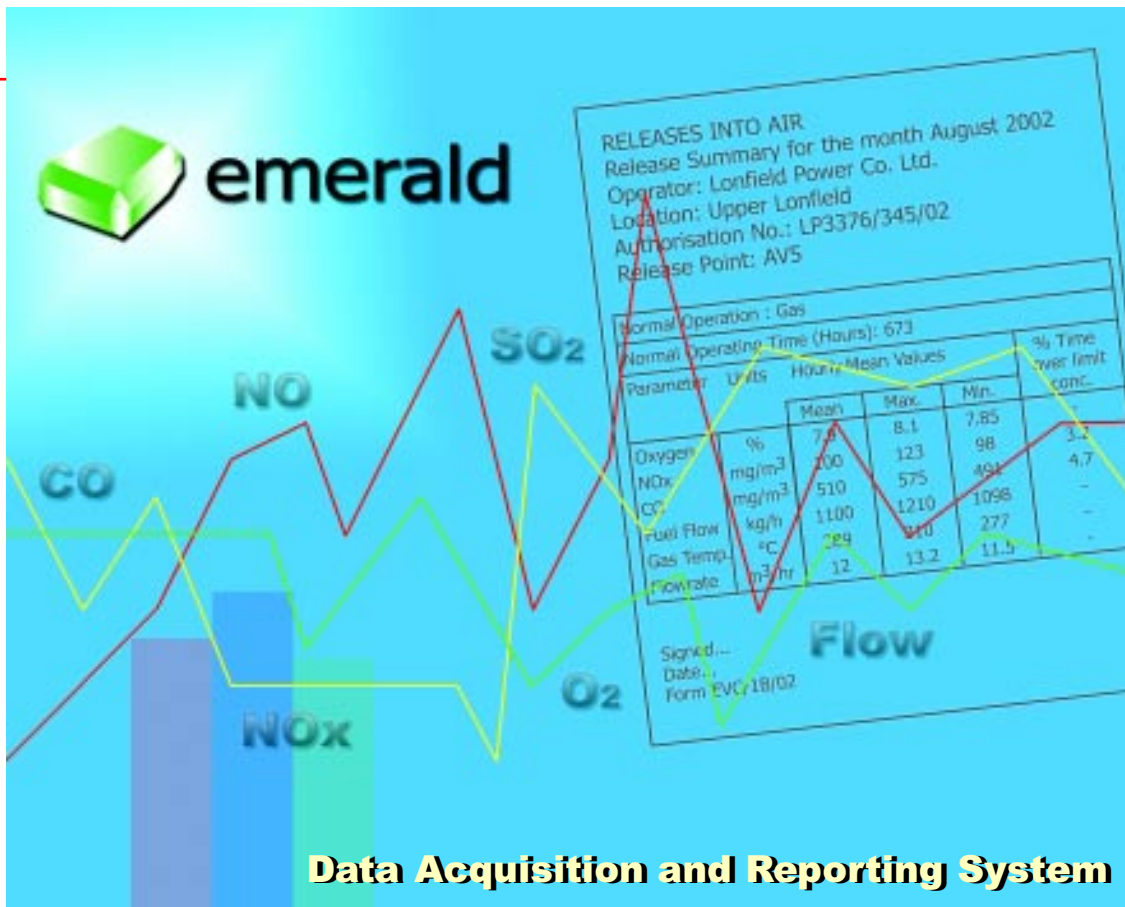# continuous

emissions

monitoring

Data Acquisition and Reporting System

LAND
instruments international

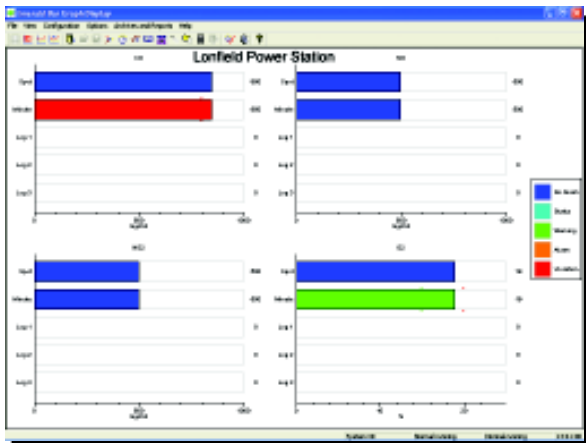**Combustion & Environmental Monitoring**

emerald
data acquisition and reporting system

Emerald is a highly flexible and fully configurable data acquisition and reporting system for continuous emissions monitoring. This inherent flexibility enables Emerald to meet the requirements of Environmental Regulation Authorities throughout the world.

Features and Benefits

- **Meets your local environmental regulations** - *Flexible configuration, adaptable to future requirements*
- **Simple to install on plant** - *Analogue, digital & serial communications using two-wire connections*
- **Comprehensive, versatile system configuration** - *Trends, reports, tables, averages, statistics, etc.*
- **Data meets known compliance standards** - *Full measurement correction & normalisation capability*
- **Automatic report generation** - *Archives and prints at required intervals*
- **Easy data access** - *Modbus link to SCADA/DCS*
- **System responds to continuous process changes** - *Event driven decision making*

Bar Chart display format

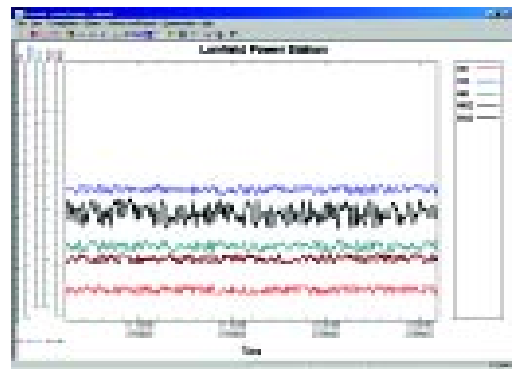## Flexible setup, simple operation

Emerald is both simple to use and highly flexible, using the power and simplicity of Windows™. Configuration and operation are fully menu-controlled and most routine functions can be fully automated.

- ▶ **Data displayed as tables or graphs**
- ▶ **Real-time or historical data display**
- ▶ **Customised display formats**
- ▶ **Continuous event log**
- ▶ **Automatic report generation**
- ▶ **Password-controlled system access**
- ▶ **Data export in ASCII format**

Meets all demands of Compliance Monitoring

Emerald has been engineered to meet current and future compliance monitoring requirements. Normalisations and emissions calculations can be configured to meet specific requirements.

- ▶ **Reports and displays in ppm, mg/Nm³, lb/cu ft, lb/mmBTU, ng/J, mass flow rate, etc.**
- ▶ **Calculation of volumetric flow, water content**
- ▶ **Normalisation to temperature, pressure, oxygen CO_2 and water content**
- ▶ **Total Mass Emissions**
- ▶ **Rolling or clock averages**
- ▶ **Alarms**
- ▶ **Statistical Limit calculations**
- ▶ **Management of multi-fuel systems**
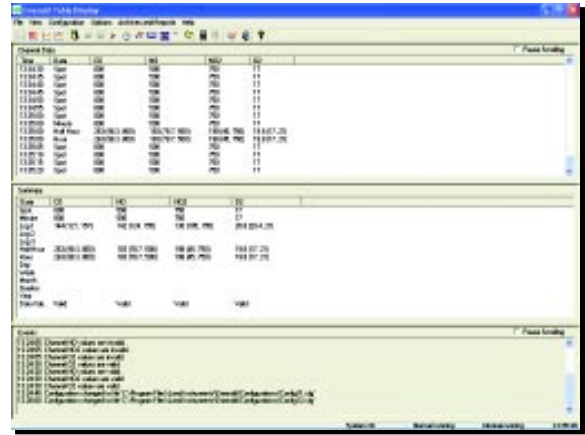- ▶ **Configurable for process Start-up and Shutdown**

Trend Graph display

Versatile Data Acquisition

Emerald can capture and store data automatically, and produce a range of calculations and reports at user-defined intervals. Configurable for analogue, digital or mixed inputs.

▶ **Automatic data storage**

▶ **Daily, monthly and annual records**

▶ **Automatic or manual archive facility**
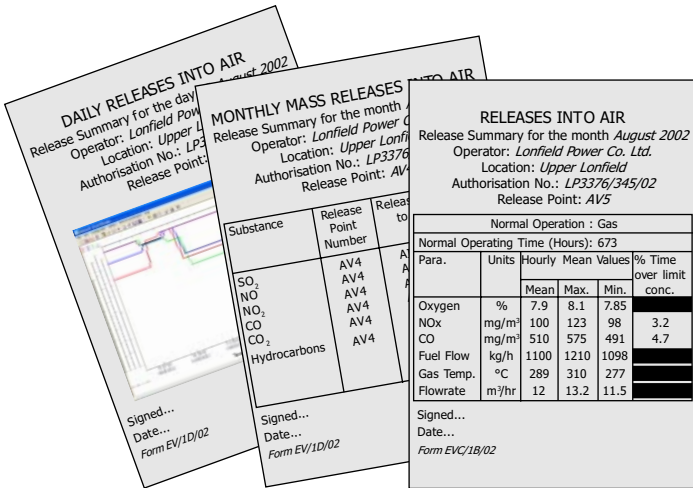
▶ **Calculation of min., mean and max. values**

Data Table and Event Log

RELEASES INTO AIR
Release Summary for the month *August 2002*
Operator: *Lonfield Power Co. Ltd.*
Location: *Upper Lonfield*
Authorisation No.: *LP3376/345/02*
Release Point: *AV5*

Normal Operation : Gas				
Normal Operating Time (Hours): 673				
Para.	Units	Hourly Mean Values			% Time over limit conc.
		Mean	Max.	Min.	
Oxygen	%	7.9	8.1	7.85	
NOx	mg/m³	100	123	98	3.2
CO	mg/m³	510	575	491	4.7
Fuel Flow	kg/h	1100	1210	1098	
Gas Temp.	°C	289	310	277	
Flowrate	m³/hr	12	13.2	11.5	

Signed…
Date…
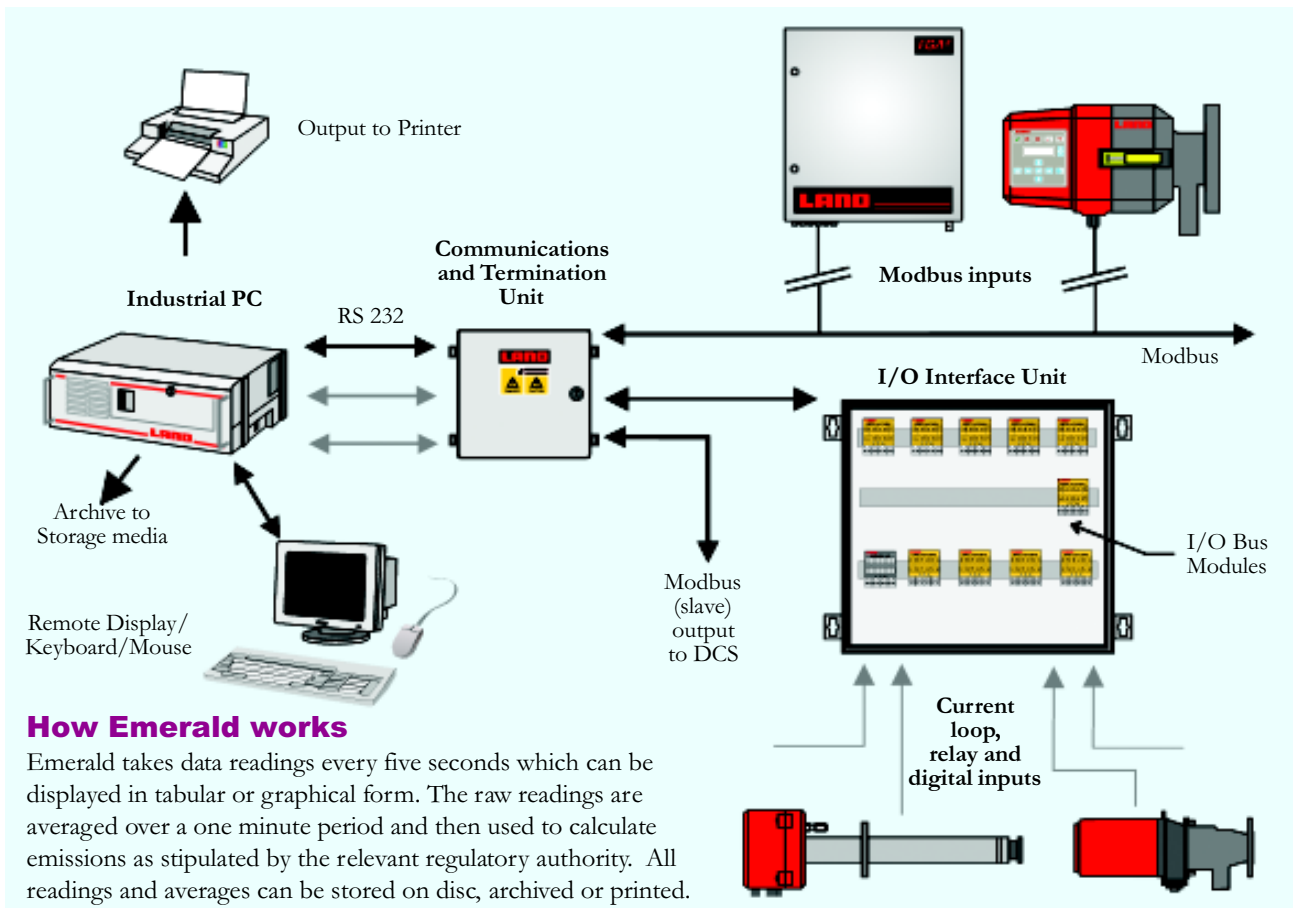*Form EVC/1B/02*

Full range of reporting formats

Environmental Emissions Reporting

Emerald has a wide range of data reporting options available, to meet the requirements of local, national and international environmental authorities.

▶ **Automatic or manual reporting**

▶ **Calculation of Average and peak values**

▶ **Time above emissions limit reporting**

▶ **Total emissions accumulation**

▶ **Correction to specified reference conditions**

Output to Printer

Industrial PC

RS 232

Communications and Termination Unit

Modbus inputs

Modbus

I/O Interface Unit

Archive to Storage media

Remote Display/ Keyboard/Mouse

Modbus (slave) output to DCS

I/O Bus Modules

Current loop, relay and digital inputs

How Emerald works

Emerald takes data readings every five seconds which can be displayed in tabular or graphical form. The raw readings are averaged over a one minute period and then used to calculate emissions as stipulated by the relevant regulatory authority. All readings and averages can be stored on disc, archived or printed.

Communications and Termination Unit

The Communications and Termination Unit (CTU) provides a convenient way to manage all the connections between the fixed plant wiring and the Emerald computer system. The unit is a small box which can be mounted up to 15m (50 ft) from the computer. An RS485 data channel is fitted as standard, which can be used for either Modbus or connection to the I/O Interface Unit. Optional second and third channels can be fitted where required.

I/O Interface Unit

This is a wall-mounted, stainless steel box containing a universal power supply and the I/O modules. Communications (to the CTU) are made using a high-speed data bus. The I/O interface unit can be mounted up to 1 mile (2 kilometres) from the Communications and Termination Unit. A low temperature version is available, which is fitted with an anti-condensation heater.

Specifications

Standard System Components

Industrial Grade Pentium PC (either rack-mountable or desktop) including: display, keyboard, mouse, colour printer and removable storage media

Communications and Termination Unit with one serial data port for Modbus communications (plus space for 2 additional ports), suitable for wall mounting

Emerald software system

Site specific configuration of software, with data acquisition, averaging, normalisation, storage and archiving

Custom created reports including monthly, quarterly and annual data

I/O Interface Unit (max. of 10 modules per Interface Unit)
  Current Loop Input (CLIP) module*, for up to 8 inputs
  Digital Input (DDIP) module, for up to 8 inputs
  Relay Output Module, for up to 5 outputs
  Current Loop Output (CLOP) module*, for up to 8 outputs

* Note: Current loop modules can be wired individually for active or passive supply operation.

Optional Components

Additional data channels for Communications and Termination Unit

Alternative languages

Rack-mounted configuration

I/O Heater Unit (for low ambient temperature)

Continuous product development may make it necessary to change these details without notice

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Land Instruments International has a comprehensive range of Combustion and Environmental Monitoring Instrumentation.

Approval applies to products designed and manufactured in the UK