



# SWAN ENVIRONMENTAL

MONITORING SOLUTIONS



## OUR GLOBAL PARTNERS



## Online TOC / BOD / COD / TN Analyzer

- Rapid method for determination of organic load and thus early warning and pollution control management.
- High performance on-line Total Organic Carbon (TOC) analyzer using the established 680°C Catalytic Combustion and Non-Dispersive Infrared (NDIR) Detection method based on USEPA/ASTM methods.
- Total Nitrogen (TN) measurement by 720°C Thermal decomposition / Chemiluminescence detection : as per EN 12260 & ASTM D-8083

### Applications:

- Practical alternative to COD/BOD for plant control, process management and monitoring of influent and effluent water in wastewater treatment plant
- Management of various plant waters. (i.e.: Washing, Rinsing, Cooling, Circulating, Boiler, Condensate, and other plant liquids)
- Monitoring of Surface Water (Rivers, Lakes and Streams)
- Water Quality Monitoring for regulatory reporting
- TOC/COD control for pharma effluent feeding to MEE (Multiple Effect Evaporators)



## Effluent Quality Monitoring System (EQMS)

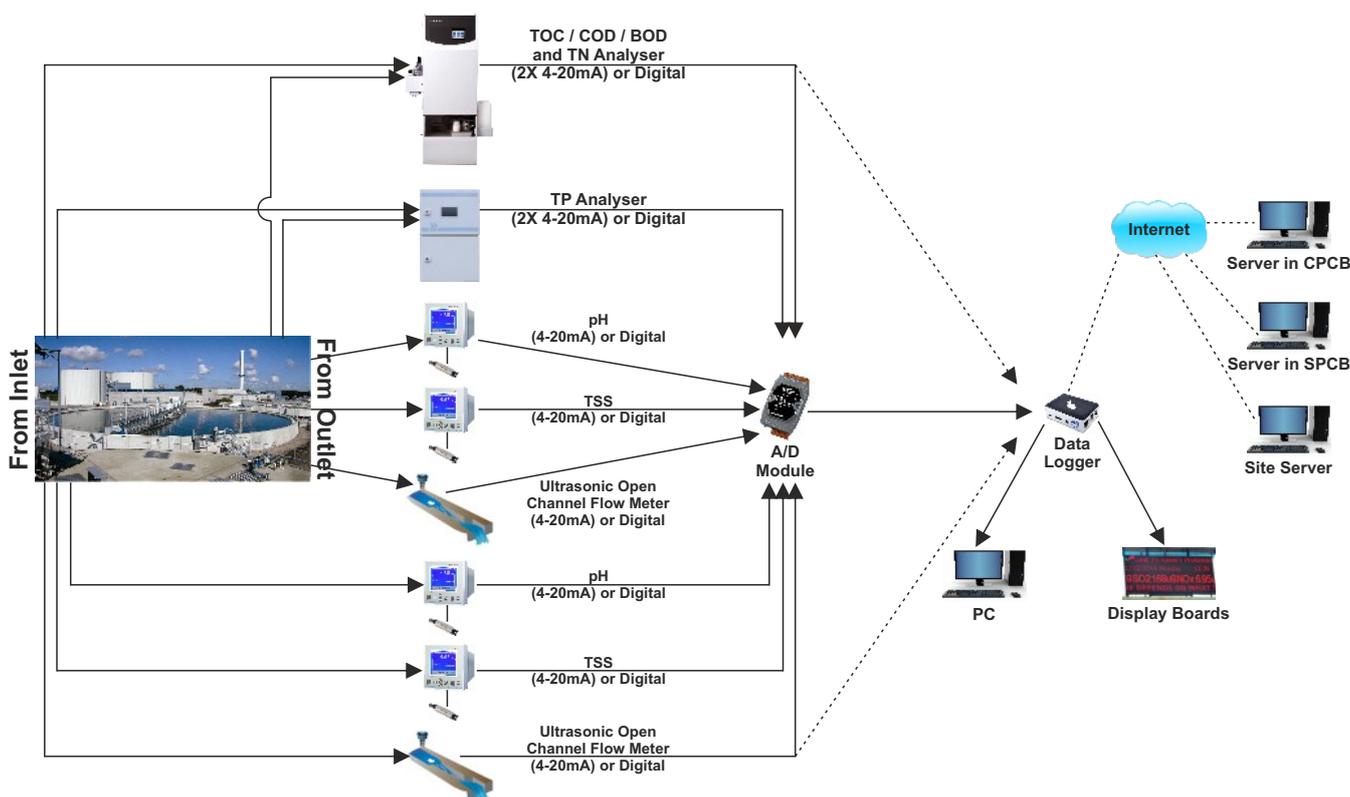
Effluent Quality Monitoring System (EQMS) is integrated with multi channel analysers which accepts sensors like pH, TSS, DO, Temperature, Flow etc., & analysers like TOC, TP etc. with all options connected to data logging system and PC/client server.

### Turnkey Solutions:

- SWAN offers turnkey solutions for EQMS that span from design and detailed engineering, system integration, supply to installations, commissioning and uploading of data to PCB and company corporate servers.
- SWAN offers entire range of associated products as part of EQMS solution that include prefabricated shelter, UPS, PC, Display Boards, Networking Components, Wi-Fi units, Gateways, A/D converters etc.
- Requirements are thoroughly studied to identify the items needed & engineering carried out to bring out most economical and sustaining customized solutions.
- Dedicated trained and experienced service team for after sales support across India.

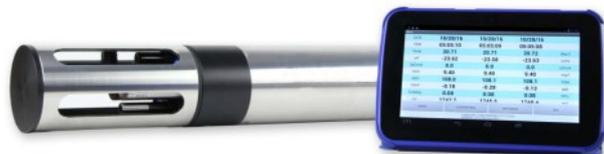
### Features:

- COD/BOD Monitoring using MCERTS Certified TOC Analyser (680°C Catalytic Combustion) which is in compliance with the regulatory methods specified in USEPA 415.1, ASTM 5310B, EN 1484 and CPCB.
- Uploading of data to CPCB, SPCBs, PCC and company Corporate Servers.
- Cloud server facility.
- Remote calibration facility.
- Monitor efficiency of ETP.



## Real Time Inline BOD / COD / TC / FC Monitoring System

- Award-winning multi-parameter, real-time sensor platform (portable or permanent) that accurately and reliably measures various parameters like BOD, COD, faecal coliforms with UV Fluorescence Technology etc. in open channels for permanent and temporary applications.
- It is the world's first scientifically proven real-time sensor for measuring BOD in a wide range of applications.
- A multiprobe that measures your choice of parameter, all in one package, that can deliver data in the toughest field conditions.
- It has been designed for its ease of use, reliable data and economical operation.
- Supplied with an integral wiper which cleans all of its sensors before every measurement cycle.
- Can be effortlessly integrated with telemetry/SCADA systems and other datalogging devices with external RS232 / Modbus / SDI12
- System is fully serviceable in the field, almost no maintenance
- Power Options : Internal lithium battery pack, external power source (mains or solar).



### Parameters:

- BOD/COD
- CDOM, TOC
- DO
- Pressure
- Chloride
- pH
- Temperature
- Optical Brighteners
- Nitrate
- Faecal Coliforms
- ORP / Redox
- Tryptophan
- Refined Oils
- Ammonium
- EC / Salinity / TDS
- Turbidity
- Crude Oils CDOM

### Applications

- BOD Loading to Wastewater Treatment Works (WWTWs)
- Combined Sewage Overflow (CSO) event monitoring
- Point Source Pollution monitoring
- Faecal Coliform monitoring
- Efficiencies of Wastewater Treatment Works
- Diffuse Pollution Monitoring
- Groundwater Water Quality Monitoring
- Survey tool combined with Bluetooth®

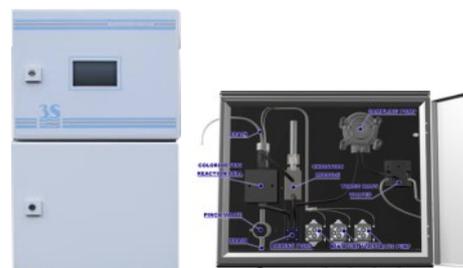
## Online pH, TSS / MLSS, Conductivity Analysers



- Continuously measure pH, TSS / MLSS, Conductivity parameters
- Microprocessor based digital program controller.
- Automatic Cleaning Control (Air jet, Water jet) Function
- Isolated DC (4-20/0-20/0-24mA) output transmission
- Built-in backlight graphical LCD
- Manual/Auto calibration
- Temperature compensation
- Real Time Trend Analyzer Function
- CE Mark Accredited

## Online Colorimetric Analyser

- Measures Total Phosphorous (TP), Cyanide, Phenol, Cr-VI, NH<sub>3</sub>, Phosphate, Chlorine
- Based on Photometric principle
- Low reagent level alarm
- Automatic calibration / Validation / Cleaning
- Separate waste line for sample containing reagents
- Long autonomy, low maintenance & operating cost
- Dual stream, Easy installation, Robust
- Color touchscreen interface



## Optical Dissolved Oxygen Sensor



- Based on luminescent optical technology. Body in Stainless steel (316 L) or Titanium
- Measures accurately even under very low oxygen concentrations. No drift, Reduced maintenance.
- "Smart" sensor stores calibration and history data within the sensor. This allows you a "plug and play" system without re-calibration.
- Digital technology for optimized measures. Modbus RS-485. Can be connected to all devices commonly used (Datalogger, Controller, Automat, Remote System...).

## Continuous Emission Monitoring System (CEMS)

Continuous Emission Monitoring System (CEMS) is integrated with multi channel analysers which measures gases like SO<sub>2</sub>, NO<sub>2</sub>, NO, CO, CO<sub>2</sub>, O<sub>2</sub>, TOC/VOC/THC etc. with all options connected to data logging system and PC/client server.



**NDUV (DOAS)**

- **SO<sub>2</sub>, NO<sub>2</sub> & NO Analyser:** NDUV (Non Dispersive Ultra Violet) based. Extractive type. High accuracy and reliability, fast response time. No cross interference between the gas being measured



**NDIR**

- **SO<sub>2</sub>, NO<sub>2</sub>, NO, CO, CO<sub>2</sub> & O<sub>2</sub> Analyser:** NDIR (Non Dispersive Infra Red) based CO & CO<sub>2</sub> measurements. In-path type. Zirconium cell based O<sub>2</sub> measurement. In-situ type. Accurate measurement of low concentration gas.



**TDLAS**

- **CO, CO<sub>2</sub> etc. Analyser:** TDLAS (Tunable Diode Laser Absorption Spectrum) technology and multiple reflection long optical path technology based. Extractive type. Measurable gases: O<sub>2</sub>, CO, NH<sub>3</sub>, H<sub>2</sub>S, CO<sub>2</sub>, CH<sub>4</sub>, H<sub>2</sub>O.



**GC-FID**

- **TOC/VOC/THC Analyser:** Based on chromatographic methods and FID detector. Can monitor VOC's, CH<sub>4</sub>, THC, NMHC, low-carbon aldehyde ketone, benzene series (benzene, toluene, xylene, ethyl benzene, isopropyl benzene) & part of halogenated hydrocarbons.

### Features:

- As per US EPA Methods and CPCB Guidelines
- In line with CPCB regulations
- Uploading of data to CPCB, SPCBs, PCC and company corporate servers.
- Cloud server facility.
- Remote calibration facility.

### Turnkey Solutions:

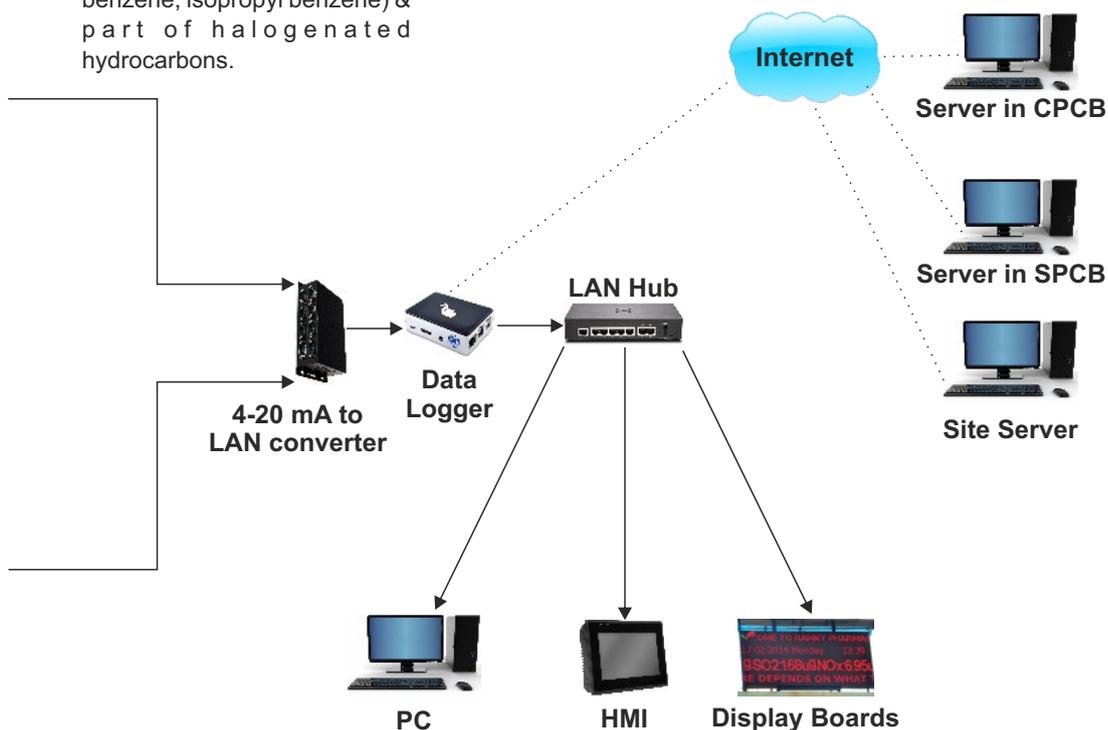
- SWAN offers turnkey solutions for CEMS that span from design and detailed engineering, system integration, supply to installations, commissioning and uploading of data to PCB and company corporate servers.
- SWAN offers entire range of associated products as part of CEMS solution that include prefabricated shelter, UPS, PC, display boards, networking components, Wi-Fi units, gateways, A/D converters etc.
- Requirements are thoroughly studied to identify the items needed & engineering carried out to bring out most economical and sustaining customized solutions.
- Dedicated trained and experienced service team for after sales support across India.



**EM 5 - CEMS**



**Dust Monitor**



## FTIR Based Continuous Emission Monitoring System

- TÜV and MCERTS certified solution (QAL1) for a wide range of demanding emission monitoring applications.
- As all system parts are heated up to 180 °C, this extractive system is ideal to measure trace concentrations of pollutants from hot, wet and corrosive gas streams.
- Based on Fourier Transform Infra Red (FTIR) measurement principle.
- Typical measuring parameters like H<sub>2</sub>O, CO<sub>2</sub>, CO, N<sub>2</sub>O, NO, NO<sub>2</sub>, SO<sub>2</sub>, HCl, HF, NH<sub>3</sub>, CH<sub>4</sub>, C<sub>2</sub>H<sub>6</sub>, C<sub>3</sub>H<sub>8</sub>, C<sub>2</sub>H<sub>4</sub>. Optional TOC (ZID), O<sub>2</sub> (Zirconium) also.
- The system can be easily configured for a new set of compounds.
- Measured components and calibration ranges can be designed according to the application.
- The operation of the system is fully automatic and controlled by the Calcmet™ software. Additionally all functions can be manually controlled.
- Both measuring data and alarm information can be transferred to other automation or reporting systems with analog or digital format.

### Key Advantages

- EN 15267 certified
- Flexible design with options according to your need
- Reliable system with low need for maintenance



## CVAF Based Mercury Monitor

- TÜV and MCERTS certified solution (QAL1) for measuring mercury continuously from hot, wet and corrosive gas streams.
- Based on Cold Vapor Atomic Fluorescence (CVAF) measurement principle.
- Consists of dilution probe, heated sample line, Gasmet mercury analyzer and Gasmet test gas generator.
- Heated dilution probe with a two-stage blowback system ensures the durability and low maintenance of the system even in demanding conditions.
- Simple probe design: Direct sampling with sample dilution and effective filter blowback system.
- The integrated thermal converter converts all mercury compounds to elemental mercury to measure total gaseous mercury.
- Has the lowest certified range in the world (0-5 µg/m<sup>3</sup>).
- Very low detection limit (ng/Nm<sup>3</sup>).
- Virtually no interference from other gases such as SO<sub>2</sub>, HCl
- Low operating costs: No need for separate chemicals, gold amalgamation concentrators, acid scrubbers or additional gases

### Key Advantages

- Lowest certified range in the world
- EN 15267 certified
- Online results
- Quick response
- Fully automatic system
- Future-proof with the highest sensitivity in the market
- Reliable system with low need for maintenance



## NDIR Based Emission Monitoring Systems

- Continuous Stack Emission Analysers based on ratio photometric NDIR Technology for measurement of 1 to 5 gases from NO<sub>x</sub>, SO<sub>2</sub>, CO, CO<sub>2</sub>, etc.. from Emissions. O<sub>2</sub> by Paramagnetic /Zirconia measurement.
- Probe is installed in the stack and Analyser in the room connected with Sample Line measures high range % to ppm levels.
- Fast Response time, High Sensitivity, High Precision, Low Drift and easy for Maintenance.
- Simultaneous display of all measured values on large LCD.
- Reduced operation cost due to small gas consumption by dry calibration.



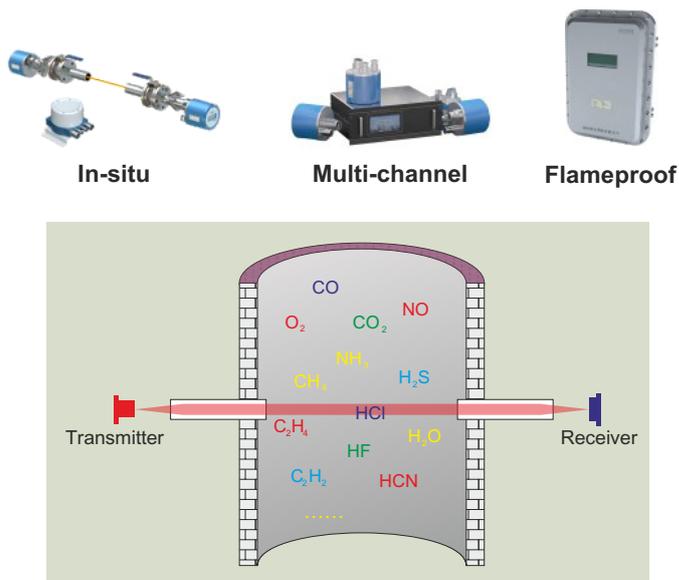
## TUV Certified Continuous Emission Monitoring Systems

- Simultaneous and continuous measurement of concentration of up to 5 gas components (NO<sub>x</sub>, SO<sub>2</sub>, CO, CO<sub>2</sub>, CH<sub>4</sub>, and O<sub>2</sub>)
- NO, SO<sub>2</sub>, CO<sub>2</sub>, CO and CH<sub>4</sub> are measured by Non-Dispersion Infrared Method (NDIR), while O<sub>2</sub> is measured by fuel cell, or zirconia method.
- Excellent prolonged stability
- Compact size and simple operation
- Virtually unaffected by the interference of moisture.
- Substantial functions, including automatic calibration, communications, and alarms.
- Easy Maintenance by adoption of single beam system.



## Laser Based Stack Gas Analysers

- Based on unique Tunable Diode Laser Absorption Spectrum (TDLAS) technology.
- LGT series laser gas analyzer for industrial online analysis and environmental online monitoring.
- Different models available are: in-situ probe type, bypass type, multi-channel type, panel mounted type and flameproof type etc.
- Laser gas analyzers are used in a wide variety of applications to measure O<sub>2</sub>, CO, NH<sub>3</sub>, CO<sub>2</sub>, CH<sub>4</sub>, H<sub>2</sub>O, H<sub>2</sub>S, HCl and HF etc.
- Measuring concentration ranges from constant to trace.
- High sensitivity, high resolution, fast response.
- Modular design, can replace laser module and detector module at the scene, don't need to adjust the light path.
- High, laser integrated in transmit unit, algorithm is directly realized within the receive unit, no additional central unit.
- Flame-proof, only positive pressure purge gas is needed.
- Support the X and Y direction coupling optical path adjustment technology (patent technology), convenient installation



## Slip Gas Analyser - NH<sub>3</sub>, NO, O<sub>2</sub>

- The Analyser (NH<sub>3</sub>, NO, O<sub>2</sub>) is based on a Tunable Semiconductor Laser Absorption Spectroscopy (TDLAS) and Ultraviolet Difference Absorption Spectroscopy (DOAS) Technology.
- Single line spectrum technology avoids interference of background gas absorption, low detection limit, small scale drift.
- More than 220°C heat tracing avoids ammonium salt crystallization and moisture dissolve and absorption
- Compact structure, easy to install, high degree of automation, small amount of maintenance.



## Pressure, Temperature & Flow-rate Integrated Monitor

- Widely used for Real-Time and continuous measurements of Flue Gas Temperature, Pressure, Velocity And Flow Quantity.
- Uses precision micro-differential pressure/static pressure sensor and unique pitot tube structural design, combined with auto. cal. and cleaning.
- LCD operating unit provides good human-machine interaction interface



## Handheld Combustion Emissions Analyser

- Evolved over the last 40 years.
- A Gas Analyzer that's Affordable & Comprehensive
- Perfect for both determining the efficiency of a combustion source as well as collecting advanced emissions data.
- Can be upgraded at any time (adding options to the same unit) to meet your changing needs.
- Low-cost, easy to use, portable.
- Applications : Boilers, Burners, Engines, Turbines, Generators, Kilns, Dryers, Heaters, Ovens etc.



## Portable FTIR Stack Gas Analyser

- FTIR (Fourier Transform Infra Red) based for short term on site measurements with wide dynamic ranges.
- Ideal tool to measure trace concentrations of pollutants in Wet, Corrosive Gas Streams
- The user can easily configure analyzer for a new set of compounds.
- Typically set-up to measure H<sub>2</sub>O, CO<sub>2</sub>, CO, NO, NO<sub>2</sub>, N<sub>2</sub>O, SO<sub>2</sub>, NH<sub>3</sub>, CH<sub>4</sub>, HCl, HF and different VOC's.
- MCERTS certified
- Portable and Battery Operated



## Portable Stack Gas Analyser

- Portable analyser using advanced technologies.
- Equipped with up to 7 electrochemical and 2 NDIR sensors. Has a built-in pressure sensor.
- Generally uses sensors: O<sub>2</sub>, CO, CO<sub>2</sub>, CH<sub>4</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, H<sub>2</sub>S, H<sub>2</sub>, Cl<sub>2</sub>, HCl, N<sub>2</sub>O, VOCs etc.
- Large internal memory for results and built-in ribbon printer for standard (non-thermal) paper.



## Portable Combustion Emissions Analyser

- Affordable, accurate, rugged, reliable, sophisticated and portable.
- Sensors are field replaceable.
- Field Calibration possible.
- Serial port (RS 232 port), USB port and Blue tooth for communication.
- Fully upgradeable. One can order new sensors & options to same unit over time
- Has a standard sample conditioning system.
- Applications : Boilers, Burners, Engines, Turbines, Generators, Kilns, Dryers, Heaters, Ovens



## Dust and Opacity Monitor

It is the most cost-effective dust monitor model, equipped with a semiconductor laser. It is excellent for measuring at the medium to long distances (3 - 10 m) and medium high concentrations. ( $> 25 \text{ mg/m}^3$ ). Laser light source-ultimate wavelength stability, Excellent collimation and High sensitivity

- Minimum optics needed - less maintenance
- Optimal for stacks up to 20 meters (with optional 100mm lens up to 40 meters)
- No moving parts-minimal maintenance
- Large operation range (0 ... 90 %)
- Good stability and reliability

### Features

- Based on the single pass measurement principle.
- Direct continuous measurement of opacity or optical density
- Small, lightweight and easy installation
- No moving parts and simple optics for long life operation
- Light source is a semiconductor laser
- Adjustable alarm values and alarm relay
- Linear voltage output 0 - 1 V and current output 4 - 20mA
- Digital LCD-display and analogue display for D-value
- 4 operation ranges (0 - 0.03 D, 0 - 0.1 D, 0 - 0.3 D, 0 - 1.0 D)
- Low maintenance requirements and small physical size due to simple optics

### Advantages of using a Laser Light Source

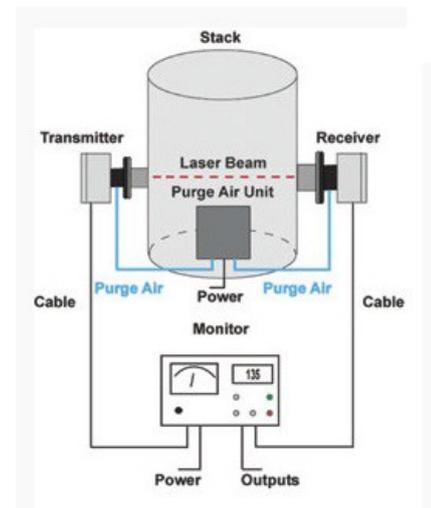
- Measuring path up to 20 meters possible, due to a narrow and intense laser light beam.
- Excellent beam collimation ( $0,04^\circ$ ) - no need to use lenses or mirrors in the transmitter making the system reliable and simple
- The analyser can be transferred to another location without factory calibration.
- The alignment of the beam is easy because the beam is narrow.

### Advantages of a semiconductor laser

- A very compact and intense light beam, the diameter is only a few millimetres. This means that only small hole, about 20mm, are needed in the stack simplifying the installation and requiring less purge air for the transmitter.
- Good stability and long life. In contrast to designs that use more traditional light bulbs, needing constant compensation, the laser source is relatively immune to the aging effect. The typical life span of a semiconductor laser is up to 10 years.
- Due to the high intensity of the laser the device can easily penetrate also higher dust densities
- Operation with known, clearly defined wavelengths. This makes the theoretical calculations and their results more predictable as opposed to conventional sources that operate over a broad range of wavelengths and whose spectrum changes with age.

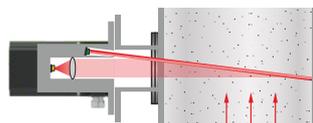
### Typical applications

- Continuous particle emission control in applications, where the measuring path is max 40 meters
- Max. dust content  $2 \text{ g/m}^3$
- This model is most commonly used in power plants burning oil, coal or bio-fuel, in cement plants or in Steel or Iron Furnaces



## Back Scattering based Dust Monitor

- Laser backward scattering type dust monitor
- In-situ type installation
- 4-20 mA analog output
- LCD Display for easy view.
- Measuring method as per CPCB guidelines
- Has In-situ zeroing and span calibration
- Automatic gain control function & temperature compensation
- Easy installation and convenient disassembly
- Without background light influence



## Tribo-electric Dust Monitor

- Dust Monitor continuously measures for 24 hrs the dust in exhaust gas at the secondary side of a dust collector or the like.
- Outputs the alarm signal at the abnormal condition
- It detects the tribo-electric charge of dust hitting the sensor probe and make outputs relative to the dust amount.
- Dust Monitor can be easily mounted on the existing facility to facilitate environmental management.



## Online Syngas Analyser

- Used for measurement of the concentration of up to 6 gases such as  $\text{CO}$ ,  $\text{CO}_2$ ,  $\text{H}_2$ ,  $\text{O}_2$ ,  $\text{CH}_4$ ,  $\text{C}_n\text{H}_m$ ,  $\text{C}_2\text{H}_2$  and  $\text{C}_2\text{H}_4$  simultaneously, and calculate the gas heating value (caloric value) and  $\text{N}_2$  balance automatically.
- Adopts intl. advanced NDIR & TCD gas analysis technology.
- Modular sensor design. Easy operation and maintenance.
- Integrated RS232/RS485 digital output and 4-20mA analog output
- Equipped with a Bluetooth module. Assist with a Smartphone APP software, it can realize Remote Control, Data download, and Remote online diagnosis function



## Online Biogas Analyser

- Designed to measure  $\text{CH}_4$ ,  $\text{CO}_2$ ,  $\text{H}_2\text{S}$  and  $\text{O}_2$  concentration simultaneously
- Based on NDIR technology for  $\text{CH}_4$ ,  $\text{CO}_2$  gases and ECD technology for  $\text{H}_2\text{S}$  and  $\text{O}_2$  gases.
- Applications: Biogas plants, landfill sites, water treatment, sludge digestion, biomethane production, CDM project, Anaerobic digestion and other fermentation processes.
- 4-20mA output and RS232 communication are available
- Modular sensor design. Easy operation and maintenance
- Self-developed gas conditioning device to remove vapor and dust in biogas for analyzer's protection in long term operation



## Multi Gas Analyser

- Precise and efficient online measurement in all kinds of processes
- NDIR: Single-Beam principle, cuvette heated up to  $85^\circ\text{C}$
- Automatic zero adjustment. Cross-sensitivity compensation
- Housing: 19 inch rack, 400 mm deep
- Number of gas components: NDIR 1-6
- Built-in sample gas pump, Built-in PC
- Low and high-precision detection limits



## Portable Gas Analyser

- Transportable gas measuring system for flexible field use
- NDIR: Single-Beam principle, cuvette heated to  $60^\circ\text{C}$
- Housing: ASA+PC-FR plastic, IP 54
- Measuring components:  $\text{CH}_4$  and  $\text{CO}_2$  (IR) /  $\text{H}_2\text{S}$  and  $\text{O}_2$  (EC)
- Measuring ranges:  $\text{CH}_4 = 0-100\%$  vol,  $\text{H}_2\text{S} = 0-2000$  ppm,  $\text{CO}_2 = 0-65\%$  vol,  $\text{O}_2 = 0-25\%$  vol
- Built-in sample gas pump



## Portable Infrared Syngas Analyser

- Ideal measurement solution for direct sampling from pipe at industrial site and gas-bag sampling analysis in laboratory, etc.
- Measures the concentration of up to 8 gases such as  $\text{CO}$ ,  $\text{CO}_2$ ,  $\text{H}_2$ ,  $\text{O}_2$ ,  $\text{CH}_4$ ,  $\text{C}_n\text{H}_m$ ,  $\text{C}_2\text{H}_2$  and  $\text{C}_2\text{H}_4$  simultaneously.
- Also calculated the gas heating value (caloric value) and  $\text{N}_2$  balance automatically.
- Small size, high accuracy, short response time, simple operation, rechargeable lithium battery power supply system.



## Handheld Biogas Analyser

- Measures up to 6 gases measuring:  $\text{CH}_4$ ,  $\text{CO}_2$ ,  $\text{H}_2\text{S}$ ,  $\text{O}_2$ ,  $\text{H}_2$ ,  $\text{CO}$  gases, even biogas flow monitoring
- Powered by lithium battery and can be used without AC power.
- It is modular sensor design ensures easy on operation and maintenance.
- Blue tooth communication to upload testing data into Mobile by specified APP directly
- GPS positioning and location



## Ultrasonic Bio-Gas Flowmeter

- Uses the latest ultrasonic transit-time differential method to measure natural gas flow and other kind of gases flow.
- No moving part, corrosion resistant, few pressure losses.
- Reliable accuracy in real time and need no routine maintenance.
- All-in-one detect probe, measure flow velocity, temperature and composition directly.
- Widely applied in industries of petroleum, chemical, electricity, metallurgy, urban gas supply etc.



## Portable Natural Gas Analyser

- Advanced NDIR gas analysis technology.
- Compact and robust design with light weight, convenient for different sites usage.
- Measures natural gas composition and heating value in real time.
- Standard configuration comprises of:  $\text{CH}_4$  +  $\text{C}_n\text{H}_m$  +  $\text{CO}_2$  + Calorific Value + Wobbe Index(optional)
- In-built sampling pump for low pressure application.
- External safety filter to protect analyzer from impurities
- Ideal for Coal bed gas and natural gas components monitoring and calorific value calculating.



An ISO 9001:2015  
Certified Company

# SWAN ENVIRONMENTAL PVT.LTD.

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