



## Continuous Emission Monitoring

GCEM 40 Series Extractive Gas Analyser CO, NO, NO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub>, CH<sub>4</sub>, HCl, CO<sub>2</sub> & H<sub>2</sub>O

### **Extractive low cost, low maintenance devices for continuous process and emissions monitoring.**

- Single or 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
- Auto routine calibration - Zero and span calibration using audit gas
- Analogue and serial outputs - Export of data to SCADA, DCS and historian systems



## GCEM 40 Series Extractive Gas Analyser

The GCEM40E hot extractive multi-channel gas analyser is CODEL's industry-proven continuous emissions monitor for difficult applications. Designed exclusively for use on a wide range of applications where the flue gas temperature is abnormally high, low or saturated.

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 GCEM40E creates 'perfect' duct conditions in a temperature controlled chamber within a separate free-standing 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 gases. The GCEM40E 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 GCEM40E analyser is capable of measuring a range of 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>, H<sub>2</sub>O and O<sub>2</sub> 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

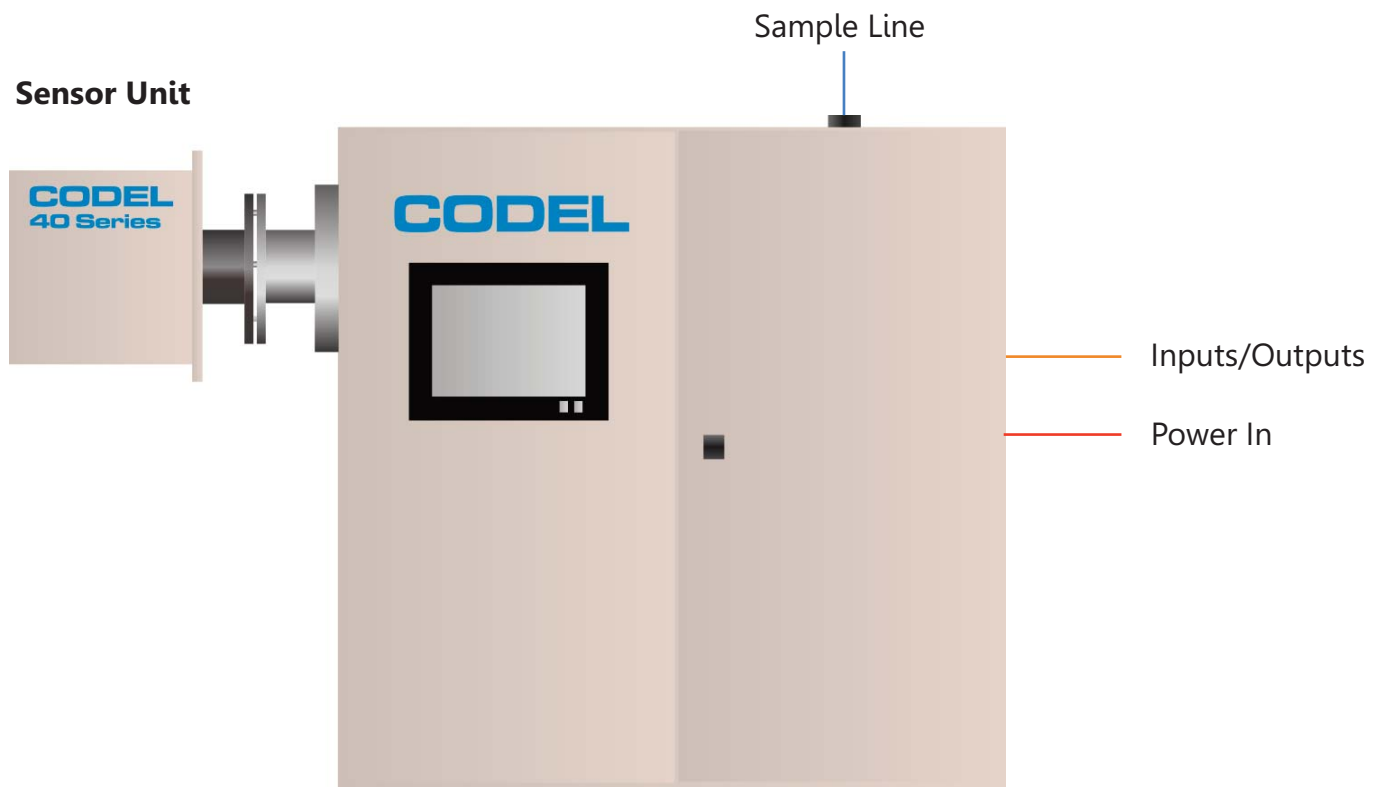


Heated Sample Line



GCEM40E Gas Analyser

## GCEM 40 Series Gas Analyser - System Arrangement

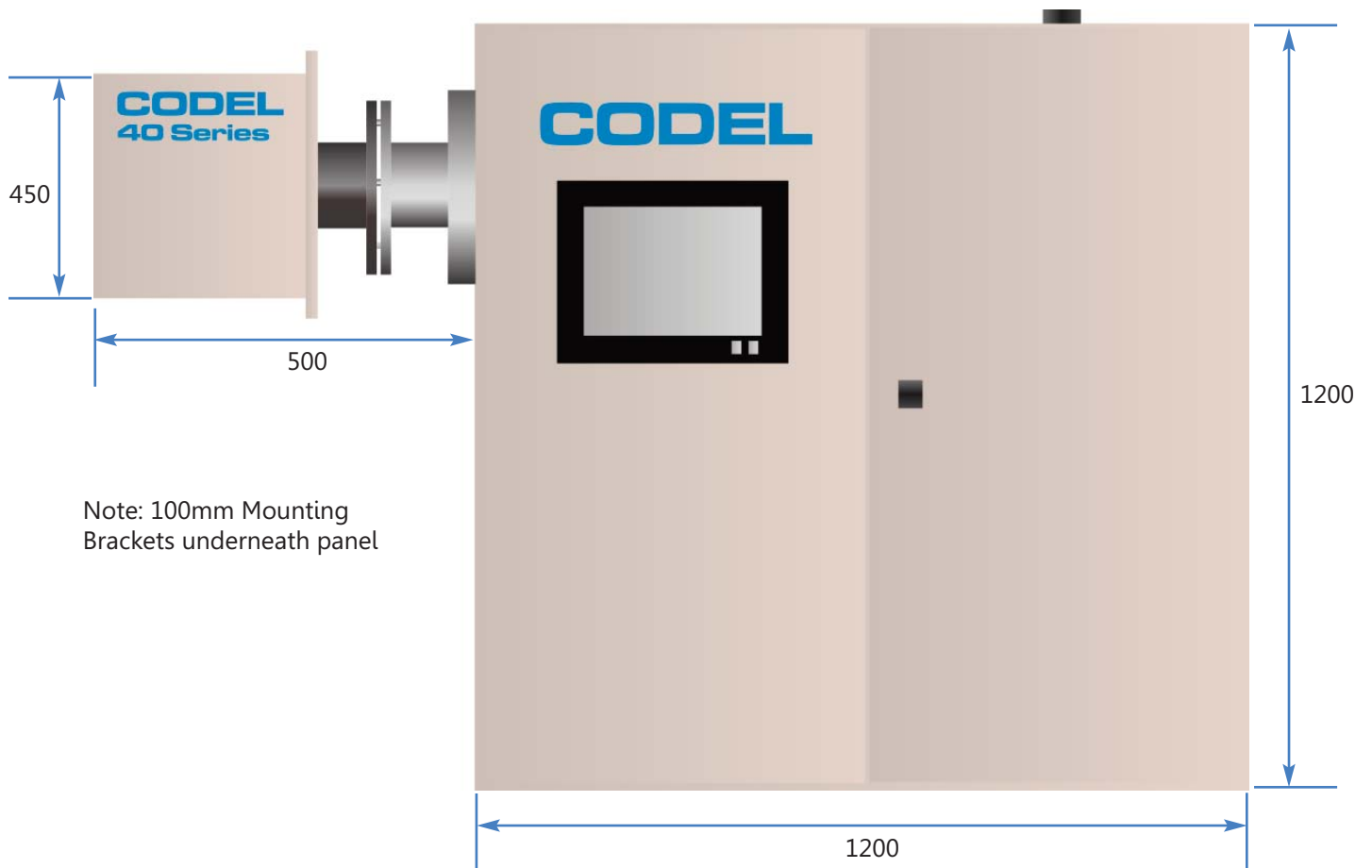


## GCEM 40 Series Gas Analyser - Options



Embedded Touch Screen Display

# GCEM 40 Series Extractive Gas Analyser - Overall Dimensions



Note: All dimensions are in mm

## SmartCEM Software

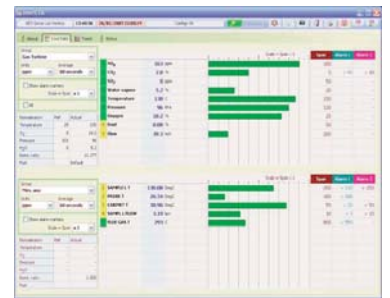
- Detailed and customisable reports to meet Regulatory Agency requirements (including Chinese EPA, LCPD, WID)
- User configurable real-time and historical graphing facilities for data analysis
- Data export to popular applications such as Excel etc
- Multi-user networking capability
- Real-time normalisation of data
- Data storage on PC hard drive of at least 10 years
- Easy installation and set-up
- Intuitive operation
- Will operate on 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

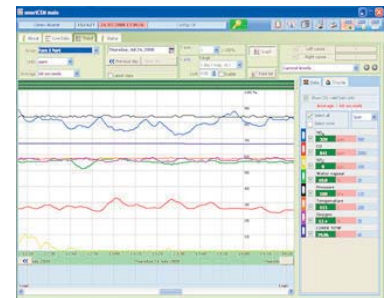
Using a serial link to communicate with the sensors, SmartCEM updates the live data screen every 30 seconds to keep the user aware of the current situation on plant, while alarms warn the operator of high emission levels.

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

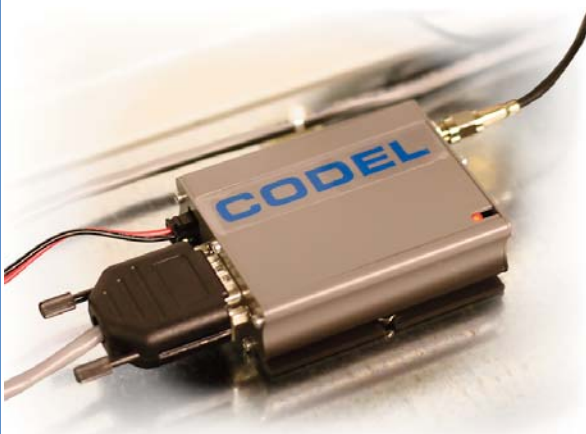
A key feature of SmartCEM is the provision of real-time and historical graphs providing detailed analysis of emissions data. One useful feature enables the user to highlight a period of time on the graph and obtain the average emissions. Data is easy to read and is configurable to individual operator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

# GCEM 40 Series Gas Analyser - Technical Specification

## Sensor Unit

Gas Species Options	Single or multi-gas measurements available: Maximum 3 gases from: CO, NO, NO <sub>2</sub> , NO <sub>x</sub> , SO <sub>2</sub> , CH <sub>4</sub> plus gas temperature Plus optional : CO <sub>2</sub> , H <sub>2</sub> O, pressure for data normalisation	
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
High Dust Loads	0 - 600°C Stainless Steel

## 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 as standard (upto 8 optional)
Serial Data	RS232 / RS485 (modbus protocol)
Construction	Mild steel construction powder coated to IP66 or 55 (Double door)
Ambient Temperature	-20°C to +50°C
Power Supply	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

## 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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