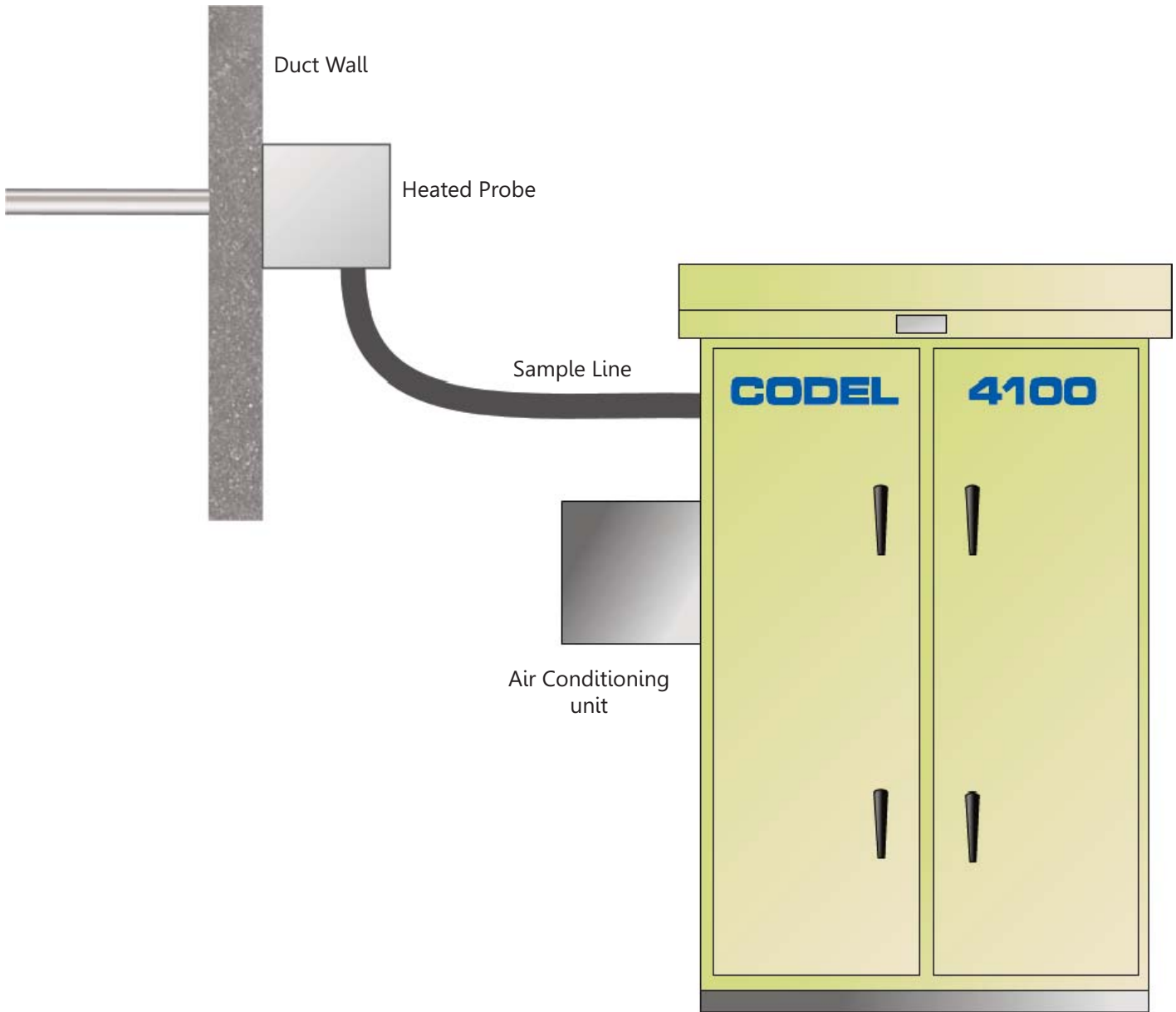


GCEM4100 Gas Analyser



Heated Sample Line

## GCEM4100 Extractive Gas Analyser - System Arrangement



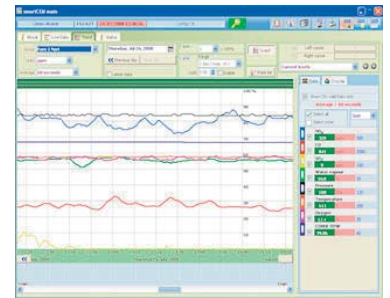
## GCEM4100 Extractive Gas Analyser - Options



Central Data Controller (CDC)

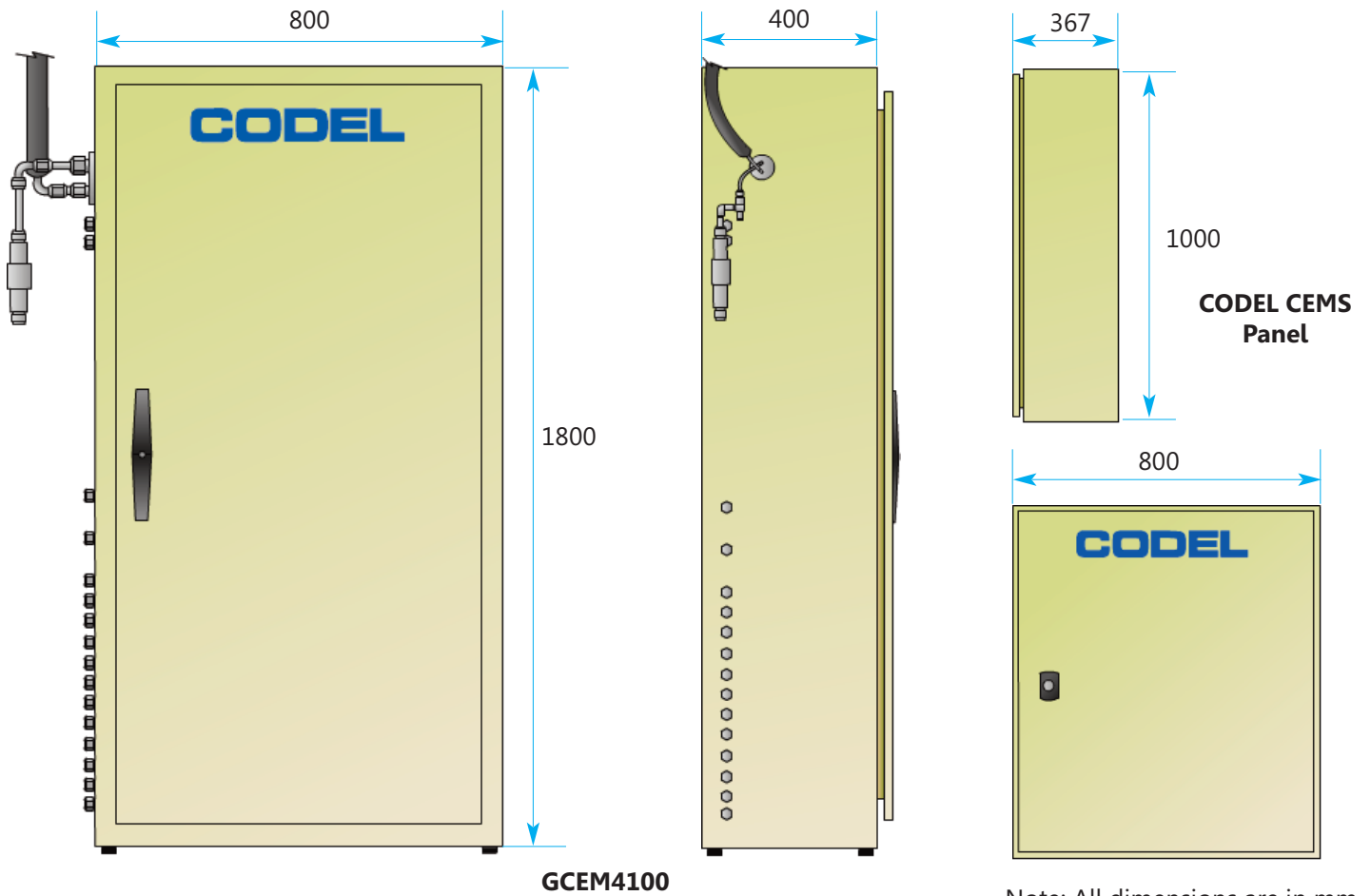


1. Plug-in 4-20mA Input PCB
2. Plug-in Contact Input PCB
3. RS485 PCB for Modbus Output

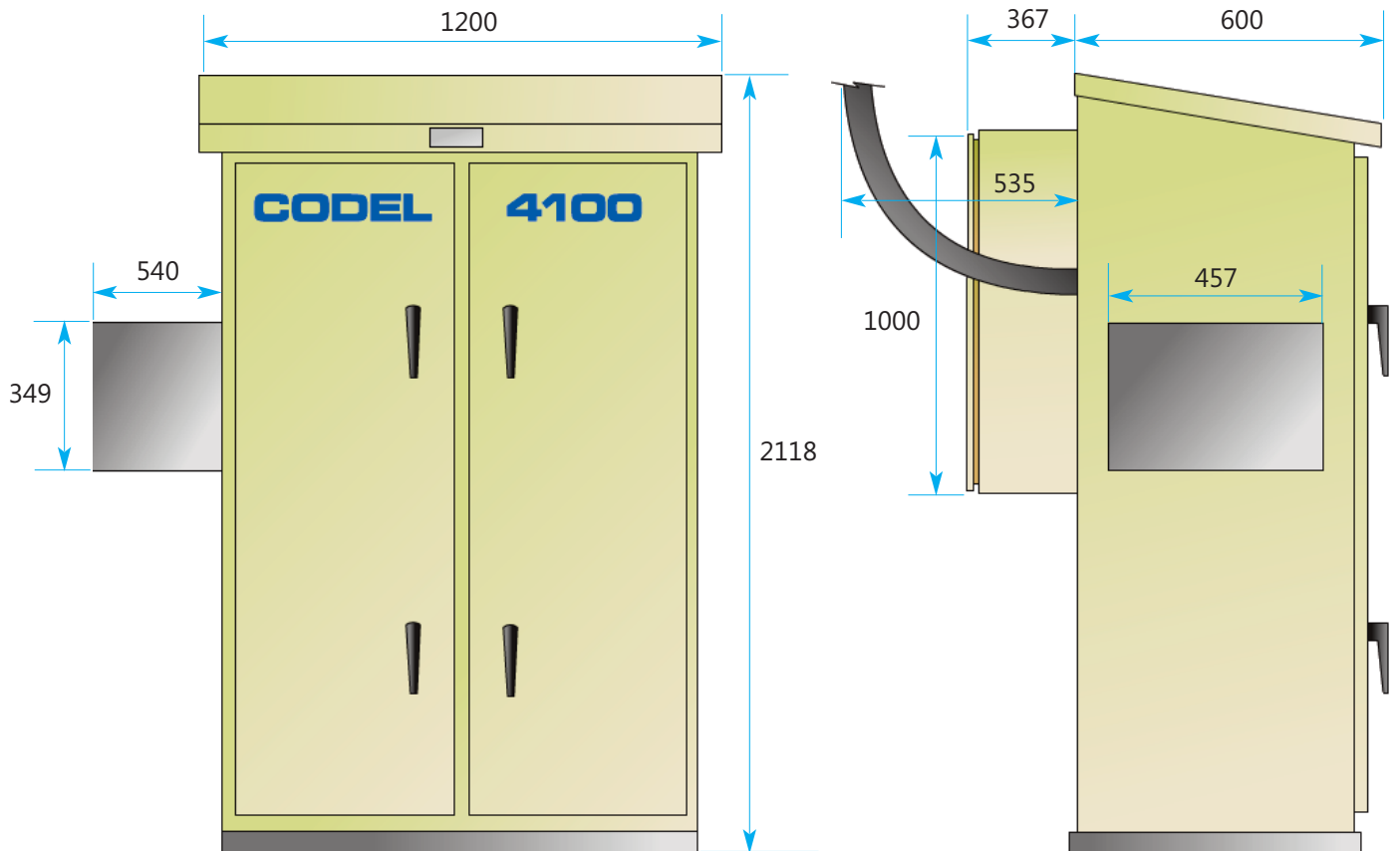


CODEL SmartCEM Software

## GCEM4100 Extractive Gas Analyser & CEMS Panel - Overall Dimensions



## GCEM4100 Extractive Gas Analyser with Air Conditioned Cabinet - Overall Dimensions



## SmartCEM Software

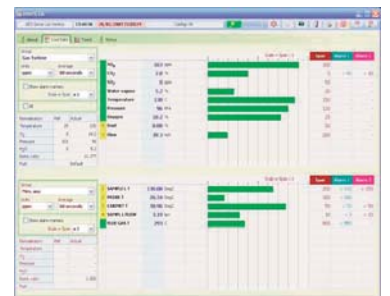
- Detailed and customisable reports to meet Regulatory Agency requirements
- User configurable real-time and historical graphing facilities for data analysis
- Data export to popular applications such as Excel etc
- Multi-user networking capability
- Real-time normalisation of data
- Satisfies EN14181 QAL3 requirements
- Data storage on PC hard drive of at least 10 years
- Easy installation and set-up
- Intuitive operation
- Will operate on all Windows based operating systems

SmartCEM Emissions Monitoring Software provides the complete solution to data gathering and analysis on CODEL-based monitoring systems. With a simple installation and set-up routine, the program takes only minutes to load and configure and comes with a comprehensive on-board help feature.

### Real-time Displays

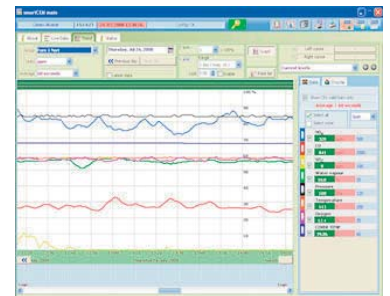
Using a serial link to communicate with the sensors, SmartCEM updates the live data screen every 30 seconds to keep the user aware of the current situation on plant, while alarms warn the operator of high emission levels.

Data is displayed in numerous formats - ppm, %, mg/Nm<sup>3</sup>, mg/m<sup>3</sup>, kg/hr assuming flow measurement is available etc. - and the change of format is instantaneous.



### Graphs

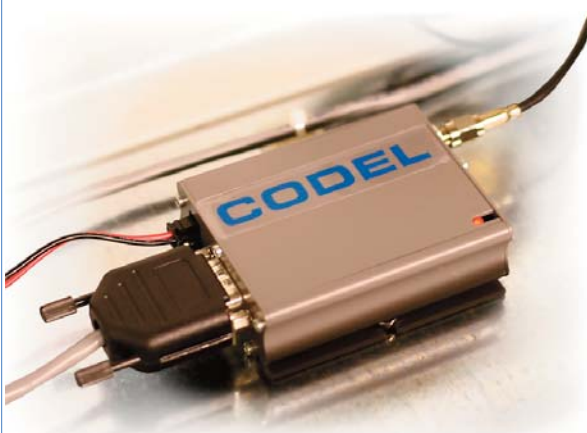
A key feature of SmartCEM is the provision of real-time and historical graphs providing detailed analysis of emissions data. One useful feature enables the user to highlight a period of time on the graph and obtain the average emissions. Data is easy to read and is configurable to individual operator requirements.



## GSM Unit

The GSM unit allows CODEL engineers direct access to any analyser in our range giving them full online remote diagnostic information for technical support.\*

This service can be offered for a nominal monthly charge



\* Network coverage can limit the use of this service

# GCEM4100 Extractive Gas Analyser - Technical Specification

## Sensor Unit

Gas Species Options	Maximum 7 gases from: CO, NO, NO <sub>2</sub> , NO <sub>x</sub> , N <sub>2</sub> O, SO <sub>2</sub> , HCl, CH <sub>4</sub> and CO <sub>2</sub> Gas temperature, pressure and H <sub>2</sub> O for data normalisation are standard.	
Measuring units	ppm, mg/Nm <sup>3</sup> , mg/m <sup>3</sup> , %	
Response Time	Less than 200 Seconds (T90)- MCERTS Specification	
Gas Temperature	Below dewpoint to 1300°C, See probe options below	
Calibration	Automatic and manual zero/span verification	
Gas Species	CO, NO, NO <sub>2</sub> , NO <sub>x</sub> , SO <sub>2</sub> , HCl, CH <sub>4</sub> , N <sub>2</sub> O	CO <sub>2</sub> , H <sub>2</sub> O
Max Measuring Range	0 - 6000 ppm, higher ranges available on request	0 - 25%
Accuracy	+/- 2ppm or 2% of span	0.5% or 2% of span
Resolution	+/- 1ppm	0.1%
Zero & span drift	+/- 2ppm or 2% of span per month	0.5% or 2% of span
Linearity	+/- 2% of span	2% of span
Repeatability	+/- 5ppm or 1% of span	0.3% or 1% of span
Ambient Temperature	-20°C to +50°C	
Construction	Corrosion resistant epoxy coated aluminium housing sealed to IP66	

## Heated Sample Line

Single Core	PTFE tube, non interchangeable, self regulating
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## Probe

Standard Probe	0 - 600°C Stainless Steel
High Temp Probe	0 - 900°C Hasteloy, 0 - 1100°C Inconol, 0 - 1300°C Kanthol

## Compliances

EMC	89/336/EEC directive compliant
Low Voltage	73/23/EEC directive compliant

## Analyser Cabinet

Analogue outputs	4-20mA current outputs for each gas channel supplied, isolated, 500Ω load max, fully configurable from software.
Logic Outputs	up to 8 x volt-free SPCO contacts, 50V, 1A max, configurable as alarm contacts 1 x volt-free SPCO contact, 50V, 1A max, for data valid signal
Inputs	1 x 4-20mA for oxygen
Serial Data	RS232
Construction	Mild steel construction powder coated to IP66 or 55 (Double door)
Ambient Temperature	-20°C to +50°C
Power Supply	90 - 132VAC or 180 - 264VAC by switch
Air Dryer	For clean, dry, oil-free air

## Services

Power	Mains 230 VAC, single phase, 50/60hz
Air Requirement	Clean and dry compressed air @ 4bar
Consumption	Air mover driven (Single line up to 60m) normal operation 100L/pm, calibration 110L/pm Pump driven (Single line over 60m) normal operation 5L/pm, calibration 30L/pm

## Optional Items

Central Data Controller	For connection to additional SmartCEM systems
Plug-in PCB	4 - 20mA Input PCB
Plug-in PCB	Contact input PCB
Plug-in PCB	RS485 PCB for Modbus Output
Software	CODEL SmartCEM Software - See SmartCEM software data sheet

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## Distributor

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